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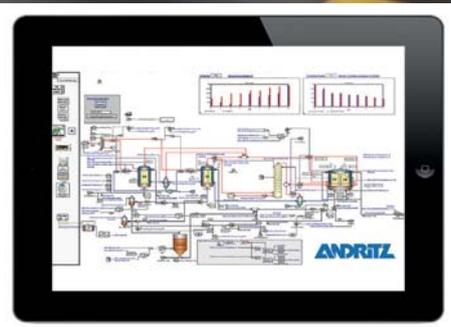


VALMET: Joining forces for innovation

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INDUSTRY NEWS



ANDRITZ



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For SCA Östrand in Sweden, success meant doubling the mill's annual production capacity from 430,000 to 900,000 t/a and therefore becoming

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COMMENT

Welcome to the first issue of Pulp, Paper & Logistics for 2019. It's interesting to see how the industry has changed since the magazine was launched in 2010 when the focus was on newsprint and speed records.

Now it is all about packaging and tissue and meeting modern-day consumer trends. The growth in packaging papers and board has been driven by on-line home deliveries and the need to reduce disposable plastic packaging with its environmental impact.

Demand for paper and board packaging has grown as retailers have responded to consumers calling for less reliance on plastic.

For example, Iceland, the UK's leading frozen-food specialist, has been reducing plastic usage in its stores through several initiatives that will collectively each year remove more than 3,000 tonnes of the material.

This reduction has been achieved by Iceland implementing a number of changes, both to food packaging and with its in-store operations that will come into full effect this year.

Iceland will eliminate plastic from its egg packaging, replacing it with boxes made from paper pulp, which will remove 600 tonnes of plastic a year. It follows the retailer's recent launch of the UK's first plastic-free packaged bananas, which will remove 10 million single-use plastic bags a year, a further saving of 57 tonnes.

In October, Iceland will no longer offer single-use plastic carrier bags in its stores, following a successful three-month trial which commenced in July. This move alone will reduce Iceland's plastic use by over 1,600 tonnes per year. The plastic bags will be replaced with 10p bags for life made from post-consumer waste.

All of which is good news for the pulp and paper industry.

For the next issue (March-April) submissions for any of the following topics should be emailed to pulppaperlogistics@virginmedia.com by 4 March. Subjects to be covered will be: Machine clothing (including rolls, wires, felts, belts, ropes and blades); Felt management and inspection; Packaging production and associated equipment.

Vince Maynard
Publisher

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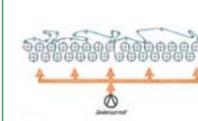
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PULP PAPER & LOGISTICS

Metsä Board scores again in climate and water programmes

Metsä Board has again been listed as a global leader in corporate sustainability by CDP, a non-profit global environmental disclosure platform, by achieving a place on the CDP A List for both climate change and water security.



It is the fourth consecutive year that Metsä Board has been included on the Water A List and the third consecutive year on the Climate A List. Metsä Board also scored A- in the CDP's Forest programme.

Metsä Board is among the top 27 companies placed on the global Water A List. This is in recognition of Metsä Board's actions in the last reporting year to manage water more sustainably. Furthermore, Metsä Board is among the top 126 of companies featured on the global Climate A List.

The position is a recognition for the company's activities in cutting

emissions, mitigating climate risks and developing the low-carbon economy. In 2018, more than 7,000 companies disclosed through CDP.

Mika Joukio, chief executive of Metsä Board, commented: "We

all need to act to combat climate change. Sustainability has to be an integral part of a responsible business and it must lead to concrete actions. I am proud that the work we do at Metsä Board was once again acknowledged by CDP and that we held our A level rating in both Climate and Water programmes."

Metsä Board produces premium fresh fibre paperboards including folding boxboards, food service boards and white kraftliners. With about 2,350 employees, its sales in 2018 were €1.8 billion. It is part of the Metsä Group, which focuses on wood supply and forest services, wood products, pulp, fresh fibre paperboards and tissue and cooking papers.

Climate change accolade for Stora Enso

Stora Enso has been top-rated in combatting global warming by CDP, which works to build a sustainable global economy. CDP has included Stora Enso on its new 2018 Climate A List, which

identifies the global companies that are taking leadership in climate action.

"We are proud of this recognition of our long-term work to reduce our emissions," said

Noel Morrin, EVP for sustainability at Stora Enso.

"For over a decade we have been actively reducing the energy intensity of our operations and our dependence on fossil fuels.

In December 2017, Stora Enso became the first forest products company to set ambitious science-based targets for reducing greenhouse gas emissions throughout our value chain."

Germany's Feldmuehle to concentrate on speciality papers

German paper maker Feldmuehle GmbH, which was acquired last June by Beteiligungsgesellschaft Kairos Industries AG and in November filed to go into administration, has pulled out of graphic paper manufacturing to concentrate on speciality papers.

The company, which has been making paper at its Uetersen site for about 100 years, has shut

down its graphic paper line and reduced its workforce to around 180.

After the company filed to open insolvency proceedings under the German Insolvency Act in November, Dr Dietmar Penzlin was appointed as provisional administrator.

Plans to keep the paper maker in business were presented during an

employee meeting on 7 December when a social plan was worked out with the works council.

In a statement, the company said: "The restructuring of the company in the context of self-administration provides for all necessary measures to improve the profitability and thus sustainable competitiveness of the company."

Production of graphic papers has been discontinued with the shut down of Feldmuehle's PM2 line.

"The focus is the concentration on the product sector speciality papers: wet- and alkali-resistant label papers as well as flexible packaging papers," said the company, which continues to be headed by managing director Heiner Kayser.



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Future assured for Zanders in Germany

German speciality paper maker Zanders has been saved from insolvency with its acquisition in December by a group led by Terje Haglund.

Insolvency administrator Dr Marc d'Avoine said following the negotiations in December: "We are pleased that the acquisition will be made by paper professionals who are already very successful in the industry. The continuation of paper production at Zanders is thus assured. All know-how carriers remain on board."

Haglund, who has been involved

in the paper industry for more than 20 years, such as with Lessebo Paper in Sweden, and more recently with the acquisition of Virginal Paper, said: "Thanks to the know-how on both sides, there are very good prerequisites for securing the Bergisch Gladbach location for the long term."

Head of management will be Andreas Willeke, who had previously been chief restructuring officer. "We will continue to produce all existing products, from Chromolux paper and board, Zanlabel and Zanpack, Zankraft, Zanflex and Zanbarrier OGR to Silver digital and Zanjet, our

successful high-speed inkjet quality," said Willeke.

"In particular, we will further develop the new grades Zanbarrier NGR and Zangrass. This all will ensure sustainability of the business going forward. This all will ensure sustainability of the business going forward."

Renamed Zanders Paper GmbH, the business will continue with around 300 employees. Some 150 will leave the company. A statement from the company said that for those affected, an interim employment society will make the



consequences socially acceptable by continuing to pay a large part of the salary for seven months, as well as job search assistance.

Zanders was founded in 1829 by Johann Wilhelm Zanders. Its portfolio has included high-gloss label papers and premium board qualities of the traditional brand Chromolux, one of the world's leading paper brands, as well as high quality variants with extra smooth or naturally napped surfaces.

Stora Enso divests June Emballage to management

Stora Enso has sold its Swedish subsidiary June Emballage AB, which specialises in small-batch custom-made transport packaging in corrugated board, to its management team.

Founded in 1988 at Jönköping,

June Emballage was acquired by Stora Enso in 1997 and extended its facilities in 2008.

Chief executive Mikael Sandberg describes the company's business concept on its website: "June Emballage manufactures product-

adapted transport packaging in corrugated board in small and medium-sized editions. We do it completely without format restrictions and with delivery time within 16 hours."

David Ekberg, SVP and head of

Corrugated Nordics, Stora Enso's Packaging Solutions division, says: "We believe that June Emballage is in a better position to serve its smaller scale markets for custom-made packaging as a stand-alone supplier."

"Stora Enso will continue to focus on growing our core business and further develop our leading corrugated packaging offering in Sweden."

Smurfit Kappa expands in France with Papcart acquisition

Smurfit Kappa has expanded in France with the acquisition of Papcart, a specialist in offset printing and converter of cardboard and corrugated board consumer packaging.

The acquisition of Papcart enables Smurfit Kappa to extend its portfolio with a complete range for the luxury goods, wines & spirits, FMCG and bag-in-box markets. Smurfit Kappa already has a strong presence

in the consumer packaging segments and corrugated board packaging for perfume and food.

With more than 70 years of experience, Papcart is equipped with the latest generation of offset printers, die-cutters, folder-glueers and finishing equipment and offers the widest spectrum of finishes required for gift and premium packaging by combining acrylic or UV inks, specific varnishes, hot and

cold foil gilding, embossing and lamination to meet even the most complex customer needs.

With the Papcart acquisition and Smurfit Kappa's current sites at Tours sur Marne, Siemco and Colorys, Smurfit Kappa now have around 700 employees including a 40-strong design department to develop customised and sustainable consumer packaging for its customers in the luxury and

consumer goods segments.

Chief executive of Smurfit Kappa Europe, Saverio Mayer, said: "This latest acquisition is of significant strategic importance for our French operations and significantly adds to the range of capabilities that we can offer our customers."

The Papcart sites in Gétigné and Jarnac have a total of 50,000sqm of production, storage and office space.

Paper process sludge turned into fertiliser

A project to develop a process for converting the sludge generated from pulp and paper manufacturing operations into fertiliser has been completed by pulp and paper maker UPM and Yara.

Funded by the Finnish Ministry of the Environment under the Raki 2 nutrient recycling programme, the project by the UPM Research Centre in Lappeenranta, Finland, Yara's Research Station in Vihti, Finland and the Reseach Center in Hanninghof, Germany investigated the possibility of developing a functional and cost-efficient recycled fertiliser in commercial volumes.

During the project, the partnership developed an organomineral fertiliser with moderately good yield results. As the production process turned out to be both technically and financially challenging, no profitable business could be generated from the project.

The sludge generated from pulp and paper manufacturing



processes was dried and complemented with mineral nutrients that are easier for the plants to absorb. Finally, the product was pelletised to facilitate transport, storage and spreading.

The pot trials conducted in Hanninghof determined how well ryegrass is able to take up the nitrogen and phosphorus derived from sludge, which, in turn, has a substantial effect on the quality and yield of the crop. The results showed that ryegrass was only able to use around 40 per cent of the total nitrogen and phosphorus in sludge, whereas the figures for mineral nitrogen and mineral phosphorus were approximately 80 per cent and 70 per cent respectively.

Field trials conducted at the Kotkaniemi Research Station showed that the yield from recycled fertiliser was 20 per cent lower compared to mineral fertiliser with an equivalent amount of total nitrogen. The proportion of nitrogen derived from sludge was 20 per cent, at most. In practical field trials, the size and durability of the recycled fertiliser pellets proved to be a challenge for the fertiliser spreaders used today. Further product development is therefore still needed.

Timo Räsänen, commercial director at Yara Suomi, says: "The objective set for our collaboration project was to develop an effective, industrial-scale nutrient solution,

in which recycled fertiliser plays a part in producing clean domestic food profitably with minimum environmental emissions.

"Recycled nutrients are part of the nutrient solutions of the future. We will together with UPM utilise the learnings from the project and continue developing the further end-uses for sludge."

Esa Laurinsilta, director of strategic partnerships at UPM added: "The Raki2 programme has built a strong framework for industrial collaboration, and has sped up the practical research to establish sustainable end-uses for sludge.

"We have gained high volumes of valuable research data that both companies can utilise in the future – either in collaboration or separately – for raw-material processing and product development. Public funding plays an important role in enabling ground-breaking circular-economy projects, and together with Yara, we would like to thank the Finnish Ministry of the Environment for sharing the financial risk with us."

Paper converter in UK expands with £7.8m loan

UK-based Task Consumer Products, a family-owned paper converter and manufacturer, has purchased a new 80,000sqft site with support from a £7.8 million HSBC loan.

The funding will enable Task to increase its production capacity by 15,000 tonnes per year, as the new facility creates the opportunity to install further production lines and store a



larger quantity of products.

The new premises will be Task

Consumer Products' second site in Wolverhampton and will initially be used as a storage and warehouse facility, with plans for a new production line to be housed on-site in the near future. The production line will modernise the firm's manufacturing capabilities, with the implementation of state-of-the-art equipment in the new factory.

Ravi Patel, managing director of Task Consumer Products, said: "The opening of our second site is an important milestone. Increasing our production and storage capabilities will be vital to the continued growth of our business. I'd like to thank our HSBC UK Relationship Director, Jack Turner, for his continued support throughout this process."

Husum mill celebrates 100 years of fibre production

Metsä Board's Husum mill in Sweden celebrated its centenary on 24 January.

The mill started up in 1919 with capacity to make 20,000 tonnes of unbleached softwood kraft pulp a year. Today Husum is a modern integrated mill site with

production capacities for 400,000 tonnes of folding boxboard, 250,000 tonnes of white kraftliner and 730,000 tonnes of bleached hardwood and softwood pulps.

Recent developments at the mill included the conversion in 2015 one of the paper machines to a white kraftliner machine. The new folding boxboard machine started

up in 2016 and a 100,000-tonne extrusion line a year later in 2017. The products are used for a wide variety of end-uses in consumer, retail packaging and food service globally with the added logistics benefit of the mill's own deep-sea port.

"Over the years the Husum site has been successfully adapted

and improved ensuring an ongoing commitment to driving greater efficiency and market leading product development. However, none of this would have been achieved without the support of our dedicated employees," said Olov Winblad von Walter, vice president of the mill.

DS Smith completes acquisition of Europac

UK-based packaging group DS Smith Plc completed the acquisition of Spain's Papeles y Cartones de Europa, known as Europac, in January.

The €1.9 billion acquisition, which was first proposed last June, makes DS Smith a leader in some of Europe's markets, selling paper-based packaging to customers in the fast-moving consumer goods markets and e-commerce, where it is already a leading supplier to customers including Amazon.

Proposing the offer to Europac shareholders in December, group chief executive Miles Roberts said: "I am delighted with the support from Europac shareholders. We look forward to



Chief executive of DS Smith Miles Roberts

welcoming Europac employees into the DS Smith Group and integrating the businesses to the benefit of all our stakeholders. This acquisition is a fantastic opportunity to enhance our customer coverage and offering in this important region."

The acquisition of Europac adds almost €900 million to DS Smith's annual sales of €5.77 billion.

Resolute completes sale of Catawba mill to New-Indy

Canada's Resolute Forest Products has completed the sale of its paper and pulp mill at Catawba in South Carolina, to New-Indy Containerboard.

The total price was US\$300 million, made up of \$260m in cash and about \$40 million of balance sheet liabilities, largely net pension benefit obligations.

"We are pleased to have completed the sale of the Catawba mill to New-Indy and wish the new team every success with its investment in the diversification of the mill's operations," said Yves Laflamme, chief executive of Resolute.

"We want to thank our employees for their hard work and dedication toward this successful outcome, and are pleased that the community will

continue to benefit from the mill's economic and social impact."

With headquarters in Montreal, Resolute Forest Products is an integrated pulp, paper and tissue manufacturer with 40 facilities in North America that sell products to almost 70 countries. It operates five pulp mills with capacity of 1.3 million tonnes, eight newsprint mills with capacity of 1.8m tonnes and five speciality paper mills with capacity of 800,000 tonnes. Its three tissue mills have capacity for 116,000 tonnes. Sales in 2017 were \$3.5bn.

New-Indy Containerboard was formed in 2012 by Kraft Group and Schwarz Partners, and is based in Ontario, California. In addition to the Catawba mill, it has three mills and one recycling centre using 100 per cent recycled fibre.

Montevideo port bid by UPM

Pulp and paper maker UPM is tendering to build and operate a specialised port at Montevideo in Uruguay. The public tendering process is being organised by the National Ports Administration.

The port would handle pulp produced by a new mill proposed by UPM for which investment was agreed with the Government of Uruguay in 2017.

The mill would have an annual capacity for about two million tonnes of eucalyptus pulp. Early estimates of the investment were about €2 billion.

As part of the agreement the Government will promote a concession for a terminal specialising in pulp in the Montevideo port with rail access.

The tender includes the design, financing, engineering, construction, operation and



UPM's chief executive Jussi Pesonen

maintenance of the pulp terminal. The concession would last 50 years.

In a statement, UPM said that port development, supporting efficient and reliable outbound logistics, is a key fundamental for the potential installation of the third pulp mill in the country. Modern facilities in the Montevideo deep sea port would

offer a competitive gateway from South America to growing export markets benefiting the Uruguayan economy.

Two preparation phases need to be successfully completed before UPM would be in a position to make a final investment decision on the pulp mill. The second preparation phase is currently proceeding.

Achieving significant progress in the implementation of the agreed infrastructure initiatives by the Government of Uruguay and any relevant items are to be agreed prior to the possible final investment decision. If these two preparation phases are concluded successfully, UPM will initiate the company's regular process of analysing and preparing an investment decision.

"The preliminary planning and infrastructure projects are proceeding as expected, but the final decision on investment will not be made until mid-2019 at the earliest. It could even be later," said UPM's chief executive Jussi Pesonen.

Helsinki-based UPM's sales in 2017 were up 2 per cent to €10.01 billion. With more than 19,000 employees it has production facilities in 12 countries.

Logistics conference comes to London

The future of the global freight and logistics industry will be shaped during a three-day conference being held in London from 9-11 July.

The 6th Annual International Physical Internet Conference (IPIC) aims to provide an open forum for researchers, industry representatives, government officials and citizens to explore leading edge freight transport and logistics concepts, methodologies, projects, technological advancements and

start-up initiatives.

Conference topics include inter-connected logistics, cross-chain control, synchromodal transportation, open logistics networks, systems & technologies for interconnected logistics, supply chain coordination and collaboration, and urban freight transport and logistics.

IPIC provides a opportunity to learn about and discuss the latest results of innovative projects and industry initiatives

in the field. Participants from all over the world, including researchers, industrial and international institutions, local authorities and standardization committees will share practices, solutions and challenges.

Fernando Liesa, secretary general for the Alliance for Logistics Innovation through Collaboration in Europe, said: "We're delighted to bring one of Europe's largest freight and logistics events, IPIC to the UK. Freight and logistics impact

on almost all aspects of our modern interconnected lives and changes in the political landscape of Europe will only make novel approaches which increase efficiency, sustainability and improve collaboration more important. The novel approach of the Physical Internet has the potential to revolutionise the sector and this event will aim to forge the future with our colleagues in the UK."

More information from www.pi.events/

Improving pulp mill operation with its twin

Increasingly precise simulations of a pulp mill's process using so-called Digital Twins make improvements in efficiency easier to achieve. PPL reports



Figure 1 The digital Twin - IDEAS model of a pulp mill's evaporation process

Since the 1980s, thanks to advances in computation technologies, simulation of processes using first-principle models has become a well-known and widely used engineering tool for various industries. As our understanding of processes has increased, representative models have become more realistic and sophisticated. The resulting improvement in accuracy has made simulation a fundamental predictive and diagnostic tool in process industries.

Accurate simulation can reduce engineering and construction costs, optimise process design,

and improve operational performance by reducing costs and increasing efficiency. In fact, simulation technology has become so advanced that it is now possible to simulate the interrelated processes of an entire pulp mill and connect these in real time to the mill's physical operation. These sophisticated first-principles based models are referred to as 'Digital Twins'.

Defining the Digital Twin

The term Digital Twin was first introduced by NASA [Ref 1] in 2010 and quickly adopted by

other industries. There is no official definition of Digital Twin as it relates to process industries; however, there are three important characteristics that are common across most descriptions of the term. Firstly, the simulation must be core to the functionality of the process. Secondly, the simulated process must follow the entire life cycle of the plant. And lastly, the simulation must be directly linked to the operation. Together, these three aspects create an intricate pairing between process and simulation – a Digital Twin.

According to the industry research and trend analysis group Gartner, the concept of

a Digital Twin is considered to be one of the most important disruptive technologies of 2018 [Ref 2]. As the internet and information technologies have been integrated into industrial operations, a new industry era known as Industry 4.0 (or the Industrial Internet of Things) has emerged. Digital Twins are a fundamental aspect of cyber-physical systems, which are one of the basic pillars of Industry 4.0, closely integrated with artificial intelligence and advanced analytics (see Figure 1).

There are some major differences between a traditional simulation and a Digital Twin. In addition to being connected

to an operational plant in real time, a true Digital Twin must run concurrent to the plant's operation, receive operation data in real time, process this data, and then generate valuable results in a timely manner.

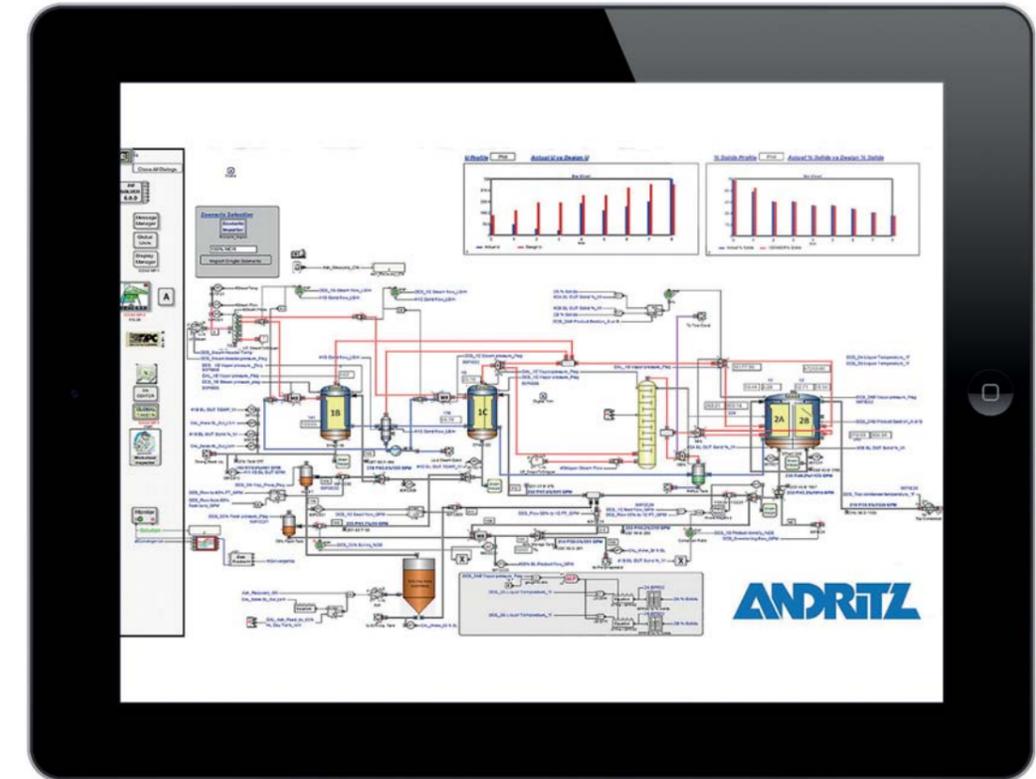
From a technical perspective, the combination of three components enables a true Digital Twin of processes to be formed: High-fidelity models, real-time connectivity to the operation being simulated, and a robust simulation environment.

The models that matter most

High-fidelity models are at the heart of any Digital Twin. The term 'fidelity' corresponds to how realistically the models represent the process. Once high-fidelity models are built, they can be used for different applications within the Digital Twin structure.

ANDRITZ provides a true Digital Twin solution for the pulp and paper industry using IDEAS simulation software and its unique execution platform. A unique feature of IDEAS is its ability to combine continuous processes with discrete events (human characteristics and interventions). This enables IDEAS to simulate pulp and paper processes spanning the entire life cycle of a mill – from feasibility studies, engineering, construction and commissioning to operation and online optimization - and then combine each individual process unit into a single, interconnected high-fidelity model.

ANDRITZ ensures the high fidelity of IDEAS models by combining the process, mechanical/physical, and control/logic aspects of a mill. Building a true representation of the entire mill operation requires



consideration of information obtained from process descriptions and calculations, P&IDs, physical layout drawings, equipment characteristics and data sheets, material-balance equations, chemical reactions, and lab test data as well as discrete events. The control system behavior and logic are integrated, as is operation data when available to further tune the models.

Once the modeling process is complete, the simulated, or virtual, mill behaves in the same way as the actual mill, providing realistic dynamic process responses. This simulation is then tied into the ANDRITZ execution and communication platform, which is connected to mill's control and monitoring systems. Through the ANDRITZ execution platform, the virtual mill can be accessed and used by ANDRITZ's Digital Twin applications (also developed using IDEAS software)

for a variety of purposes at different stages of the project life-cycle.

Benefits of Digital Twin technology

Digital Twin applications have a wide range of uses. During the early stages of a project, Digital Twin applications can analyse the pros and cons of various design scenarios, eliminate design mistakes, identify potential bottlenecks and early engineering flaws, and inform necessary equipment specifications. Operator training simulators similar to flight simulators can be built using the digital replica of the mill.

Later in the life cycle, applications can be used to measure the conditions and/or physical characteristics of a process and provide virtual measurements where real-world measurements are impossible and real-time plant-wide optimisation

becomes possible.

Digital Twin technology can also be used to simulate the future operation of a mill, providing insights that can be used to conduct maintenance, manage inventory, guard against process failures, and minimise the impact of major events such as shutdowns.

For example, one of ANDRITZ's Digital Twin applications, called the IDEAS Designer, can be used to automatically run the virtual mill through thousands of what-if design and equipment scenarios in order to optimize the circuit design and determine the most competitive net present value (NPV).

Another, the IDEAS Instructor, allows operators to train using the virtual rather than real plant environment. And the IDEAS Guardian application connects to the mill's real-time operation, allowing numerous what-if scenarios to be run rapidly

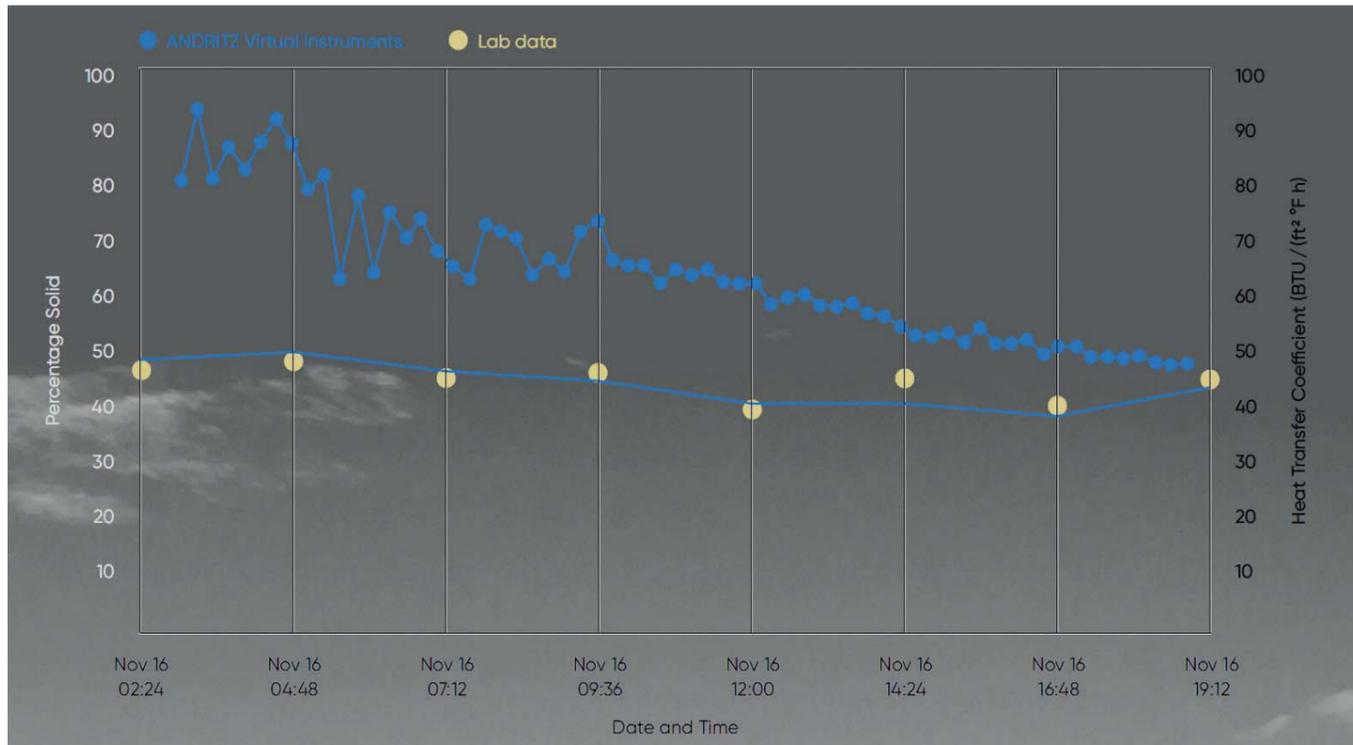


Figure 2: The yellow dots are the lab data points. The plot represents 82 data points at 15-minute intervals. The IDEAS Virtual Instrument predicts the percentage of solids in the evaporator (blue trace). The plot represents 82 data points at 15-minute intervals. Virtual Instrument value for heat transfer coefficient with time. The decline in value reflects fouling of the evaporator surfaces. The plot represents 82 data points at 15-minute intervals.

alongside the mill's operation using real-time data. The results provided can be applied for condition monitoring and optimized decision-making.

Using Digital Twins in real time

Connecting the Digital Twin applications to real-time operations is what truly unlocks the full potential of the ANDRITZ Digital Twin solution. Consider the evaporation process in a pulp mill (Figure 2). The virtual model of the pulp mill is connected to the mill's real-time operation. The IDEAS Guardian application uses this replica to detect any undesired conditions such as fouling and scaling, and is also used to take virtual measurements that are not accessible in the real world using conventional instrumentation.

Operational evaporation data on pressure, temperature, and flow are the inputs in real time, and IDEAS Guardian outputs virtual instrument information to the operator screens, including heat transfer coefficients and predicated evaporator percentage solids, DeltaTs, BPRs per effect, heat and mass balance, and production levels.

The IDEAS Guardian uses this virtual instrument data to enable operators to continuously analyze fouling of heat transfer surfaces, guiding them by providing the optimal cleaning frequency. In the case of a physical instrument failure, the IDEAS Guardian can be set to automatically input values from that instrument's virtual twin into the control system, bypassing the need for manual input and thereby eliminating any disruption of operation.

You could compare the concept and function of the ANDRITZ Digital Twin architecture to that of a smartphone. The IDEAS simulation software and first-principle model are like the phone itself and its hardware, systems, and circuitry. The ANDRITZ execution platform is like the operating system, the iOS or Android, that allows the phone's functionality to be accessed as well as connected to other systems and devices. The Digital Twin applications are the mobile "apps". Through the operating system, the 'apps' draw on specific functions, connections, and data to either perform a specific task or generate a specific result.

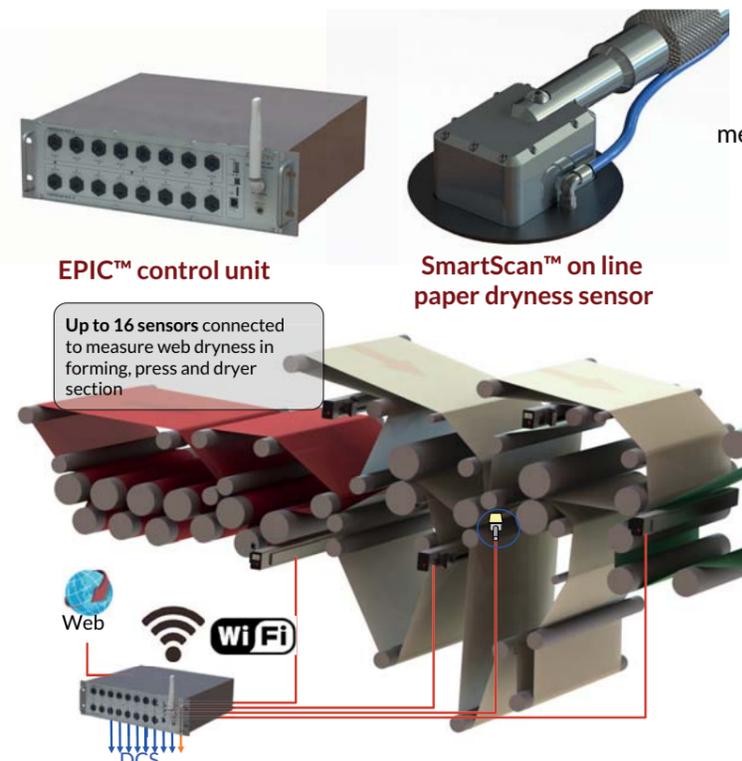
The trajectory of the pulp and paper industry continues towards Industry 4.0 as more and more mills integrate new

and cutting-edge technologies into their operations. Digital Twin technology can greatly enhance the efficiency, cost-effectiveness, productivity, and profitability of pulp mill operations, and industry-leading systems, like IDEAS, that combine high-fidelity models with real-time connectivity and an advanced operating platform, are poised to take those operations to the next level.

More information from www.andritz.com/metris or Sohail Nazari at sohail.nazari@andritz.com

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Dealing with wax in board manufacturing

The performance of a containerboard line can be adversely affected when wax changes the substrates surface friction. Here's a product that helps solve the problem. PPL reports

Surface friction of the outside ply of a linerboard is a critical characteristic. Commonly measured as the 'slip' or 'slide' angle, it can have an impact on production and converting operations, along with contributing to stacking and handling difficulties.

A second major issue is the effect that wax absorbed on the surface of fibres has on board strength characteristics. Typically, 'suspended' wax will attach to the surface of individual fibres and adversely impact fibre/fibre bonding. This results in lower overall sheet strength.

Wax enters the system from the recycling plant when old corrugated containers (OCC) are used. Furnish associated with wax includes curtain-coated and wax-cascaded corrugated boxes. Half of all petroleum-based paraffin waxes that are generated are used in curtain-coated applications or cascaded-corrugated containers to provide moisture and water resistance. Few mills are able to remove this wax contamination.

The mill recycling operation is often carried out at elevated temperatures. The typical operating temperature range is 125-160 deg F. The majority of paraffin waxes have melting points in the 122-132 deg F range. Dispersed wax is a stable suspension that has the ability to permeate off the fibre into the water phase. Dispersed wax particles measuring 5-100 microns



in a suspended state make for poor removal in typical stock preparation systems. Wax can be present in three potential forms:

1. Free wax
2. Suspended wax
3. Absorbed wax

Free wax:

At low operating temperatures (less than 120 deg F) this form of wax is maximised. Wax has not been absorbed onto the fibre and can be found as large particles that float. This is the only form of wax that can be removed by using reverse-type cleaners, through flow cleaners, centrifuge methods and the like, due to its large size and low specific gravity. Screening equipment is not effective in removing suspended and absorbed wax forms. Free wax removal is around 10 per cent of the total. It is then logical to assume that cleaning equipment is only operating at 10 per cent efficiency for wax removal; 90 per cent of wax stays in the system in the following forms.

Suspended/dispersed wax:

Not much suspended wax is generated at lower temperatures. However, in the range of 122-160 deg F fine wax dispersion is increased. Upon cooling the dispersed wax is stabilised and coats fibre on contact. Suspended wax does not agglomerate to form large particles unless reacted with other types of contaminants or control chemistry. Particle size for typical suspended/dispersed wax is in the 5-100 micron range.

Absorbed wax:

This wax attaches itself to the fibre but can continue to be liberated as suspended wax under the high temperature and mechanical sheer action within the system. Absorbed wax and suspended wax will continuously shift from the 'absorbed' form to the 'suspended' form and back again under these conditions. Addition of Enesco's 1000 agglomeration technology initiates the development of 'suspended wax agglomerations,' while

significantly reducing absorbed wax.

Cold pulping:

Stock pulped at 120 deg F has shown reduced concentrations of wax in the water from 60ppm down to 4ppm. Under such conditions a typical board mill producing around 350 tons per day can expect to see:

- 0.6 ton/day wax entering system
- 0.37 ton/day at the decker
- 0.02 ton/day wax in water feeding machine
- 0.04 ton/day removed at reverse cleaners

Enesco: the mechanism

Enesco International's approach to combat stickies and wax problems is unique in that three different methods are utilised to obtain maximum reduction of contaminant loading in the recycled paper process system.

The Enesco product is a 100 per cent active dry powder, a blend of wetting agents and inorganic polymers fed to the recycled fibre pulper. It is available in 2.27kg or 22.7 kg repulpable bags or make down systems, deink dosage rates of approximately 0.6kg per ton of recycled furnish in the pulper.

Pulper treatment:

Enesco begins to work in the pulper by interacting with the wax/fibre and stickies/fibre interface. This maximises initial 'macro-stickies & free wax' particle size and rigidity during repulping. When reductions in temperature and caustic are possible this will

further enhance removal of free wax by reducing these typical dispersion effects.

Continued action of Enesco promotes agglomeration to increase stickies/wax particle size. Smaller macro-stickies, very small micro-stickies and 'suspended wax' build into larger agglomerations. These newly-formed agglomerations are effectively removed by system screening equipment.

This chemistry also maximises removal of contaminants that are not removed by the fine screens. Enesco reacts with entrained air in the system to lower the

'apparent density' of stickies and wax that are not removed by mechanical screens.

This mechanism enables 'micro-air bubbles' to adhere to the stickies/wax/Enesco matrix. This allows agglomerates of 'micro-stickies and wax', with actual specific densities of 1.0 to be perceived as much lighter. These smaller agglomerations are subsequently removed from the fibre stream by lightweight cleaning equipment. The reduction of entrained air in the system results in improved stock drainage and eliminates/reduces system defoamer use.

Contamination removal:

Contaminant agglomerations are subsequently removed by equipment typically found in today's recycled fibre stock preparation systems. Coarse and fine screening remove large agglomerates, while lightweight material removal equipment such as reverse/through-flow centrifugal cleaners, gyro-clean and dissolved air flotation (DAF) units remove smaller agglomerations that Enesco has 'density' modified.

Passivation:

Contaminants that do remain with the pulp are effectively

passivated. The inorganic portion of Enesco specifically neutralises the surface of these small stickies and wax particles. The inorganic barrier detackifies the surface and inhibits stickies deposition on paper machine fabrics. Many applications also experience significant stickies control benefits in the dryer section and throughout the converting/printing process.

More information from Enesco International, Hampton, New Hampshire 03842, USA. Tel: 1 603 926 4830. Website: www.ensesco.com Email: steve@ensesco.com

INDUSTRY NEWS

Best practice in coffee cup recycling demonstrated

In what is seen as an example of the circular economy, the first reusable coffee cup that enables contactless payments is being packaged in a folding carton made from recycled takeaway cups.

Costa Coffee's 'Clever Cup', which uses Barclaycard contactless payment technology, is also creating value from the UK coffee chain's own waste stream by recycling its takeaway cups. Each box contains waste fibre from one 'medio'-sized cup.

Cumbria-based James Cropper has been working with Costa on recovering and recycling its takeaway coffee cups since the launch of CupCycling in September 2017. The project to develop Clever Cup's packaging is a good example of what can be produced from cup fibres processed through the world's first-ever facility dedicated to converting cups into fine papers and sustainable packaging.



James Cropper is helping the Costa chain recycle its paper cups

The launch forms part of Costa Coffee's wider re-launch of its 'next generation' reusable cup range, giving customers the option to use reusable cups over single-use takeaway cups.

Richard Burnett, market sector manager from James Cropper, said: "This is a really exciting step for Costa who have brought about the marriage of

technology and sustainability, of convenience and environmental responsibility. They are one of the leading lights on the high street in addressing the issue of disposable coffee cups, setting an example for others in the coffee business.

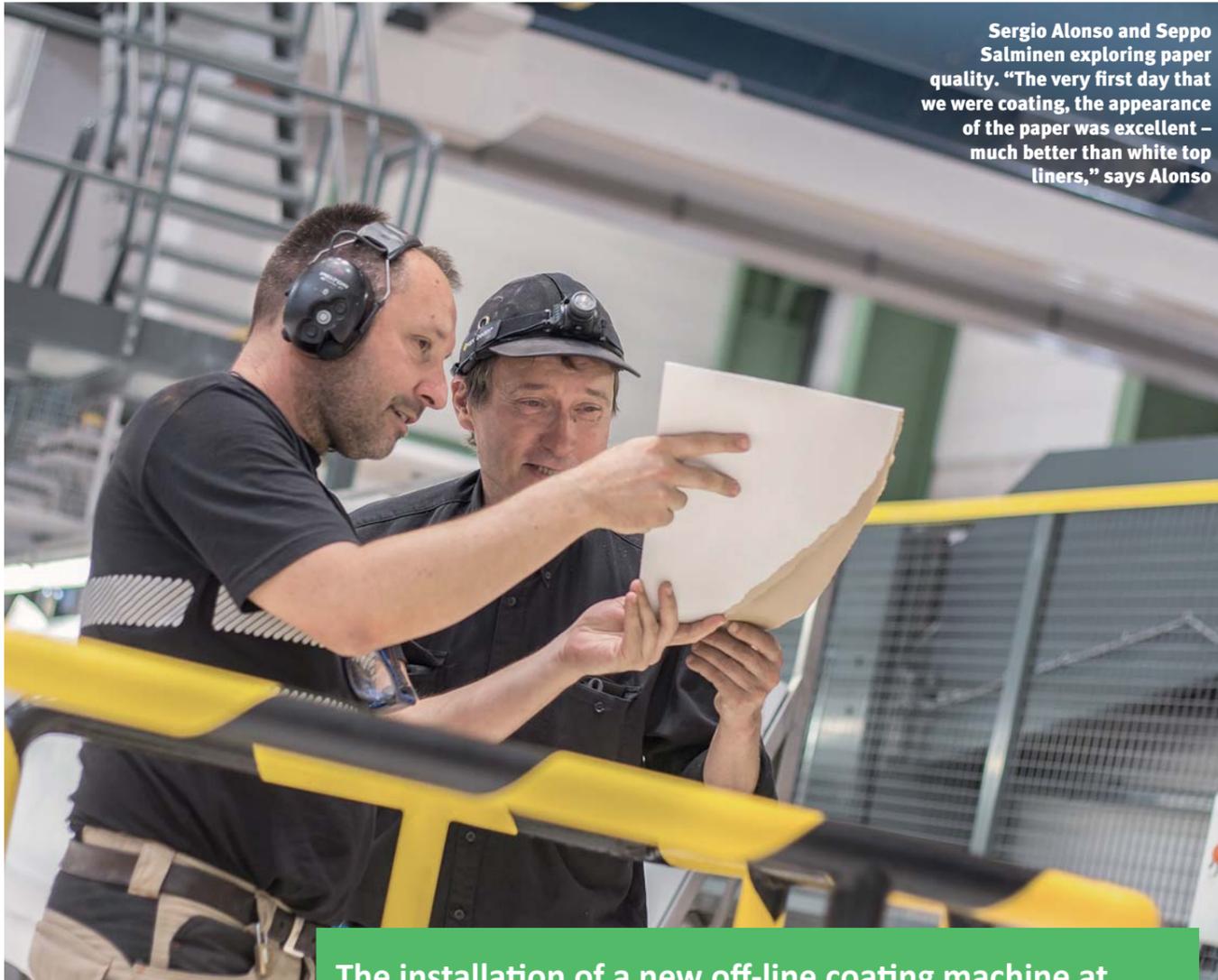
"To date, we have recycled 30 million coffee cups at our world-first CupCycling facility.

However, we actually have the capacity to convert 500 million per year into papers for packaging in all colours for anyone wanting to follow in Costa's foot-steps."

Jason Cotta, managing director of Costa Coffee, commented: "Whilst we are committed to ensuring more takeaway coffee cups are recovered and recycled we also want to incentivise and reward customers who help reduce the number of takeaway cups being wasted, and hope the innovative Clever Cup will become an additional incentive for increasing the use of reusable cups."

James Cropper's CupCycling facility at its paper mill in Kendal has been praised for its groundbreaking approach to solving the waste coffee cup issue. The company is also best known for its custom coloured papers and moulded fibre products for packaging.

Joining forces for innovation



Sergio Alonso and Seppo Salminen exploring paper quality. "The very first day that we were coating, the appearance of the paper was excellent – much better than white top liners," says Alonso

The installation of a new off-line coating machine at SAICA's El Burgo mill in Spain brought unexpected benefits. Pauliina Purola reports for PPL. Photography: Joonas Nieminen

Although SA Industrias Celulosa Aragonesa (SAICA) was aiming for improved quality, reduced costs, and responsible fibre use at its El Burgo mill in north-west Spain the containerboard manufacturer found itself with innovative coated white top liner grades with better properties than it bargained for.

This was a result of three partners joining forces – SAICA, Valmet and pigment supplier

Omya – with the installation of a new off-line coating machine. "SAICA is a fully integrated containerboard producer. We go from recycling of paper all the way to box production. Among the players in the containerboard market, we consider ourselves as the one with the strongest focus on papermaking innovations,"

says Federico Asensio, group director for R&D&i at SAICA. "Our idea with the new off-line coating machine was, if we wanted to replace white fibres with something else, it had to be printable with a standard flexo printing technology," Asensio says. Having the full cycle of box

production in its own hands, SAICA started its development journey for the new product together with Valmet and pigment supplier Omya. A cycle of trial and improvement Trust and partnership have been the forces carrying this project

forwards. The development partnership between SAICA and Valmet was completed when pigment supplier Omya joined. Asensio describes the three partners: "We worked as a group, as a team. We made the base paper at our industrial units, and we went together to Valmet's pilot facilities to coat it. We took the new paper to our corrugators and converting units to produce the board and run the printing trials. It made us realise the goal was achievable, although there was still room for improvement in several variables." The cycle of development started again – the cycle of trial and improvement. Eventually, SAICA and Valmet shook hands

on a complete off-line coating machine. Pilot trials: a key element Being able to test the final products at each step of the project was essential, and the pilot facilities at the Valmet Paper Technology Center have been key to this. Alberto Mena, head of pulp and chemicals for R&D&i projects at SAICA, explains the pilots: "The final product is much better than we expected. This is due to the pilot trials. The people there were very flexible. We needed to make many modifications to the pilot machine and trial programmes. They never expressed any irritation, and they always did their best. The flexibility was



Alberto Mena (left), Head of Pulp and Chemicals for R&D&i projects, and Diego Compaired, Innovation Technology Project Manager of SAICA

impressive – we believe it's the best pilot facility we've ever used." SAICA's Innovation Technology

Project Manager for R&D&i Diego Compaired was also complimentary: "The pilot trials



The new off-line coating machine

sped up the coating definition with an opportunity to test different ingredients and different coating amounts.”

Now that the coating machine is up and running, the benefits of the pilot trials are clear. Sergio Alonso, production manager of PM10 & OMC at SAICA, explains: “Now we are only fine-tuning the machine. The pilot trials ensured the very first rolls were of high quality.”

The first high-quality rolls were produced by the new coating machine before the end of January 2018.

Clear targets

The main idea at the beginning was to replace the white fibres with something else to save on costs and improve the appearance of the final paper.

There were also other targets, as Compaired reveals: “One target of this project was to increase our product range, as we had a lack

We were about to do something nobody else had done before. We knew that Valmet wanted to make this project fly

of coated grades. We wanted to offer our customers a wide range of products made from recycled raw material. The process we developed is one of the most innovative in the world in the recent years.”

Using only brown fibre requires quite a lot from coating. “We wanted to have a wider range of products, to have more flexibility



“The paper had better brightness. It was totally even, with none of the impurities that usually result from recycled fibres,” says Federico Asensio

in the market,” says Compaired. “The coverage is very good, too. It is the main reason why we are not using a white layer of fibres. The very first day that we were coating, the appearance of the paper was excellent – much better than white top liners,” says Alonso about the importance of the even coverage of curtain coating and the good results of the project.

In May 2018, SAICA launched its new Infinite collection of high-quality 100 per cent recycled white papers.

More than they bargained for

The results were much better than expected. “After some trials, there was a moment in the research project when we realised that the behaviour of the new grade was completely different to the

ones we wanted to replace,” says Asensio. “The paper had better brightness. It was totally even, with none of the impurities that usually result from recycled fibres. There were no minor defects of coloured fibres, black spots, or changes in other colour variables. But the most important property was the enhanced brightness of the paper, and the lightness and intensity of the printing colours. The colours appeared glossier.”

Asensio explains more about the development phase: “With standard white top testliners, you cannot control the three variables of whiteness. With this new way to produce the paper, we could control those with each parent roll. We managed to supply the market with products that add real value. It is a big advantage to have a very good-looking box at

a very affordable price compared to the traditional double-coated grades.”

SAICA had managed to develop a novel product and with more properties than they bargained for.

Very positive feedback

Customers who have experienced the new grades have been very positive towards the products.

OMC superintendent Javier Garcia Muñoz from SAICA shares their comments: “We have received very positive feedback from our customers about the quality and the printability of our papers.”

Compaired adds: “Our customers are quite impressed with the performance of our papers. In terms of printability, they perform very well. The behaviour in corrugating lines is very good. In

fact, compared to the competition, this paper can be glued much more easily on corrugating lines, offering the possibility to reduce glue consumption. It also reduces the washboard effect – it gives a much more uniform surface on which to print.”

A beautiful partnership

Customers seem to be very satisfied with the new product range. For Asensio, this was also a journey of trust and partnership: “When you are looking at an innovation project, you need to feel comfortable and trust the capabilities of your supplier – your partner. We needed a very strong partner capable of reacting to unknown events – we were about to do something nobody else had done before. We knew that Valmet

Off-line coating machine delivery with Valmet installation

- 2 x OptiCart Stream parent roll carts
- Transfer rails and rebuild of existing transfer rails
- Unwind station
- Coating station supply systems
- OptiCoat Layer two-layer curtain coating station and OptiCoat Jet blade coating station
- Coating drying section with OptiDry Coat air dryers
- OptiAir Recovery heat recovery system
- OptiCalender Sort soft nip calender
- OptiReel Linear reel
- OptiWin Drum two-drum winder
- Valmet DNA machine controls
- Valmet IQ Quality Management Solution including quality control system, coat weight profilers and process and quality vision
- Valmet PQV web break analysis and web inspection system
- Sectional drive controls
- An extensive machine clothing and blade package for start-up

wanted to make this project fly. “This is a very beautiful story of partnership. Together, the three of us have succeeded in delivering

an innovative grade to the market. Together, we added value to our customers, to brand owners,” says Asensio.

Together towards innovation



“Pilot trials at Valmet Paper Technology Center were really helpful in this coating machine project. SAICA was aiming for something completely new, and people really want to see the unexpected happen with small-

scale pilot machinery. My task has been to help SAICA with the pilot trials and fine-tuning the full-scale machinery at El Burgo in Spain,” says Jukka Heimonen, paper technology manager at Valmet. “I started to work with the

SAICA team well before the start-up. This was their first time doing coated boards, and their personnel needed training. SAICA sent 20 people for training with Valmet’s pilot machinery. It was good to get to know them well in



Jukka Heimonen, Paper Technology Manager at Valmet

the training: how they worked, their goals.

“We studied together the coating colour preparation, coating basics, taping the rolls, and changing the coating blades. This training opportunity had a great effect on the start-up of the new coating machine. Everything went really well.”

Efficiency in the dryer section

A number of projects carried out by Heimbach's TASK-Force illustrate the potential for making cost savings and improving productivity by using pocket ventilation. PPL reports

Whenver energy savings are discussed in relation to a paper making line the focus often tends to shift to the dryer section. Nearly 65 per cent of total energy demand comes from the drying process.

This makes it imperative that, for example, air inflow and outflow are accurate in the hood, as this is where analysis can often highlight bottlenecks or areas for improvement.

This is one measure among many that helps papermakers not only save costs, but also increases productivity. All of this relies heavily on a fine-tuned dryer section.

In this article, Heimbach TASK-Force offers some guidance on pocket ventilation which, approached correctly, will reap considerable rewards.

The first case study is about a customer that produces newsprint in the range of 40 to 60 g/sqm at 1,000 metres per minute. The machine has been regularly measured and successively optimised by Heimbach TASK for an extensive period of time.

Lasting improvement

On the basis of measurements made, a step-by-step restructuring of the dryer section from conventional to slalom was recommended. This was tackled over the following few years; first the third, then the fourth dryer group (groups one and two were already running as a slalom).

The first success yielded was

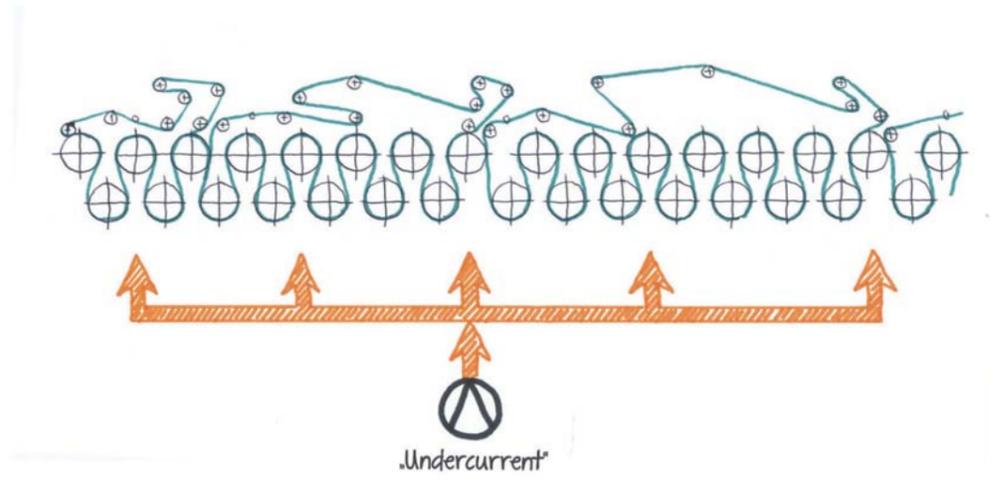


Figure 1: Unfavourable – “undercurrent”

clearly improved runnability and visibly fewer sheet breaks at the same production speed as before. Thomas Fischer, leader of TASK, summarises it aptly: “More productivity, more quality, more efficiency.”

However, this was not the end of the optimisation plan as the air inflow was still directed into

the basement as “undercurrent” (Figure 1). This means it flows past the machine but does not contribute to the drying process.

Blow pipes showing the way

Consequently the drying performance was still not sufficient in the production of heavier grades (60 g/sqm) at

maximum speed. In this case the path to a solution was the use of blow pipes, which significantly improved drying capacity.

Blow pipes are built into the cylinder pockets, which in many cases mean both higher productivity and energy savings per ton of paper – one measure, two benefits. This

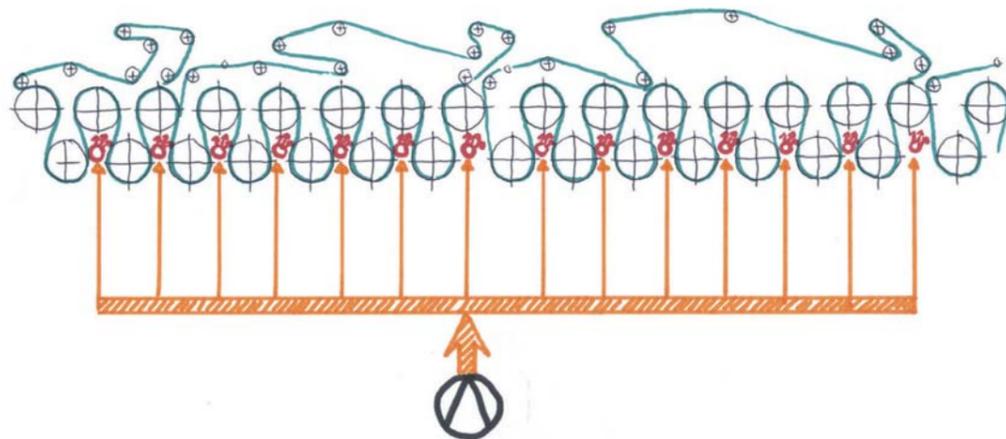


Figure 2: Very good – blow pipes distribute air in a sensible and directed way

was also the outcome with the customer, though of course all the optimisations should be considered as a whole in this case.

In total, the slalom conversions and blow pipe installations extended over several years.

Airflow altered and improved

In the end, all pockets were equipped with blow pipes (Figure 2) which meant that the ‘undercurrent’ no longer flowed into the basement, where it is almost completely ineffective.

Instead the air is directed where it is really needed in order to remove the water vapour from the paper sheet as efficiently as possible. The optimum blowpipe position in the cylinder pockets can be seen in Figure 3.

Ever since, the air has been used in a more targeted way, and the customer has also been able to produce heavier grades at 1,000 m/min. This resulted in a 17 per cent productivity increase, bearing in mind that installation costs were quite low.

This is a long-term optimisation which brought the customer millions of euros of additional sales.

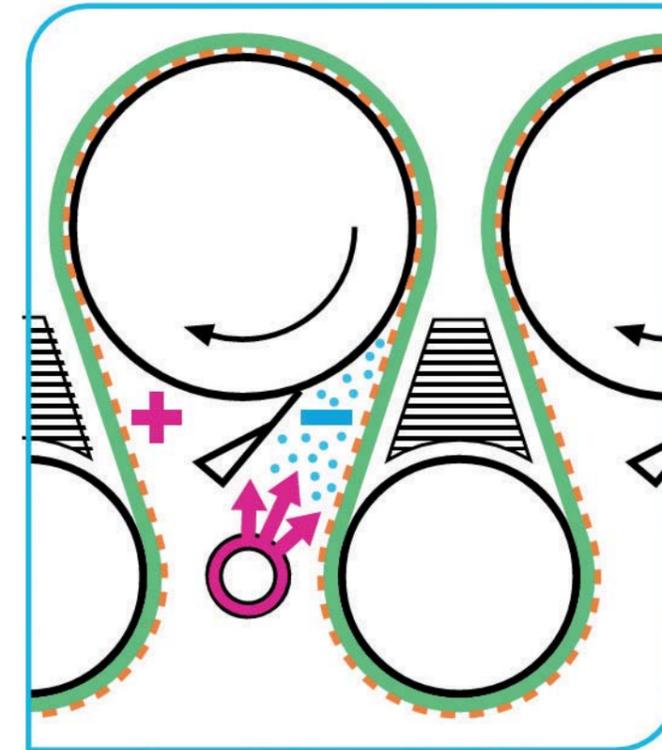


Figure 3: Blow pipe located in the optimum position

Great effect

Looking at the details, the customer was able to use one less dryer fabric in the third dryer group while achieving improved runnability. This was owing to, amongst other things, the reduction in sheet breaks.

The same applies to the

second part of the dryer section restructuring (fourth group). If the additional turnover referred to above is calculated, it is in theory possible to add some millions of euros to the top line.

However, this is not always so straightforward, which is why calculations of economic

efficiency vary considerably in practice: “The best way to approach this,” Fisher explains, “is to look at every machine for what it is: unique.”

Naturally, if every paper machine is different, the numbers will always be relative. Nevertheless, an increase in economic efficiency of 17 per cent can be said to be an impressive argument on its own.

Using blow boxes

Generally, slalom groups and optimum pocket ventilation are almost always beneficial. Blow pipes are not always necessarily needed, as other techniques have been effective.

Slalom group blow boxes, for example, are a sensible alternative: These are, like blow pipes, placed behind the doctor, so that the air in the pockets is distributed evenly – from the middle of the machine to both front and drive side (Figure 4).

An accumulation of moisture towards the machine centre is therefore avoided; the sheet is also better pressed to the dryer fabrics. And a stabilised sheet significantly and effectively reduces possible sheet fluttering. ▶

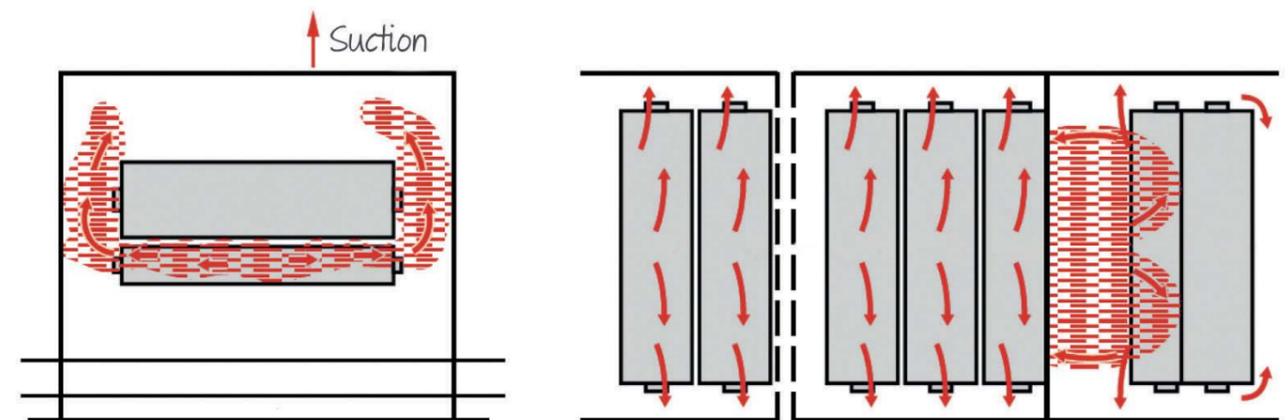


Figure 4: Recommended air flow from the pockets

Many practical benefits are achieved from one source: optimum pocket ventilation. A further example demonstrates why – as so often – uniformity is crucial.

Moisture: a most important detail

A customer asked Heimbach to measure and evaluate the status of its pocket ventilation. Figure 5 shows the TASK log including all relevant parameters. On this paper machine blow boxes were installed only in the pockets under cylinders 30, 33, 36, and 38.

This gave an uneven result in terms of ventilation: In places where the pockets are ventilated the absolute moisture is lowered by 38 per cent – a significant reduction.

Looked at the other way, the pockets that are not ventilated contain much more moisture. In conclusion: the blow boxes make it possible for significantly more water to be absorbed and transported away in these pockets.

This is as obvious as important when comparing Figure 5 with a different machine configuration.

Uniformity as a benefit

The dryer group in Figure 6 shows blow boxes in all pockets.

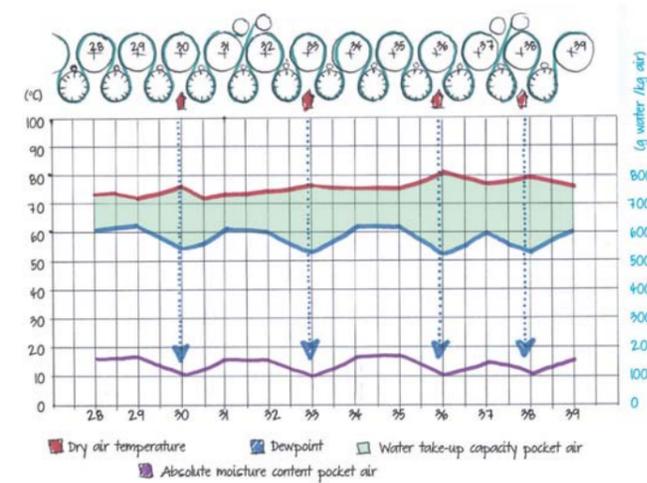


Figure 5: Uneven pocket ventilation equals uneven moisture removal

At first glance, everything is even with both the dry air and the dew point temperatures very regular. As a result, this also affects the water absorption capacity of the air in the pocket. This means in practice that air flow is even from the middle of the machine in all pockets towards both edges.

Furthermore, the lower moisture content of the air in all pockets leads to higher water take-up capacity: "In summary, very effective removal of the evaporated water from all pockets," Fischer states. "The target was achieved in this case too, because an optimum CD moisture profile is, as

everybody knows, a key quality characteristic across all paper grades."

The process is crucial

Unwelcome wet streaks can be all but eliminated with the use of the right technology and appropriate adjustment of the machine components.

The examples mentioned are certainly convincing as practical achievements, but they are all

based on a process that always starts with measurements, since the appearance of moisture streaks can have more than one cause.

TASK always recommends assessing the situations by means of measurements, and only then should optimisation and restructuring be considered. This creates certainty, and simplifies assessment and evaluation.

Air doctors as an option

Similarly, in the third case, a customer opted for air doctor technology, a space-saving alternative that involves a combination of doctor beam and blow box (Figure 7).

Air doctors are very well suited to both conventional and slalom positions. Besides optimum use of space in the pockets, air doctors have the advantage of directing the supply air directly into the wedge between the exiting sheet and the cylinder – leading to an evening out of the vacuum created. This also applies to conventional groups.

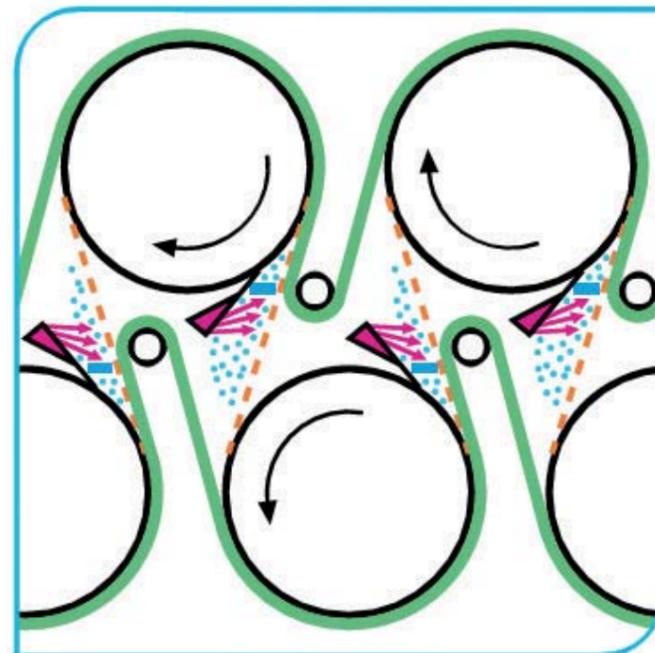


Figure 7: Air doctors in cross section

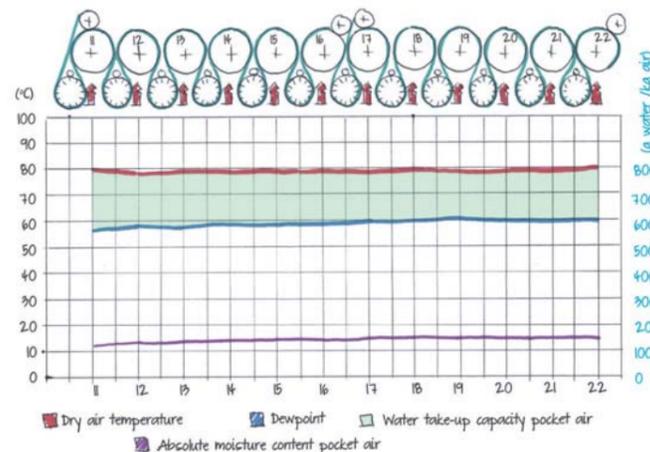


Figure 6: Even pocket ventilation – regularity across the board January/February 2019

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What's cooking?

The third generation of Valmet's CompactCooking system for mills processing hardwoods offers flexibility, improved steaming and washing, and easier maintenance. PPL reports

Valmet's CompactCooking first hit the market in 1997, with the second generation following in 2003. Currently, close to 50 systems are

in operation, helping pulp mills worldwide to achieve excellent pulp quality, maximise pulp yield and minimise pulp reject, as well as to cut steam and power consumption.

"CompactCooking has been the obvious choice for a majority of pulp mills, but we can always improve," says Patrik Lidbäck, sales manager for CompactCooking.

"Some customers with mega-size hardwood digesters have asked for improvements. As we constantly develop our products and systems, customer feedback is a key element of this improvement process. Based on our development work, the new generation mainly focuses on pulp mills cooking hardwoods, in particular mega size mills,"

The trend is towards ever-larger pulp mills, as larger-scale facilities enable more cost-effective production and increased profitability.

"Large-scale facilities bring specific challenges," says Lidbäck. "The greater size imposes greater

stresses on the equipment in order to ensure optimal operation. The third generation of CompactCooking from Valmet boosts a continuous cooking system that is excellent for mega-mills

"CompactCooking is a successful concept that we have developed further in a variety of ways," says Jonas Saetheråsen, project manager for the development of the third generation of CompactCooking.

"We have improved steaming and washing, and we can now offer an even more efficient and flexible system. The third generation of CompactCooking is



Jonas Saetheråsen led the project team that developed the third generation of CompactCooking

also easier to maintain, providing reduced maintenance thanks to a new, more cost-effective layout and by replacing high pressure feeder with pumps."

Improved steaming and washing

The new CompactCooking has a more efficient steaming process than its predecessor, allowing for much better conditions for the impregnation process. The washing performance has also been improved. The pulp from the digester is cleaner, so there is less demand on downstream processes.

"The chemical consumption in the bleaching plant will decrease due to the more efficient washing. Our development work has led us to focus on the subsequent processing steps as well. When continuous cooking works really well, it positively affects the processes that follow," says Saetheråsen.

Even the name – CompactCooking – alludes to the fact that the cooking system is compact, with the third generation being even less space consuming.

"CompactCooking is perfectly named. The new system is space-efficient and easy to maintain. The



"CompactCooking has been the obvious choice for a majority of pulp mills," says Patrik Lidbäck, sales manager for CompactCooking

new layout minimises the cost of peripheral systems, such as pipes and platforms," says Lidbäck.

Tailor-made solutions

"CompactCooking is modular, and tailor-made to suit individual customer requirements. Some customers need an entire system, while others are simply looking to upgrade parts of their cooking plant," Lidbäck explains.

Flexibility is the keyword, and the goal of the project team was to build a system that can be developed in collaboration with the customer.

"CompactCooking is prepared to handle changes that may arise. For instance, the pulp mill might want to produce a new pulp grade, or to boost production as the mill scales up to achieve higher production," says Saetheråsen. "The third generation of CompactCooking has built-in flexibility and can be adapted to meet the changes pulp mills will be facing."

Multiple specialists involved

The development work has involved many experts at Valmet. Jonas Saetheråsen led the project team that developed the third

Proven benefits

ImpBin technology

- Impregnation at low temperature and for a long time

Two-vessel system concept

- Low cooking temperature
- Enables liquor-to-wood ratio control
- Enables black liquor recirculation for high yield
- Concurrent operation

Simplicity

- Few active components

Results

- High yield
- Low reject amount
- Low energy consumption
- Easy to maintain
- High availability

Next-generation performance improvements

Optimised bleachability

- Improved alkali profile
- Cleaner pulp at the end of the cook

Improved washing

- Up to three radial wash zones

Improved flexibility

- Three cooking zones
- Possibilities to adjust temperature and alkali charge throughout the cook

Improved maintenance/accessibility

- Screen cleaning

Improved sustainability

- Odor-free impregnation vessel
- Connected to DNCG
- Improved turpentine recovery for softwood

generation of CompactCooking. "We have very diverse skillsets within the project team: machine designers, plant engineers, process engineers, and staff from our laboratory among many

others. Everyone has contributed with their unique skills. Laboratory trials and simulations are crucial steps on the way to producing a new product or a new process at an industrial scale," he says.

Sustainable optical brightening agent launched

A new optical brightening agent (OBA), especially designed for food packaging and paper, has been launched by Switzerland-based Archroma.

With food-contact approval by the US Food and Drug Administration, Leucophor AFCN liq has been developed to meet the need for food containers made from renewable sources, such as paper and board.

Leucophor AFCN liq was designed:

- with approval for use in food-contact paper and paperboard under FDA Food Contact

Notification 1921, which became effective on 9 November 2018.

- for stock application and for use in coating formulations that contain polyvinyl alcohol (PVOH), carboxymethyl cellulose (CMC) or casein as a secondary binder.

- as a disulphonated OBA, with a characteristically high substantivity



in the wet-end delivering the paper maker cost savings through the ability to make more rapid grade changes.

“There is a fast-growing demand for food packaging made with paper and board, and our Leucophor AFCN liquid OBA has been developed to help

manufacturers to respond to that demand,” said Archroma’s Andrew Jackson.

“Complementing our FDA-compliant tetrasulphonated OBAs and shading colourants, Leucophor AFCN liquid provides our customers with greater flexibility to produce attractive,

white, paper-based packaging and containers for food applications. Because it’s our nature.”

More information from Archroma Coatings, Adhesives & Sealants, Neuhofstrasse 11, 4153 Reinach, Switzerland. Tel: 41 61 716 3400. Website: www.archroma.com

Software tool for monitoring environmental loading

A software tool for on-line life cycle assessment that offers information to the operators of paper and tissue machines, or complete mills, is under development by Finland’s VTT Technical Research Centre.

The software measures the impact of operational procedures on product-based environmental loading so that the operation’s carbon footprint can be monitored.

VTT says: “Climate change and increasing shortages of natural resources are encouraging

business enterprises to clarify how their products and services are burdening the environment throughout their entire life cycle. Methods include the calculation of carbon footprints, acidification or eutrophication of waterways, use of fossil raw materials and rare minerals, and nitrogen and sulphur emissions. However, the means to understand the environmental impacts of emissions caused during production on a real time basis are still inadequate.”

The project is funded by the EU as part of its Horizon

2020 research and innovation programme.

There are several advantages to monitoring production-based environmental impacts in real time. Not only can processes be optimised more precisely, but all employees participating in the control process can also see the effects of their decisions. For example, the operator of a paper machine can see, in real time, how its operation impacts its carbon footprint.

VTT is developing an on-line LCA software tool that provides data

to the operators of production equipment, a process section or an entire plant concerning the impacts of procedures on production- and product-based environmental loading.

The system also takes the procurement of raw materials into consideration in the life cycle assessment.

More information from VTT Technical Research Centre of Finland Ltd. Tel: 358 40 829 8982. Contact senior scientist Jouni Savolainen by email at jouni.savolainen@vtt.fi

Gas-fired air handling unit shipped to paper maker in Peru

A gas-fired air handling unit has been supplied by Mark Climate Technology to a paper maker in Peru. The AHU 35-25 unit provides 32,000 cubic metres per hour of air and is equipped with two G+200 heating modules. Modulating recirculation dampers provide the option to recirculate air from the building and therefore lower the overall gas consumption of the unit.

As standard, the Mark AHU series is made from seawater-resistant aluminium panels. With the stainless-steel heat exchangers of the Mark G+ condensing heating modules, this provides an excellent solution for the humid and coastal environment of Lima, the capital of Peru.

The unit was divided in four sections for shipping in a standard 40ft container. On site in Peru, the AHU was assembled by the client’s local service



team. Fine commissioning of the control system was carried out from Mark’s headquarters in the Netherlands, using integrated webserver technology.

The AHU is used for heating a

new warehouse to a temperature of 35 deg C. This temperature is required for post-drying of manufactured paper products. A second unit has recently been ordered.

More information from Mark Climate Technology, Beneden verlaat 87-89, 9645 BM Veendam, The Netherlands. Tel: 31 598 656 623. Email: info@markclimate.co.uk

Improvements to wastewater treatment processes

Valmet and Kemira have agreed to develop wastewater and sludge treatment applications for industrial plants in Europe, including paper mills.

Reliable real-time measurement data will increase the water treatment process visibility and enable predictive and proactive process management. The target is to bring significant savings and efficiency improvements to customers.

The partnership combines Valmet’s comprehensive analyser and measurement technology, process optimisation know-how and on-site service network with Kemira’s strong chemistry and process optimisation expertise in municipal and industrial water treatment. The agreement widens the existing industrial internet ecosystem collaboration between the two companies.

“Polymers and chemicals

are an important part of the wastewater treatment process which is one reason why this collaboration with Kemira is a great opportunity for us,” says Heli Karaila, manager for wastewater automation at Valmet. “Especially in sludge dewatering, the right chemicals selection is one of the key elements to achieve the best performance.”

Jussi Ruotsalainen, application development manager at

Kemira, added: “We are actively expanding our portfolio of smart chemistry through the KemConnect platform, for example sludge dewatering and phosphorus treatment. As part of this full-service approach, it makes perfect sense to partner up with a leading industrial automation hardware, software and equipment service provider like Valmet.”

More information from www.valmet.com/wastewater

Sappi increases capacity at its Saiccor pulp mill

As part of the Vulindlela project at Sappi's Saiccor pulp mill in South Africa, Valmet is supplying a range of processes.

Valmet will be supplying a new baling line and rebuilding a cutter layboy, and in a separate order will deliver a magnesium oxide No 3 brown stock washing and screening line.

The value of the orders is more than €10 million.

Target for the Vulindlela project

is to reduce the environmental footprint of the mill and to increase its annual output from 783,000 to 890,000 ADt.

The baling line includes a new cross cutter roll, new baling line machinery with a bale quality system. In addition, a bale quality system will be installed on the existing baling line. The existing conveyors between the cutter and the new baling line will be upgraded to fit the new production. The capacity of the

new baling line will be 1,200 ADt per day.

"Valmet was selected as the supplier of this equipment for their cost effective and innovative solution that meets the required production rate," says Wayne Weston, Vulindlela Project Director at Sappi.

For the brown stock washing and screening line, the order includes the deknottling, screening and brown stock washing area, and auxiliaries like centrifugal pumps, field instruments, control valves, tower and tanks. The delivery also includes a service agreement on performance and reliability monitoring for the TwinRoll presses. The monitoring consists of a cloud application on the Valmet platform.



"Valmet's large reference base for fibre line key equipment, such as the TwinRoll presses for sulphite pulp/dissolving pulp, gives confidence to our customers that we can handle their special processes. We are happy to be a part of the Vulindlela Project and it is an important breakthrough for Valmet to utilize the TwinRoll presses in the Saiccor mill," says Eva Engfeldt, sales manager for the Fiber Processing Business Unit at Valmet.

Located south of Durban, the Saiccor pulp mill is the world's largest manufacturing site for fully bleached sulphite dissolving wood pulp.



India's Century Pulp and Paper orders second tissue line

A complete tissue production line has been ordered from Valmet by Century Pulp and Paper (CPP) for its mill at Lalkua in India.

The Advantage tissue line will be CPP's second from Valmet, the first being installed in 2008.

"We are excited to be the first company in India to install a tissue line equipped with an Advantage ViscoNip press. The combination of the state-of-the-art pressing technology and Advantage ReDry will provide significant energy savings, uniform moisture profile and nip load flexibility up to 150 kN/m," says J P Narain, chief



From left: Salim Ahmad Saifee (CPP), Anil Setia (CPP), J P Narain (CPP), Tomas Karlsson (Valmet) and Nandkumar DM (Valmet)

executive of Century Pulp and Paper.

"The new production line will add over 36,000 tonnes of high-quality facial tissue, toilet tissue, kitchen towel and napkin grades to the company's current annual

production capacity."

The TM7 line will comprise Advantage DCT 100HS tissue machine with a width of 2,850mm and a design speed of 2,000 metres per minute. It will be equipped with an OptiFlo

headbox, a 16-foot Yankee cylinder, an AirCap and Hot Air system, as well as a SoftReel A reel. It also features the new ReDry technology, a novel way to recover energy from hood exhaust air to heat the web before drying.

The raw material is virgin fibre, and the production line is optimized to save energy and enhance the quality of the final product.

A division of Century Textile and Industries Ltd, CPP produces writing and printing paper, and is a leading manufacturer of tissue and board, as well as Rayon Grade Pulp (RGP) products.

Dryer section of Smurfit's Facture mill to be rebuilt

Smurfit Kappa Cellulose du Pin is having the entire dryer section of the 6m-wide wire PM5 line at its Facture mill in France rebuilt by Toscotec.

The project includes 36 new TT SteelDryers with a diameter of 1.8m, maintaining the same machine length of the existing 43 cast-iron units.

Included in the order are four new TT Unirolls for the first battery. Toscotec will also rebuild the existing post-dryer section to increase productivity by adding two new TT SteelDryers.

A rope-less tail threading system throughout the whole dryer section is included, an optimised tail transfer to the Film Press with a TT Ripper and TT Transfer (vacuum belt device) and an improved paper sheet transfer between press and dryer section.

The main auxiliary systems will also be part of Toscotec's



work, including the lubrication system, the hood with its air and ventilation system and the sheet stabilisation. The hall ventilation system will be also part of the package.

The PM5 produces White Top Kraft Liner with a trim of 5,500 mm. The rebuild will enable the

mill to increase machine speed to approximately 900 m/min to strengthen Smurfit Kappa's position as the leading European supplier of White Top Kraft Liner.

The supply is on a turnkey basis and includes engineering, erection, commissioning, start-up assistance and training.

Completion is planned for the first quarter of 2020.

Bruno Tormen, Smurfit Kappa Cellulose du Pin's mill manager says: "At Smurfit Kappa, we offer our customers constant, secure and reliable quality thanks to our unrivalled standards. Toscotec's design met our targets in terms of the dryer section's performance and machine production increase. The high level of customisation of their turnkey solution was one of the deciding factors for our choice, along with the significant advantages of TT Steel Dryers."

Fabrizio Charrier, Toscotec's area sales manager, added: "It gives us great satisfaction to be selected for such an important rebuild project by Smurfit Kappa Cellulose du Pin. Thanks to the increased efficiency of the overall drying process, PM5 will significantly boost its capacity, and deliver actual energy savings, thereby cutting the mill's energy bill."

ATMP line for Kabel Premium Pulp & Paper in Germany

Kabel Premium Pulp & Paper has ordered a new advanced thermo-mechanical pulp (ATMP) line for its mill at Hagen in Germany from Andritz.

ATMP technology is a highly-optimised process with modular steps that ensure enhanced fibre properties at reduced energy consumption. Start-up is scheduled for the final quarter of 2019.

Second-hand machines that Kabel Premium bought from a former magazine paper production line in Germany will also be refurbished by Andritz.



Andritz will also install several key equipment units: a new MSD Impressafiner to delaminate

and impregnate chips even more gently and efficiently as well as new fibre centrifuges

to guarantee superior fibre/steam separation. Two second-hand and refurbished Andritz high-consistency refiners will form part of the first and second refining stages. The order also includes the DCS system, complete installation of the scope delivered, basic engineering, commissioning, and start-up.

Kabel Premium Pulp & Paper has a long history as a producer of top-quality printing paper. Established in 1896, the company has around 540 employees.

Pulp drying and biomass boilers for the Arauco mill in Chile

As part of the construction of what will be one of the largest pulp investments in the world, a pulp drying and baling, recovery boiler and biomass boiler has been ordered from Valmet for Arauco's MAPA project in Chile.

Arauco is investing US\$2.35 billion to increase production capacity and to build the new pulp production line at the Arauco Mill in the Biobío Region, Chile.

Valmet is not revealing the value of the order but projects of this scope usually cost up to €300 million (US\$342m).

The project includes the construction of a new production line, Line 3, with an annual capacity of 1.56 million tons that will increase capacity at the mill to 2.21m tons. The new line is expected to start operation in 2021.

Franco Bozzalla, senior vice-president for pulp and energy at Arauco, explained the reasoning



behind the order.

"In addition to high quality pulp, the expansion project allows us to continue generating clean and renewable energy from forest biomass, due to the construction of a new biomass boiler," he said. "The boiler supplies clean energy to the mill and the surplus electricity will be delivered to the National Electrical Grid."

Bertel Karlstedt, business line president for pulp and energy at Valmet, added: "We have had good cooperation with Arauco for over 15 years, and we are happy to deliver key technology for the

company's state-of-the art pulp mill. This delivery is significant also for our project and technology teams globally. The project is led from Finland and key components are produced in our own workshops. The employment impact in Finland is close to 300 man-years."

The pulp drying line will have a daily capacity of 5,000 air dry tons (Adt) and consist of two complete drying machines, including four high capacity baling lines. The pulp drying machines are designed for high availability with production capacity of

2,500 tons/day and a web width of eight metres for each machine, with a possibility for future capacity increase through debottlenecking.

The tailored boiler island consists of a recovery boiler with a daily capacity of 6,300 tons dry solids (tDS) and a fluidised bed power boiler with thermal capacity of 160MW.

The recovery boiler features advanced high-power features, enabling maximum energy efficiency and high electricity production, and smelt spout cleaning robot for improved safety and operator friendliness. The power boiler is tailored to burn local biomass, such as eucalyptus bark, sawdust, shavings and residues as well as sludge.

Arauco operates in the forestry, pulp, lumber, plywood, composite panels, millwork, and renewable energy businesses, with 42 mills in North America, South America, Europe and South Africa, and yearly sales of around \$5bn.

Mondi SCP orders OCC and containerboard lines

Old corrugated container (OCC) and OptiConcept M containerboard lines with a winder are being supplied by Valmet to Mondi SCP's mill at Ružomberok in Slovakia, with an expected start-up at the end of 2020.

They comprise a new PM19 line, which is designed to produce an environmentally-sound containerboard grade, kraft top white, which combines the strength, printability and appearance benefits of a white

virgin fibre top layer with the economic advantages of a recycled fibre bottom layer.

The stock preparation line will include a hardwood stock line, a save-all and broke system, an approach flow system to the OCC line, which contains pulper feeding and vertical pulper systems, high and low consistency (HC and LC) cleaning systems and coarse and fine screening systems with fractionation, thickening disc filters for short and long fibre

lines and long fibre dispersion system.

The containerboard machine will include an OptiConcept M containerboard machine from headbox to reel followed by an OptiWin Drum two-drum winder. The winder will be equipped with Dual Unwind giving even higher capacity due to a one-minute parent roll change. The delivery will also include an OptiAir high humidity hood and other related air and ventilation systems, a surface starch preparation system

and supply system for sizer.

"During the concept development phase, Valmet was actively promoting technical solutions. We are confident of Valmet's technical competence and concept. In addition to the well proven technology of Valmet, we also appreciate the continuous development and innovations of Valmet giving us further development opportunities in the future," says Herbert Hummer, project director at Mondi SCP.



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Efficiency system for Hamburger Rieger's PM2 stock preparation unit

A complete stock preparation unit has been ordered from Voith by Hamburger Rieger for the new PM2 line it is constructing at Spremberg in Germany.

Voith will supply three separate stock preparation lines with a total capacity of 2,450 metric tons per day.

Representing an investment of €370 million (US\$422m), construction work started on Hamburger Rieger's new paper machine following a ground-breaking ceremony last September. With an expected start-up date in June 2020, the 7.8m-wide PM2 will produce up to 500,000 tonnes a year of White Top Testliner in a range of grades.

Voith says the key to the stock preparation concept is its OnEfficiency.DIP (deinked pulp: recycled waste paper without colour residues) system, which has already proven effective for the manufacture of graphic papers based on recovered paper. The process is now being used for the first time in the production of packaging papers. In the stock preparation unit of the new PM2, ultra-modern sensors and actuators ensure consistent raw material quality and low running costs.

The system consists of two yield control modules, two bleach control modules and an optimiser. The yield control module uses online sensors to measure the ash content and whiteness of



the stock. Using actuators, the flotation technology automatically adjusts it as necessary to obtain the required degree of whiteness. The bleach control module also measures the whiteness before and after a bleaching step. If necessary, actuators also regulate the flow of chemical additives here as well. The control modules are connected with the optimiser, which defines optimum target values based on the optimization of running costs. The cost model takes account of relevant parameters such as energy, raw material and chemicals. This dynamic interaction between the individual components reduces quality fluctuations, which occur thanks to the heterogeneity of the raw material or production adjustments. This at the same time improves production costs.

On the PM2 at Spremberg, Voith is also testing a new prototype of a virtual sensor which uses the measurements in the stock storage

tower and the process parameters to predict contamination areas. The optimiser uses the model calculated in this process to optimally adjust the variables. The self-learning system allows for automated controls, which means that the full potential of the system can be reached sooner.

At present, only the OnEfficiency.DIP from Voith offers this kind of comprehensive performance. According to Hamburger Rieger this was a decisive factor in awarding the order for the stock preparation unit. With a tailored service package, Voith ensures that the OnEfficiency system will continue to perform optimally in the long term.

Hamburger Rieger is part of the Hamburger Containerboard Division of the Austrian Prinzhorn Group, whose annual production of more than two million metric tons makes it one of the market leaders in the segment for white uncoated and coated testliner.

Other news

- Valmet and Mercer Group have signed an agreement for on-line performance monitoring for nine Valmet TwinRoll wash presses at the Mercer Stendal mill in Germany. The agreement is valid for one year, with the option of being extended. During this period, Valmet and Mercer will co-operate to further develop fleet management with respect to predictive maintenance and reliability. "This will allow the Stendal mill to monitor performance, which will hopefully result in more uptime as well as savings on chemicals," says Dr Gerhard Wulf, technical manager at Mercer Stendal.

- An automation system update and expansion for Gasum's project at the Metsä Tissue Mänttä mill in Finland is being supplied by Valmet. As part of the project, the mill will replace liquefied petroleum gas (LPG) with Gasum's low-emission liquefied natural gas (LNG) in the burners of the drying processes on its tissue machines. "Valmet's flexible approach and familiarisation with Metsä Tissue enabled us to offer a turnkey delivery to the customer," says Tommy Mattila, sales and marketing director at Gasum.



Tissue line at ICT Iberica is fifth supplied by Valmet

ICT Iberica's mill in Burgo, Spain, has successfully started up its new Advantage DCT 200HS tissue production line supplied by Valmet.

The tissue line supplied by Valmet meets ICT Iberica's objective to produce the highest quality tissue. Valmet has previously delivered four tissue lines to ICT's mills in Italy, France and Poland.

Silvano Marcelli, technical manager at ICT and Antonio Jordan, project manager at ICT Iberica, commented: "Thanks to the teamwork between Valmet and ICT technicians, the project achieved all the objectives, both



in terms of quality and timing. The capability to manage the main planning of all the phases – engineering, installation and commissioning – in a flexible way, the final tuning of the on-site activities, joined with the skills of the team members involved

in the project, were the keys to achieve a regular and smooth start-up."

The new line adds production of 70,000 tons a year for toilet, towel, facial, and napkin grades for the European market, made from virgin fibre.

Valmet delivered a complete tissue production line including a stock preparation system and an Advantage DCT 200HS tissue machine. It also included a two-layer OptiFlo Headbox, Advantage ReTurne energy recovery system, Advantage ViscoNip press and Advantage SoftReel reel, as well as Advantage AirCap hood, steam generator and a complete mill equipment system from bale handling to fan pumps.

The ICT group was founded in 1978 and currently operates ten paper machines in four European countries. With the latest installation its global annual production capacity increased from 540,000 to 610,000 tons.

Argentina's CMPC mill starts up new Yankee from Toscotec

Papelera del Plata, part of CMPC Tissue Latam group, recently started up a new steel Yankee dryer supplied by Toscotec on the PM3 line at its Zarate mill in Argentina.

This is a repeat order for Italy-based Toscotec, which in 2010 started up another steel Yankee at CMPC Tissue's mill in Uruguay. These TT SYD steel Yankee dryers replaced two existing units supplied by another manufacturer.

At the Zarate mill, the TT SYD-12FT dryer has a diameter of 3,660mm and a face width of 2,800mm. Included in the order was Toscotec's patented deckle insulation system, which enables safe and practical application



of the deckle insulation on the Yankee's heads without any machining, the drive group, support and bearings, and the main components of the steam and condensate system. The

service package included the engineering design, installation supervision, commissioning and start-up assistance, as well as on-site training programme.

Simone Pieruccini, Toscotec's

pressure vessel technical manager, said: "In order to meet the stringent delivery requirements of the customer, we manufactured and delivered the TT SYD in record time. From the project kick-off meeting to the notice of goods ready for shipment, it took us only three-and-a-half months. Thanks to the good cooperation with Papelera del Plata, installation, commissioning and start-up were very successful and the TT SYD started performing well from day one."

One of the biggest pulp and paper manufacturers in Latin America, CMPC has mills in eight countries and yearly capacity of 700,000 tonnes.

Chartered Institute of Logistics and Transport in the UK appoints Paul Sainthouse as president

Paul Sainthouse has been appointed as president of the Chartered Institute of Logistics and Transport in the UK for 2019.

This year is a special for CILT, because throughout 2019 the Institute will celebrate its centenary.

Commenting on his appointment, Sainthouse, who is managing director of Dawsongroup bus and coach ltd, said: "I am delighted to accept the Presidency for the year ahead. Our sectors face numerous challenges as well as opportunities in this very rapidly evolving world and I hope that CILT(UK), in its centenary year, will continue to be recognised as an



Paul Sainthouse, 2019 president of CILT(UK)

increasingly relevant organisation with an important part to play in upholding professionalism, delivering thought leadership and supporting its individual members personal development."

Sainthouse will build upon the work of his predecessor Robin Proctor, who helped implement a new strategy and shape a new vision for the Institute.

"It has been an honour to be President of CILT (UK). I took the role at an important time for our profession and also for the Institute," said Proctor. "I am proud of the job we have done to ensure we successfully raised awareness of and promoted CILT's influence throughout the profession. I wish Paul all the very best in this role, and I am sure he will lead the Institute with distinction throughout this special celebratory year."

Paul Sainthouse has spent more than 30 years with Dawsongroup, a specialist asset rental business

operating in several related markets within the logistics sector, joining as a management trainee in 1987, and since 2002 in his current role as managing director of the group's bus and coach business.

Kevin Richardson, chief executive of CILT (UK), welcomed Sainthouse, saying: "At CILT, we recognise the need to raise standards and attract and develop the talent that will enable us to support the sectors that we represent. Paul's parliamentary connections and active involvement in the profession make him the right man to represent the Institute during our centenary year and positively promote CILT (UK) and the critical role of our sectors during what will be a challenging year for us all."

Prof Dr Lutz Engisch reviews benefits of carbon fibre components in the paper industry

The benefits of carbon fibre components being used in the printing, paper making and related industries have been reviewed in an academic study.

Professor Dr Lutz Engisch from the Leipzig University of Applied Sciences presented the results of his research at the recent ERA Packaging & Decorative Conference in Turin.

"There is an increasing trend for using carbon fibre for components such as print cylinder sleeves for easier handling and idler rollers as



Professor Dr Lutz Engisch

they can reach higher rotational speeds than metal rollers for a given diameter," the study concludes.

"This is particularly important

when wide web widths are used such as in paper making and polymer film manufacturing."

While the performance benefits of carbon-fibre components

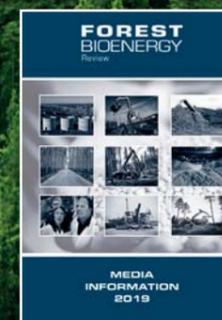
have been established in the aviation and automotive industries, their use in the printing industry for rollers and cylinders has so far not been well documented, despite the fact that they are being used. Carbon fibre combines strength with low weight making it an ideal material for parts where weight is a critical factor.

Copies of the study, in English and German, are available from Dutch-based carbon fibre product manufacturer Pronexos at contact@pronexos.com.

FOREST BIOENERGY Review



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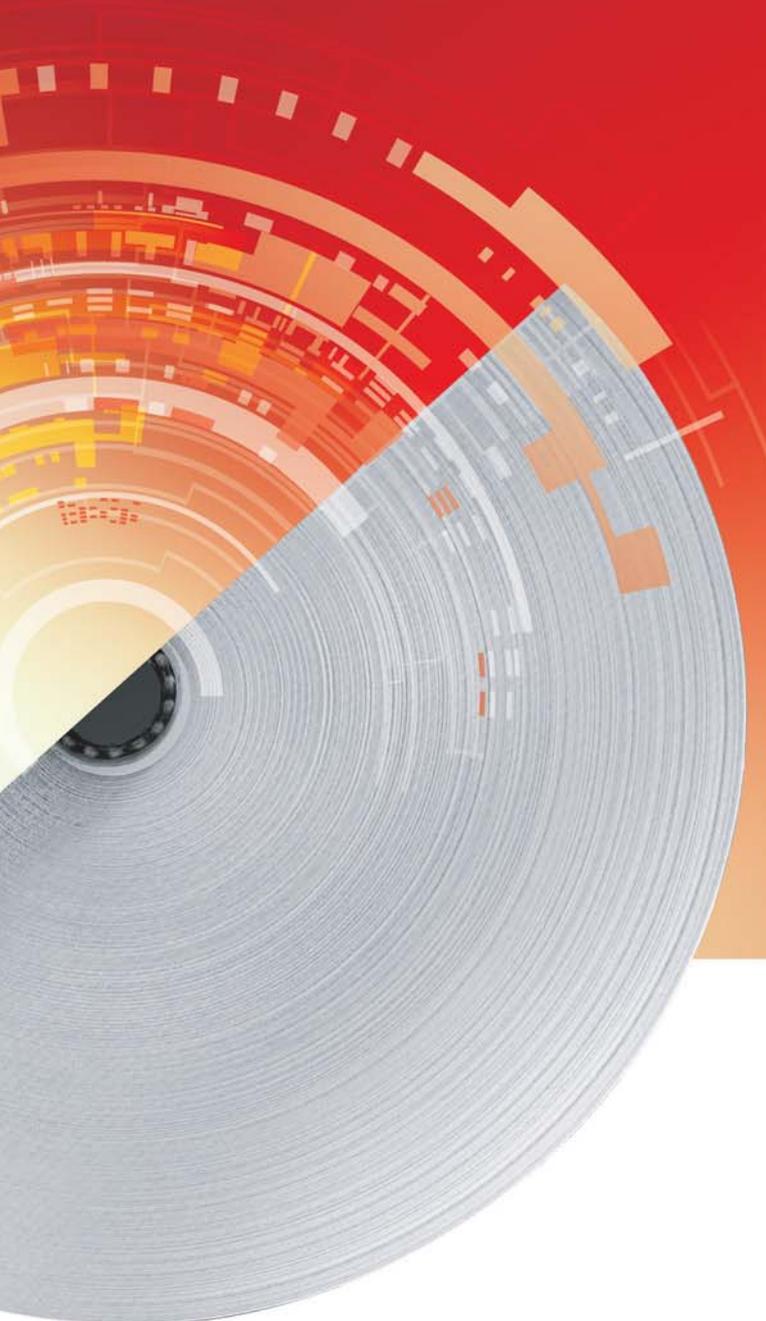
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