

P3

Paper Print Packaging

» **Paperazzo**

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7./8.2020

**One
Magazine –
three
different
perspectives**



P3

Paper Print Packaging

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ipw + biofibre magazine



Dear Readers,

May I provoke you a little? The industry has had a difficult year and a somewhat blurred future lies ahead. So no reason for big fireworks, right? – but maybe the perfect moment to take a look at the self-presentation and external image. The effort for serious reporting has increased this year, because corporate communication is increasingly characterized by superlativitis. Every day they rattle down in staccato, the “world market leaders”, “technology leaders” and “driving forces” with their “innovative”, “unprecedented”, “impressive”, “groundbreaking”, “outstanding”, „standard setting” and of course “revolutionary” new achievements and “world premieres”.

Now, as is well known, announced revolutions do not take place, and cynics might even use the word fear blossom, but let’s be honest: Which 80s marketing seminars did the euphemism consultants come from who consider something like this to be contemporary and expedient? And what light do such cheap, blatant phrases, used by the dozen, throw on what some companies think about the maturity and comprehension of their customers?

The paper, print and media industries are navigating a difficult environment. Nevertheless, it has solutions to offer – future-proof solutions that can be sold on the market seriously and with a certain touch of humility. However, the accompanying appearance often does not keep up with these products and services, especially in the light of increasing transparency. Perhaps in 2021 the industry should re-focus on its own strengths and the necessary modesty that goes with it. The spin doctors, on the other hand, may go into the desert. And please: don’t pass GO!

I wish you a happy and prosperous New Year!

A handwritten signature in black ink that reads "Stefan Breitenfeld". The signature is written in a cursive, flowing style.

Stefan Breitenfeld
Editor-in-Chief

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Refuelling the Future



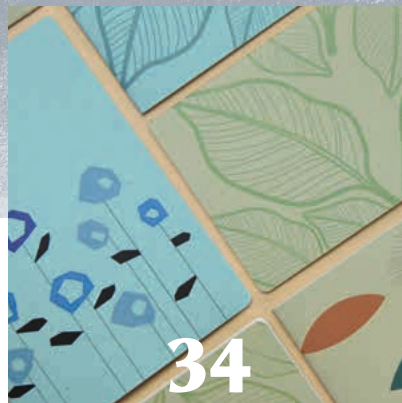
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1. *Paperazzo* reports about diverse types of paper, discerning finishing and printing processes. It is the trade magazine for paper decisionmakers, print buyers, creative printers, agencies, publishers and producers of branded goods.

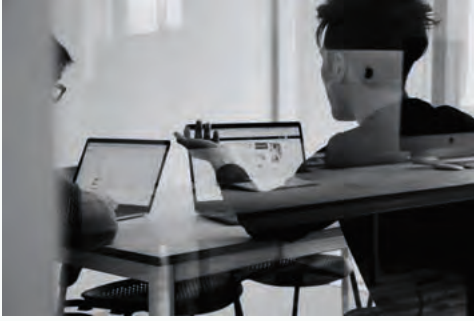


2. *Druckspiegel* is the leading trade magazine for decision makers in the print and media industry operating in the German-speaking area. It reports about the most important technical and economic developments in the industry.



3. *ipw* reports on pulp & paper producers, their suppliers and international activities as well as sustainability. bio-fibre magazine covers new kinds of paperlike materials and biocomposites or bioplastics based on wood fibres.

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Metsä Group

Employee Ethics Survey

In the summer of 2020, Metsä Group conducted a large-scale ethics barometer, the aim of which is to get insights on how Metsä Group’s personnel perceives that business ethics and the Code of Conduct are realized in practice. Metsä Group’s updated Code of Conduct was launched in spring 2019. More than 6,000 Metsä Group employees responded to the survey.

The results of the first ethics barometer were good overall. Based on the results of the survey, awareness of the requirements related to business ethics is at a very good level, the personnel regards the topic as

important and also feels that people at Metsä Group act ethically correct.

In the light of the results, development needs can be identified in different areas of human resource management, equal treatment of people and in a culture where people have the courage to report unethical conduct and their concerns are addressed. Metsä Group is launching development measures identified based on the results in order to further promote ethical company culture.

“Acting ethically correct in all situations is very important at Metsä Group. Good results on average must not lead us to think that there is no room for improvement in the work communities and in the conduct of each one of us. The achieved result provides us a good platform to further develop our operations,” comments Ilkka Hämälä, President and CEO of Metsä Group.

The Ethics Barometer is used to measure responsible corporate culture, which is one of Metsä Group’s 2030 strategic sustainability objectives. The target result set for the ethics index is 100 percent by 2030. The result of the first survey was 84.4 percent. ∞

Flint Group

Acquisition in North America

Flint Group Packaging Inks announced the acquisition of Poteet Printing Systems LLC located in Charlotte, NC, USA. This acquisition aligns with a key element of Flint Group Packaging’s strategy to grow not only organically, but also via acquisition.

Poteet manufactures and sells water-based inks for Flexographic applications to printers and converters across the United States. The company supports the key paper & board applications for corrugated post- and pre-print and digital products, as well as targeted water-based paper packaging print demands. Poteet’s main production facilities are located in Charlotte, NC, and Fort Worth, Texas; the business has two additional warehouse locations in North Carolina. The company currently employs 60+ people. ∞



Toscotec

Consumption Reduction at Wepa Giershagen

Wepa Group is one of the largest tissue manufacturers in Europe, with 13 sites, 21 paper machines, a production of approx. 780,000 t/year, and a positive annual growth trend. Since 2002, Toscotec and Wepa’s cooperation has been particularly strong at Wepa Marsberg-Giershagen, where Toscotec supplied a new tissue line on a turnkey basis, completely rebuilt PM 5 in two different steps and installed new hoods on other two existing machines, with the result that all tissue machines at the mill are now equipped with TT Hoods.

In order to evaluate the return on the investment, it is always interesting to compare the efficiency of the equipment – consumption and performance - before and after the rebuild. This comparison is particularly clear if looking at PM 4 and PM 7, where the modification involved



only the hoods and the air system. After the installation of TT Hood on PM 4, the mill achieved a 12.5 percent reduction in gas consumption and 50mpm increase in machine speed. The results on PM 7 were similar, with a 13.3 percent reduction in gas consumption and 50mpm increase in speed.

In general terms, for a tissue machine that produces 30,000 t/y with a thermal consumption of 1.3MWh/t, 10 percent of drying energy savings equals a cost reduction of approximately 4 €/t, i.e. 120,000 €/y. Additional savings coming from electrical load reduction and machine speed increase must also be considered. ∞

Dutch IPA

Unique and Immersive Beer Labels

Dutch IPA revealed that it has developed thousands of distinctive beer-bottle labels using the HP Indigo WS6900 and the HP SmartStream Designer software. Each label is uniquely designed to tell a story with the brand’s mascot, Captain IPA, through various illustrations, with HP SmartStream’s algorithms enabling Dutch IPA to create vast combinations of specific design elements. ∞





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Walki

PET-Free Solution for Ovenable Trays

EU is expected to revise the 1994 Packaging Directive to require all plastic packaging to be reusable or recyclable by 2030. The implementation of the Single Use Plastic Directive will ban materials like styrofoam containers. Several EU countries are also considering a tax on plastic and single use items.

Walki has developed an ovenable tray made of renewable fibre to help customers comply. The Walki Pack is 100 percent PET-free and easy to recycle.

“At Walki, we are eager to support the transition away from aluminium and plastic-based solutions towards fibre-based alternatives”, says Annika Sundell, Executive Vice President, Innovation and Business Development at Walki.

The tray can stay in the oven for up to 60 minutes. The trays are also suitable for a wide variety of applications including frozen or chilled ready-made meals, such as fish and baked goods. The Walki Pack Tray solution can be used for folded and pressed trays and the inner part of the tray is available in brown or white. The barrier materials are kept to a minimum to make them easily recyclable.

“We are continuously working on increasing the fibre-content in our products and with the launch of the new tray material we have taken a giant step forward towards monomaterial solutions”, concludes Annika Sundell. \\\

Erratum

Metapaper vs Roemerturm

In our P3 issue 3./4.2020 we made a mistake on page 7: The message about the Metapaper fine paper “Black & White” was erroneously illustrated with an image of the James Cropper papers Bowston Black and TacCard White sold by Roemerturm. We apologize for the mistake and hereby show you the correct product image from Metapaper. For information on increasing the range at Roemerturm, including the mentioned papers by James Cropper, please see www.p3-news.com/En/News/12623 \\\



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PulpEye

Thirty CrillEye Modules Installed Worldwide

Since the first installation in 2013, PulpEye has now installed thirty CrillEye online analysers worldwide. The technology, developed in cooperation with Innventia, makes it possible to measure the amount of crill and hence to calculate and control tensile, tear, burst, Scott Bond, z-strength bulk, and density in combination with fibre data.

Crill consists of fibrils which are about one hundred times thinner than the fibres, invisible for traditional camera technology. Even though crill represents only approx. 1 percent by weight of the particles in a suspension, it may contribute to as much as 50 percent of the free surface. The more crill found on and around fibres, the better binding ability they have, which in turn results in a stronger paper and board. The original technology was invented at Innventia, now a part of the Swedish research institute RISE, and in 2013 the cooperation between Innventia and PulpEye resulted in the CrillEye module.

“Waggeryd Cell, a Swedish producer of BCTMP pulp, was the first brave company to try CrillEye technology on mechanical pulp and we had a very good cooperation when starting up and finetuning the technology,” says Öjvind Sundvall, MD at PulpEye. “CrillEye combined with the ExtractEye software means that tear, tensile, burst, z-strength, Scott Bond, bulk and density can be calculated by this technology. As the CrillEye measurements are online, less man-hours are required to do these tests manually in the laboratory.”

“Once the technology was proven at Waggeryd Cell the number of installations started to take off, in the beginning by customers adding a CrillEye to their existing set of PulpEye modules but it is now standard in our deliveries. Since its introduction, the number of CrillEye modules recently reached thirty and is in use in pulp and paper mills worldwide. CrillEye number 30 was recently delivered to a European kraft paper mill.” \\\



Stora Enso

Change of Forest Assets Valuation Method

Stora Enso has decided to start using a valuation method for its forest assets in the Nordics based on market transaction data and change the accounting policy from the fourth quarter of 2020 onwards. Preliminary estimations, based on transactions in those areas in which Stora Enso has forest land, indicate that the value of the Group’s forest assets, including leased land, will be between EUR 6.5 billion and EUR 7.0 billion, compared with the end of Q3/2020 book value of EUR 5.4 billion. The review will take into account also the latest transaction prices. \\\



Durst

7 Product of the Year Awards

Durst announced that Durst and Vanguard won a combined seven 2020 Product of the Year awards – the most in the history of the company, and a reflection of the new combined Durst Group organization product depth and reach.

“The PRINTING United Awards together with our acquisition of Vanguard and our investment in LiftERP further confirm the Durst Group as a powerhouse in the US Graphics Industry,” said Christoph Gamper, CEO and co-owner of the Durst Group. “We look forward to offering the new expanded portfolio worldwide in 2021 and further expanding our leading position in the global LFP market.”

The following products won 2020 Product of the Year:

- Durst Rho 2500: UV/Latex Hybrid
- Durst Rhotex 325: RTR Dye Sublimation on Textile
- Vanguard VDR5-E: Flatbed/Hybrid UV/Latex
- Vanguard VKM600T: Flatbed/Hybrid UV/Latex
- Vanguard VK300HS: Flatbed/Hybrid with White UV/Latex
- LiftERP: Workflow/MIS/CRM
- Durst Workflow: Software – RIP

Tim Saur, President of Durst North America stated, “As a Durst Group, we essentially won in every price segment available to print providers in the market.” He continued, “Through the talent of our incredible engineering group in Europe, and the design capability of the entire Vanguard team in Atlanta, it is no surprise to me that we won so many product awards.”

PRINTING United Alliance brings together companies from all over the world in the specialty imaging and print industry. This annual competition showcases the highest quality machines and most innovative advances within the wide format color printing industry. \\\

Sustainability

Clariant Wins Henkel and ICIS Awards

Clariant announced that the company was recently honoured with various high-level awards in the area of sustainability and innovation. Henkel Adhesive Technologies presented Clariant its Sustainability Award 2020. In addition, Clariant won in two categories of this year’s ICIS Innovation Awards: Clariant’s multi-purpose additive Licocare® RBW Vita, derived from crude rice bran wax, won ‘Best Product’, and the ammonia synthesis catalyst AmoMax™-Casale, jointly developed with Casale SA, won ‘Best Sustainable Process’.

“Since both innovation and sustainability are among Clariant’s strategic pillars, it makes me very proud to see that the efforts of our teams are being recognized



by our business partner Henkel as well as a leading industry publication in ICIS. It shows that we are on the right track with our transformation into a leading specialty chemicals company,” said Clariant’s Chief Operating Officer Hans Bohnen.

Clariant was honoured with the Henkel Sustainability Award 2020 for being the best external partner for Henkel Adhesive Technologies and supporting it

in providing higher value, better performance and a lower environmental footprint to its customers. One highlight of the business partnership was a customized Clariant Sustainability webinar for Henkel’s R&D-, Procurement-, Regulatory- and Sustainability-teams. Attended by over 100 Henkel employees across three regions, it marked an innovative approach of collaboration between both companies and was rated very valuable by all participants. Furthermore, Clariant’s outstanding Ecovadis score and transparency on the carbon footprint of its materials were a clear differentiator.

“Sustainability has become a megatrend across the different markets we serve and we see a major increase of customer demands for solutions with regards to CO2-reduction, circular economy and health and safety,” explained Christian Kirsten, Corporate Senior Vice President and Global Head of the Automotive and Metals business at Henkel. \\\

Varel

Heavy Investment

Papier- und Kartonfabrik Varel (PKV) is continuing to consistently implement its strategic program, which comprises a total of 280 million Euro, with future-oriented investments in its cartonboard production. In a very wide range of cartonboard products, the high grammages have always been a specialty of Varel.

These days, engineers and fitters are putting the finishing touches to major investments in equipment for PKV board production: board machine 2 will soon be able to use a completely new online sheeter, and the sheeter of board machine 3 has been extensively modernized. Both machines from the renowned Spanish manufacturer Pasaban will thus ensure even higher quality in board production in future. Among other things, this will include further improved state-of-the-art precision cutting, higher availability and thus a larger cutting capacity, so that the company is well prepared for further investments in board machines.

“High-quality cardboard made of waste paper is sustainable, flexible and resilient - this product has a future,” says PKV shareholder Kristian Evers. “We have always made sure that we are as broadly based as possible for our customers. These investments will help us to move forward – together with our outstanding know-how, especially in the area of high grammages.”

Cardboard is produced in Varel in basis weights between 350 and 1400 g/m², as gray or brown board, GD or GT and laminated quality. All products are FSC-certified and recyclable in accordance with the EN 13430 standard. Customers use the versatile products in the food industry, for industrial solutions, POS packaging or heavy-duty shipping envelopes made of brown cardboard.

Further investments in cartonboard production are in preparation, for example a modernization of the stock preparation. The Varel paper and board mill will further develop its plant in the coming years to a production capacity of one million tons of corrugated board paper and board. \\\



Valmet

Acquisition of PMP Group Completed

Valmet has completed the acquisition of PMP Group in Poland following the agreement that was announced in September. PMP Group is a provider of technologies and services for the paper industry. The enterprise value of the acquisition is approximately EUR 64 million, plus a conditional and capped earn-out component.

The acquired business becomes a part of Valmet’s Paper business line. PMP Group supplies process technologies and services for tissue, board and paper machines globally, focusing on small and medium-sized tissue machines and board and paper machine rebuilds. The net sales of the company were approximately EUR 70 million

in the fiscal year 2019. The company employs about 650 people in Poland, China, USA and Italy. PMP will be included in Valmet’s financial reporting for the first time in Valmet’s fourth quarter financial reporting 2020.

Jari Vähäpesola, Business Line President, Paper, Valmet, says: “The acquisition was completed as planned and we are happy to welcome 650 new colleagues to Valmet. The combination of Valmet’s current paper technology and services for wide and fast machines and rebuilds, together with PMP’s product portfolio, competence and presence in strategic markets, will create new business opportunities. From now on we will work as one team with a wider product offering, to further strengthen our capabilities to serve paper, board and tissue producers globally.” \\\

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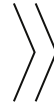
Cortec

New Biobased Fabric

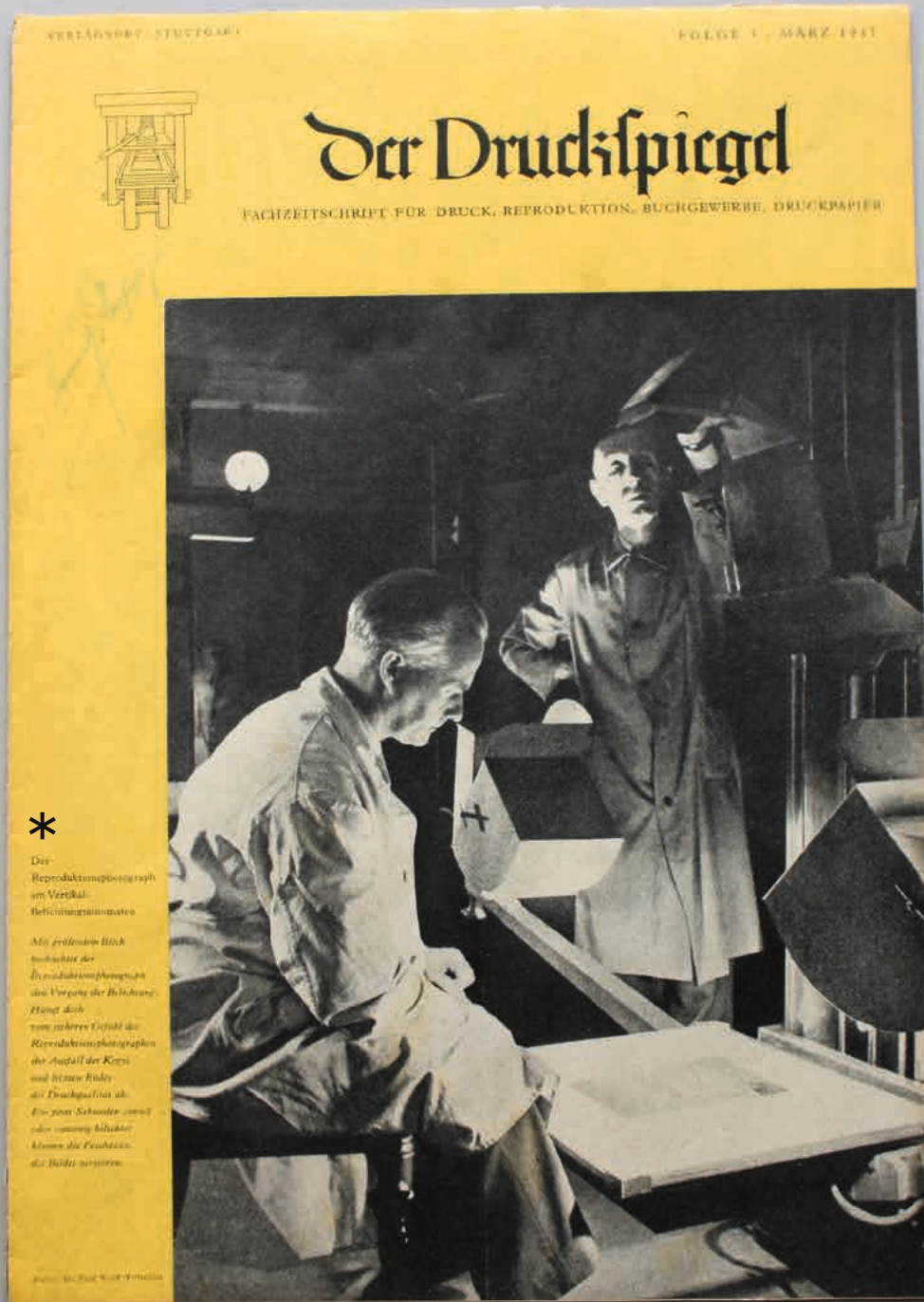
BioPad® is a “green” technology flexible corrosion inhibiting device constructed from biobased non-woven material, providing a sustainable packaging option for corrosion inhibition. Its high VpCl® concentration, in combination with a thin design, results in material reduction by up to 94 percent in comparison to similar



polyurethane foam emitting devices. The USDA Certified Biobased Product provides up to two times as much corrosion inhibiting action as its conventional VCI counterpart. It is excellent for protection of ferrous and non-ferrous metals as well as various alloys. \\\



We do open our morgue and look back ... here one of the first issues of Druckspiegel from 1947.

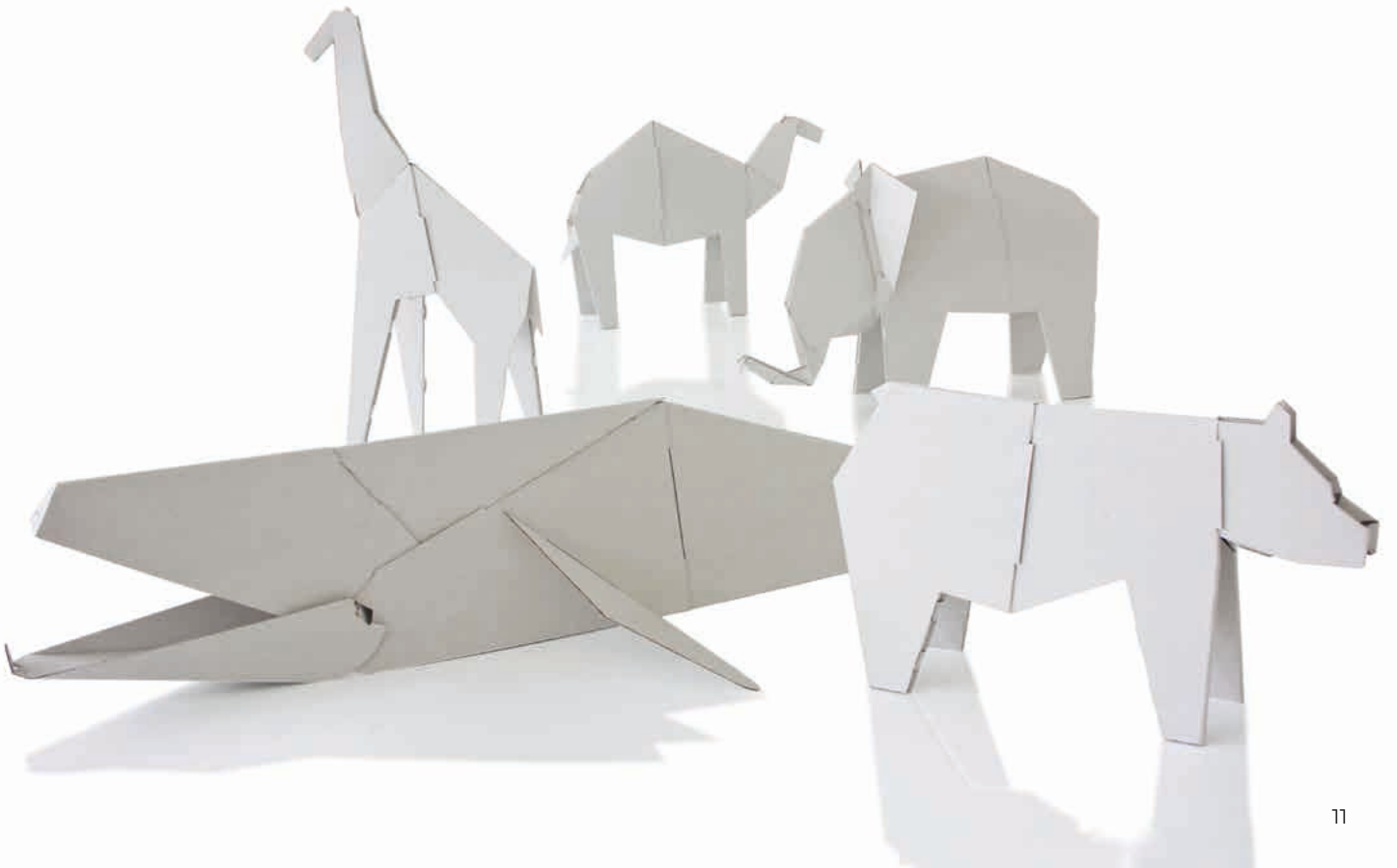


* „Der Reproduktionsphotograph am Vertikal-Belichtungsautomaten“ (Photo: Dr. Paul Wolff Tritschler)



... **Paperthings** ...

MY ZOO was designed by Martí Guixé for Magis. Bear, dromedary, elephant, giraffe and whale made of cardboard, available in two dimensions. www.magisdesign.com





Södra

Refuelling the Future

Södra is committed to being free of fossil fuels across the entire group by 2030, including all transport. As well as driving fossil fuels out of its value chain, the company has started up a world first – a biomethanol plant at its Mönsterås pulp mill. The result? The project is ambitious but achievable.

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The Swedish forest products group Södra is best known for its pulp and timber production. These remain the core focus of the Group but in recent years the company has also stepped up its mission to contribute further to a more circular economy, setting several environmental targets which have been given the same priority as the company's financial targets.

Among them was the bold declaration in 2016 that Södra would become free of fossil fuels across all operations, including transport, by 2030. The company had already committed to being fossil-free for production by 2020 and now hits that production target on a day-to-day basis, leaving transport as Södra's main source of greenhouse emissions. In 2019 Södra was 99.5 percent fossil-free for production and 94 percent fossil-free overall.

When the project started, Södra was using 85,000 m³ of fossil fuels in its transport system. Internal reliance on fossil fuels has been eliminated. Södra only offers renewable choices (HVO and RME) for trucks at its on-site filling stations, up from 50 percent in 2016. It is also involved in pioneering work to build the world's first large-

scale biodiesel production facility based on solid biomass through the Silva Green Fuel joint venture. This would be in addition to the current use of tall-oil, the pulp production by-product, as a source of bio-diesel, which already produces a healthy surplus over the company's own needs. And there are numerous other initiatives such as the use of electric forklift trucks across production sites.

This leaves external transportation and here cooperation with the company's partners across the logistics chain is crucial if the 2030 target is to be met. The company has been working with customers, suppliers and authorities in an effort to move more of its goods by rail but the key is that all forms of transportation are powered by renewable energy.

With internal transport already 100 percent fossil-free, the emphasis is now on two areas: technical innovation and external partners – creating a pull effect by producing fossil-free alternatives within the Group and pushing others in the chain to reduce their use of fossil-based fuels. "We believe that if we are to succeed in transitioning our transportation system, we must



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- 1 A world first: Södra's Mönsterås pulp mill inaugurated its commercial biomethanol plant last October. The plant has a capacity of 5,250 tpy of biomethanol, which is being marketed as Liquid Forest.
- 2 Electric forklift trucks are just one initiative in Södra's bid to become entirely free of fossil fuels.
- 3 Södra only offers renewable choices (HVO and RME) for trucks at its on-site filling stations.
- 4 Project Manager Henrik Brodin. "Our role is split between the supply side and demand side, as producers and consumers of renewable energy. We take our responsibility for both very seriously."

stimulate demand for sustainable transportation," says Project Manager Henrik Brodin. "Our role is split between the supply side and demand side, as producers and consumers of renewable energy. We take our responsibility for both very seriously."

The pull: A "world first"

Technical innovation has taken the form of a world first at the company's Mönsterås pulp mill with the inauguration in October of a SEK-100 million (EUR 10.5 million) commercial biomethanol plant. Södra's biomethanol is made from the same wood raw materials that the pulp mills use, sustainably sourced from the company's own members' forests in Southern Sweden. The plant has a capacity of 5,250 tpy of biomethanol, which is being marketed as Liquid Forest.

Production begins with the sulphate pulp process at the mill – methanol is created during the cooking process when woodchips and chemicals react to separate the cellulose and hemicellulose. After cooking, the chemicals, lignin and other residues are washed out of the pulp to form black liquor, whose water content is then reduced by evaporation. What remains is a condensate of methanol, turpentine and sulphur compounds.

The condensate is cleaned to be reused in the mill, creating raw methanol which is a mixture of combustible residues, normally burned to produce heat and energy. But thanks to a patented extraction process, Södra can now produce a commercial grade methanol product instead – about 10 kg of biomethanol for every tonne of pulp. The new product is certified according to ISCC, indicating that its manufacturing is environmentally, socially and economically sustaina-

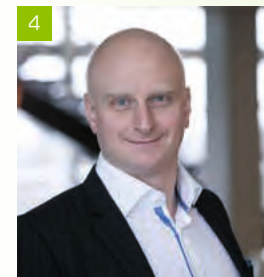
ble. Initially, pilot deliveries were sent to Danish biofuels producer Emmelev A/S for use instead of fossil-derived methanol in its biodiesel production. Emmelev A/S is a Danish family-owned agricultural company that has developed large-scale biodiesel production from local canola (rapeseed) but currently uses fossil methanol as a raw material in production.

"Södra's investment in biomethanol is entirely in line with the European Green Deal (see below), which has the aim of dramatically reducing our carbon footprint and reducing emissions. By manufacturing the world's first fossil-free biomethanol, we are demonstrating how engineering prowess and innovation can contribute to the transition of society. We are pleased that the importance of this kind of investment is understood by politicians," says Lena Ek, Chairman of Södra.

The Push: Getting others in on the act

Methanol is already a major commodity but its biggest impact in terms of Södra's ambitions would be to see biomethanol used as a fuel in shipping. Even fossil-derived methanol offers several notable environmental advantages over heavy fuel oil (HFO). It degrades naturally in water and emits neither sulphur, nitrates, nor particulates. Biomethanol is molecularly identical to the fossil-derived version, so substitution is straightforward.

When the project was first launched four years ago, Brodin identified shipping as the biggest hurdle for Södra to achieve its goal of becoming fossil-free across all transportation. In recent years, Södra has increased its sales of forest products to Asia, a market that can only be com-



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mercially viable when served by sea freight from Sweden. But sea freight remains heavily tied to fossil-based fuels, requiring substantial investment and time to retrofit or replace vessels. The fact that shipping companies have not been subject to a carbon tax has meant there has not been much motivation to switch from fossil-based HFO either.

However, says Brodin, things are changing. The Fastwater project is one of several initiatives targeted at achieving the Paris and IMO targets of a 50 percent reduction in carbon dioxide from maritime transport by 2050. Fastwater aims to accelerate shipping's move towards methanol, and the more ships that can use methanol, the more that can use the fossil-free version, bio-methanol.

Fastwater and the EU's Green Deal, including a proposed revision of the EU emissions reduction target from 40% to 55% by 2030, are piling on the pressure and Brodin believes shipping companies are taking note. Maersk, for example, is publicising its Eco Delivery innovation: "A carbon neutral way of shipping is not a distant reality anymore," claims the company. Brodin is the first to admit that a shipping giant such as Maersk has much more leverage than Södra to reduce the use of fossil fuels in sea freight, but the bio-methanol plant at Mönsterås is a significant strategic and technical contribution.

The EU's Green Deal is a major motivator not only for shipping but throughout the supply chain. Mette Quinn, Head of Unit for the EU ETS Implementation and IT DG Climate Action, told PRIMA 2000 delegates online earlier this year that the challenging backdrop of the economic fall-out caused by Covid-19 offers an opportunity to accelerate investment into a clean transition. There has been a complete decoupling in Europe of economic activity and greenhouse gas (GHG) emissions: the EU's net GHG emissions and removals in 2019 reduced emissions by an estimated 25% compared to 1990, while GDP grew by 62%.

When the project started, Södra was using 85,000 m³ of fossil fuels in its transport system. Internal reliance on fossil fuels has now been eliminated.

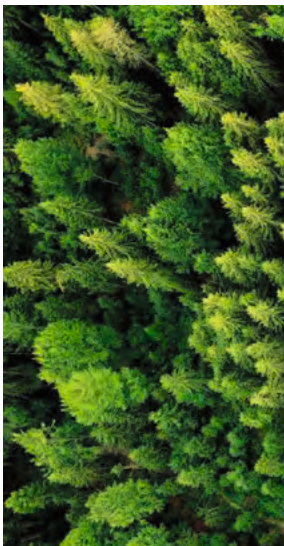
The EU is calling for climate neutrality by 2050, which means tougher action is needed, including a European Climate Law which the European Commission will propose, aimed at turning political commitment into a legal obligation and what it hopes will be a trigger for investment. "Reaching this target will require action by all sectors of our economy," says Quinn. "We have focussed a lot on climate and energy in the past. But now we need to see a focus on decarbonising the whole economy."

To 2030 and beyond

When Södra launched the 2030 project, it was driven by increasing awareness of sustainability issues among Södra's 50,000-plus forest owner members as well as customers and wider society. The use of fewer and more sustainable resources made not just ethical sense but economic, too. It also sat well with the company's overall sustainability ethos. As Brodin pointed out: "It's not just a question of reducing our dependence on fossil fuels. We want to aim high, to have a more positive impact on the planet by reducing our energy use, not just switching from one fuel to another. Efficient management of resources is key for the future."

That was then but the view still holds. Södra knew the ambition to eliminate fossil fuels from the entire Group was a bold one – it had never been achieved across a whole company of this size. But the combination of what Brodin calls 'responsible risk taking', innovation and partnerships with suppliers is paying off and, he says, "2030 is more realistic every day".

"Society has moved further than I anticipated," Brodin continues. "Take bio-based aviation fuel for example. Not so long ago it was no more than an idea. Now it is a technology which just needs scaling up. This is not to dismiss the challenges ahead, but the positive 'can-do' attitude to technology gives a huge boost to progress. We see increased interest among customers and other supply chains. Fossil-free, climate neutral – it's changing all the time but gathering pace in the right direction and we intend to be part of the more sustainable solution." |||



Paper Industry Presents Main Decarbonisation Pathways to 2030

2030 is a pivotal year for the decarbonisation of Europe. It is the year by which the European Union must have significantly reduced its emissions, by 40 percent as a minimum, and even up to 55 percent if the more ambitious target proposed is to be adopted.

For any industrial sector, reaching these figures, particularly after the economic crisis deriving from the pandemic, requires significant investments towards clean and efficient energy sources, as well as a renewed policy framework opening the market to sustainable products made from renewable materials.

“The European paper industry has a unique role to play in the fight against climate change by offering immediate and affordable solutions. We have a vision on how we can contribute, and we could do even more with the right regulatory environment. Our 2030 Industry Manifesto published today maps out the ways in which we can deliver potential for carbon reduction. With substantial and targeted support from the EU as part of its Green Deal legislative package, these factors can play an essential role in reducing carbon emissions, potentially exceeding the already ambitious targets,” commented Ignazio Capuano, Cepi chairman, in occasion of the Manifesto’s launch during the 2020 edition of Cepi’s annual conference, Paper and Beyond.

Our manifesto identifies the three main catalysts for our decarbonisation effort:

Product substitution

Our industry can provide climate-friendly substitutes to fossil-based, carbon-intensive products currently on the market, potentially creating a multiplier effect through our expertise in the circular economy.

The European Union should help create new markets for renewable bio-based products and ensure there is a steady supply of recyclable raw materials, like high quality virgin fibre. Furthermore, recycling could be further enhanced through improvement and harmonisation of the European waste collection systems.

Sustainable forest management

Forests are essential in our fight against climate change. They support biodiversity and act as a carbon sink. Our industry, together with our

forest-based industrial partners, contributes to their active and timely management, leading to effective reforestation, regeneration of harvested areas and safeguarding biodiversity. A strategic EU-wide framework for forest management would significantly boost and support our work. The framework would need to look at data-based socio-economic indicators for biodiversity to determine the availability of forests, help support their regeneration and ensure the application of our industry standards in other sectors and regions of the world.

Emission reduction in production processes

We have already achieved significant results in our decarbonisation efforts. The emissions still present are almost entirely due to energy consumption. While increasing energy costs would simply make the European industry less competitive, we do believe more can be achieved through a renewed European industrial strategy aimed at promoting carbon-neutral production in Europe.

This strategy should support and reward investments in reducing emissions through energy efficiency, CO₂ avoidance and renewables. It should pave the way for broader availability for carbon-neutral energy sources, and secure effective protection for our sector against the risk of carbon leakage.

“The Green Deal is not just a political programme by Ursula von der Leyen: it is a tsunami of policy and legislation that will profoundly change businesses and industry – ours included. It is now that our future is being decided! Our industry in Europe has already moved very far in its effort towards decarbonization and sustainability, in spite of the difference between companies in processes and products and even in access to resources due to different geographical locations. We are now ready to move to the next steps and we are sure the European Union can see the unique added-value we can bring,” said Jori Ringman, Cepi’s Director General. |||



Fig 1: Standard SSB with paired binder yarns and higher void volume.



Fig 2: Primoselect concept with only a single binder yarn: Lower void volume, reduced caliper, faster dewatering.

Heimbach

Always Keep Things Clean

How to describe a modern paper machine? A sensitive giant is probably the best fit. In order to have perfect paper at the reel, all components have to work together perfectly and in harmony. In other words every discrepancy, no matter how small, can sometimes have a surprising and detrimental effect on the production process.

As is already well known, a good sheet of paper starts in the forming section, and to ensure that everything runs smoothly here, the fabric must be kept clean and open for long periods of time. You can find out here just how important the subject of forming fabric cleaning and conditioning is.

The methods essentially differentiate between mechanical and chemical cleaning, each of which can be used alone or in combination. In this article we will deal with the most widely used method, mechanical cleaning.

Cleaning is usually effected with showers and only on rare occasions with brushes or wipes that rub against the surface of the fabric, as they carry a risk of extra surface wear.

Did you know that conditioning starts with the choice of clothing? The design of a forming fabric has a huge impact on how dirty it gets, or how clean it remains. It is worth taking a look inside here at a fabric with fewer internal crossover points when compared to conventional SSB fabrics. Primoselect, as shown here, benefits from this

as fewer fibres and of course dirt particles remain within the fabric and are transported around the loop. Reduced thickness and low void volume thus help ensure improved former hygiene (Fig 1 & 2).

The alpha and omega of H₂O

If you are conditioning clothing, you should definitely focus on the quality and composition of the water used in the process, as this will have a significant effect on the cleaning result. Chemical or thermal influences can lead to the escape of dissolved salts which are deposited on the fabric or even the machine frame. The following applies in connection with cleaning showers: The water jets should be filtered and have the same pH value and the same temperature as the clothing and machine parts that are being treated.

Just as important: The solids loading of the water is a key factor in the choice of nozzle. The more particles there are, the larger the nozzle diameter must be to prevent clogging.

We recommend that you check the nozzles in all showers on a regular basis and replace them at an early stage. Bad cleaning or blocked nozzles can lead to local wear as seen below. Here the doctor conditioning nozzles were blocked and fibres had accumulated on the paper-side return roll, wearing out the paper side of the fabric.

Pressure to reach your goals

Nowadays, fabrics consist of several layers: paper side, centre, machine side. In this type of fabric structure, fibres, fillers, salts and stickies can fill up in several dimensions at the same time, which has a negative effect on fabric drainage capability and can possibly also lead to problems in the system.



Fig 3: Dirty fabric.

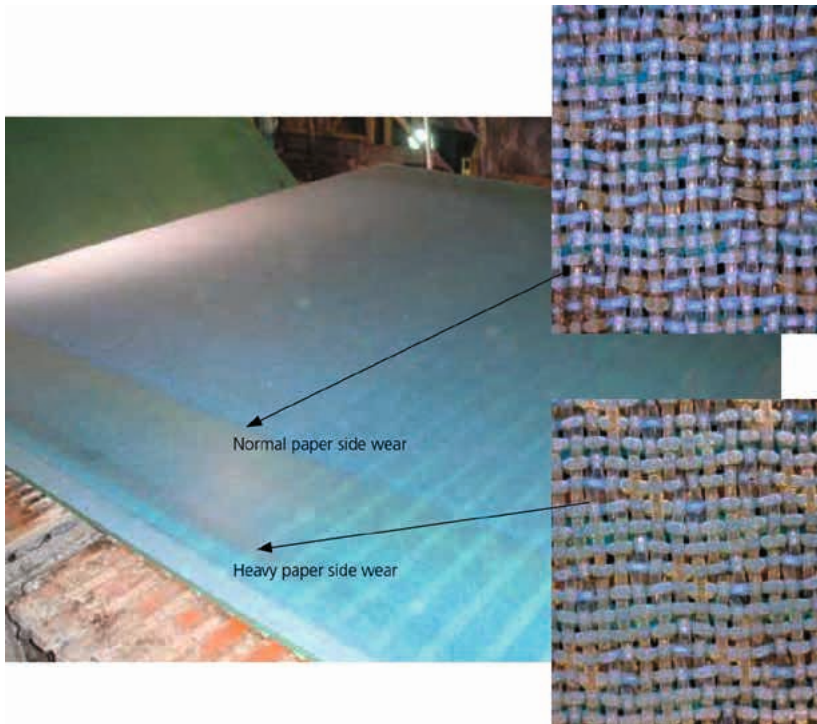
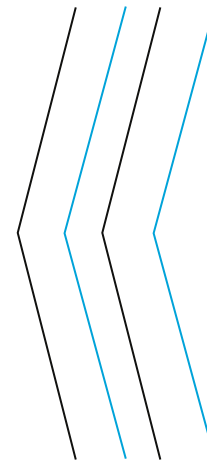


Fig 4: Comparison wear.



when the fabric exits the roll. It fills with air and water which flushes loose debris through the fabric. Additional dewatering and cleaning is achieved on the following rolls through overpressure that occurs when the roll and fabric converge. This works particularly effectively with thin fabrics with few crossover points such as Primoselect.

For optimal cleaning results it is critical that fan nozzles overlap correctly which enables the fabric to be wetted evenly. This is necessary because uneven cleaning can cause premature fabric wear and sheet formation can also be disturbed by the presence of dirt particles (Fig 6 & 7).

The fan nozzles should be aligned on the machine side of the fabric. Typical water pressure should be between 10–15 bar and distance between nozzles should be 100–300 mm.

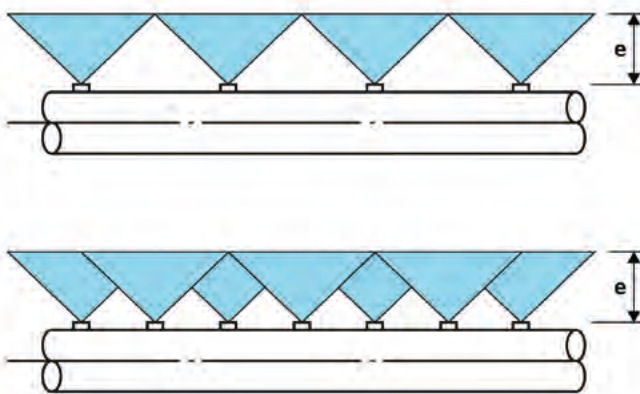


Fig 6: ND Shower overlapping (@PMS).

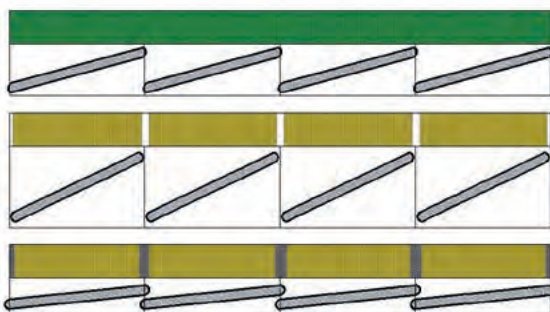


Fig 7: Presentation of flat jet nozzles for an even application of water (@PMS).

In order for the dirt particles to be effectively removed, a high volume flow or pressure (possibly a combination of both) will be required. In principle, the following applies: The pressure should be as high as necessary so that the deposits are actually removed and not just loosened. At the same time it should be as low as possible, so

as to avoid damage to the fabric, and also of course to save energy (Fig 3 & 4).

Showers with fan nozzles

Showers equipped with fan nozzles work well – through a combination of wetting and the natural vacuum that is created

High Pressure shower: Positioning and set-up

The set-up of the nozzles is of critical importance when ensuring that every dirt particle is removed.

- Choose a jet with laminar flow.
- This must be located approximately 100 mm away from the fabric and slightly rotated into the run direction.
- The cross direction traversing speed should be one nozzle diameter per revolution.

Fig 8 shows a shower pipe on the front side: All nozzles are in excellent condition, the water jet is laminar. Fig 9 shows the same shower on the drive side. Here some nozzles must be damaged or partially blocked as the jet is turbulent. By this we mean that the jet dissolves into individual

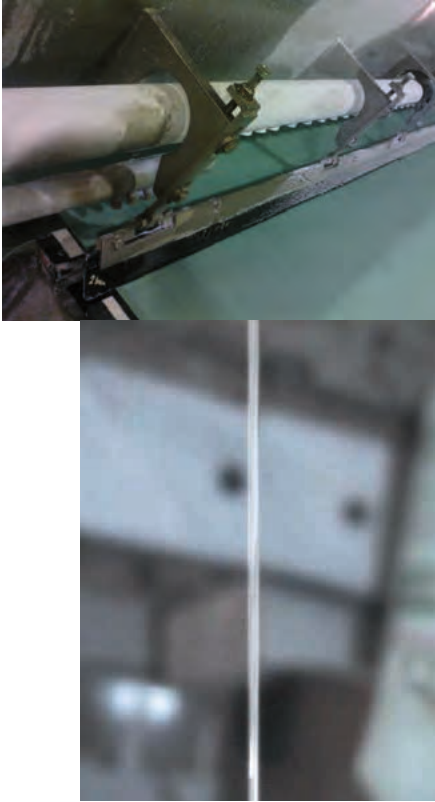


Fig 8: Optimal, laminar water jet.

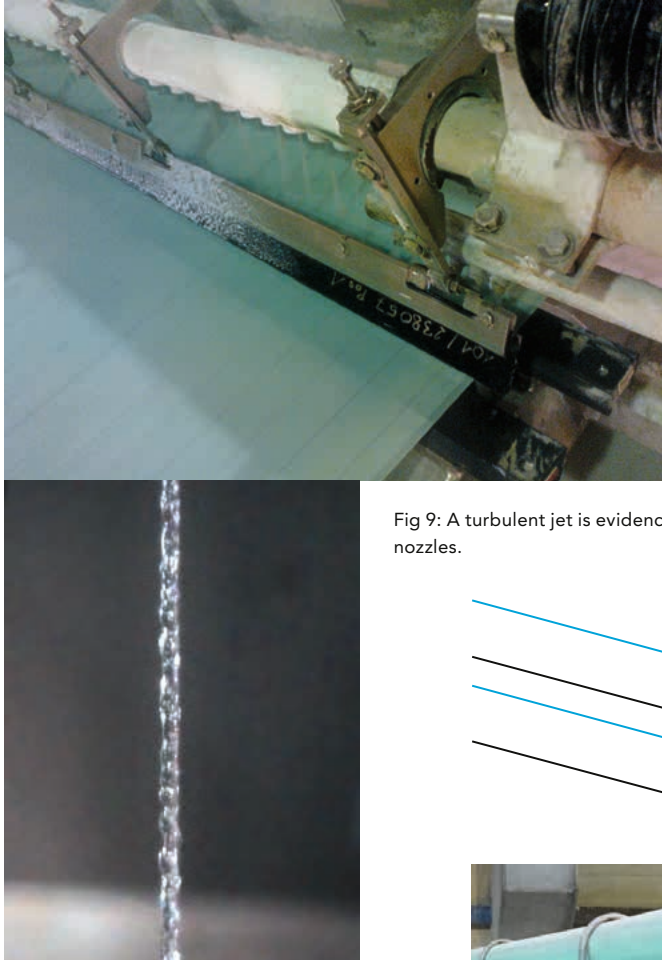


Fig 9: A turbulent jet is evidence of defective nozzles.

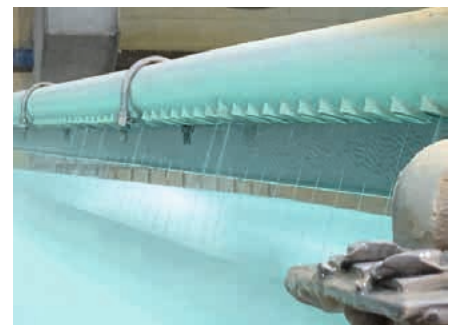
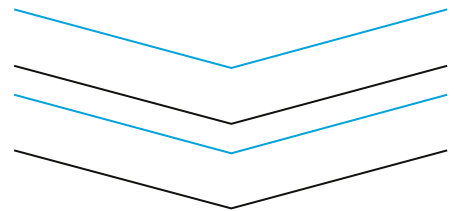


Fig 11: Topformer.

particles before it hits the screen surface. The cleaning effect is low and there is also a risk that paper-side yarns will be suffer damage.

It is advisable to check the quality and condition of the water jet on a regular basis in order to identify and correct any changes in good time. In the case of defective, dirty or even partially clogged nozzles, the water jet will be compromised, which can lead to poor CD profiles of the sheet.

High Pressure shower: Position of the showers

How and where high-pressure showers are located plays a major role - both with regard to the cleaning effect and to prevent further contamination. Some systems have both machine-side and paper-side high-pressure showers. More often though, there will be a single shower located on the paper side of the fabric.

Typical arrangements are:

- a) Shortly before a return roll: This is where the water can most easily penetrate the fabric. The narrowing gap between the roll and the fabric pushes the water and contaminants back again through the fabric and out of the paper side.
- b) Between two deflector rolls and underneath a mist removal box. The latter is designed to remove both water spray and contaminants.

In the case of topformers the shower water is commonly directed into a Uhle box area where both water and contaminants are collected and washed away (Fig 11).

High Tech Cleaning Equipment

Modern high-speed gap former machines place particularly high demands on cleanliness. Together with increasingly advanced

plant technology, there are now many alternative types of cleaning units with single or multiple nozzles that traverse the entire width of the forming fabric. Compared to high-pressure showers, they consume significantly less water.

Conditioning, like choosing the right design of clothing, is a very complex topic. It pays off twice and should by no means be neglected: After all, it is much easier to keep a fabric clean in the first place than to clean a dirty fabric.

In this article, we have limited ourselves to the essential aspects and have hopefully made it clear how important this operation is for the entire production process. |||

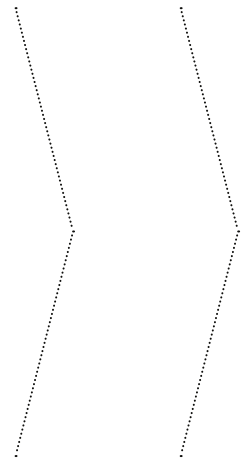


Primoselect

The future for forming fabrics

Primoselect is a unique concept in forming fabric design: Within this product group **Primoselect.HD** is the perfect solution for **packaging paper** production.

- **Optimised production** in terms of runnability, dryness, energy consumption and efficiency
- More open structure and low caliper leading to **improved drainage**
- **Good sheet formation**
- Robust machine side providing **better stability and longer life**
- **Easy to clean**, increased retention, less sheet breaks
- **Less fibre and water carry**



Creativity & Context

"It all starts over there!"

Be it Forfel, Ach and Krokodeil or Bartholomäus Blumenbart: Those who like to design children's books often come into contact with whimsical characters. The Viennese-based illustrator Nadine Kappacher has just the right touch for such appearances. In the Paperazzo conversation, she states that inspiration can be drawn from pretty much all walks of life. And that you shouldn't always take the world too seriously.



The native of the Austrian Burgenland summarizes her résumé briefly and succinctly in the lower area of an A4 page - elsewhere it would be enough for several people. Firstly, there are the studies: Ethnology, Social and Cultural Anthropology, International Development, African Studies, plus Philosophy "as a minor". And on it goes: training as a print graphic artist, marketing for the Kunstthalle Wien, working for several years in the letterpress studio Herz & Co. Finally, working as a freelance illustrator, including open painting evenings and workshops. Two children were added. And actually she wanted to become



a ballerina ... How does it all work together - in a field of activity that lives primarily from inspiration and creativity?

Good riddance, little demon!

"I started to put my first drawings online in a blog because I struggled with finishing my studies and writing my thesis," says Nadine about how it all began. "These pictures were small black and white drawings, depicting the conversations with the inner demon who laughs at you, doesn't trust you with anything. Self-doubt, depression, everyday stuff. But at some point there came colors and new stories - and the little demon said goodbye. I then did children's books and other commissions and worked for magazines. And tried not to lose sight of my own, free creativity - because that's where the whole pool for inspiration lies."

Meerweh!

Her website can be found at www.meerweh.at, so it is not surprising that the longing for the sea



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My workplace is a huge mess.”

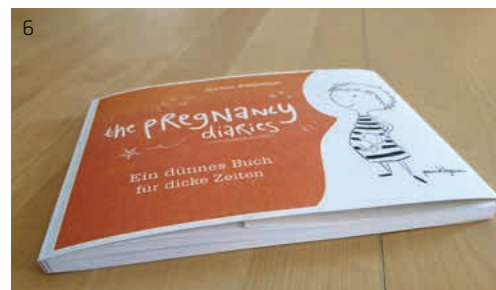


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1+2 From the book "Urlaub, Ahoi".

3 At the drawing board.

4 Nadine Kappacher.

5 Do I have to move?

6 The Pregnancy Diaries.

is one of the main sources of Nadine's creative work: "The vastness, the blue, the never-ending waves. I draw fish and even more fish. For me, that's the best way to relax." But the love for the material plays an important role, too: the feel of the paper, the mixing of colors, the smell at work. "With Herz and Co in the letterpress studio, I was able to live out my irrepressible love of handicrafts and passion for paper. I worked on the printing press, mixed colors, then made card sets in the paper processing department and also drew customer orders."

Thin book for thick times

The artistic handling of ever new challenges has a liberating and inspiring effect. "In my first pregnancy - again challenged by new situations that had to be overcome - I drew what was to become the Pregnancy Diaries." (Editor's note: Published in 2020 by the publisher punktgenau in Vienna, see below.) "The dispute with the bumps of everyday life, the small and the big questions, the struggle and reconciliation with the inner demons - all of these are sources that you can tap into for the benefit of your own creativity," says Nadine. "And, of course, the humor that goes with it."

Worlds in pictures

When it comes to drawing, the artist, who describes herself as an "anti-perfectionist", is largely autodidact. "I never did an apprenticeship," she says, "but I've painted and drawn a lot since early childhood. It runs in the family - we create worlds in pictures. The focus was never on learning a 'correct representation' or the ability to draw, but the enjoyment and necessity of drawing. Drawing the same thing over and over again, purely for relaxation. Playing with colors. Create characters and let them speak. Represent the very everyday states of mind."

A preferred way of working has nevertheless emerged over the years, she confirms: "My primary techniques are fineliners on paper, coloring with crayons, or watercolor. Most of the time I work on a reduced scale. Still, my workplace is a huge mess. Due to the increased amount of commissioned work, I also got into digital drawing. Initially with a lot of skepticism (the paper !? the colors !?), but now I really appreciate the combination of both! And so working with collages has become more important for me again. I draw and paint areas on the paper, then scan them and digitally cut them up. Of course, I also cut up and collage with scissors and paper; is there anything



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3



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more beautiful? Every now and then I unpack the sewing machine and sew the paper, embroider threads in it, and sew old book pages on it. Or I take out Erika, the typewriter, and type sentences on carbon paper, then cut them out and paste them into my pictures."

Out of the context ...

In general, the love of the word should not go unmentioned. "Song lyrics and all kinds of other words and half-sentences find their way into my pictures. I like it when the words and sentences in my drawings are irritating. What has been ta-

ken out of context has a beautiful meaning of its own," smiles Nadine and adds: "It should either make you think - or stop the thinking and turn it around."

... into the studio

Nadine has her workplace in the Vienna Atelier Brutstätte, a "combine for yoga, text and image". She shares the premises with Eva Karel, an author, yoga teacher and painter, and Lena Raubbaum - author, speaker and also yoga teacher. "We are kind of a prank inclination group and it's pretty colorful, lively and fun here. In the studio I also hold workshops and once a month my open painting evening. It is initially a space to work on your own projects completely independently, but many participants also come there with the desire to get inspiration and finally to draw again. It is meant to be a low-threshold access to drawing - without claiming perfection."

Coloring and craft templates

With the cancellation of workshops, exhibitions, markets and book presentations due to the corona pandemic, 2020 was a difficult year in this environment as well, confirms Nadine: "My work has shifted - especially towards my web shop. And of course I drew a lot with and for my child-



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ren – especially coloring and handcraft templates. Those who are interested can find the materials on my website and at Illustrators against Covid19.”

The desire to try new things over and over again remains a driving force in Nadine’s life, and so the gaze is directed towards the future: “In autumn I started painting shop windows with chalk paint. And that will probably be my new passion. This one big project over three days and many meters was a lot of fun!” |||

Selected publications

- The Pregnancy Diaries. Verlag punktgenau, 2020. ISBN 978-3-9504855-5-4
- Urlaub, Ahoi! Tyrolia Verlag, 2020, Author: Corinna Antelmann. ISBN 978-3-7022-3841-4
- Geschichten von Jana. Tyrolia Verlag 2015, Author: Sarah Orlovsky. ISBN 978-3-7022-3439-3
- Edi Dickstur und der Norz. Obelisk Verlag 2010, Author: Jutta Treiber. ISBN 978-3-8519-7618-2

¹ As Nadine explains: “Meerweh is a German expression, a made-up-word, describing the longing for the sea. It’s a modification of the word „Fernweh” – this is an actual word! – which means being in pain because you are stuck at your boring home, when you’d rather be far, far away, exploring the unknown.”



5

- 1 From the series “You are not alone”.
- 2 Nose to nose.
- 3 I have a bear at home.
- 4 The owl tree.
- 5 I don’t like this Monday anymore.
- 6 Stinky Winter & Desperate Spring.

6





Voith

The Potential of Sustainable Papermaking

In light of the current debate on climate protection and sustainability, the paper industry, like all resource-intensive industries, needs to develop sustainably. The main focus is on the conservation of resources and a decarbonization of the paper manufacturing process.

The Confederation of European Paper Industries (CEPI) has already confirmed that it intends to reduce CO₂ emissions by 80 percent by 2050 compared to 1990 levels. This will require breakthrough technologies and a consistent shift to sustainable energy sources. The ambitious climate protection goals are putting pressure on paper manufacturers and their sub-suppliers.

The paper industry in China is also facing the urgent challenge of becoming more environmentally friendly. This year, China officially pledged to be carbon neutral by 2060. At the same time, apart from environmental legislation, the megatrend of sustainability has long been affecting all areas of our lives and all industries. The huge interest in sustainable products on the part of consumers and growing societal pressures are consistently showing paper manufacturers and their sub-suppliers the way to a sustainable paper production process.

As a material, paper has great potential to make a positive contribution to climate protection and sustainability, thanks to its use of renewable raw materials and recyclability. This also needs to be exploited in the manufacturing process. Solutions for climate-friendly paper production are already available as are companies that are exploring what paper manufacturing of the future will look like. This story will provide an overview of revolutionary technologies, a wastewater-free paper mill and the great potential of paper as a recyclable material.

Innovations for decarbonization and the conservation of resources

Voith is working on the development of solutions and technologies to fundamentally reshape the paper manufacturing process and, as a result, conserve resources, save

energy and minimize the CO₂ footprint. "We are conducting research into various options that have the potential to fundamentally change our conception of paper manufacturing," says Frank Opletal, Chief Technology Officer, Voith Paper. "Our approaches draw on processes that reduce CO₂ consumption and save raw materials." One very promising solution could massively minimize the use of water and reduce the thermal energy requirement by up to 80 percent compared with current levels.

"In addition, we are looking into numerous other optimization approaches and are using new development methods, for instance in the field of bionics," says Opletal. "This involves applying the principles of nature to our products to enable new functionalities and design. One example is the development of slitters for winders, the principle of which is based on the self-sharpening teeth of a beaver."

- 1 Closed water loop: All water used in production is cleaned in a “biological kidney” and then returned to the production process.
- 2 Voith’s technologies help paper producers minimize their carbon footprint and reduce water and fiber consumption.
- 3 Not just wishful thinking: Efficient machines and processes ensure resource-conserving paper manufacturing.



Concerted response to the big issues affecting the paper industry

Making the paper manufacturing process more sustainable requires sound process expertise and enormous effort. As a full-line supplier, Voith aims to develop integrated solutions that go beyond the improvement of individual sections and focus on the entire paper production process and the challenges associated with it. “For example, we are also looking into the question of where the necessary energy for the drying process will come from in future,” says Opletal. “Thanks to the successive expansion of renewable energy sources, the availability of regenerative energy in particular will continue to grow. Moreover, the capture and storage of the CO₂ emitted in the overall process can offer an approach to decarbonization.”

To pursue these issues even more systematically, Voith is forging alliances. The company is partnering with start-ups to develop solutions designed to help paper manufacturers create CO₂ sinks at their production facilities. One promising approach is the use of an innovative pyrolysis process in which part of the required thermal energy can be provided by recovering thermal energy from biomass, without CO₂ emissions.

As part of an industrial consortium that is realizing the Model Factory Paper, Voith also aims to acquire fundamental insights into sustainable technological solutions for paper manufacturing of the future and help develop them. The objective of this center for disruptive innovation projects being established in Düren, Germany, is to conduct research into resource-efficient,

climate-neutral and energy-optimized paper manufacturing processes. The project can draw on extensive funding from the “Rheinisches Revier” compensation fund, which is intended to drive structural change in the region after the phase out of lignite and is supported by numerous major companies and sub-suppliers from the paper industry. The Technical University of Darmstadt and the Papiertechnische Stiftung (paper technology foundation, PTS) will provide scientific input. Construction of the Model Factory will begin in the next two to three years.

Not just wishful thinking

“A lot of what we want to achieve in the future is already within reach,” says Opletal. For example, the company is already offering solutions for zero-effluent paper manufacturing. A production line incorporating a closed water loop and modern process technology for wastewater treatment has recently gone into operation in Germany. In this zero-effluent mill, which features a “biological kidney” system, all process water used in the paper production process is cleaned in the mill’s own water treatment facility and then returned to the production process. At the same time, fresh water consumption is drastically reduced. “This is the first time this kind of system has been developed and installed in a new build,” Opletal stresses. “And it’s done without a safety net; there will be no option to just flick a switch and channel the water out of the process. Our technological expertise and sound process knowledge have made it possible.”

With its BlueLine stock preparation, Voith currently offers the “most resource-

conserving process concept on the market worldwide” that enables minimal energy consumption and reduces the CO₂ footprint of paper production. The BlueLine system achieves significant energy savings of up to 20 percent in the DIP process and 25 percent in the OCC process, compared with standard stock preparation facilities. Alongside energy consumption, the focus is primarily on even more efficient treatment of recovered fibers in the BlueLine OCC process to reduce the input and consumption of virgin fibers. “In Europe, the recycling rates for paper are more than 72 percent,” says Opletal. “This is necessary and important to further advance the sustainability of the material. As a technology group, this also means that we have to develop even more efficient systems that recover paper fibers from recycled paper in sufficiently high quality. The greater the yield and the higher the quality of recovered paper fibers from this process, the better the subsequent paper quality, even without buying in virgin fibers. This protects the environment and reduces production costs.”

Digital technologies for more efficiency and sustainability

Digital solutions are already key factors in conserving resources and reducing CO₂ emissions. “Digitalization plays a key role when it comes to reconciling ecological and economic requirements,” says Opletal. “Digital solutions from our Papermaking 4.0 portfolio allow better monitoring of all processes and therefore more precise production control, which in turn results



- 1 Frank Opletal, Chief Technology Officer Voith Paper, is responsible for the development of new technologies for climate-friendly paper manufacturing.
- 2 Digital solutions are key factors in conserving resources and reducing CO₂ emissions.

in real time and thus allow paper producers to tap into extensive optimization potential. "With one of these apps, our OnEfficiency.BreakProtect system, we also use artificial intelligence to make recommendations to operators on how to avoid sheet breaks," adds Opletal. "This ultimately improves the efficiency of the plant and increases production capacity."

New areas of application for paper

To fully exploit the potential of this sustainable material, the areas of application for paper should be extended in future. In this context, its great recycling potential makes it a good alternative to common, mainly petroleum-based materials. Among the developments needed are alternatives to mostly plastic-based packaging used for foodstuffs or confectionery. At the same time, the necessary barrier properties, for permeability to oxygen, water vapor or liquids cannot be achieved with paper alone. This is where flexible and innovative packaging solutions can offer an answer. In collaboration with a manufacturer of specialty papers, Voith has developed a 100-percent recyclable, flexible packaging paper with barrier properties. In this con-

junction, the coating process in particular is a major hurdle, because when applying the functional layer the aqueous dispersion is very temperature-sensitive. "The layers applied by our coater are based on aqueous polymer dispersions and give the paper various barrier properties," says Opletal. These kinds of sustainable packaging solutions can be used, for example, for food packaging, hygiene articles or cleaning products. The demand from customers around the world for trials with barrier papers is so great that the company is now adapting the trial coating machine in its Technology Center to precisely meet these requirements. To this end, the drying capacities will be significantly expanded, the web run optimized and the latest automation and sensor technology installed. In this way, the drying behavior of the application media can be optimally controlled, and in-depth knowledge about the production of barrier papers can be gained. This gives customers the opportunity to produce new, functional types of paper in a targeted manner.

Frank Opletal is not deterred by the fact that there is still a long road ahead to achieve climate-neutral production, despite all the approaches available: "This resource-intensive industry cannot become climate-neutral overnight. It will take a lot of small steps, innovations and new approaches to achieve genuinely sustainable paper production. But the potential of the material is so great that this journey is definitely more than worth it." |||

in higher efficiency and better availability. This saves energy, resources and operating costs." The ecological footprint of paper manufacturing can be further optimized through the use of data-driven process control systems like OnEfficiency.Strength. In the near future, new apps on the OnCumulus IIoT platform will among other things enable complete transparency of all energy consumption in a paper mill



**#SUS
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Discover the potential of sustainable papermaking.

It is our responsibility as a full-line supplier to secure the lowest resource consumption. This is why our innovations are designed to help you minimize the carbon footprint as well as to reduce water and fiber consumption in the papermaking process. Our eco-friendly solutions increase your production efficiency and lead to cost reductions. Let's focus on sustainable paper production to make our world better with paper. voith.com/paper-sustainability



Smithers

Change in Paper and Board Industry

Paper and paperboard manufacturing is being impacted by online shopping and other global forces. This dominating change in consumer purchasing habits is creating opportunities for the packaging industry that is being supported by a variety of disruptive technologies.

The industry is in the process of reacting to the top disruptive technologies, which Smithers has outlined in its new report Ten-Year Forecast of Disruptive Technologies in Paper and Board to 2030.

The paper and board industry is part of the global economy where new businesses and competing products and technologies are being introduced at a dazzling pace. For example, Big Data, artificial intelligence and robotics are increasingly being used by the industry. This new report from Smithers looks at the application and limitations of these technologies, and the need for cybersecurity to protect digital platforms. On top of this, legislation, ta-

riffs, subsidies and climate change, and COVID-19 are all having an impact.

Global consumption of paper and board

The increased demand for traditional paper and board is driven by population growth and greater urbanisation in China, India, Africa and Eastern Europe. Global printed paper volume reached 49.4 trillion A4 print equivalents in 2020 and is expected to plateau at this volume until 2024 (Smithers, The Future of Global Printing to 2024). Print volumes are falling in Western Europe (-2.5% CAGR) and North America

(-2.3%), whereas they are growing in Latin America (1.7% CAGR), Asia (1.2% CAGR) and Africa (4.0% CAGR).

COVID-19

The world has been in the midst of the COVID-19 pandemic, which has changed the way we live. Online sales of packaged goods have increased. In North America alone, packaging demand increased by 8% during the month of April 2020. In contrast, several newspapers have gone out of business or have suffered financial hardship because of lack of advertising as society shut down. After the pandemic subsides, long term, demand for packaging will probably exceed historical averages by one or two percent, whereas newsprint will decline at a significantly greater rate than in the past.

Top 20 disruptive technologies

The top 20 disruptive technologies in paper and board covered in this new report from Smithers can be grouped into four

TABLE E.1 Top 20 technologies for paper and board, 2020–30

Rank	Technology
1	Internet shopping and e-commerce
2	Electronic media in advertising, news, books, archiving
3	Lightweighting of packaging boards
4	Paper machine conversions (for example newsprint to lightweight board)
5	Bioenergy generation (heat, gas, electricity)
6	Intelligent/smart sensors
7	Big data analytics
8	Artificial intelligence (AI)/machine learning (ML)
9	Recyclable plastic
10	Recyclable barrier coatings
11	Precision controls for fast grade changes
12	Greater use of mechanical pulps and hardwoods in packaging and tissue grades
13	Digital printing of corrugated (inkjet)
14	Compostable plastics
15	New pulp mills with biorefinery concepts
16	Beltex strategies to recover, sort and recycle waste paper
17	Robotics
18	Industrial cybersecurity
19	Precision forestry
20	Kraft lignin



general categories: Impact of the internet on consumer behaviour; digitisation of the paper and board industry; paper and board substitution for plastic; and internal transformation of the paper and board industry. The technologies with the highest likelihood of technical success have all been installed on a commercial scale to some extent, including internet shopping, electronic media, paper machine conversions, digital inkjet printing of corrugated, bioenergy generation, and lightweighting.

The internet

The internet, which has spawned e-commerce and electronic media, has had a major impact not only on the paper and board industry but on the way we work and live. Via the internet, we can now read the news and get information immediately, often for free. In the past, we sought merchandise or services by perusing classified ads in newspapers or advertisements in magazines. Now it is possible from the comfort of a computer keyboard or smartphone to search the entire world for something through platforms such as Amazon, Alibaba and eBay.

With the disappearance of advertising dollars, many newspapers in Europe and North America have folded, reduced print runs, or have moved to digital platforms. Magazines have also declined but may find a niche in luxury goods. In the US, the internet has surpassed television for advertising dollars, and e-books are now more popular than printed books.

As demonstration of the booming popularity of online shopping, a recent study in Australia found that more Aussies than ever are turning to the internet to purchase goods instead of heading in store. According to a new Finder report, 88% of respondents – equivalent to 17 million Australians – are doing their shopping online. In fact, Aussies are spending roughly 5.3 hours per week – around 36 working days a year – browsing the web for new things to buy. Men confessed to spending more time than women shopping online, with 5.7 hours per week compared to 4.9 hours per week. And Aussies are spending big, with an average of \$188 a week, or \$9,776 a year on online shopping – including online grocery shopping. As expected, the dramatic rise particularly over the past six months is a reaction to the COVID-19 lockdown.

Digitisation

Most technologies ranked in the top 20 are in the digitisation category. Pulp mills and paper and board machines are already highly instrumented and many functions are under computer control. Applications in the forest resource and harvesting, because of their complexities, are less advanced but are starting to enter the digital age. Key digital technologies include: Intelligent/smart sensors, Big data analytics, artificial intelligence (AI)/machine learning (ML); precision controls for fast grade changes; digital printing of corrugated (inkjet); robotics; cybersecurity; and precision forestry. An instrumented mill

is awash in data and information, some of which is used in control loops and some is displayed for operators to monitor and to help guide their decisions.

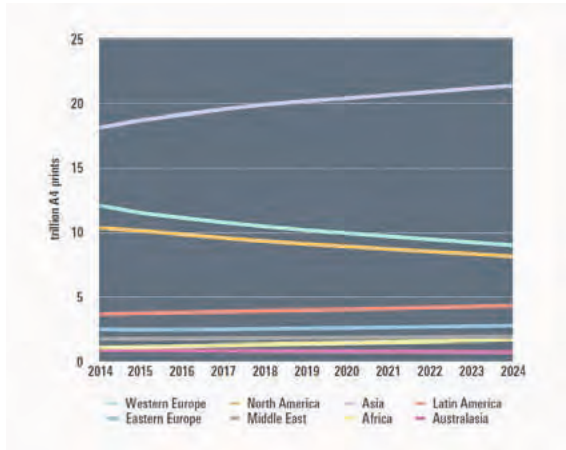
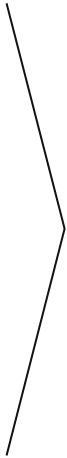
Big data has the promise to mine and massage this avalanche of data into simpler and more useful forms using computing tools that have recently been developed.

Intelligent sensors, which have a microprocessor physically on the sensor, are part of the solution. The microprocessor can process raw signals, sometimes from multiple heads, and convert this into a physically meaningful result. Although no sensors are available to measure important product parameters online such as strength, soft sensors can calculate this by mathematically combining signals from a number of different sensors. Some sensors use artificial intelligence to learn and continuously update their parameters. Intelligence sensors are a key component in precision controls for fast grade changes.

Robots are using artificial intelligence for warehousing and sorting of recycled materials. The industry is at the beginning of the journey to apply artificial intelligence/machine learning to perform some functions that are now the responsibility of operators. However, digitisation has an Achilles heel. As companies become completely dependent on their digital platform, they are vulnerable to hackers, criminals and competitors who can steal their information and cripple their operations. This means that cybersecurity is a high priority.

Substitution for plastic

In the next decade, legislation will be in place in the US, Europe and China to ban single-use plastics and insist that most other plastic be recycled. Despite the fact that over half the paper and board in the US is recycled, less than 10% of plastics now are. Restrictions on plastics create a major opportunity for fibre-based products to fill the gap.



In response to these changes, the plastics industry is making major investments in technologies to recycle plastics, including the European Union’s “Horizon 2020” project. Compostable plastic is based on plant-based polymers such as polylactic acid (PLA), which is a sustainable raw material. If successful, these efforts will diminish paper’s advantages in recycling and thereby limit paper and board’s potential market share.

Currently though, board packaging is forecast to grow consumption. It can be split into three main categories: corrugated board, folding cartons, and liquid packaging board (LPB). Corrugated board packaging consumption is influenced by a range of factors, including urbanisation, growing disposable incomes in emerging economies, ageing and growing populations and smaller family units. Growing environmental concerns also benefit the corrugated board market due to perceived and real environmental benefits of cellulose-based packaging.

Folding carton demand is predicted to grow in four main end-use segments: more spending is expected on luxury items; the on-the-go eating trend will drive demand for retail carry-out cartons; a larger ageing population will increase demand in the pharmaceuticals category; while beverage carton demand is also expected to grow.

Liquid packaging board consumption is likely to be maintained over the forecast period by the healthy eating trend, together with growing consumption patterns in the emerging markets. A key trend for LPB producers is the growing use of renewable materials to enhance their environmental credentials.

It should be noted that most liquid containers, even if they are primarily composed of fibre, have polymer or foil barrier layers that cause difficulties and contamination when recycling. Recyclable barrier coatings will open up market share. Sort-at-source, digitising the collection and using robots with AI in the collection centres has shown that improvements are possible.

In recent news, packaging and paper manufacturer Mondi and BIOhof are replacing plastic wrap with a fully corrugated solution for fresh produce. Mondi has collaborated with BIOhof Kirchweidach, an organic farm in Bavaria, to design a sustainable packaging solution for 500g packs of tomatoes on the vine to be distributed to PENNY supermarkets, owned by major German retailer REWE Group.

Coral Tray fulfils BIOhof’s objective of replacing its previous packaging, which used 2.5 g of plastic film per pack, with a recyclable and plastic-free solution, supporting REWE Group’s sustainability goals. It’s called ‘Coral Tray’ because of its resemblance to undersea coral and contribution to reducing plastic waste, potentially helping to protect marine life. The new packaging is fully recyclable and made of renewable material and recycled corrugated board, which has an average recycling rate of over 80% in Europe.

Internal industry transformation

Transformation of the paper and board industry includes converting machines to make different and novel products, and reducing fibre costs. This includes dis-

ruptive technologies: Lightweighting of packaging boards; Paper machine conversions; Bioenergy generation; Greater use of mechanical pulps and hardwoods; New pulp mills with biorefinery concepts; and Kraft lignin.

In response to the decline in printing and writing papers, paper machine conversions from newsprint to lightweight linerboard are common. Because the production of one converted newsprint machine equals the average yearly global increase in linerboard demand, there could be an oversupply in this market.

This coming decade is the dawn of the biorefinery concept. There are now several plants making by-products such as electricity, methane, methanol, biodiesel and lignin. Major investments have been made to produce cellulose derivatives such as cellulose fibrils (CF), microfibrillated cellulose (MFC) and CNC (cellulose nanocrystals). Most of these products are for internal mill use, but partnerships are developing outside markets for these materials.

In other developments, use of cellulose derivatives such as CF and MFC could allow a step change in lightweighting and permit greater use of hardwoods and mechanical pulps in some products.

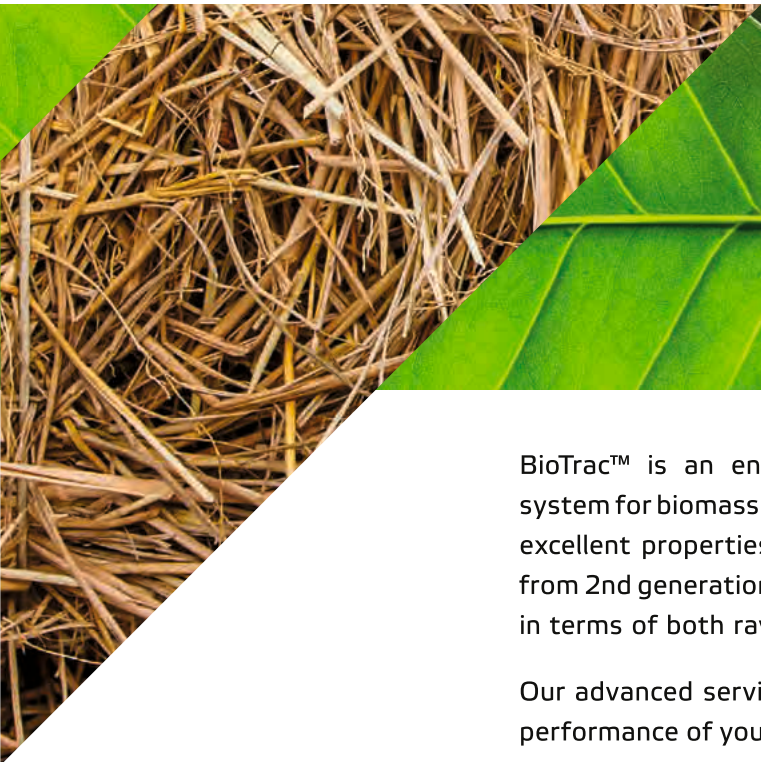
About the report

The Ten-Year Forecast of Disruptive Technologies in Paper and Board to 2030 provides comprehensive analysis of the market and technological drivers behind the ongoing expansion of this sector. Research included in the report using a combination of primary and secondary research, including interviews and technology evaluations with industry experts across the globe.

Exclusive report content includes an authoritative listing of the top 20 disruptive technologies that will impact the paper and board industry across 2020–30; in-depth technology profiles outlining routes to market the commercial impact; and a comprehensive examination of the key trends and drivers that will shape the future of paperboard supply and use.

To download a brochure on the Ten-Year Forecast of Disruptive Technologies in Paper and Board to 2030, please visit the website www.smithers.com. ||| **Janine Young**

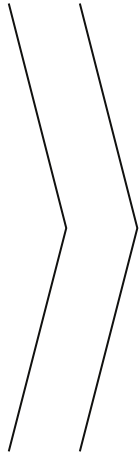
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Solving

A Large Range of AGVs for Paper Production

Since the foundation of the company more than 40 years ago Solving has specialised in the design and manufacture of heavy load handling systems. The products range from simple hand-controlled devices to highly sophisticated automated handling systems using both air bearings and wheels. For the paper industry Solving offers a wide range of customised systems ensuring not only efficient and continuous production but also a considerably safer handling environment for both personnel and products.

Many Scandinavian paper and boxboard manufacturers have been Solving's customers for some decades and Solving installations can now be found all over the world. Stora Enso, Metsä Board, UPM and Cartulinas are a few examples of companies that currently benefit from Solving products to assist their production processes, ensuring high standards of safety, productivity and ergonomics. Most Solving installations nowadays are automated guided vehicles, AGVs, supporting the general trend towards increased automation in the paper industry worldwide.

An international customer case

One example of a customised Solving installation is a system incorporating seven AGVs to automate the handling process of boxboard sheet pallets.

The AGV system is used to pick up empty pallets from the storage area and take them to the sheet cutting machines. The AGVs then collect the loaded pallets and transport them to conveyors, which in turn forward them to a packaging line. To allow for fast and efficient after-sales support, systems for remote monitoring and fault finding can be incorporated in the AGV system.

Solving was the chosen supplier based on their previous experience in paper handling systems for the Finnish paper industry, and the installation was designed around specific customer requirements, such as improved safety, the need for higher productivity and less damage to the product. Efficiency was also improved with adjustable AGV forks, allowing sheet pallets of varying sizes to be handled in production.



- 1 Customised Solving AGVs assist boxboard manufacturers with improved safety, higher productivity and less damage to the product.
- 2 Paper reels can easily be stacked on top of each other with this Solving AGV fitted with a gripping device.
- 3 Solving core handling AGV equipped with a gripping device allowing the cores to be picked up from any desired height.

Different loads require different solutions

Solving AGVs enable heavy industrial loads such as sheet pallets, paper reels and cores to be transported efficiently and safely. Although every customer's project requires a unique approach to meet particular specifications and requirements, some typical applications for Solving AGVs in the paper industry can be identified.

Fitted with automatically adjustable forks, Solving AGVs for sheet pallets enable handling of all sizes of pallets. A self-adjusting upper load support holds the sheet stacks in place and thus prevents them from slipping during braking or cornering. For reel handling, different types of equipment can be applied depending on whether the reels are handled in horizontal or in vertical position.

AGVs for horizontal paper reel handling use infinitely variable forks and a built-in lifting device for picking up the reels directly off the floor, or from any desired height. If needed, integrated rotating devices for unwinding the reel can be incorporated. The load handling forks are adjustable to accommodate a variety of reel sizes, enabling the same AGV to be used at various stations in the production process.

For the vertical transport of paper reels, Solving AGVs are equipped with a gripping device including a lifting function to lift the paper reel from and to any desired height. The gripping device also reduces handling damage to a minimum. As with all Solving's paper handling AGVs, safety is guaranteed by laser and electromechanical bumpers, emergency stop buttons and photocells.

Transporting paper cores can also be fully automated with AGVs customised for every installation's special requirements. With built-in gripping devices cores can be picked up either from the end or the long side. Adjustable in

height, the devices provide easy access to paper cores at any desired height, which is important from an ergonomic perspective.

Common features of the Solving AGV

Customised driverless Solving AGVs are installed by paper manufacturers to carry out monotonous tasks with high transport availability. Operational times of up to 20 hours a day can be achieved using fast rechargeable batteries.

Operation is easily monitored from a control station whilst status and error messages are displayed clearly on a graphic display panel. Safety is ensured for personnel, products and other equipment in the area by laser and electromechanical bumpers, emergency stop buttons, photocells, audible signals and warning lights on the AGVs. Bluespots projecting a blue warning spot on the floor to warn pedestrians and forklift drivers of an approaching AGV also improve safety.

Various navigation methods such as laser, contour, magnetic spot and magnetic tape, or a combination of these, are selected depending on the customer's requirements, frequency of transportation, existing facilities, factory layout, cost of installation and future expansion.

Future trends

A general trend in the market is that the demand for fine paper has decreased, whereas it is continuously expanding for boxboard and special paper. Online-shopping and a trend towards new packaging solutions to replace plastics is also a contributing factor.

With their extensive experience in the paper industry, Solving has exceptional expertise available to assist European manufacturers in the field of high-quality automated handling systems. |||



Left to right: Michał Kuczkowski (Sales Manager Xeikon), Izabela Harczuk (president of Flexolabels), Sławomir Perwejnisi (representative of Flexolabels).

Xeikon

Driving Business Development at Flexolabels, Poland

Flexolabels Sp.z.o.o, a label printer based in Wrocław, Poland, has taken delivery of a Xeikon 3300 digital label press to further drive business and address customer demand. Today the company specialises in digital label printing for the pharmaceutical, food and cosmetic industries.

Established in 2013, Flexolabels moved into digital production five years ago with the installation of a Xeikon 3030 digital label press to extend its capabilities and enhance the company's portfolio potential with new solutions and new products.

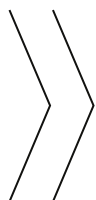
Izabela Harczuk, CEO, tells the story of how the company has grown: "Today, Xeikon machinery is driving our business forward. The most significant benefit is the opportunity to extend our product range. Adopting Xeikon digital technology has enabled us to engage with several new industries and propose new solutions which were not possible before. When Flexolabels was established, we were an ordinary flexo label printer using traditional processes (flexography, typography) but right from the start we were looking out for new solutions that would allow us to extend our production potential and enable us to offer a range of new and original

products. It took us more than a year to review the digital technology available. We knew we needed to find the best digital technology partner for our company and for our customers. In 2015 we invested in a Xeikon 3030 full colour digital press and since then our business has gone from strength to strength. Now we have upgraded to a Xeikon 3300 with even more advantages enabled by Xeikon's X-800 digital front end - increased speeds for faster delivery times, shorter runs and the ability to produce even more complex and creative labels. Our decision to work with Xeikon was definitely the right choice."

The flexibility of a Xeikon digital press

Flexolabels' decision to invest in a Xeikon 3030 was partly due to knowing the press could be upgraded in the future to other models such as the 3300 or the more extended 3500 version. Harczuk continues: "At the beginning we didn't have the experience we have now. We selected a model appropriate for narrow web (330 mm) but printing at lower speeds. At the time, we believed the speed of the press corresponded to the speeds of our traditional presses after factoring in downtimes, swapping printing matrices or replacing the inks. However, Xeikon's digital press was adapted to continuous work and could realistically print up to 20 hours in a three-shift system, without any downtime."

After three years their customers began to place increasingly bigger orders with the expectation of increasingly shorter delivery times. As Harczuk says, "The lack of any requirement to invest in polygraphic pre-press processing had changed our customers' approach to label ordering and there was an obvious appreciation of



The Xeikon 3300 digital label press



the quality of the labels we were able to produce with the Xeikon equipment. Clients were able to go online and alter the appearance of labels from one order to the next as they pleased. Introducing new versions, running shorter batches and making a new visual identification was no longer a problem for them or for us as the label manufacturer. With our latest investment and thanks to the upgrade in speed on the Xeikon 3300 (which only took a few hours and did not require any moving or shifting of the press), we have doubled speed and productivity. Our printing speed at 20m/min corresponds to a speed of 45-50 m/min in conventional printing (again taking into consideration downtime related to the time it takes to switch between jobs with conventional technology). Thanks to this, the pay-back period for the Xeikon press has been practically cut in half and the differences in traditional printing and digital printing costs have become even more blurred."

The Xeikon digital press gave Flexolabels maximum opportunities to diversify their options in several ways - from printing variable data, numbers and images, to printing short runs and providing ecologically sound solutions through printing with dry toner for accredited food safety as well as security type solutions which include brand security (micro printing, using toners visible only in UV light). The company's awareness of the impact of the packaging industry on the environment was one of the most important factors in their choice of digital technology.

Flexolabels and the Ecological Aspect

The company's choice of a Xeikon press amongst other things was based on their recognition of the amount of waste being generated within the packaging industry in the form of inks or raw materials, or emission of gases into the atmosphere, such as ozone which is formed during the

printing process by pigments cured by UV light. Harczuk explains: "Thanks to our digital label press, we are able to minimise the amount of raw material waste we produce. We utilise Xeikon's VariLane, a software plug-in to the Xeikon X-800 Digital Front End, making it possible to create digital imposition templates with different SKUs and different sizes within the same print job. This has allowed us to combine various jobs on one substrate so that we only need one width of raw material. Jobs can be optimally combined both lengthwise and across a single substrate – this results in the reduction of substrate waste up to 10%. Furthermore, the dry toners used in the Xeikon press are safe for the operator, the product and the environment: any contact with them (or even accidental consumption) poses no harm to human health, and their potential disposal is much cheaper than for UV pigments (UV dyes and inks). Thanks to the toners being cured in a process devoid of UV lamps, no noxious gases are emitted into the environment (zero volatile organic compounds - VOCs). Dry toner does not require processing water and does not cause water contamination. It is worth a mention that the labels printed on a Xeikon press are suitable for recycling since the toner is easy to remove and does not contain any harmful chemical substances. Xeikon's digital technology gives us everything we need to address our ecological goals."

Flexolabels is building its business model with an eye to the future and is looking to further invest. Izabel Harczuk concludes: "We are seriously considering investing in another digital press from Xeikon because the benefits so far have been invaluable to us, especially during these atypical circumstances. For example, the option to rapidly change the design of printed labels due to the COVID-19 pandemic has helped us meet our customer's requirements and the ability to print and deliver labels within 24 hours has also been very much appreciated by our clients." |||



Especially for the classic desiccant closure DASG 1, Sanner recorded an enormous increase in demand – by a full 30 percent.

COVID-19

Sanner Increases Overall Production

So far, Sanner has successfully made it through the Corona crisis. In fact, the demand for solutions from the international manufacturer of pharmaceutical primary packaging and medical technology products has even increased by more than ten percent.

Packaging solutions for effervescent tablets are particularly in demand. Hence, the company has increased its capacities – and is doing everything possible to provide customers with the usual high delivery reliability and quality.

The demand for effervescent vitamin C tablets, as well as for other nutritional supplements is increasing and has led to supply bottlenecks, especially during the Corona crisis. Sanner recognized the challenges early on and acted quickly. “We already expanded our capacities in May and were able to meet the increased demand and maintain our delivery capability,” says Dr. Johannis Willem van Vliet, Managing Director of the Sanner Group. As Peter Hülsmann, Head of Purchasing and Material Disposition at sanotact GmbH, confirms, “especially in troubled times, it becomes clear who is a reliable partner. Therefore, I would like to thank the entire Sanner team for their delivery reliability in Corona times.”

30 percent more desiccant closures

In addition to an enormous sales increase of around 30 percent in the classic DASG 1 desiccant closure, Sanner also recorded a rising de-

mand for tubes manufactured in the IML process and drop-in desiccant solutions such as AdCap® and AdPack®. In addition, medical devices such as components for corona and other rapid tests as well as inhalers are also in greater demand. In total, Sanner increased its global production by more than ten percent. The company and its employees have been working extra shifts in both Germany and China since May. At the German site in Bensheim, three new machines for the production of desiccant closures were put into operation and additional staff were hired.

Relocation in Bensheim planned for 2025

“We expect demand for our products to remain very high,” says van Vliet. “In order to further expand our capacities and, above all, to produce with the latest digital and sustainable technologies, we are currently planning to move the Bensheim plant to the new Stubenwald II industrial park.” In 2025, Sanner plans to fully commission the new site, which will cover an area of approximately 30,000 square meters. “Until then, we will of course continue to provide our customers with the quality and delivery reliability they are accustomed to – exactly as a partnership-based cooperation should be in times of crisis,” says van Vliet.

Cooperation in partnership pays off

Penny Humphries, Operations Manager at Aviz Laboratories in South Africa, confirms that the company is doing this excellently worldwide. “We have had a very successful relationship with Sanner for a number of years now, with constant supply and excellent quality. During COVID-19, the fantastic service from Sanner became even more apparent. We had a massive increase in demand. One phone call to Sanner was sufficient and within 24 hours we received a solid commitment on delivery despite their already overloaded production. There has never been a time where Sanner has let us down and they always work incredibly hard to find solutions for us.” |||



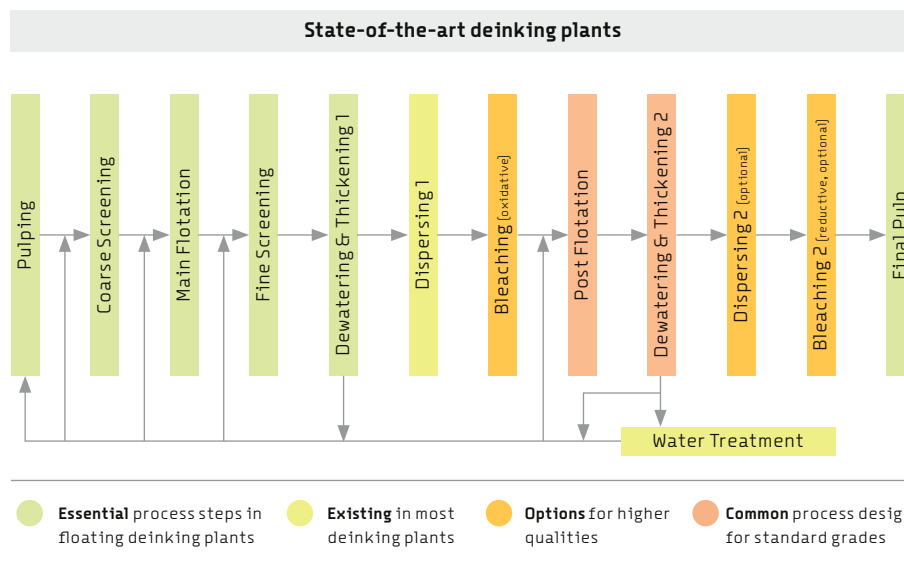
Dr. Johannis Willem van Vliet, Managing Director of the Sanner Group.



What Does it Mean?

Standard Flotation Deinking Process

Printed paper is recycled using the so-called flotation deinking process. Thomas Glaser (Siegwerk) explains the term.



In the first stage, known as pulping, the shredded, printed paper is made into a pulp by mixing it with water and chemicals. Due to the mechanical forces and the chemicals, the ink films of the prints are broken up and detached from the cellulose fibers. This pulp then goes through a coarse filtration and is transported to the flotation cell, where it is further diluted with water.

In order to deink the small printing ink particles, i.e. to remove them from the paper fiber, air is blown into the pulp. If the printing ink particles are small and hydrophobic enough (10–250 microns), they attach to the rising air bubbles and are thus carried to the surface. The resulting froth can then simply be skimmed away.

Removing the printing ink increases the whiteness of the waste paper. Additional bleaching is used to further increase the degree of whiteness. The cellulose paper fibers can be recycled around 4–6 times before they become too short for waste paper production.

Thanks to recycling by means of flotation deinking, around 70 percent water and 60 percent energy can be saved compared to direct paper production. 50 percent of the deinking sludge and froth are used for the production of bricks - they give the desired fine-pored openings. The other 50 percent is burned and converted into energy. ||| **Thomas Glaser, Head of Technology, Business Unit Sheetfed EMEA, Siegwerk**



“Unfold Your Potential”

1

Double Productivity in Commercial

Which solutions do commercial printers need to be competitive and profitable in the market? Which processes and interfaces offer potential to be leveraged, and how can print shop staff be even better supported? These are the questions the experts at Heidelberger Druckmaschinen AG (Heidelberg) asked themselves when developing the latest innovations.



2



3

- 1 Heidelberg showcases as a world premiere the automated workflow from PDF to stacked folded sheets for the first time.
- 2 The Speedmaster XL 106-8+P+L 2020 generation has everything needed to systematically harness the performance of the press. Operator navigation reaches a new level with further intelligent assistance systems and the use of artificial intelligence.
- 3 With Plate to Unit, the new, fully automated printing plate logistics system at the press, the printing plates are provided and removed using a fully automated process.

The answers are set to raise the productivity in the sector to a new level: for highly industrialized commercial printing companies with standardized workflows, Heidelberg is showcasing autonomous production from data input right through to the folded signature – Push to Stop end-to-end – for the first time.

The Prinect Production Manager production workflow organizes the digitized processes in the smart print shop with its broad-based, scalable range of functions. It delivers streamlined, cost-efficient workflows and growth potential, even in smaller and medium-sized companies. And it integrates not only offset printing presses but also digital presses via the Prinect Digital Front End (DFE).

The Digital Cluster production mode is a new functionality in the Prinect DFE. It enables several new-generation Versafire presses to share a job queue, so the jobs can be organized with the optimal distribution.

Everything happens autonomously

In mid-October, Heidelberg held a “world premiere” of completely autonomous production at an in-person event at the Wiesloch-Walldorf site. The powerful, digital planning system Prinect Scheduler schedules the incoming data in the optimum order based on criteria such as paper, color assignment, and folding layout. Imaging of the printing plates takes place fully automatically via the Suprasetter production line in the correct order. “Prinect knows at all times which plates are stored where. The order of the jobs in the plate storage system is optimized so that changes from job to job are kept as small as possible – we call this incremental makeready. Based on substrate parameters and job data, the anticipated paper stretch can be calculated and already compensated for during the imaging. This saves time and reduces paper waste,” explains Rainer Wolf, Head of Segment Management Commercial at Heidelberg.

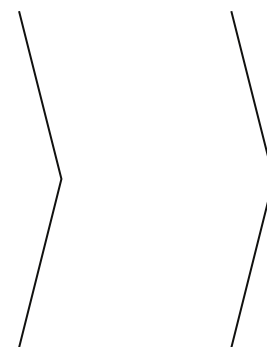
The jobs are automatically loaded directly into the job memory of the printing press by the Prinect Scheduler. This includes the information about where the plate is stored. With Plate to Unit, the new and fully automatic printing plate logistics at the printing press, the printing plates are provided and removed using a fully automated process. “With industrial production of short runs, we get to ten to twenty job changes per hour in no time at all. Plate to Unit reduces the operator’s workload and ensures a reliable and

stable process. Each plate has its own ID. This is how we ensure that the right plate is provided at the right time in the right printing unit. The risk of creases or scratches on the plate is eliminated. The process is more stable, downtimes are minimized, and the quality is better,” says Rainer Wolf happily.

The 2020 generation of the Speedmaster XL 106-8+P+L has everything needed to systematically harness the performance of the press. Operator navigation reaches a new level with further intelligent assistance systems and the use of artificial intelligence. The new Heidelberg UX thus delivers a new user experience and a modern workstation that provides ergonomic assistance for top performance. For example, the patented Intellistart 3 software organizes and optimizes the makeready processes. The new Intellirun software extends the navigation functionality beyond the makeready process. It provides the operator with continuous information appropriate to the situation on which activities are required to avoid unnecessary auxiliary times. For example, the Wallscreen XL switches to the job preparation menu in good time before the run is reached. The operator can review the data in good time, become familiar with the upcoming change sequence, and provide any materials not yet available. Navigation functions like these are becoming more and more important. On the Wallscreen XL, the Intelliguide timeline display ensures transparency across all processes. The operator can see exactly where manual interventions are needed. However, operator navigation is not limited to the machine control station: it is now also available at the printing units thanks to the new Intelliline. LED strips show whether the press is in production or makeready mode, and whether and if so where the operator needs to take action. With the Press Center Mobile app, control station information is also available on the go. The operator always has the job data and press status available in real time and can use it, for example, when providing materials for the next job.

To be able to head into postpress with a zero-waste pile, the waste sorting gate has been integrated in a perfecting press for the first time. The press detects waste sheets and automatically ejects them. The ejected sheets are immediately shredded and disposed of via a vacuum unit. This means there is no more collection bin to empty.

Ever shorter delivery times require that the sheets get to postpress as quickly as possible. The new generation of the DryStar LED Pro dryer systems is not only 20 percent lighter, it is also





more powerful and ensures a dry pile in the delivery, which can go straight into postpress.

This is then sent by an unattended transport system to the Stahlfolder KH 82-P folding machine, which folds around 15,000 sheets per hour using the shingled folding principle. The KH 82-P is also integrated via the Push to Stop concept and detects the next signature automatically by the printed barcode. Each new signature is autonomously recognized and automatically started. Compared with the previous workflows, this eliminates a total of six steps as well as the factor of operator influence. "The operator moves around seven tonnes of paper in one shift on this high-performance machine – a bundle every 12 seconds. The only way we can continuously realize the full potential of the press is by significantly reducing the operator's workload. This is why we developed an industrial robotic solution with the Stahlfolder P-Stacker, which also permits the use of Euro pallets. Most of the know-how here is in the sophisticated gripper system, which was modeled on the human hand," explains Rainer Wolf. The folding machine operator enjoys a significant reduction in workload and gets a modern, automated, and highly productive workstation.

Another world premiere in the area of folding machines is the Stahlfolder TH 56 Pharma, which sets a new performance standard in the growth field of pharmaceuticals with extensive automation and a robust machine platform. It features many new extras that enable much more economical production of a wide range of package inserts than on most of the folding machines around nowadays that require manual adjustment.

There are also new Push to Stop solutions for cutting on the Polar cutting systems. Whereas

jogging used to be a laborious manual process, the new AirGo Jog system now fully automates it.

"We speak provocatively about doubling productivity with Push to Stop – end-to-end. That is quite possible for the majority of print shops – a small number are already demonstrating this in real life, and not just the web-to-print printers, either. It's our mission to enable our customers to unlock this potential. Because our customers' success is ultimately our success, too," explains Rainer Wolf.

Smart Print Shop delivering high flexibility and more profit in medium-sized print shops

At the event, Heidelberg also demonstrated how the Smart Print Shop is the solution for economical production and surviving increasingly tough competition for smaller and medium-sized print shops, too. "Less overtime and special shifts as well as more time to build customer loyalty, on top of this having transparency about which jobs are profitable and which are not. All of these are benefits that the Smart Print Shop provides, and that are also important for smaller businesses. Their production volumes are smaller and more varied. Accordingly they need different products that fit their budget. We have a lot to offer here, with our broad portfolio. From scalable software solutions and Push to Stop functionalities on all printing presses to corresponding solutions in postpress," says Rainer Wolf.

The completely redesigned Prinect Press Center 2020 generation with the new Speedmaster Operating System brings Push to Stop functionality and the Prinect Cloud interface to



2

- 1 An unattended transport system moves the finished sheet pile to the Stahlfolder KH 82-P folding machine. This is also integrated via the Push to Stop concept and detects the next signature automatically by the printed barcode.
- 2 Another premiere in the area of folding machines is the Stahlfolder TH 56 Pharma, which sets a new performance standard in the growth field of pharmaceuticals with extensive automation and a robust machine platform.
- 3 Thanks to the tried-and-tested Heidelberg Color Management system, the color space of the Versafire is used in such a way that the result is best matched to the offset printed sheet.

every Speedmaster – from the SX 52 to the XL 106. On the two Speedmaster CX 75 and XL 75 presses, the visitors saw how the many new assistance systems are making the Prinect Press Center a modern, attractive workstation. With the Heidelberg UX, the operator is able to continuously tap into the performance potential of the press. These digitized and automated processes permit navigated printing – all the way up to postpress on the Stahlfolder KH 82 folding machine, which is also integrated into the Push to Stop concept.

Medium-sized print shops are characterized by a broad portfolio of services, for which they use both offset and digital printing. With the Versafire, Heidelberg offers a digital sheetfed printing system that is integrated in all the different printing processes via the Prinect DFE.

This close integration of offset and digital printing means that the customer can still decide which printing method is the most economical for the specific job and the current workload up until shortly before printing starts. Even short runs previously produced using offset printing can be post-produced using digital printing without any trouble. The operators are familiar with the workflow sequence, and neither need to specialize nor switch with another operator. Sources of errors go down, flexibility and profitability go up.

Thanks to the tried-and-tested Heidelberg Color Management system, the color space of the Versafire is used in such a way that the result is best matched to the offset printed sheet. The screen technology is identical. This opens up the door for hybrid productions, where for example a customized and personalized title is printed digitally and the content pages are printed using offset, or even for incorporating offset pre-printed sheets into the end product with the Versafire.

For print shops with a high volume of digital print jobs, Heidelberg has developed a further functionality for the Prinect DFE with the new Digital Cluster production mode. It enables smart

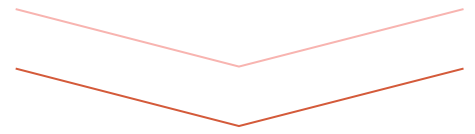
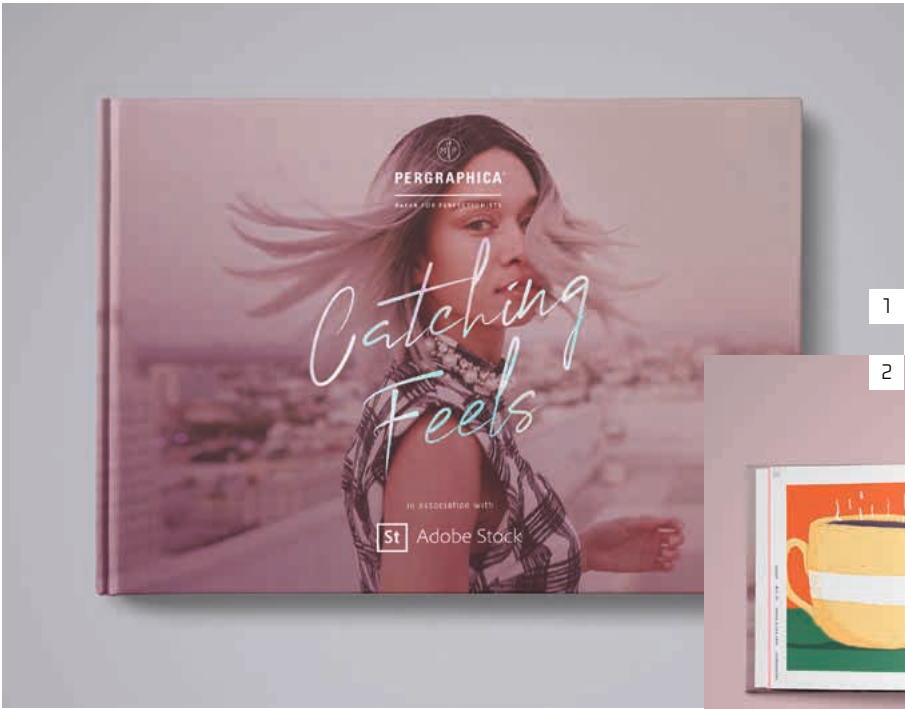


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job management in a productive cluster of two or more Versafire presses, connected via the Prinect DFE.

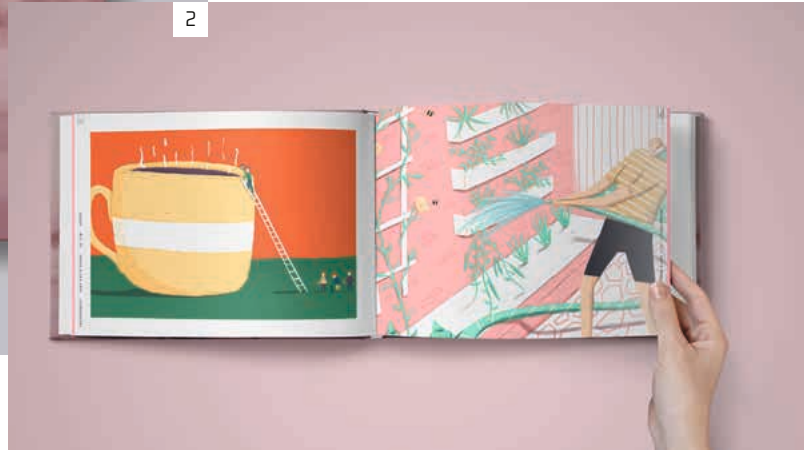
The Digital Cluster production mode is a scalable solution requiring little up-front investment for growing the digital production volume with an eye on value for money.

The Versafire stands for reliability and quality. The integrated Media Management Tool provides automatic setting of over 200 press parameters to achieve the perfect printed image on a variety of substrates. Fine adjustment of these parameters is also possible for special substrates, for example if the end customer wants a special paper. The Versafire processes a wide variety of substrates, from synthetic, textured, and metalized materials and offset pre-printed materials, to special formats in widths of up to 1,260 mm or short runs of customized packagings. "The Versafire offers print shops a wide product portfolio, flexible tailoring and expansion of their range of print jobs, and thus new business models, and all with an attractive price/performance ratio, especially compared with liquid toner or inkjet systems," sums up Rainer Wolf. "Over 1,600 installations are proof of the Versafire's success in the professional printing environment. It is an integral part of our portfolio and a growing area we want to expand further." |||



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Mondi Pergraphica

A Question of Colour

The demands on the paper and packaging industry are increasing continually. Designers and end customers want a high-quality product in different colour variations and with personalised finishes.

Mondi has embraced these challenges, adding a coloured range to its Pergraphica design paper portfolio. Sounds simple enough, but there are years of strategy and product development behind this decision.

What colours does the market need?

Looking at the paper market today, you can see very clear colour trends. The starting point is an analysis of the special market segment of coloured papers. Mondi has carried out surveys among marketing professionals for luxury brands, packaging providers, finishing companies, designers and premium printers, all of whom set the highest standards when it comes to paper. In the luxury packaging segment, for instance, a preference for dark and saturated colours was noted. This target group also

very clearly defines the characteristics for coloured paper for these high-end applications. Colour consistency, certified sustainability and a high level of service are a given. Quality criteria for finishing, in particular folding, embellishing and direct printing, make all the difference.

Dark colour variations for the luxury packaging market

For five years, the Mondi Pergraphica range of design papers focused on the essentials: three shades of white and two surfaces in both machine directions in the key sizes and weights. Later, an ivory paper for book printing and a black paper for creative and packaging applications were added. Last September, Mondi added 30 new, vibrant colours to the Pergraphica range, including ten so-called 'Dark &

Deep Colours', those particularly difficult to produce, classy dark and intense shades demanded by manufacturers of packaging for luxury items. The challenge for Mondi, and indeed many other paper makers, is to make these colours withstand a lot in use without fading.

How is coloured paper made?

To produce coloured paper, dye is added at the very beginning of the process, at the point where the pulp is mixed with water, to create a mushy mixture the paper is made from in the machine. This diffuses the dye into the fibres of the pulp, creating a paper that contains colour all the way through, rather than dye just being added to the surface or even printed on. It is the only way to achieve the unique features of coloured paper, without showing white



- 1 In cooperation with Adobe Stock, Mondi shows in the illustrated book "Catching Feels" the creative possibilities that modern colors and good paper quality offer artists.
- 2 Colored papers in high quality offer the perfect basis for graphics and photographs. Pergraphica's motto here is "Creatives inspiring Creatives".
- 3 Charasmic Red, Mysterious Blue or Precious Purple: In addition to excellent quality, the Mondi experts also use evocative names to arouse emotions with their new colored paper.

edges or revealing a white core when folding. The new shades underwent a series of stress and product tests at the Mondi Neusiedler paper mill in Austria. They were tested to confirm that they would meet the requirements of packaging material without diminishing their strength or appearance.

Safety and Sustainability

In order to ensure the smooth production of coloured paper, manufacturers need to bear a number of factors in mind. Firstly, the dye must withstand the heat and pressure of the paper machine and be consistent in the finished product. Once defined, a colour must look exactly the same in each production run. This is part of the customer promise and a great advantage of coloured paper as opposed to printed paper, which even with the best colour management can easily result in discrepancies. At the same time, the dye must be compliant with strict safety and sustainability regulations, stipulated by certifications such as the EU Ecolabel.

All Pergraphica colours are free from heavy metals and meet the strict FSC® certification guidelines. Composition is even more complex for black dye, as is the case with Pergraphica Infinite Black, which has been certified as food-safe. Even if the paper is only used as secondary packaging for a bar of chocolate, it must meet those stringent safety criteria, as there is a possibility of it coming into direct contact with a food product.

Testing, testing, testing

Verifying the colour consistency and acceptance of different finishing processes of new colours requires a number of tests. The paper is printed using offset and screen printing with CMYK and spot colours and then exposed to hot foil stamping and other finishing processes. It must be able to withstand all of this in order to convince the customer and be put into mass production.

The new colours in the Pergraphica range underwent these tests at GT Trendhouse 42, a specialist premium packaging printer based in Gelsenkirchen, Germany. Although the results were promising, even after this product development phase there is fine tuning to do, strengths to improve on and weaknesses to eliminate.

Paper creates emotion

The paper industry is a highly technical sector. When it comes to colour, however, it targets primarily creative professionals. To them, as well as the end consumer, colour is often linked to an emotion. When naming a new product range, it is therefore a good idea to not only consider clear and consistent wording, but to choose a name that can already stir a certain emotion. In packaging in particular, the right colour package can ultimately result in closing the deal. Mondi therefore decided on evocative names for the new Pergraphica colours that are nonetheless in line with the brand, such as Mysterious Blue, Precious Purple and Euphoric Pink.

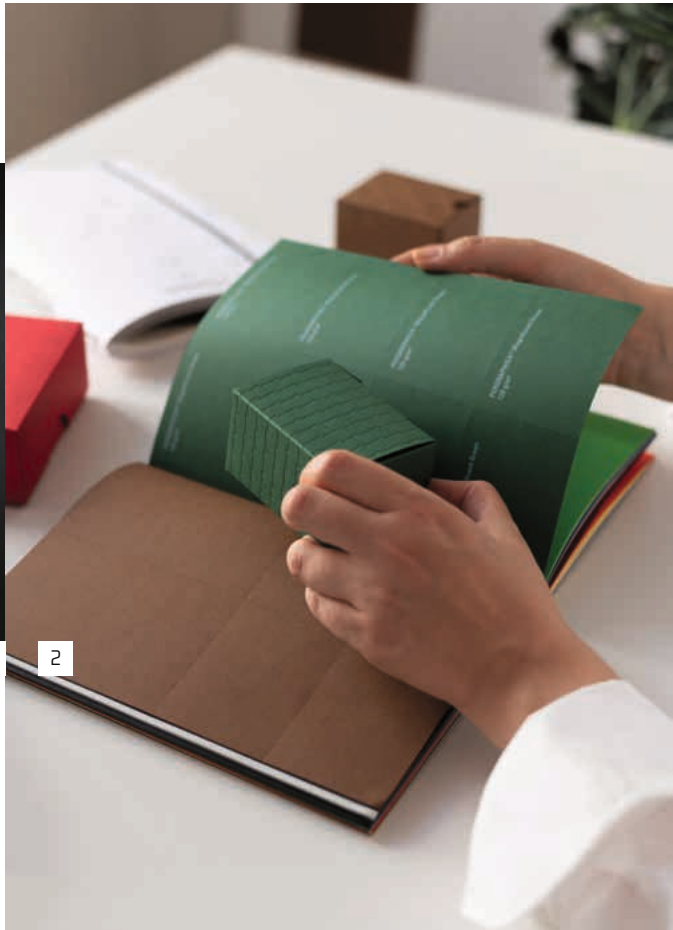
Unboxing experiences to wow customers

A name alone does not make a brand, however. Manufacturers of luxury watches, perfumes and cosmetics use high-quality coloured paper in order to offer customers a haptic experience. They know that the intention to buy increases dramatically, when a customer picks up a box from a shelf that appeals to another sense, the sense of touch. They want to turn unboxing into an emotional experience that not only confirms the customer's decision to buy, but will also look good on Instagram. At the same time, they need a reliable partner and a product whose quality has been tailored to their core applications.

Paper enables emotional experiences through the visual and haptic appeal of the paper itself, but also with its tested and verified technical qualities that enable a wide range of finishing possibilities, as finishing processes lend an additional dimension to the finished package.

The right tools

Embossing, debossing and hot foil stamping processes show the level of detail that can be achieved with the right techniques and the right paper. With laser cutting, tiny patterns can be embedded in the paper. Laser engraving is particularly suited to coloured papers, as the heat of the laser changes the colour on the engraved areas. In addition, finishing is not always just a visual gimmick, but can be a question of accessibility, as is the case with Braille.



- 1 The composition of the dyes in papers that are certified as food-safe is particularly challenging. This is the case with Infinite Black from the Mondi Pergraphica range.
- 2 Dark, saturated colors are currently particularly popular with designers in the luxury packaging segment. Elaborate embossing and engraving make the packaging appear even more valuable.

Showcasing the papers' benefits and demonstrating possible finishing solutions requires the right tools.

In addition to a new Pergraphica Colours Feelbook, presenting the look and feel, as well as the scope, availability and properties of the new range, Mondi has created an additional marketing tool – the Wow Box. "The idea was to start with the unboxing experience and set the scene for the customer", explains Stephanie Kienapfel, Team Lead Professional Printing Papers at Mondi. Ultimately, the Wow Box is a box full of boxes, each showcasing different colours and finishing solutions, making it possible to simply yet impressively demonstrate a whole range of different finishing techniques.

Digital and analogue

The benefit of such a high-quality marketing tool is that it really does have a wow effect on the customer; however, the costs are so high that it cannot be widely implemented.

So how do you get a tool like the Wow Box on the desks of potential customers, especially now that travel and personal meetings have been severely restricted for

safety reasons? A good digital marketing strategy can help. Visually appealing products work well on video and can be widely distributed via internal sales channels. Fine papers and all their possible applications are also suitable for social media use.

But the most important element is team training, as only experts can ultimately convince customers of the product benefits. This enables professionals to discover a whole range of digital and analogue touchpoints of the new products.

Successful launch

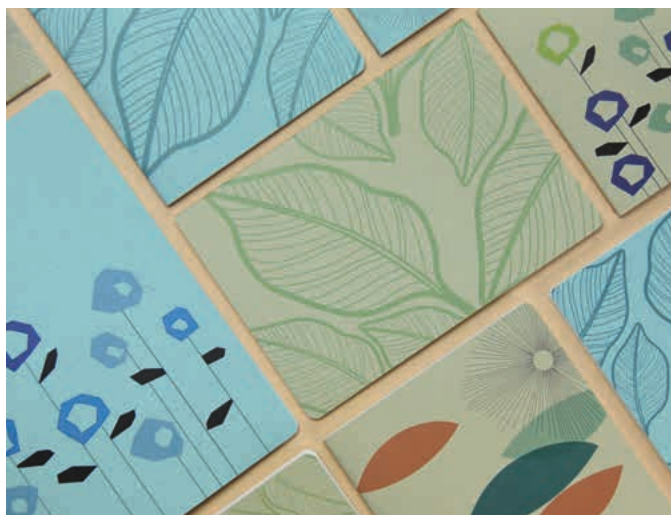
In September 2020, Mondi launched the new Pergraphica campaign titled 'Catching Feels' during a virtual press conference and several customer events. The campaign was developed in a unique digital/analogue partnership with Adobe Stock. As well as the new Pergraphica Colours, Mondi also presented the Wow Box, complemented by the new lookbook targeted primarily at a creative target audience in the print and design sector. Adobe Stock and Pergraphica share many values. For instance, Adobe Stock's motto, 'Make Something Amazing', is similar to Pergraphica's 'Creatives inspiring Creati-

ves'. Mondi's combined digital/analogue strategy, 'from screen to paper', presented Adobe Stock with a great opportunity to demonstrate how the right paper can bring Adobe Stock's pictures to life even more.

After two years in the making, the new coloured papers, and in particular the strategy behind them, must prove their worth. Stephanie Kienapfel assesses the outcome, stating that "if customer interest following the press conference is anything to go by, then the launch was indeed a great success. The emotions came across, the arguments presented were convincing." The interaction between the digital and analogue channels and new and traditional media also went smoothly. Whether or not the paper will also sell well remains to be seen; however, some projects have already been implemented with great success. ||| **Markus Widmer, Team Lead Customer Experience at Mondi Uncoated Fine Paper**

Further information

www.mymondi.net/ufp/en/brand/pergraphica/darkanddeepcolours
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www.mymondi.net/ufp/en/reference-stories/gttrendhouse



Favini

Eco-Friendly Notebooks

Among the trends of Paperworld 2020/2021: “Reborn” by Cartotecnica Favini. The range of ecological notebooks is part of the “Smooth Sorbet”- segment due to their striking pastel tones.

Sustainable Choice of Paper

When producing the “Reborn” notebooks, Favini was interested in combining design with sustainability. As with many other paper and stationery designs, this project aims to highlight the ecological thought behind-the-scenes in the final product, too. Therefore, a focus on choice of material was just as important as the nature-inspired patterns found on the finished notebooks.

Chosen for the “Reborn” range were Favini’s creative re-use papers “Crush” and “Remake”. They are ideal for the production of eco-friendly paper products such as the “Reborn” notebooks due to their unique properties: they are made with agro-industrial processing and leather residues respectively, in partial substitution of tree cellulose.

Crush: Paper from Organic Products

The “Crush” range by Favini excites due to its components. It is made by replacing up to 15 percent of virgin tree pulp with the

process residues of organic products and includes by-products from citrus fruits, grapes, cherries, lavender, corn, olives, coffee, kiwi fruits, hazelnuts and almonds. Instead of ending up in landfill, these natural raw materials are saved and used for the production of the paper. “Crush” is FSC-certified, GMO free, contains 40 percent post-consumer recycled waste and is produced with EKOenergy. Therefore, another eco-friendly aspect of the paper’s production is the reduction in carbon footprint by 20 percent.

Remake: Paper with Leather Surface

When producing their paper range “Remake”, Favini looked no further than discarded residue from leather manufacturing processes. Due to this unique approach, the paper is considered a revolutionary example of upcycling in the paper sector. Overall,

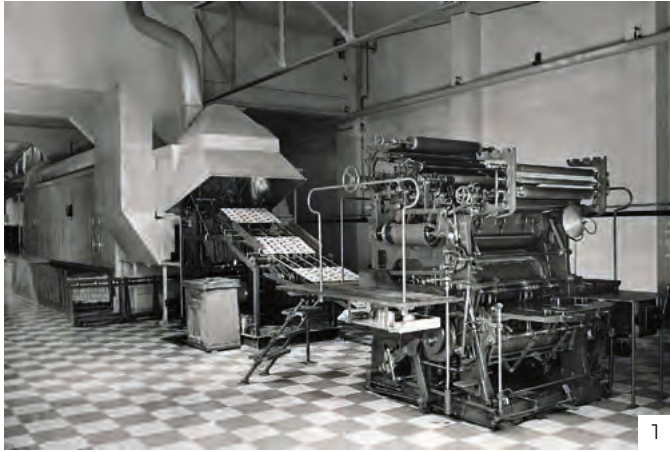
this approach allows to replace 25 percent of wood tree pulp with leather residues. Thereby, “Remake” is 100 percent recyclable and biodegradable. Additionally, the paper range contains 40 percent recycled pulp and was also produced with EKOenergy. Due to the leather by-products, which are sourced from traceable Italian origin, the paper has a soft and velvety feel.

Nature’s Patterns

In order to emphasise the ecological thought behind the production of the “Reborn”-notebooks, Favini was interested in creating covers with patterns inspired by nature and plants: foliage is part of the cover designs just as well as geometric illustrations of abstract flowers and leaves. The designs perfectly fit the delicate hues of the “Crush” and “Remake” ranges and round off the tactile sensations of the paper surfaces. ||| **Sabrina Vetter**



Crush + Remake = Reborn: New, “pastelly” Notebooks by Favini.



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Koenig & Bauer

From the First Continuous Drying Oven to a Modern MetalStar 3 Decorating Line

The loyalty of the Beiersdorf company as a customer plays a special role in the history of metal decorating and is closely linked with the very roots of Koenig & Bauer MetalPrint.

LTG Lufttechnische GmbH, a specialist supplier of industrial air conditioning systems, entered the metal decorating market with the first continuous drying oven for metal sheets in 1932. The newly designed oven was an absolute innovation and was paired with a metal decorating press from the Mailänder company which printed the distinctive blue Nivea Creme tins. The first metal decorating line was born.

In the past, the sheets had been transported to a batch dryer and then unloaded again by hand, but now they could be conveyed to the oven automatically, carried through the thermal drying process by way of a chain drive and subsequently unloaded automatically.

A letter of recommendation dating from 1937 proves just how much Beiers-

dorf appreciated the LTG oven. Quote: "We are very satisfied with the drying oven for metal sheets supplied by your company. The best proof of this was our decision to follow the installation of the first oven with an order for two more."

Metal decorating lines

The two companies – Mailänder and LTG – worked together for many decades and installed hundreds of metal decorating lines worldwide until Mailänder was bought up by LTG in 1994. In 2006, LTG Mailänder was acquired by the Koenig & Bauer Group, and integrated into the company which today operates as Koenig & Bauer MetalPrint.

Beiersdorf has remained loyal to the machines of Koenig & Bauer to this day.

And the famous Nivea Creme tins are still produced – albeit now on an ultramodern high-performance MetalStar 3 decorating line which was installed at the beginning of the year. In place of a thermal drying oven, the metal sheets are today cured with a UV system. Modern features accelerate make-ready and enhance productivity. For example, the MetalStar 3 incorporates fully automatic plate changing. With CleanTronic Synchro the blankets and impression cylinders can be washed at the same time, or the blankets can be washed using two washing beams. CleanTronic SRW permits simultaneous washing of the ink rollers, blankets and impression cylinders. The time required for the washing process is thus significantly shorter. |||



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- 1 The first LTG drying oven installed after a Mailänder metal decorating press in 1932.
- 2 The new two-colour MetalStar 3 UV decorating line.
- 3 MetalStar 3 which continues to produce the famous blue tins for Nivea Creme.
- 4 A Nivea Creme tin from the 1930s.



Awarded and included in the yearbook: The best posters in the DACH region.



Yearbook

The Best in Poster Design

Each year, the association 100 Beste Plakate e.V. honors the most innovative and pioneering poster designs from Germany, Austria and Switzerland and celebrates classical, printed posters as supreme among the graphic arts.

Founded in 2001, the association follows the tradition of the competition "100 Beste Plakate des Jahres" (100 Best Posters of the Year) – founded in 1966 in the GDR and after the German reunification for designs from Germany only – as well as sporadic honors for poster design in Switzerland. Therefore, the 100 best posters were honored for the 19th time in 2020. Poster designers, graphic designers, students, advertising agencies, printers and customers were invited to submit their outstanding poster designs.

Exhibitions and Yearbook

The goal of the competition is to honor excellent achievements in the area of poster design from three countries by presenting them to the public in a yearbook as well as in exhibitions. While the posters are exhibited internationally, the book featuring the 100 best posters is a project that especially excites graphic artists, designers and advertisers. The book for year 19 depicts the 100 honored posters from 684 applicants

with 2,247 submissions. 100 posters from Germany (45x), Switzerland (52x) and Austria (3x) are divided into three categories: A (commissioned work), B (in-house projects) and C (students projects).

Poster Presentation in Two Parts

30 designers, curators, artists, architects and theorists were invited to write a description about the selected posters as part of the book project. The texts are not just traditional jury statements but are personal evaluations of each poster project. Among the themes and thoughts which are negotiated in these texts are "How do language and image correlate? How can visual codes, optical phenomena and trends be described via text?"



Responsible for the book design were Florian Lamm and Jakob Kirch from the graphic design studio Lamm & Kirch, located in Leipzig, Germany. The studio's interest in the old and the new, the obvious and the hidden can be found in the black and white cover of the book. The yearbook, in which also all jurors are introduced, is divided into two parts: a textbook, in which 30 text are collected, while the second part features images, presenting a poster on each page. ||| **Sabrina Vetter**

"100 Beste Plakate 19: Deutschland, Österreich, Schweiz" was published by Kettler Verlag in 2020 (German/English). 17 x 24 cm, 332 pages, Softcover, ISBN 978-3-86206-825-8.

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Paper Atlas 2020

Growing Amount of Recycled Paper in Municipalities and Universities

Federal Minister Svenja Schulze honored the winners of the 2020 Paper Atlas in the Federal Environment Ministry in Berlin on October 6th. More than 180 municipalities and universities took part in the competition launched by the Initiative Pro Recyclingpapier (IPR) and its partners in this extraordinary year. Erlangen prevailed as the "most recycling paper friendly city", the Paderborn district as the "most recycling paper friendly district" and the FernUniversität in Hagen as the "most recycling paper friendly university".

The "Rookie of the Year" awards went to Cuxhaven, the IIm district and the University of Cologne. The cities of Freiburg and Siegen as well as the University of Tübingen received special awards for many years of outstanding commitment.

The paper atlas shows the paper consumption and the proportion of paper with the Blue Angel in German cities, districts and universities. The 99 large and medium-sized cities achieved a new record with an average recycling paper quota of 91 percent - for the first time in the history of the paper atlas, it was above 90 percent. The district competition sets two new records: Despite the extraordinary circumstances, 40 districts took part for the first time. The new attendance record underlines the great willingness to disclose data on paper consumption and recycling paper quotas, and to measure oneself in the positive competition. The districts also set a new record when it comes to using paper with the Blue Angel: The average recycling paper quota has risen again – to 85.48 percent. The 43 universities are also continuing their course and are

using more than 75 percent Blue Angel paper for the first time. Together, the participants achieve a saving of 528 million liters of water and 108 million kilowatt hours of energy.

"The impressive participation this year shows once again that the switch to recycled paper has become a calling card for sustainable action in more and more municipalities and universities. The paper atlas has offered transparency, orientation and motivation for thirteen years now," said Ulrich Feuersinger, spokesman for IPR.



Federal Environment Minister Svenja Schulze with the winners of the 2020 Paper Atlas.

The paper atlas was launched by IPR in 2008 in order to promote the use of recycled paper with the Blue Angel in cities by means of a positive competition. Universities and districts have been able to participate in their own competitions since 2016. Partners are the Federal Environment Ministry, the Federal Environment Agency, the German Association of Cities, the Association of German Cities and Municipalities, the German District Association and the German Association of Universities. |||

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de hebreis voluntatibus additū nouerit eque usq; ad duo pūda iuxta theodorigis dūm exat edicōne: qui simplicitate hūonis a septuaginta interpretibus nō discordat. Nec ergo et uobis et studioſo cuiq; fecisse me sciens nō ambigo multos fore qui uel inuidia uel supercilio male uolunt contemneret et uidere predara quam disceat: et de turbulento magis riuo quam de purissimo fonte potare. *Explicit prologus. Incipit liber ymnarū uel coliloqueorū.*

Ratus uir qui nō abiit in cōsilio impiorū: et in uia peccatorum nō stetit: et in cathedra phtēlie nō sedit. Sed in lege domini uolūtas eius: et in lege eius medicabit die ac nocte. Et erit tanq; lignū quod plātarum est secus decursus aquarū: qđ fructū suū dabit in tēpore suo. Et foliū eius nō defluet: et omnia quecuq; faciet prosperabūtur. Non sic impij nō sic: sed tanq; puluis quē proicit uētus a facie terre. Fides nō relinquit impij i iudicio: neq; peccatores in cōsilio iustorū. Quoniam nouit dominus uia iustorū: et iter impiorum prebit. *Psalmus.*
Quare fremuerūt gentes: et ipsi meditati sunt inania? Absceuerūt reges terre et principes cōuenierunt in unū: aduersus dñm et aduersus cristū ei. Dirumpant uincta eorū: et piciant a nobis iugū iporū. Qui habitac i celis iridebit eos: et dñs subleuabit eos. Tunc loquit ad eos in ira sua: et in furore suo cōturbabit eos. Ego autem cōstitui sum rex ab eo super syon montem sandū ei: pōitōs preceptū eius. Dominus dixit ad me filius

meus es tu: ego hodie genui te. **P**ostula a me et dabo tibi gentes hereditatem tuā: et possessionē tuā animos terre. Reges eos i uirga ferrea: et tanq; uas figuli cōfringet eos. Et nūc reges intelligite: erudimini q̄ iudicatis terrā. Seruite dño i timore: et reuelate ei tu timore. **A**pprehendite disciplinam: ne quando irascatur dominus et peccatis de uia iusta. Cum exarserit in breui ira eius: beati omnes qui cōfidunt in eo. *psalmus dauid cum fugeret a facie abſalon filii sui.*

Domine qđ multiplicati sunt qui tribulāt me: multi insurgūt aduersum me. Multi dicūt anime meę: nō est salus ipsi in deo eius. Tu autē dñe susceptor meę es: gloria mea et regalēas caput meū. **V**ox mea ad dominū clamauit: et exaudiuit me de monte sancto suo. Ego domini et soporatus sum: et exultet quia dñs suscepit me. **N**on timebo milia populi circūdantis me: exurge dñe saluū me fac deus meus. **Q**uoniam tu percussisti omnes aduersantes michi sine causa: dentes peccatorū cōtriuisti. **D**omini est salus: et super populū tuum benedictio tua. *Inſerim in cernitib; psalmus dauid.*

Quoniam inuocasti exaudiuit me deus iusticie mee: i tribulatione dilatasti michi. **M**iserece mei: et exaudi orationē meā. **F**ilij hominū usq; quo graui corde: ut quid diligitis uanitatem et queritis mēdicinā? **E**t scitote quoniam mēdicauit dñs sādum suū: dñs exaudiet me cū clamauero ad eū. **I**rascentini et nolite peccare: qui diuitias in cordibus uestris in cubilibus uestris compungimini. **S**anctificate sacrificiū iusticie et sperate in domino: multi dicunt qđ ostendit nobis bona.



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Artwork: Mark Brammann

