

# P3

Paper Print Packaging

» **Paperazzo**

» **Druckspiegel**

» **ipw** *bio-fibre* MAGAZINE

7./8.2021

→ **ANDRITZ**

**12th Power Fluid CFB  
Boiler for Japan**

→ **MUSEUM**

**Text and Image  
in a Media Tunnel**

→ **GAW TECHNOLOGIES**

**70 Years: A Tradition  
of Innovation**

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**One  
Magazine –  
three  
different  
perspectives**



**P3**

**Paper Print Packaging**

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News powered by Druckspiegel, Paperazzo und  
ipw + biofibre magazine



## Pray for miracles, work for change.

Thomas Aquinas (1224–1274), Italian philosopher and Dominican Father

### Dear Readers,

This is the last issue of P3 that will appear in print. From now on we will offer the magazine exclusively as an e-paper. After so many years, it's hard to contemplate such a move without emotion – but it's necessary. We explain the reasons for this turning point in more detail to you on pages 6 and 7.

Apart from current events (as there are, for example: pandemic events, cost explosion, supply crisis, shortage of raw materials), which we inform you about daily in a tried and tested way on our websites, we have put together a series of informative specialist articles with some detailed insights into the respective topics. For example, Koenig & Bauer provide information about a new generation of large-format sheetfed offset presses (large-format printing is a focus of this issue anyway), Vera Goldschmidt talks in an interview about investing in a Jet Press 750S, Lanxess explains the coloring of special papers using inorganic pigments, GKD Group introduces a new kind of corrugator belt, and with the Prince of Hesse we give you pure wine – stylishly packaged by Metsä Board!

On the occasion of its 70th birthday, we also shed light on the history and current portfolio of the Grazer Armaturen Werk in Austria, better known internationally under the name GAW.

Incidentally, you can easily access the ePaper of the current issue via [www.p3-news.com/fo94ab2c](http://www.p3-news.com/fo94ab2c) – or simply scan the shown QR code with your mobile phone!

Have a great read & stay safe!

*Stefan Breitenfeld*

Stefan Breitenfeld  
Editor-in-Chief



# P3

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7./8.2021



**Flashback**  
*Druckspiegel*  
1951–1954



**Paper & People**  
*Text and Image in a Media Tunnel*



**Point of View**  
*From Local Fibre Resources to Sustainable Paper Products*



**Education Gap**  
*Management Information System*



**Companies & Markets**  
*A Tradition of Innovation*



**Special Paper**  
*Inorganic Pigments for Coloring Specialty Paper*



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.

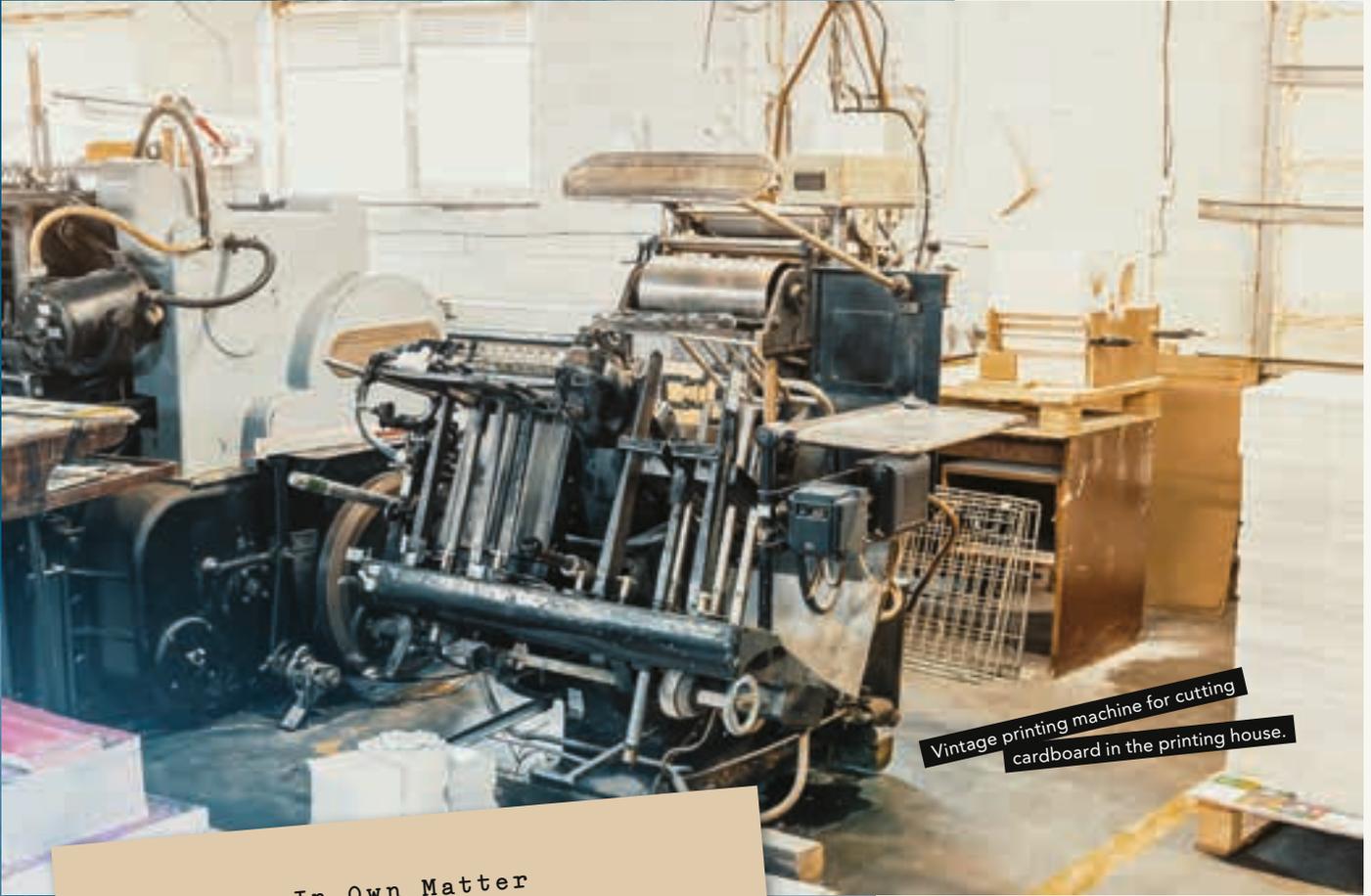


2. *Druckspiegel* is the leading trade magazine for decision makers in the print and media industry operating in the German-speaking area. It reports about the most important technical and economic developments in the industry.



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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Vintage printing machine for cutting cardboard in the printing house.

In Own Matter

# Print Finished!

**The ongoing change in the industry – or to put it plainly: digitization – does not stop at the publisher and the specialist articles that have been compiled and prepared for you. In order to take the current requirements and needs into account, we have decided to take a serious step: From 2022, P3 will appear exclusively as an ePaper!**

## Dear readers!

Of course, it seems strange at first glance: a magazine that deals with paper and print will in future be presented as a purely digital medium? But time does not leave us without a trace, and on closer inspection it makes sense to execute the cut - which has to come anyway – now.

The fact that there are also calculatory considerations behind this need not be concealed. The profitability of print products is now more questionable than ever. Newspaper and magazine publishers have been reporting falling (print) runs for years, while the demand for digital offers is increasing. Newspaper printing plants have long since begun to convert their systems in order to be able to accept additional jobs – often commercial jobs – and thus to secure their capacity utilization, which would otherwise no longer exist. No, print is not dying out – packaging printing already takes care of that, compensating for a lot (and probably also concealing it) – but print will lose importance in broad terms. Anyone who does not want to admit this trend should bear in mind that the relationship between “analog generations” and digital natives is continuously shif-



Print still life with lettering, brushes and other tools.

ting towards the latter year after year. Many specialist publications - across industries – no longer exist; in some cases the publishers behind it have ceased to exist, too, because they did not notice the change or did not notice it in time. Or they ignored it. Nowadays, specialist information and news have to be up-to-date and permanently available regardless of location. We don't want to be the last on this path - we want to actively shape it.

But there is yet another, compelling reason: sustainable management. In the past few months, there has been an increasing tendency for us to receive requests to switch to a digital subscription. Both private and commercial readers are banning print magazines from their mailboxes and desks in the interests of sustainability. These decisions are about the form, not the content – which is one of the reasons why the P3 will only be available digitally in the future – directly on your smartphone, tablet or PC.

## The topicality increases

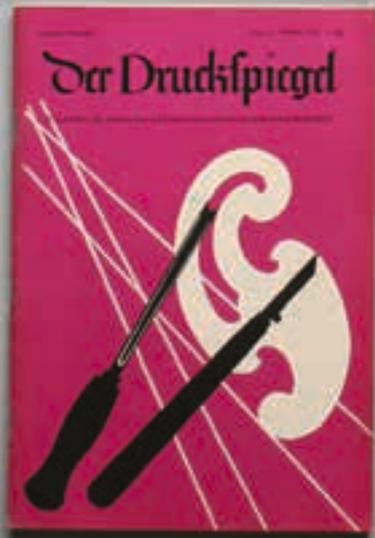
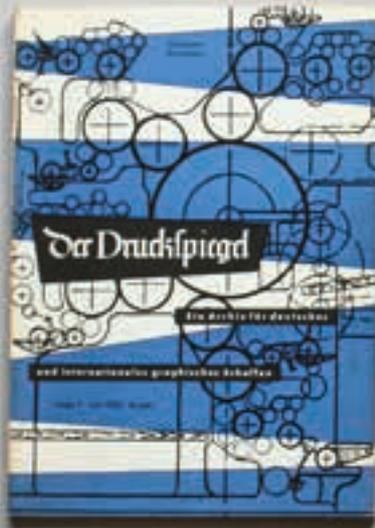
But don't worry: you don't have to jump into the deep end with us. Right from the start, P3 was also available as an ePaper, which has long since proven itself. The know-how and the necessary infrastructure are therefore already in place – the content for the previous print editions was crea-

ted and prepared digitally anyway. For you, the reader, this means: Immediate access to the current, but also to previous editions – without a pile of paper. In addition, the German and English versions are simultaneously available, the contents of which are not always identical due to the different readership groups. The topicality also increases; it is in the nature of things that a digital edition is available much earlier than a printed edition can land in your mailbox. And since there is no binding to a predefined layout, more design and content options open up – for example, the integration of media types and links, or simply the detachment from a fixed page limit.

With this in mind, we hope that you will take this step with us – because tomorrow, today will already be yesterday. So that you do not have to completely change your habits, subscribers to the print magazine will receive a small printed supplement with each digital issue until further notice, which will provide information on the current headlines and the content and should enable you to access our ePaper in a suitable form. Your previous subscription will automatically be adjusted to the new conditions. For online registration for the digital edition, we will soon provide you with a corresponding tool on our website – or you can contact us directly at [abo@p3-news.com](mailto:abo@p3-news.com). |||



We do open our morgue and look back ... here some Editions of Druckspiegel from 1951–1954.



# [ Paperthings ]



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Opening

# Text and Image in a Media Tunnel

The Norwegian Printing Museum has opened in Stavanger, Norway, on November 20th. It is located on the site of a former sardine can factory in the historic old town.



The factory building is home to the Norwegian Canning Museum. It was architecturally expanded by Eder Biesel Arkitekter. The exhibition in the new building comes from Atelier Brückner. Both museums operate jointly under the Iddis brand, derived from *iddikett*, the word for label in the regional dialect.

The Norwegian Printing Museum spans more than 40,000 years – from the first human traditions in the form of cave paintings to the digital present. One focus is on the change in printing techniques for word and image – with regional and local references: In Stavanger, the art of printing flourished from the late 19th century, as the local canned fish production resulted in numerous print jobs. The label was of central importance for the marketing of canned fish. From Stavanger they were exported all over the world – until the 1950s. The exhibition offers playful access to more than a thousand sardine can labels.

They are accessible digitally. In addition, the historic lithography stones, a lithography press, various printing rollers and the establishment of a photo laboratory are impressive. In a spacious workshop area, the Print Shop, on the upper floor of the museum, half a dozen historical printing machines can also be admired in action.

## Chronological course

The museum exhibition extends over two large room units on the ground floor of the building, which are connected by a shared media tunnel. The staged corridor is the climax of the course. It can be approached from both sides. The course is arranged chronologically: If the visitor enters the museum from the Canning Museum, the first exhibition room deals with the reproduction of the image with a focus on lithography and photography. A flood of images rises from a camera, spiraling into the present in the media corridor and then leading back to a Gutenberg printing press, accompanied by daily newspapers, typewriters and early computers.

The printing press is the central exhibit in the second exhibition room. In terms of content and space, it is the turning point: with the invention of movable type, the widespread distribution of printed matter was possible from 1450 onwards. Printed sheets of paper shoot up out of the press and into the media tunnel, leading to today's e-publishing.

Before the printing industry established itself, the scriptorium was the central place for writ-



Gutenberg printing press and media tunnel.



Media tunnel in the museum.



Exhibition area "Written Word".



Print Shop.

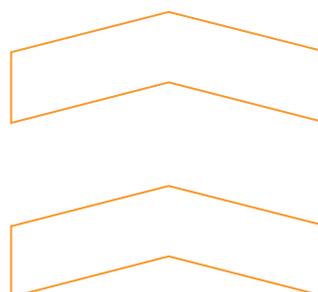
ten reproduction. It is – equivalent to the printing press – staged as a spatial unit.

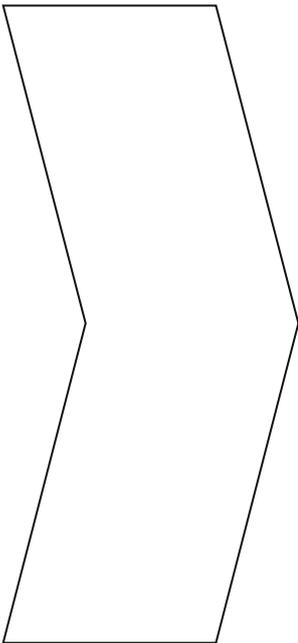
### Fascinating printing industry

The exhibition rooms are structured using cubic wooden shelves. The cubes can be individually combined and equipped with exhibits or even printed. Type cases in which the letters of the printing industry found their place are the guiding principle of this classification system. The print shop on the upper floor of the building is also designed to be flexible: the topic texts and the labels on the exhibits are printed on boards. They are tucked into wooden strips around the exhibition space and into the chest-high zoning that separates individual subject areas from one another: Different printing processes are used for comparison. Typesetting and bookbinding are also topics. Stavanger's printing industry with its rattling marvels continues to fascinate even the present.

The exhibition is open Tuesday to Friday: 11 a.m. to 3 p.m., Thursday also 3 p.m. to 7 p.m., Saturday and Sunday 11 a.m. to 4 p.m. |||

[www.iddismuseum.no/en](http://www.iddismuseum.no/en)





20 Years

## Koehler Paper Celebrates Anniversary of Production Line 2

Koehler Paper, a Koehler Group company, had the opportunity to celebrate an unusual birthday at the end of 2021. Production line 2, consisting of paper machine 2 and coating machine 2, was put into operation at the Kehl site at the end of 2001 and accordingly has now played a part in the Oberkirch-based family-run enterprise's success story for a good 20 years.

Paper machine 2 is used exclusively for the production of thermal paper. With a length of 123 meters, the machine is longer than a soccer field. It is also the "fastest thermal paper machine in the world", and is known for coupling its speed with astoundingly consistent quality. This all makes it possible to use it to produce more than 1 million checkout rolls a day, with these slips being found everywhere across the world.

Paper machine 2 revolutionized the thermal paper market

Paper machine 2 is the reason why Koehler Paper is so successful in the thermal paper market, as it enabled the company to produce lightweight thermal paper with grammages of less than 50 gsm. "Koehler pioneered lightweight thermal paper for POS with grammages of 48 gsm and less – that transformed the market. Truth is, the



1 Paper machine 2 is characterized especially by its high speed and its astoundingly consistent quality. This all makes it possible to use it to produce more than 1 million checkout rolls a day, with these slips being found everywhere across the world.

2 From left to right: Joachim Uhl (Mill Director at the Kehl site), Joachim Fuchs (Production Manager for Paper Machine 2), Georg Streif (Kehl Production Coordinator), and Thomas Peter (Production Manager Kehl site) next to paper machine 2.

machine was predestined to make lightweight thermal paper to this very day," says Willy Früh, Director Thermal Paper Division at Koehler Paper. "When we talk about thermal paper production, you could say we've been playing in the Champions League for 20 years now."

"The fact that the machine keeps beating speed records time and time again and is one of the fastest offline coating machines of its time nowadays is something that we have the production line team to thank for in particular. The production line was also a guiding light for other investments at Koehler," adds Joachim Uhl, Mill Director at the Kehl site.

## Continuous optimizations make paper machine a flagship model

Employees who were to work on production line 2 received training during the planning stage already. This made it possible to put the machine into operation smoothly back then and quickly

start making ready-to-sell paper. However, it goes without saying that continuous optimizations were required in order to guarantee success in the long term.

Georg Streif, the Production Coordinator at the Kehl site, led the project's implementation on the production side of things at the time. Together with Joachim Fuchs, who is the Production Manager for production line 2 today, he takes a look back: "Since we put it into operation, we've made around 3,000 optimizations to paper machine 2, and when we put them all together, that's what has ultimately made the machine what it is today. And we're still getting a lot of great ideas from our employees. After all, the time after an optimization is also the time before the next one!

"At any rate, this has made paper machine 2 an extremely constant and reliable high-availability machine that continues to be industry-leading. We get the best results at speeds of over 1,600 m/min." |||

Valmet

# From Local Fibre Resources to Sustainable Paper Products

**In many parts of the world, we see innovative efforts in the search to produce paper more sustainably. The development is coming on strong as tissue producers are exploring if regional and local fibre resources might be an opportunity for them.**

bio-fibre MAGAZINE

Wood fibre has been the main source of paper production since the mid-1800s. Although it is considered a sustainable material, it can't be grown everywhere: In most cases, transportation is a necessary part of the supply chain. It is also known that transportation brings energy use and CO2 emissions. Separately, burning residue from various crops makes a major contribution to air pollution. By utilizing resources close to home and turning them into sustainable paper products, local business owners are empowered, job opportunities are created, and entire communities can benefit positively from such investments.

In this article, we will introduce you to various materials that can be used to make tissue, such as straw, bagasse, bamboo and microfibrillated cellulose (MFC). We have spoken to some leading experts, all with their own area of expertise.

## Adding wheat straw fibre to the product mix

More than 20 years ago, wheat straw burning in the state of Washington contributed to more air pollution than the top 20 industrial manufacturers in the state. So

they started to look at an alternative commercial use for the wheat instead of burning it. A question was raised: Could a new technique make it possible to explore the potential of creating pulp from straw?

Today, Columbia Pulp, located in the eastern part of Washington state, is a manufacturer of wheat straw. We spoke to the CEO, John Begley, who says the company is strategically located in the center of one of the world's largest wheat-growing areas.

As a substitute for hard wood fibre, Columbia Pulp has added their fibre to various end-use products. And the findings have been successful. By utilizing an agricultural residual product, both energy and water savings can be achieved. Only a quarter of the water is used compared to that required by a normal pulping process. There is little or no odor, as it is a sulfur-free process. The product is unbleached and completely chlorine-free. Begley is proud of the

state-of-the-art process operated by Columbia Pulp.

## Pulp made from bagasse

The residue that remains after sugarcane stalks are crushed and the sugar is extracted are called bagasse. As alternative use is limited, it contributes to the problem of agricultural waste in India and air pollution when burned. However, bagasse can be transformed into an environmentally friendly product.

Naini Group and its Managing Director Pawan Agarwal may be pioneers when it comes to producing pulp from bagasse. The company had already started in 1998, so this relatively unknown source of fibre is anything but new to them. According to Agarwal, bagasse has some wonderful characteristics. It is a clean fibre with low lignin, and is easy to wash and easy to





- 1 Burning residue from various crops such as wheat straw makes a major contribution to air pollution.
- 2 The characteristics of bamboo fibres are similar to soft and hardwood fibres and it thus suits well for tissue products.
- 3 Microfibrillated cellulose, also called MFC, is a cellulose material that falls under the fibril range.
- 4 Ulf Johnson, Concept Manager, Mill Technology at Valmet.
- 5 David Cowles, Global Market Development Manager, Nanotechnologies at Valmet.
- 6 John Begley, CEO of Columbia Pulp.
- 7 Pawan Agarwal, Managing Director of Naini Group.



use is being explored in personal care, bio-medical products, anti-fog coatings, hand sanitizers and material reinforcements.

bleach. If the production process is done properly, you can get good fibre from bagasse. Where paper properties are concerned, it is very comparable with paper made from wood pulp.

Three of the biggest advantages that Agarwal sees with bagasse are its bleachability, uniformity and the strength of the paper. If he must pick one drawback, it would be the lower bulk.

### Microfibrillated cellulose – the green solution for today and beyond

What is it, and how can it be used? If there is one person who can answer those questions, it's David Cowles, Global Market Development Manager, Nanotechnologies at Valmet. He is currently working with a team of Valmet experts and researchers in

collaboration with the University of Maine. Microfibrillated cellulose, also called MFC, is a cellulose material that falls under the fibril range. At Valmet, we measure it as a percentage of total fines. And a fine in this case is a fibre that is less than 0.2 mm long.

The benefits of MFC are many. It is a sustainable tree-derived resource. Cowles gives an example: "Let's imagine a tree made of eucalyptus. It may take between six and eight years before it is fully grown and ready for harvesting. That tree root can then be used a total of two or three times in a possible 20 years or so. MFC also offers production flexibility, because it uses mechanical or chemical processes, or a combination of the two." Cowles summarizes MFC as a toolbox of opportunities for papermakers that are only limited by the imagination.

Naturally, at Valmet, we speak about MFC in relation to paper products. But its

### The benefits of using bamboo in tissue making

The characteristics of bamboo fibres are similar to soft- and hardwood fibres and because of this, it can be suitable for producing tissue. Ulf Johnson, Concept Manager, Mill Technology at Valmet, explains that in Asia, bamboo is frequently used to produce facial and bath tissue. Concerning its environmental aspects, it is fast growing and ready for harvest in one to two years. Locally or regionally grown bamboo often means less transportation. And it emits more oxygen than a comparable tree. Exploring the possibilities of producing tissue from non-wood is like going back in history. Johnson means we are now revisiting lost expertise, and he is hopeful for the future. Together, we have many opportunities to produce paper more sustainably than ever.

||| **Anna Boström Mora, Marketing Manager, Tissue Business, Valmet**



Heading towards climate-neutral production: Andritz supplies a second fiber preparation system to Gutex.

Andritz

## Second Fiber Preparation System for Gutex Holzfaserplattenwerk

**International technology group Andritz has received an order from Gutex Holzfaserplattenwerk to supply a second fiber preparation system for the production of insulation board in Eschbach, Germany. Start-up is scheduled for the second quarter of 2023.**

*bio-fibre* MAGAZINE

The scope of supply comprises a complete fiber preparation line, including a debarking and chipping line as well as the steel structure, piping material and installation work. The new, highly efficient line will mainly process softwood chips as raw material and feature the following technological highlights:

- Wood processing technology for receiving of logs, an Andritz RotaBarker debarking system and a horizontally fed HHQ-Chipper for consistently good chip quality at high production rates
- Fully automatic chip storage system with reclaiming and screening equipment
- High-consistency (HC) refiner ensuring a constant refining gap that is essential to obtain high fiber quality and low specific energy consumption

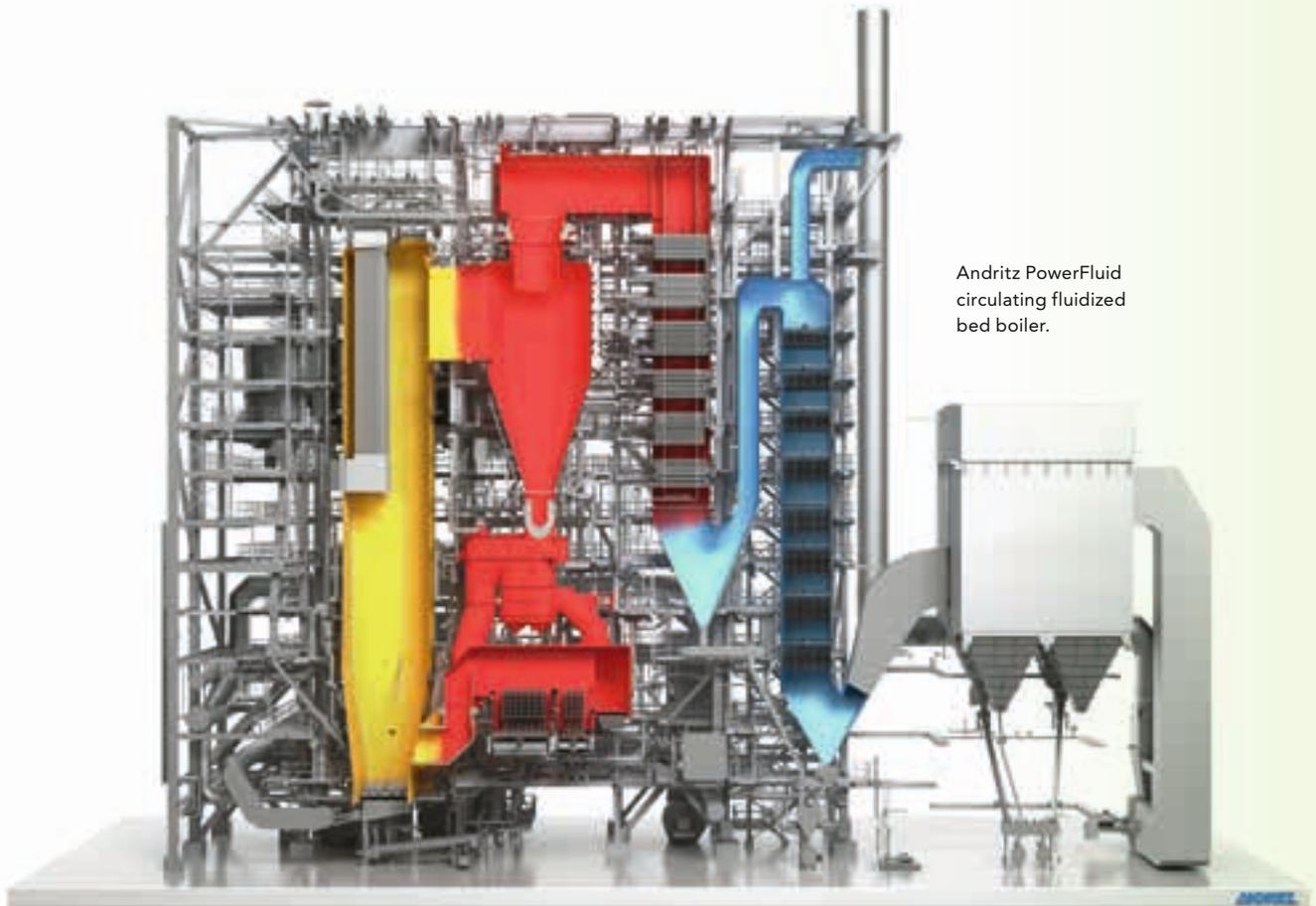
- Steam Recovery System SRS for efficient recovery of surplus steam and greater thermal efficiency of the fiber preparation system

Oliver Bauch, Plant Manager at Gutex Holzfaserplattenwerk, says: "Climate-neutral production of our sustainable products is a further milestone in our company's history that we want to achieve with reliable partners like Andritz."

Michael Rupp, Vice President for Panelboard Systems at the Andritz Paper, Fiber and Recycling Division, adds, "I perceive and value Gutex as a customer that focuses on both innovative insulation board products and environmentally friendly manufacturing technologies. We are very proud to have the opportunity to install our complete front-end technology."

### About Gutex

Gutex is one of Europe's pioneers in ecological insulation solutions. The family business based in the Black Forest near where the borders of Germany, Switzerland, and France meet first started making wood fiber insulation products back in 1932. Gutex has been producing wood fiberboard insulation with a homogeneous raw density profile since 2006 using an innovative dry process and was the first manufacturer in the world to do so. The technique allows Gutex to manufacture single-plywood fiberboard insulation in up to 240 mm thickness with significant quality advantages. |||



Andritz PowerFluid circulating fluidized bed boiler.

Andritz

## 12th PowerFluid CFB Boiler for Japan

International technology group Andritz has received another order from Toyo Engineering Corporation in Japan to supply a 50-MWe PowerFluid circulating fluidized bed (CFB) boiler on EPS basis. The boiler will be part of the biomass power plant in Tahara-shi, Aichi Prefecture, in Japan. Start-up is planned for 2025.

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The Andritz PowerFluid boiler will be integrated into a biomass-fired power generation facility that will be fueled by wood pellets. With its high efficiency and state-of-the-art technology, it is the perfect solution to meet greenhouse gas reduction targets and contribute towards carbon neutrality in Japan. The biomass power plant will be capable of supplying power for roughly 110,000 households in Japan.

As the company states: "This order once again confirms Andritz's strong partnership with Toyo Engineering Cooperation. Andritz is proud to be part of this remarkable project and make another important contribution towards the Japanese power industry's move from fossil fuel to renewable energy resources." |||



Kelheim Fibres production plant in Lower Bavaria.

Viscose Speciality Fibres

# Kelheim Fibres Publishes Sustainability Report

**Kelheim Fibres, manufacturer of viscose speciality fibres, has published its first Sustainability Report. Sustainability Manager Timo Thunitgut is very pleased to have reached this milestone: “Credibility and trust are based on transparency.”**

bio-fibre MAGAZINE

Our Sustainability Report according to the framework of the UN Global Compact follows these principles and presents our actions fully transparently. It shows how we as a company live up to our responsibility for people and the environment; it reveals our contribution to combatting one of the biggest global problems of our time - the increasing waste problem caused by disposable plastic products - with our biodegradable fibres.”

As part of their EMAS certification, the Bavarians have already been publishing an annual environmental statement since 2020, in which all relevant environmental data are available to the public. The Sustainability Report, which will also be published annually, goes one step further he-

re - it covers not only the company’s environmental performance, but also Corporate Social Responsibility as a whole.

Following this approach, the fibre experts have also created a new structure internally, which gives even more weight to the area of CSR: In future, all sustainability topics will be centrally integrated in the new CSR department (formerly HSE, Health, Safety & Environment) under the leadership of Wolfgang Ott. Wolfgang Ott: “Responsible corporate behaviour is and will increasingly become a relevant competitive differentiator. By bundling all CSR aspects in one department, our CSR performance, a topic that has been firmly anchored in our philosophy for years, will gain even more visibility and impact.” |||

# Your next step forward with testing and piloting

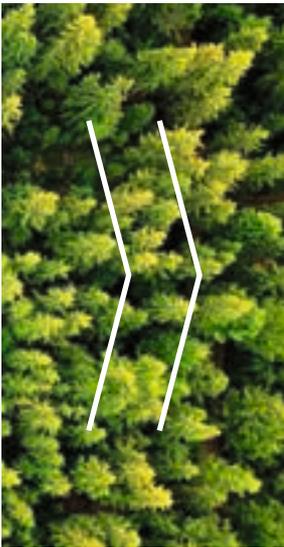


Valmet Paper Technology Center provides the world's most comprehensive testing and piloting environment for paper and board makers worldwide. Whether you want to change up your production, improve the efficiency of your existing process or test raw materials, we have your entire process covered. To ensure peace of mind and investment security, you should invest in solutions that you know to be tried and tested.

At Valmet Paper Technology Center, technologies, automation, services, and latest innovations are available and proven in practice – also remotely. Thanks to a customized process tailored to mirror your process, the results are directly translatable to your real process environment.

For more information [valmet.com/pmpiloting](https://valmet.com/pmpiloting)





Cepi

## European Pulp & Paper Industry Supports EU Action to Safeguard the World's Forests

Following the publication by the European Commission on November 17 of a draft regulation on deforestation, the Confederation of European Paper Industries, Cepi, comments on the EU executive arm's new proposal.

The upcoming regulation is aiming to minimise the risk that commodities associated with deforestation and forest degradation are placed on the EU market. A timely step demonstrating the EU's commitment to halt global forest loss, and which follows a recent COP26 pledge by more than 100 countries to halt global deforestation that was also countersigned by the European Union.

The European Pulp and Paper Industry has a strategic interest in keeping global forest growing and healthy. Its commitment to sustainable forest management practices has propelled its involvement in effective reforestation, regeneration of harvested areas and the preservation of biodiversity and valuable habitats.

The positive experience of the EU Timber Regulation, introduced a decade ago to prevent illegally logged timber to be used on EU markets, proves that the Union can lead by example and use regulation to stimulate better forest governance in trade partner countries. This is a domain where Cepi and its members have considerable experience, having supported since decades the uptake of third-party verified forest certification to prove responsible forest management.

However, Cepi considers that, to make real changes when tackling commodity-induced deforestation, it is crucial that efforts target the real drivers of problem. Agricultural commodities driving land conversion play a major role when it comes to embodied deforestation associated to EU imports. From a global perspective, a recent international assessment by the Food and Agriculture Organisation of the United Nations (FAO)

confirmed that the role of agriculture in global deforestation is even more detrimental than previously thought. It presently accounts for 90% of global deforestation. In this, the EU partnerships for development are vital in mitigating unsustainable pressures on forest land.

Cepi welcomes the fact that the new EU draft regulation endorses internationally agreed, well-established FAO definitions of forest and deforestation. This ensures clarity and consistency with other forest-related international processes. However, Cepi underlines that there needs to be more discussion on the burden put on wood products, an efficient approach would put more emphasis on tackling the main systemic drivers behind deforestation: agricultural expansion and poverty.

Cepi also stresses the importance of avoiding an unnecessarily increase of burden for local operators. To this aim, the Regulation must provide the possibility of using existing global forest certification schemes, such as the one of the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC), as valid tools to assess and mitigate risks connected to deforestation and forest degradation.

"We welcome impactful and targeted action to tackle the EU footprint on global deforestation," commented Cepi Director General Jori Ringman, "and this is best done by focusing on the most important causes. This is vital for our sector as our industry, our investments, our future totally depend on maintaining healthy forests."|||



What Does it Mean?

# Management Information System

**The term “Management Information System” is commonly used – as a catchphrase, however, it often only causes glassy eyes. Before he started working for the publishing house, the author Stefan Breitenfeld was, among other things, a research assistant in the Working Group Business Informatics – Management Information Systems at the Faculty of Computer Science at the University of Magdeburg. He tries to define the term briefly but precisely.**



Management information systems use key figure cockpits to reduce complexity.

A management information system (MIS) is a software-based information system that is intended to support the operational and – within limits – strategic management of a company by reducing the complexity of its tasks (analysis, planning, control, resource management, decision-making ...). In recent years, the term has increasingly become part of everyday language, which means that in theory and practice there are different, sometimes fuzzy, historically determined or even contradicting definitions, which we will not go into further here.

At its core, a MIS supports the user by reproducing a real image of the current company status – this includes internal as well as external factors (e.g. the market situation). The mapping is usually done via reports or previously defined key figures, which are condensed in a suitable form into so-called key figure cockpits or can be incorporated into a balanced scorecard. A correctly configured system can be used for planning and communication, but also for optimizing business processes. As with every information system, the MIS is also based on the idea

that usage depicts a process that should lead to continuous improvement, which in the best case means a competitive advantage.

The need for a MIS in the company is therefore not met with the installation of the software. Rather, it is crucial for the application's benefit that the relevant parameters have been recognized and determined in advance (although some systems can use data mining methods to provide additional information that would not be known or apparent without the use of AI). Imperfect, incorrectly selected or too complex key figures are not corrected by a MIS, as are unrealistic goals or poor strategies. In extreme cases, the unreflective use of such software can endanger the company's success. Consequently, it may make sense to combine the introduction of a management information system with an external consulting service. The service provider should not only know the industry, but also have in-depth knowledge of business management and economic interrelationships in general. |||



GAW Technologies: 70 Years

## A Tradition of Innovation

Entrepreneurial courage and an all along strong culture of innovation are the ingredients of the 70-year success story of GAW technologies.



- 1 Nina Pildner-Steinburg and Wolfgang Senner, CEOs.
- 2 Machine feed at the beginning of the 50s – one of the first GAW products.
- 3 The owners Jochen und Jörg Pildner-Steinburg in front of a portrait of their father and company founder Erhardt.
- 4 GAW starch preparation – saving resources also „for rent“.
- 5 Coating Color Recycling System for the recovery of pigments from coating colour waste water.



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The Austrian family company, which was once founded in a garage, has built a strong brand in the paper industry within a very short period. Today it has become a dispensable and reliable technology partner in the treatment of chemicals, starch, coatings, wastewater and process water as well as automation and digitization.

When Erhardt Pildner-Steinburg, born in 1912, founded the "Grazer Armaturen Werk" in 1951, he probably had no idea that his company would evolve into an export-oriented global business over time. The success story began in a garage in Graz, Austria. Erhardt Pildner-Steinburg employed five people when he initially produced interchangeable and V-belt pulleys for woodworking machines, but also feeder and valves for pulp and paper mills.

Soon it was not enough for Pildner-Steinburg to manufacture only valves and fittings. He was mostly interested in the entire scope of work and so he began to develop chemical processing systems for the production of paper. An order from the

Welsler paper factory in 1956 gave the starting signal for the company's path to success. Further orders from Mayr-Melnhof and Neusiedler AG followed and laid the foundation for the beginning of the rise of the – then still young – company in the plant engineering and construction sector. The first systems had successful start-ups and Pildner-Steinburg, equipped with a corresponding pioneering spirit, pushed the implementation of his ideas into marketable products with systematic meticulousness.

### Austria is not enough

As early as 1960, companies from abroad began to become aware of GAW. The first cross-border order came from the Stremška Mitrovica paper mill in former Yugoslavia. And the list of countries was getting longer and longer: exports followed from Iraq to Sri Lanka, from Italy to the USA, from Portugal to South America. GAW was entering new sales markets on almost

all continents of the world at a time when for most people in Austria holidays on the northern Italian Adriatic beaches was still considered as a sign of ultimate internationality.

This internationalization continued, after the early death of Pildner-Steinburg in 1974, under the management of his two sons Jochen and Jörg. With the establishment of subsidiaries, the company's global presence systematically expanded. First in the United States of America and Canada, then in South Africa. The geographic expansion continued into the Far East, particularly to China, in the 1990s. Brazil and India followed, and hundreds of reference projects in almost all parts of the world speak a clear language: a strong local presence creates the basis for really understanding the customer, being able to interact closely and thereby earning the highest level of trust.

### The art of engineering and innovative power lead to a Hidden Champion

Like other successful family businesses, GAW is characterized by a high level of innovation since its origin. By consistently broadening the product range, Pildner-Steinburg very soon secured the market position in the processing technology sector and his sons subsequently pushed the company's development further to become a provider of complete turnkey systems. In the second half of the 1990s, GAW knew that the plan had worked out: KNP Leykam (today Sappi Gratkorn) made a large order for the at the time world's largest paper machine for the production of triple-coated wood-free paper. The scope of supply of turnkey equipment included a pigment processing system with storage and the auxiliary processing systems including storage, starch conversion system as well as the complete coating kitchen and working stations, and all systems were successfully put into operation.

It was also the first time that the self-developed ECO-R pressure filters as well as the Variable Shear Technology (called VST) were introduced to the market. These features are technologically remarkable and still "unbeaten" as well as in operation.

The VST technology can be adjusted for all applications. It is based on a continuous adjustability of the rotor-stator overlap during operation and thus securing an optimal ratio between drive and shear.



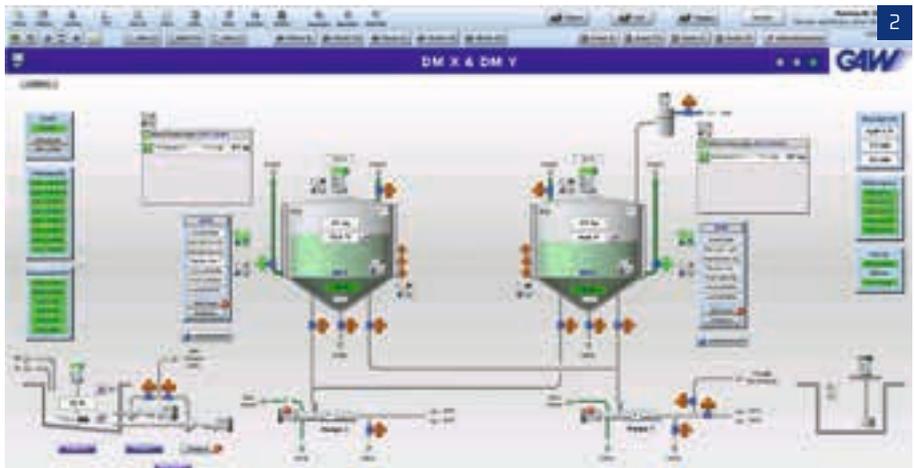
## Technologically knowing the customers world inside out

The R&D expenses of GAW reflect the high priority that innovations have always enjoyed at the company. Each year around 10 percent of the operating performance are spent on development work, mainly focusing on the reduction of the use of water, energy and raw materials in the customer's production process.

A strong example of how to achieve impressive resource savings are the GAW systems for processing starch. Especially when native starch is used – the so-called enzymatic starch processing. By combining two modes of operation in a very special way, it creates a customized starch size at the end of the modification process. This size includes the requested viscosity and molar mass distribution for the respective application – regardless of the starch type, starch temperature and solids content. Expensive raw material losses are no longer an issue, as the dwell time in the system can be set as required and is kept constant at all times, i.e. also during a stop or start of the system. Therefore, it is possible to run with almost no wastewater.

It is quite convenient, that these GAW systems are also available for rent and customers are happy to use them. On the one hand to bypass failures or bottlenecks in production, but on the other hand also when it comes to carrying out tests with new raw materials in a parallel mode.

In addition, a very compact modular system for heat recovery is also available: the patented Heat Recovery System ensures that the expansion steam (and the thermal energy it contains) is not escaping into the atmosphere unused after the boiling of



the starch. The savings result in more than 50 percent of the energy required to inactivate the jet cooker.

Another patented innovation is the Coating Color Recovery System. This process for recovering coating colors does not only require 70 percent less energy than grinding fresh pigment. It also significantly reduces the amount of wastewater because the separated sewage water is completely returned to the process.

GAW implements a large part of the new developments in cooperation with customers directly at their mills. The GAW technical center in Graz is another possibility, especially for pilot tests and test series. The equipment includes all GAW key components, test systems and extensive laboratory material. Many of the innovations already mentioned as well as a lot of other ideas origin in these halls and were successfully brought to life.

A recent example is the research on a new process that is using cavitation for the

preparation of starch. The focus of the project is the reduction of energy by minimizing the need for steam. At the same time, GAW researchers expect a significant saving of the required enzyme – accompanied by an improvement of the paper quality and greater variability in the operation mode range.

## Thinking and acting long-term

In 2016, a generation change took place at GAW technologies. Since then, Nina Pildner-Steinburg and Wolfgang Senner have been leading the global technology company, which has earned a high reputation for its service, product and consultation quality as well as delivery reliability. The primary goal of the management is to expand the company, to make it stronger and to pass it on to the next generation. "Accordingly, our corporate strategy is positioned towards long-term organic growth



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- 1 Membrantrennanlage – GAW water technologies.
- 2 MES – Produktmanagementsystem für kontinuierlichen und Batch-Betrieb.
- 3+4 In the GAW technical center – dispersing laboratory trial under real conditions.

based on a diversified and global business structure. Our success is based on the fact that our customers can be sure that we will still be there in 20 years,” specifies Nina Pildner-Steinburg. “With our broad portfolio of systems, products, services and digital solutions, it is our aim to continue to enthruse our customers in the pulp and paper industry as well as from the chemicals and composites segments,” adds Wolfgang Senner.

Some time ago the GAW water technologies business unit started to put a focus on the topic of water and wastewater treatment in the paper manufacturing process and was introduced in addition to the existing applications (in the field of fully automated processing and production of chemicals, starch and coating compounds as well as the grinding of calcium carbonate). The filtration and membrane separation processes for boiler feed water, process water and tertiary wastewater are tailored to the respective requirements. The consumption of the valuable resource water and thus the impact on costs and the environment are massively reduced.

## 100 percent recycled

Let’s take a quick look away from the paper industry. In other words, what makes GAW successful? “We definitely act highly flexible and dynamically when the corporate environment demands it or if we see opportunities,” says Nina Pildner-Steinburg, “and we understand our technologies and processes so well that we can adapt them

for use in other industrial segments within a very short time.”

For example, next year a hydrosulphite dissolving plant from GAW will go into operation at Renewcell, a young Swedish company that has developed a remarkable new recycling technology and is now building an industrial-scale textile recycling plant in Sundsvall. In the future, used cotton, denim, rayon and other cellulose fibers will be dissolved and 100 percent recycled to so-called Circulose® cellulose.

## Growing with digitalization

Just as society, the economy and the world of work are changing because of digitization. Plant engineering and construction is also changing dynamically and in some cases fundamentally and at a faster pace, whereby the topic of digitization is not groundbreaking for this industry. The development that began decades ago is now simply moving forward with very large strides. The automation of the GAW systems found its way into the company decades ago, just as remote services have been standard for a long time.

“Today the direction of impact of our digital agenda lies in the enhancement of the existing product portfolio with those digital capabilities that offer our customers additional added value, as well as in the development of new digital applications for our traditional core markets,” emphasizes Wolfgang Senner. For the special requirements of pulp, paper and cardboard manufacturers, solutions based on data analysis already exist. The aim is to reduce energy consumption, to improve pulp and paper quality or to increase process safety. Among other things, barrier coating has a high priority and is an example for safety in the area of food packaging.

In this case, GAW uses its automationX®-MES product management system for product and batch tracking to plan and optimize the order data or to record, visualize and analyze the performance and quality data. If the customers want to bring the best out

of their production facilities (minimizing raw material and energy consumption and at the same time increasing throughput and product quality by reducing fluctuations in critical process variables or correcting disruptions more quickly), appropriate APC solutions are used – for example in the areas of starch, wet end or drying, where steam savings of up to 6 percent can be achieved.

Nina Pildner-Steinburg is convinced that “the dynamic of technological change, which has so far shaped the history of GAW, will continue to be a formative element in the development of our company. Also in the digital age, nothing stands in the way of it. Especially not if you are lucky enough to be able to work with people who appreciate our climate of trust and openness between all hierarchical levels and departments. And this naturally has a positive effect on innovation.”

## With a strong background

To conclude, let’s look back in history once more. As already mentioned, a key entrepreneurial decision in corporate development was the path from a component manufacturer to a supplier of turnkey systems. But that was not enough: since the 1990s the owners have not only pushed forward the diversification of their company. Shortly after that, they also began to buy companies in other business areas, thereby deepening the structure of a family-run industrial holding company.

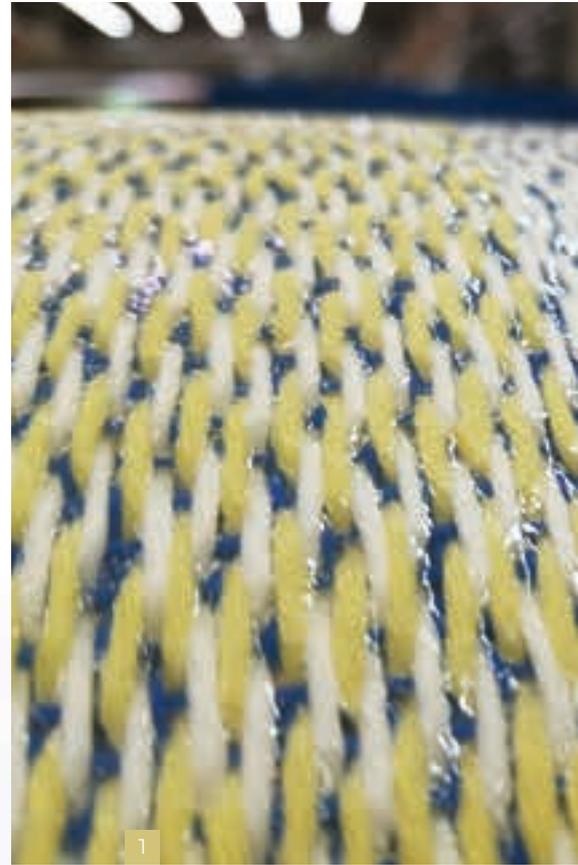
GAW technologies is now a proud part of the GAW Group, a global technology company group owned by the family Pildner-Steinburg. The portfolio of systems, products and industrial services serves eight essential markets in almost all regions of the world: paper, plastics, chemicals, transport infrastructure, building materials, food, medical technology and optoelectronics. Reason enough to look forward to the next seventy years full of action. |||

[www.gaw.at/en](http://www.gaw.at/en)

GKD Group

# New Corrugator Belt Exceeds High Expectations

“The results speak for themselves,” says Irene Lopez, Director Sales & Sourcing at Finsa Filtros Industriales S.L., distribution partner of the GKD Group (GKD) in Spain for 30 years. Within just six months, the new corrugator belt Conducto® 3322 from GKD was sold twelve times over during its market launch in Spain and Portugal.



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It has been installed in four systems belonging to renowned corrugated board manufacturers and is already far exceeding their expectations. In addition to significantly higher air permeability, corrugated board quality, and productivity than was achieved with previous belts, customers claim that the GKD corrugator belt also impresses with up to 50 percent savings in drive energy.

Largely responsible for the rapid launch success is Corrugator S.L., a sought-after partner among corrugated board manufacturers for technical system support. The customers heeded the trusted advice of

the technicians and decided to follow their recommendation to switch their corrugator belt. A decision that obviously proved to be the right one: Many of these customers have already recommended the Conducto® 3322 within their global company networks.

The Conducto® 3322 was launched on the German market almost two years ago and is used by a series of large corrugated board manufacturers in the double facer section as the top belt and occasionally as the lower belt. Its construction from two-and-a-half-ply hybrid mesh combines an internal structure of polyester monofila-

ments and bronze wires in the running direction with a warp of staple fiber yarn. In addition, the edge is reinforced with aramid. While conventional belts are up to eight millimeters thick, the Conducto® 3322 has a thickness of just 5.7 millimeters and, at a weight of 3.95 kilograms/square meter, it is also considerably lighter. Despite the low weight, its robust design guarantees the required even pressure for optimal contact between the corrugated board and the heating plates. This stability is due to a special thermosetting, which also avoids unwanted stretching. The key difference from conventional belts, however, is the

- 1 The construction of the new GKD corrugator belt Conducto® 3322 from two and a half ply hybrid mesh combines an internal structure of polyester monofilaments and bronze wires in the running direction with a warp of staple fiber yarn.
- 2 The high air permeability of the Conducto® 3322 permits fast, full surface moisture evaporation of the corrugated board.
- 3 Irene Lopez, Director Sales & Sourcing at Finsa Filtros Industriales S.L.



tor Ortiz: They didn't want to make such important technical decisions without the corresponding evaluation and advice from the experts. Corrugator S.L. was founded in 1992 by Alfonso Ortiz in Guissona in northeast Spain. It was built on the many years he had spent working for a manufacturer of corrugated board and paper belts. The new company specialized in manufacturer-independent technical support, belt assembly, and repair with 24/7 service. It was also sales partner of a German manufacturer of widely used corrugator belts for many years. Victor Ortiz has been working together with his father in technical support for 20 years and is now the main contact for customers. Extensive knowledge of the market and products make him a valued partner for checking and assessing machine specifications or providing support for production optimization. The special design of the Conducto® 3322 convinced Victor Ortiz immediately: "The belt is really different from all the other belts from other manufacturers." On the basis of his many years of working with the corrugator belts from GKD's competitors, Victor Ortiz immediately recognized that: "There is no other comparable belt!" That is what won him over as the new exclusive distribution partner for Finsa Filtros and GKD for the Spanish corrugated board market. In order to properly assess the corrugator belt in detail, he visited GKD's ultra-modern production department in Germany. This resulted in an in-depth exchange with the GKD technicians on the belt properties and possible approaches for further development. Meanwhile, Victor Ortiz introduced the Conducto® 3322 to his longstanding regular customers and new interested parties. With his profound knowledge of the relevant system landscape and production requirements, he quickly knew to convince companies from reputable groups such as International Paper, Saica, Petit, or Font Packaging, as well as independent corrugated board manufacturers like Mora Y Goma

or Xuker ASC 21 S.L. of the new belt. The robustness and openness of the belt and the faster processing that these allow are unique in Victor Ortiz's opinion. According to the expert, another advantage of the Conducto® 3322 is the effective dissipation of electrostatic charge. "The customers can see the bronze filaments and we can prove dissipation using test devices."

### High pressure to succeed when switching

These are arguments that also motivated Ricardo Pereira, Industrial Manager of Saica Pack Ovar, Portugal, to consider changing providers. With an annual production of 90 million square meters of corrugated board, the company based in Ovar in the north of Portugal is one of the biggest manufacturers on the highly competitive and demanding Portuguese market. For the production of its large portfolio, Saica Pack uses a 120-meter-long corrugated board production system from Medesa (wet-end) and Fosber (dry-end), which produces up to 250 meters of corrugated board per minute. The eighteen-meter-long and 2.74-meter-wide double facer section is an interfic system with shoes. Major customers include a Swedish furniture store and Portugal's leading wine wholesaler. Although the factory in Ovar hadn't been a customer of Corrugator S.L., Ricardo Pereira asked Victor Ortiz for help with an urgent problem: In the production of a new coated paper, there were significant quality problems and high levels of waste with the old belt that had been used for many years. This paper is produced in all types and grammages. Due to the low permeability, however, it was hard for the moisture to escape, as the corrugator belt that had previously been used had insufficient permeability. To bring the paper onto the market quickly, however, a reliable alternative needed to be found for production as quickly as possible. Due to his many years

high air permeability of the Conducto® 3322, which permits fast, full-surface moisture evaporation of the corrugated board. Thanks to the shorter drying time and improved processing quality, the systems can be run at a higher speed. Unlike conventional belts, the new corrugator belt also shows no tendency to clog.

### Recommended by experts

The market launch in Spain by Finsa Filtros proved difficult at first, however, recalls Irene Lopez. Potential customers always referred to Corrugator S.L., headed by Vic-



- 1 The special belt design of the belt with a bronze filament ensures that the electrostatic charge of the belt is safely dissipated and the energy consumption is reduced by 20 percent.
- 2 With the Conducto® 3322, Saica Pack Ovar produces the demanding new product from corrugated board in the required high quality.

of experience – especially with the belt used previously – all hopes were placed in Victor Ortiz to find a suitable solution.

### Test passed with flying colors

He presented the Conducto® 3322 and recommended testing it for a week. If the result didn't meet Saica Pack's expectations, the old belt would be refitted free of charge. "For a corrugated board factory that has been working with one type of belt for years, such a change is no easy decision," explains Ricardo Pereira. As a belt can affect all parameters of the system such as glue, glue application, temperature, etc. and these then need to be completely reset, this involves a risk that should not be underestimated. "For us, the risk was particularly great because our goal was a better quality corrugated board. However, we had to take the risk because of the quality problem with our new product," recalls Pereira. In installing the new belt, Corrugator S.L. quickly proved that it had been the right decision. "The belt allows us to produce this new corrugated board in the required high quality, so we are adapting all parameters for the new belt," was the verdict announced at Saica Pack in Portugal after a short time. Ricardo Pereira is also greatly satisfied in all other respects: "The special belt design with a bronze filament ensures that the electrostatic charge of the belt is safely dissipated. Just by changing the top belt alone, we have reduced our energy consumption by 20 percent." He

expects to be able to double this reduction again by replacing the lower belt with the GKD belt. "We hadn't reckoned with that, it was a very positive bonus," says Ricardo Pereira. Due to the greater permeability of the belt, it was also possible to cut glue consumption in the double gluer by ten percent. "Our quality goal was to maintain the evenness of the corrugated board, because it was good. We also achieved this flatness with the new belt, along with these savings, too." Add to this the significant increase in productivity from the Conducto® 3322, as Ricardo Pereira calculates it: "With the new belt, we were able to increase the operating speed for the new paper from 120 meters/minute to 180 meters/minute, which is an increase of 50 percent!"

### Better plannability through comprehensive service

Yet it is not only the new belt and the results achieved with it that justify the extremely positive conclusion. "I find it important to talk about the service, too," says Ricardo Pereira. In the past, the old belt lost the properties it displayed when it was installed after a time. When questioned, the previous belt supplier always told him that the only way to test the belt's degree of permeability was to pour water onto it and count the seconds until it ran through. Victor Ortiz, on the other hand, measures the permeability of the corrugator belt using a testing device, enabling long-term plannability of belt change and maintenance

costs within the scope of regular inspection visits. "This is very important to us, as in the past, the first indicator we had that the belt needed to be changed soon was the poor quality of the corrugated board," says Ricardo Pereira. "This service from Corrugator S.L. is very, very good for us!" Saica Pack in Ovar produces two million meters of corrugated board per week. "We are still testing and are waiting to see how the belt performs in the next six months," says the Industrial Manager. He is not the only one filled with optimism by the guarantee of 50 million running meters for the GKD belt given by Finsa Filtros. While he is already thinking about replacing the lower belt with a Conducto® 3322, several other factories in the Saica Group have already expressed an interest in this belt. "Without the experience and knowledge of Corrugator S.L. and the customers' trust in this competence, it would not have been possible to launch the new corrugator belt onto the market so quickly," says Irene Lopez from Finsa Filtros. The quality of the corrugated board produced with the Conducto® 3322 and the savings and improvements in productivity that can be made will accelerate further market penetration accordingly. As will the close exchange between customers, Victor Ortiz, Finsa Filtros, and the production and development departments at GKD. The advantages of this are clear for Ricardo Pereira: "The cooperation with Corrugator and the new belt are the best way to serve our customers." |||

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Baumüller

## Modular Engineering for Web Processing Machines

With the Web & Foil software template, Nuremberg-based automation specialist Baumüller is rolling out another template that can be used specifically for web processing machines.

Baumüller's software templates save developers a lot of time: The templates contain a large number of the required functions as well as motion modules and templates for functions such as alarm handling and prepared visualizations. This means that machine programmers no longer have to worry about the basics during development and can instead put the time saved to full use in process programming. With the Web & Foil software template specifically tailored to web processing machines, Baumüller is expanding its machine templates to include another industry solution.

Web processing machines usually have a virtual master axis to which the other drives of the individual process steps are synchronized. The template can be used for machines and systems for paper and foil production, e.g. in foil bag, corrugated board, folded carton and printing machines.

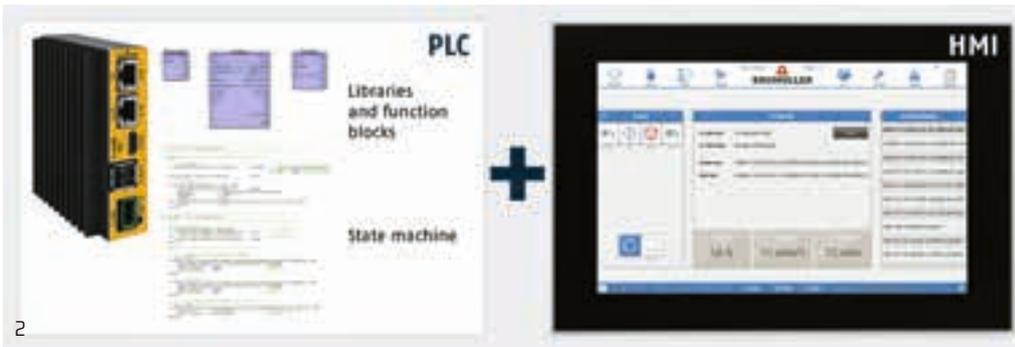
The advantage: Complete template instead of individual libraries

Many automation providers merely deliver the individual libraries for the respective software project. By contrast, the Web & Foil template not only contains the necessary libraries but also includes general templates for implementation of the visualization or fault management. In addition to the basic functions, the Web & Foil software template also includes machine functions.

### Basic functions

The developer does not have to set up the basic functions again from scratch, but instead they are selected and parameterized directly. Routine tasks such as the instancing of motion modules or linking variables with the modules are no longer necessary.

- Virtual master – maser shaft, on which the other drives can synchronize within the machine. The function is mapped via the MC\_MasterEngine function module.
- Cams – specified movement of a slave axis depending on the position of the virtual maser. Not only dynamic, jerky profiles, but also jerk-limited movement profiles can be mapped.
- Recipe management – management of the product-related settings at the machine. With this function the settings can be stored, loaded, edited and exported.



- 1 The template contains the software for the typical process steps of web-guiding machines, e.g. for foil bag machines.
- 2 Example of printing mark control: the template contains motion libraries and templates for the visualization.
- 3 In addition to the basic functions, the template also contains the functions for the individual process steps of a standard machine.



- User level management – Each user can be assigned different rights for operation and access to functions and settings of the machine.
- Monitoring – monitoring of the individual machine modules, for example, monitoring of the status of the inputs/outputs, the fieldbus or specific values on the basis of a graphic evaluation (e.g. servo motor temperature).
- Alarm handling – machine faults are collected and displayed. These can be acknowledged via the visualization after they have been eliminated.
- Manual mode – The individual motors can also be run in manual mode, for example, for material or format change.
- Heating bar – The temperature control for the heating bar is included.
- Cutting – Depending on how the cutting unit is executed mechanically, here it is possible to implement this function using different technologies.
- Feed – Material is conveyed into the machine.
- Stacking– Foil placement can also be implemented via existing cam functions. Positioning via positioning modules would also be possible.

With the Web & Foil software template for web processing machines, developers save a lot of time, especially in the start-up phase of a project, and can therefore better concentrate on the important machine functions. For the machine manufacturer, this means a faster time-to-market and significantly reduced development costs.

## Machine functions

The templates contain frequently used machine functions for paper and foil processing. These only have to be adjusted to the respective application.

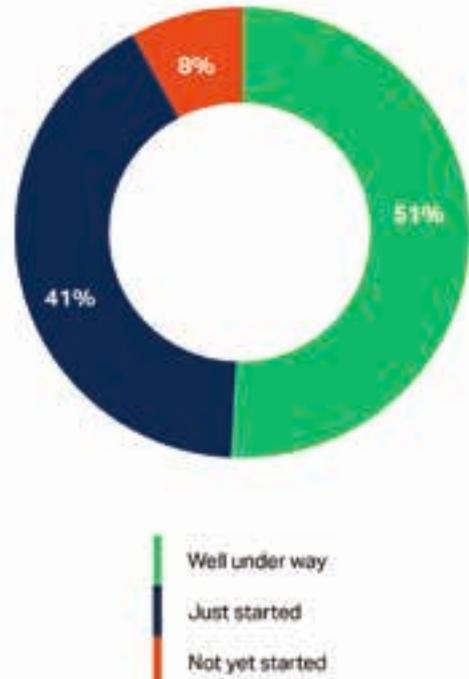
- Impeller – Is the connection between the welding unit and foil placement. Modules for this are provided in the template, which enable operation via cams.
- Register control – The modules for print mark detection are included. Based on this, machine-specific register control can be implemented.
- Cam group – control, for example, of time-controlled or position-controlled cams including dead time compensation.

## About Baumüller

Based in Nuremberg, Baumüller is a manufacturer of electric automation and drive systems. At production sites in Germany, the Czech Republic, Slovenia and China as well as in over 40 branches worldwide, around 2,000 employees develop and produce intelligent system solutions for machine manufacturing and e-mobility.

In addition, the range of services offered by the Baumüller Group includes engineering, assembly and industrial relocation as well as services, thus covering all aspects of life cycle management. |||

How far along is your business with the digital transformation journey?



Loftware

# How Manufacturers are Digitizing Their Labeling Solutions

The modernization of enterprise resource planning is also impacting labeling solutions, and this is where the cloud plays an essential role. It facilitates the integration of various business applications and thus offers companies decisive advantages in the digitization of their labeling processes.

A current study by Loftware of 300 IT managers from manufacturing companies in Germany, France, Great Britain and the USA shows that organizations still face major challenges when it comes to digitization. According to this, over 50 percent of the companies have already modernized their production processes or are at least already well advanced. However, 41 percent are just at the beginning of digitization, while eight percent have not even started.

This sweeping trend in IT modernization is also having an impact on labeling. When large companies update their ERP system, this, among other things, leads to them subsequently modernizing their labeling systems and often migrating to or implementing a new standardized global labeling solution.

The cloud is the other major driver driving the enterprise labeling transition. 18 percent of the survey participants have already moved their entire IT infrastructure to the cloud. And another 37 percent have moved most of their IT infrastructure to the cloud.

However, there are also skeptical voices among the study participants on the subject of the cloud. 27 percent fear a loss of

performance and 26 percent expect problems with the integration with other company systems. Therefore, companies should rely on a trusted labeling solution that has already proven its efficiency in practice and easily supports comprehensive integration with ERP software such as SAP and Oracle as well as manufacturing execution systems (MES) and warehouse management systems (WMS).

## Integration in business solutions is a must

Such an integration option is of central importance, because it allows companies to use existing business processes and important data sources without the users having to be retrained. Such integration also increases the accuracy and consistency of data because it comes from a single trusted source. In this way, companies reduce the risk of labeling errors and avoid the resulting disadvantages such as production stoppages or delays in transport.

Thanks to efficient integration into ERP solutions and other systems, companies can also automate work processes, adapt individual customer or industry requirements and thus increase the efficiency of labeling.

The use of cloud technology helps with this integration. One of the most important catalysts for this is cloud-to-cloud integration: a cloud business system is integrated into another cloud business system. Companies should make sure that the integration of their labeling system is as easy as possible thanks to cloud connector APIs.

## Cloud-based labeling solutions offer clear advantages

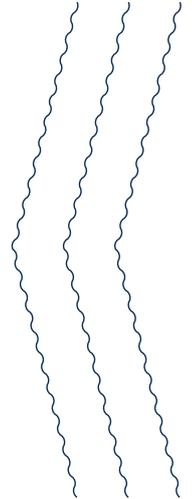
The companies surveyed most frequently switch to the cloud in the following areas: Enterprise Resource Planning (42 percent), Supply Chain Management (40 percent) and Sales & Operations Planning (40 percent).

There is still a long way to go, but the trend towards the cloud in the manufacturing industry cannot be overlooked. And cloud-based labeling is an integral part of this ongoing migration. This enables companies not only to rationalize and globally scale the labeling process, but also to save considerable costs that they would otherwise have to spend on maintaining the expensive IT infrastructure. This is confirmed by the questioned IT managers from the manufacturing industry: 31 percent see sa-



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- 1 Over 50 percent of the companies have already modernized their production processes or are at least already well advanced. However, 41 percent are just at the beginning of digitization, while eight percent have not yet started.
- 2 Author Josh Roffmann, Vice President, Loftware, is responsible for product management.



vings potential in the use of the cloud for hardware and 29 percent for IT services.

One of the major advantages of cloud-based labeling solutions is their greater flexibility. Regardless of whether the labels are needed in the warehouse, in the factory or in another facility, those responsible with the appropriate authorizations can create or update them from any location via a browser. This greater flexibility also paid off during the pandemic, for example, when home office was compulsory in many regions. In this way, a cloud-based labeling solution ensures that business operations can be maintained even in difficult times.

In addition, this approach offers better collaboration: By extending labeling to partners and suppliers, they have access to correct label data, so that costly and time-consuming re-labeling due to faulty labels is reduced throughout the supply chain. Promoting consistency in the supply chain also helps prevent product counterfeiting and diversions. With a cloud-based labeling solution, companies can also improve relationships with partners in the supply chain. After all, around 30 percent of the companies surveyed expect this from a modernization of their labeling system.

## Comply with international safety standards

The advantages of a modern labeling system are also evident in relation to compliance with global safety standards. With a range of input parameters, users can create product labels that correspond to several international legal systems and contain relevant information for safe and smooth transport.

Such a solution offers the possibility, for example, of creating warning notices in several languages depending on the country of origin and destination, or barcodes that companies can use to track their products. In addition, users can dynamically place images and pictograms on the labels and, if necessary, even include additives and safety instructions.

## Into the future with a cloud-first strategy

The time has come for a more centralized approach to labeling. Companies need uniform management of administration and label templates across the entire supply chain. They need to be able to grow and scale easily. Centralized, cloud-based technology reduces the complexity and

problems associated with installing and maintaining labeling systems. This gives companies immediate access to the functions they need, optimized administration and more security in terms of access and transparency.

As there are many labeling operations across the supply chain and the integration of this labeling is of great value, it is becoming increasingly important to involve other partners as well. A cloud-based labeling solution is best suited for this.

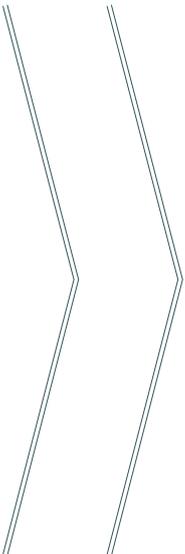
In order to be competitive in an increasingly networked world where high quality products have to be delivered faster and to more markets, traditional labeling methods with manual processes and different printing solutions are unsuitable. Companies should completely digitize and standardize the process of product labeling and integrate it into manufacturing and logistics systems using a cloud-first approach. This not only improves quality and responsiveness, but also lowers costs and shortens the time to introduce new products. ||| **Josh Roffmann, Vice President, Loftware**



Koenig & Bauer

## New Generation of Large-Format Sheetfed Offset Presses

What was originally planned as an international event can only be presented to smaller groups of interested users for the time being – when carrying out print tests or live video demonstrations: Koenig & Bauer is proud to announce the market launch of a brand new generation of its Rapida 145 and Rapida 164 large-format sheetfed offset presses. The new press generation is available with immediate effect.

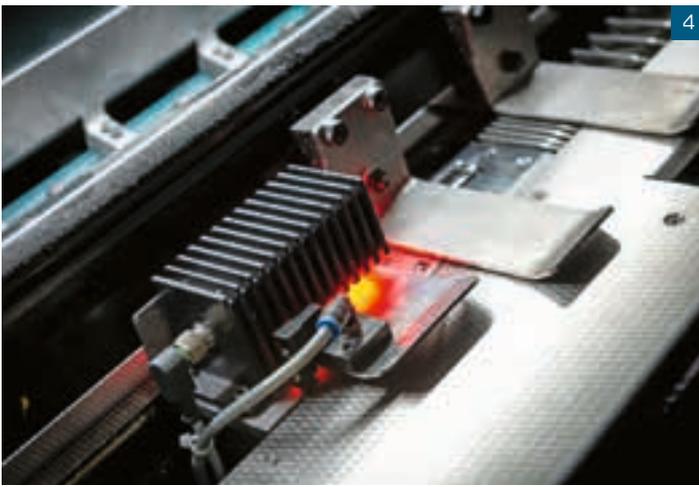


The fact that both large-format series now boast the same new innovative design as all the latest Koenig & Bauer presses immediately catches the eye. Along with this, there are also many other new features that will enable the large-format Rapidas to consolidate their position in this format class. They handle sheet formats up to 1,060 x 1,450 mm (Rapida 145) and 1,205 x 1,640 mm (Rapida 164) at a standard maximum production speed of 16,000 sheets/hr in board production. Incorporation of a high-speed package raises the top speeds another notch, allowing them to handle 18,000 sheets/hr (Rapida 145) and 17,000 sheets/hr (Rapida 164). Alongside new upgrades to the automation features, they offer the performance parameters of the latest medium-format presses – for twice the print format or even more.

The operating concept has also been given a makeover. Large touch panels on the feeder, on the first printing unit and at the delivery render many buttons and other operating elements superfluous. All routine processes that are normally activated decentrally from the console can therefore be controlled just as conveniently on the press itself. A prominent status indicator at the delivery provides instant updates on the current press status. Different colours are used to signal whether the press is in production, standby or maintenance mode.

### Digital control and monitoring

The ErgoTronic console features a touchscreen monitor and a large wallscreen. All relevant information is presented in a clearly structured



fashion on both displays. A host of additional functions allow production to be monitored in real time. Production data and other information, such as CO2 emissions, are available at a glance. Autonomous printing of a job list, app-based control of many press functions, access to the CustomerCommunity as a central point of contact between users and the manufacturer, and, of course, a function to start individual press programs using presets based on the data supplied or previously saved – the console is the digital hub for all production processes in the printshop.

This applies to quality assurance in equal measure. Three different systems combine inline colour control (with the option of grey balance control) with functions for production monitoring (QualiTronic PrintCheck), comparison with the pre-press PDF (QualiTronic PDFCheck) and content inspection (QualiTronic PDF HighRes).

### Additional benefits for packaging specialists

The new Rapida large format generation brings significant improvements for the core application area of packaging printing in particular. Substrate versatility was already very broad in the past,

allowing board thicknesses of up to 1.2 or 1.6 mm. Universal gripper systems make this possible. On the new presses, the range of substrates handled can be increased further still – even beyond the 2 mm mark – by simply converting the printing units. For companies that work with heavy board grades or offer post-printing on corrugated board involving printing and finishing a full spectrum in an inline process, the new capabilities represent a quantum leap forward.

Other important changes concern the options to allow increased pile heights. Five variants are available, covering the range from 185 to – as a new option – 925 mm. Raising piles by 185, 370 or 555 mm can also be achieved by placing the press on cast blocks. The additional outlay for special press foundations can then be saved.

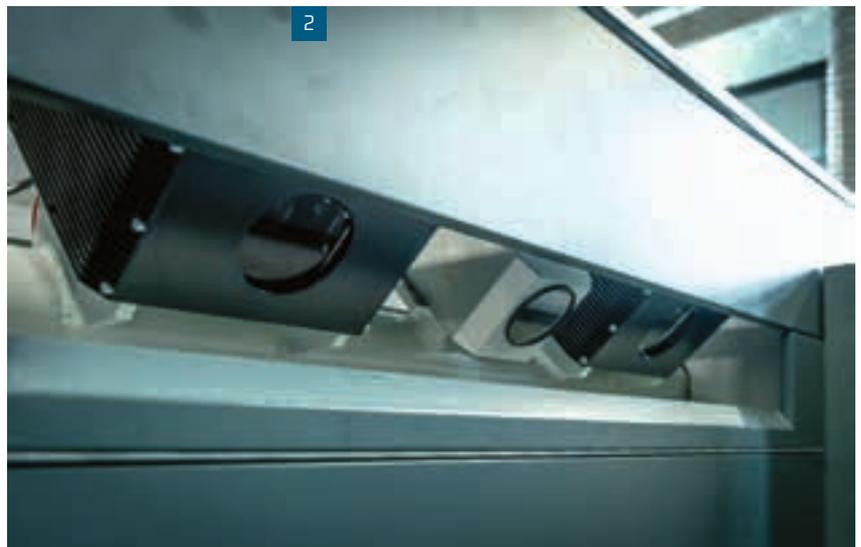
### Significant improvements in many details

Many less visible but nonetheless important details have also been overhauled. These include the sheet guiding elements in the delivery and delivery extension (dryer section). Modifications like this have been paramount in realising top production speeds of up to 18,000 sheets/

- 1 The new Rapida 145 now boasts the same new design as all the latest presses from Koenig & Bauer.
- 2 Endless configuration options: this Rapida 145 in the CEC at Koenig & Bauer Sheetfed stands on 555 mm cast blocks and features seven printing units, two coaters, intermediate drying units, a three-section extended delivery with twin-pile capabilities, and fully automatic pile logistics.
- 3 As is immediately evident here on the feeder head, there are now only very few manual operating elements anywhere on the press. Practically all processes can be controlled by means of touch panels or the main console.
- 4 Most Rapida presses for large-format sheetfed offset are equipped with the sidelay-free infeed system DriveTronic SIS.
- 5 DriveTronic SPC: fully automatic plate changing with unbent printing plates.



- 1 Anilox roller changes can be realised quickly by a single person without the need for tools – thanks to the AniSleeve technology.
- 2 Cameras for inline colour control (centre) and sheet inspection at resolutions of up to 260 dpi check every single sheet during production. Errors and defects are visualised on the wallscreen, and reports are produced to verify the quality.



hr with an even broader range of substrates and finishing applications. Thanks to a dynamic sheet brake, visibility and accessibility at the delivery remain unhindered. There is no need for complicated sheet braking systems or delivery grippers.

Long-life gripper shafts with automatic lubrication and a reduced number of manual lubrication points help simplify maintenance. The same applies to the new AC drive motor of the large-format Rapidas. It is not only practically maintenance-free, but also reduces energy consumption.

### High production capacity and flexibility

All the existing automation and high performance features of the previous models are, of course, still available for the new Rapida generation. This begins with the sheer endless choice of press configurations, with up to 16 printing and finishing units, together with options such as a reel-to-sheet feeder, automatically convertible perfecting, coating and drying units, a double-pile delivery, and extends to a range of non-stop pile changing and logistics components. This means that individual press configurations can be tailored specifically to the very specific requirements of packaging and commercial printers.

When it comes to automation, the new Rapida generation sets a new benchmark in large-format printing. The sidelay-free infeed DriveT-

ronic SIS, simultaneous plate changing with DriveTronic SPC, the disengaging of unused inking units as a standard feature, CleanTronic cloth-based washing systems for parallel washing processes, fast coating forme changes with DriveTronic SFC and anilox roller changing with AniSleeve are just a few of the automation components that enable many processes to run concurrently at job changeover and thereby contribute to the shortest ever makeready times. The dryer modules, too, are manufactured by Koenig & Bauer. After all, dryer systems are one of the company's core competencies.

All system components and automation functions serve one goal, namely to provide users with the best possible support, and to enable them to produce efficiently and successfully, whether in packaging or the commercial segment. The large-format Rapidas are therefore the ideal means of production, and ensure print companies are equipped for all current and future challenges. |||

[www.koenig-bauer.com/de/newdimension/](http://www.koenig-bauer.com/de/newdimension/)

# PTS Conference Paper & Board for Food Contact



**Venue:**  
Online  
Conference



**Date:**  
02. & 03.  
March 2022



**Information:**  
[www.ptspaper.com/events](http://www.ptspaper.com/events)

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Delegates will learn about new developments concerning legal, product and analytical requirements regarding paper, board, cardboard and tissue for food contact.

## Conference Hosts:

**Dr. Antja Harling**  
Division Manager  
Material Testing &  
Analysis



[antje.harling@ptspaper.de](mailto:antje.harling@ptspaper.de)

**Dr. Markus Kleebauer**  
Project Manager  
Functional Surfaces



[markus.kleebauer@ptspaper.de](mailto:markus.kleebauer@ptspaper.de)

## Day 1:

### Keynote

#### “Trends in Fibre based packaging”

Peter Désilets, Volker Muche –  
pacocon Sustainability Concepts GmbH

### Regulatory Trends

#### “Current developments in FCM law in EU and Germany”

Katharina Adler –  
Federal Ministry of Food and Agriculture

#### “Council of Europe Resolution of Paper & Board (Version 2021)”

Dr. Christa Hametner –  
Austrian Agency for Health and Food Safety

#### “EU Single Use Plastics Directive, National Regulations and the impact on Paper and Board FCM”

Nina Tavakkoli – Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

#### “Food contact material regulation for paper and board in France: Fiche MCDA N°4.”

Matthieu Schelcher –  
Centre Technique du Papier

### Microbiology Topics

#### “Antimicrobial and Antiviral surfaces and relevance for FCM”

Dr. Justus Hermannsdörfer –  
Nanoinitiative Bayern GmbH

#### “An update on in-vitro bioassay-based risk assessment of paper food contact materials”

Elisa Mayrhofer –  
OFI Technologie & Innovation GmbH

## Day 2:

### Converting

#### “Printing inks for food contact materials – modern industry concepts and new regulatory developments”

Dr. Matthias Henker –  
European Printing Ink Association

#### “Measuring MOH migration from adhesives into food”

Dr. Martin Lommatzsch –  
Laboratory Lommatzsch & Säger GmbH

#### “Ensuring the safety of adhesives for food packaging”

Monika Toenissen – FEICA - Association of the European Adhesive & Sealant Industry

#### “(Biobased) Barriers for Food Packaging Applications”

Dr. Martina Lindner & Dr. Frank Welle –  
Fraunhofer Institute for Process Engineering and Packaging IVV

### Substances and Analytics

#### “Analysis of Microplastics in water and packaging materials”

Dr. Dieter Fischer –  
Leibniz Institute of Polymer Research

#### “Sustainable Chemical Additives”

Dr. Dominik Stumm – Wöllner GmbH

#### “Chloropropanols (3-MCPD, 1,3-DCP) and their Migration from Paper & Board FCM”

Dr. Robin Korte & Fabrian Brenz –  
Chemisches und Veterinäruntersuchungsamt Münsterland-Emscher-Lippe

#### “Moulded Fibres FCM – an ecological alternative for food contact”

Jeff Buczynski – Huhtamaki Product Steward,  
Huhtamaki North America

» Expert Talks

» Question & Answer Sessions



Organization, Contact & Information:  
[ptsacademy@ptspaper.de](mailto:ptsacademy@ptspaper.de)



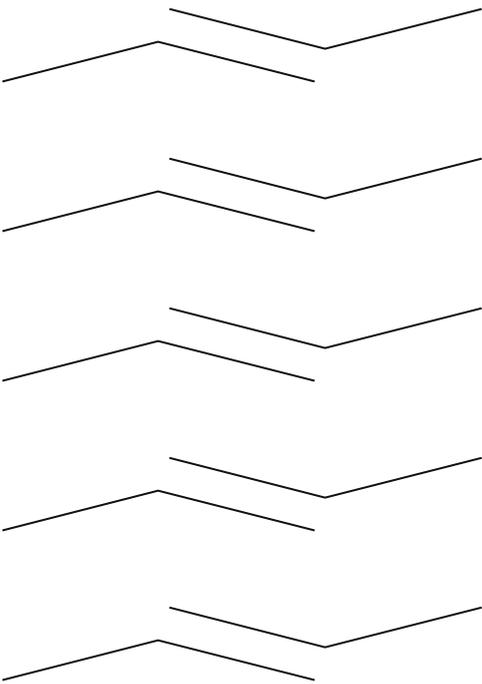
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Goldschmidt print shop

**“Honesty With Customers is Extremely Important”**



How they could dare to invest a lot of money in a new building and a machine conversion under such unforeseeable circumstances was a question that the employees of the Goldschmidt print shop in Werlte in Emsland often heard in the first year of the pandemic. But these steps had been planned well in advance – and pursued goals that were perfectly in line with the changed situation. In an interview, Vera Goldschmidt, third-generation managing director of the company, talks about the background, reservations, as well as orientation and restructuring in an increasingly challenging economic environment.

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Vera Goldschmidt:  
“We have to accept that the market is changing.”

**M**s. Goldschmidt, let's start at the beginning: Please tell us something about the history of the print shop.

"Ruckzuck – Goldschmidt Druck" was the catchy advertising slogan that my grandfather Emil Goldschmidt came up with. He founded the company in Werlte in 1950. He was a master printer and typesetter and started out with a small machine in the backyard that included a book and stationery store. The business grew slowly, and when my father Wilhelm Goldschmidt joined the company in the 1970s, they moved into a new building in the industrial area. Under his management, the print shop developed into an up-and-coming, medium-sized company. In the 1990s he set up another location in Schwerin, which we still operate there today. In 2003, a location in Emsland was added through the takeover of "Van Acken Druck GmbH" in Lingen.

My career in our family business began in 2013. I have been managing director since January 2016, together with my father. So I now represent the 3rd generation. In April 2021 we moved into a modern new building in Werlte, which combines the two Emsland locations. We are a fully integrated printing company with a media department, offset and digital printing and an advertising technology department. We mainly

supply customers in the B2B sector, but we also have a branch for private customers.

**What does the print shop's portfolio currently look like and where do you see particular strengths compared to the competition?**

We are extremely broadly based, basically we supply our customers with just about everything that can be printed or printed to. According to the motto "Nothing is impossible", we supply the customer holistically, whether it is printed matter, advertising material or advertising technology products. Customers receive good and honest advice from us and find in us a contact person from whom they can obtain almost everything in the print sector. We are very flexible towards the customer, so that we can react quickly and reliably.

The pandemic has turned a lot of what previously seemed obvious upside down, hitting the printing industry particularly hard. What experiences have you been able to gather in the last two years and how have you dealt with them?

We also had to struggle with a drop in sales, in particular advertising measures and program booklets for events, printed matter for trade fairs or invitations from private customers have almost completely disappeared. I am therefore



The new building in Werlte combines the production of the Werlte and Lingen sites.





The employees were also involved in the decision to purchase a Jet Press 750S.

digital system in B2 format to better adapt to our customers' needs.

Of course there were dissenting votes or at least reservations. At first my father found it difficult to part with the existing machine, which I can understand. He had invested a lot of money and was proud of the machine, with the format of which we were the only printer in our region. However, he was always very open to new technologies and quickly recognized the advantages of a new digital printing system. We made the decision together and also involved other employees. Now we are all fully behind the new machine.

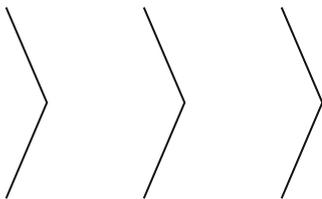
**Have competing products been considered? What ultimately made the difference?**

Of course, we took a close look at all comparable digital printing machines in B2 format on the market. The offer is rather manageable. The decisive factor in our decision to go with the Jetpress was the combination of quality, price and sustainability reasons. This refers to the water-based inks, which are proven to be better deinkable than the competitor's products. We also liked the good cooperation with Fujifilm. We were closely accompanied and a fair partnership was formed.

**Was there at any time the fear that the shot could backfire?**

In the run-up, you certainly think a lot about whether the decisions you are making are right or what problems could arise. It was crucial to involve the employees involved, to listen to their opinions and not just toss a machine in their face. We talked to colleagues well in advance whether they could even imagine working on such a digital printing system. In principle, digital printing is nothing new for us, we have been working with it for over 20 years. However, the inkjet technology and the make are certainly something new for us, and the employees first had to be trained.

After several discussions and inspections of the machine in another print shop, it quickly became clear that one of our experienced offset printers, who had previously worked on the large machine, was very open to the new technology. Another very young colleague from the media department was also enthusiastic about it. Now two colleagues with very different backgrounds and from two completely different generations operate the machine with a lot of commitment and complement each other perfectly.



very happy that we have restructured our company significantly during this time. This step had been planned since 2017 and was implemented from the beginning of 2020. The core of these measures was our new building in Werlte, which was to combine production from both houses (Werlte and Lingen). Construction began in April 2020, exactly during the first lockdown. We were often asked how we could dare to invest a lot of money in a new building in such times, since the general situation is so unmanageable and unpredictable. In hindsight, going through with the project was the right thing to do. If we were to start construction now, we would have to reckon with significantly higher costs and longer construction times. In addition, we had aimed for the construction for good reasons: Saving costs by merging two production sites (leases, energy costs), which also results in a better workflow and a clearer overview. After exactly one year of construction, we were able to move. I'm 100% sure it was the right decision and the perfect timing.

**With the correspondingly clouded economic outlook in mind, the print shop has invested in a Jet Press 750S from Fujifilm (see <http://www.p3-news.com/De/News/20850>). That sounds like an unusual, if not brave, decision. What were the reasons for the investment and were there any dissenting voices?**

In addition to the new building, our restructuring measure also included a machine conversion. At the Lingen location, we operated an offset machine in B1 format, among other things. However, we have not been able to fully utilize it for a long time, since the trend towards smaller runs, but more variable and varied printed matter, has been on the rise for several years. We decided to sell the large offset press and invest in a new

*“It was crucial to involve the employees involved, to listen to their opinions and not just toss a machine in their face.”*

**In the meantime, there are new challenges to be overcome: paper shortages, especially in the graphic paper sector, rising energy and freight costs, problems with the reliability of supply chains ... What do you think is the best way to deal with such a situation? And: How much honesty can customers tolerate?**

We have no choice but to make the best of the situation. We have to accept that the market is changing, adapt to it and sensitize our customers so that they follow the path.

Especially in such a difficult situation, honesty towards the customer is extremely important. Because the increasing paper prices and delivery delays are known to many through the press, or because there are similar problems in many industries, most customers understand the higher costs. When submitting an offer or when placing an order, we immediately point out to our customers that they have to reckon with higher prices and longer delivery times, as acceptance is then significantly higher. I'm sometimes amazed at how little resistance there is in general, probably because many things are becoming more expensive at the moment.

**"Print is becoming more expensive" - that was one of the core statements of the year-end meeting of the Board of Directors of the Bava-**

**rian Printing and Media Association (VDMB). Do you think this is a problematic but understandable conclusion?**

Yes, unfortunately that is the logical consequence of these factors. There is a great danger that customers will think twice about whether they should still have their printed matter produced at all, or whether they would rather go digital. As a result, our industry continues to lose volume. This was exacerbated even further by the pandemic.

But I also believe that you can see opportunities in such a crisis. Perhaps less will be printed, but more consciously. I am counting on customers placing more value on individuality, quality and special features in the future, choosing more special paper and wanting smaller runs. The aspect of sustainable printing is also playing an increasingly important role. We are FSC-certified, print climate-neutrally, generate electricity from our own photovoltaic system, use the waste heat from the machines and have greatly reduced our waste by switching to digital printing.

This is exactly what we have prepared for, so I see ourselves well prepared for the future.

**Ms. Goldschmidt, thank you very much for the interview! |||**

The Goldschmidt print shop is FSC-certified, prints climate-neutrally and draws its electricity from its own photovoltaic system.





Comprehensive know-how in the manufacturing of inorganic pigments.

Lanxess

## Inorganic Pigments for Coloring Specialty Papers

The use of pigments in the paper industry generally refers to the use of extenders such as chalk or kaolin. Practically insoluble inorganic colorants according to DIN 55943 are used only in specialty papers where, for example, very good drying and wet opacity are required.



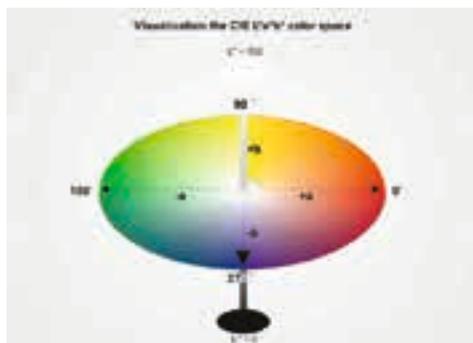
**A**long with further raw materials and additives, depending on the finished type of paper, the inorganic pigments are used directly in stock preparation (mass coloration) and are reprocessed into decorative papers on special paper machines. These papers ultimately become either pressing materials for decorative lami-

nates or decorative films that are subsequently pressed onto particle board and used primarily in the furniture industry.

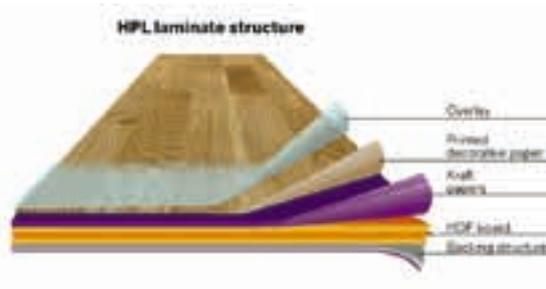
### Pigments – The difference lies in the optical properties

Understandably, the optical properties – color, tinting strength and hiding power –

are of particular importance for colorants such as inorganic pigments. To begin with, color is the main focus of attention, as it determines a pigment's ability to bring a color concept or sample to fruition. It results from the contrast between light absorption (K) and light scattering ability (S). The ratio of the two variables determines visible reflection.



The CIELAB color space.



Typical structure of a decorative HPL pressed material.

Colorimetry can be used to determine the color of a pigment, which is either characterized as numeric color values or represented within a color system. The CIELAB color space is described by  $L^*$ ,  $a^*$  and  $b^*$ , where:

- $L^*$  = the light-dark axis
- $a^*$  = the red-green axis
- $b^*$  = the yellow-blue axis

The farther the color location is from the colorless point – i.e. from the perception of “no color” such as white, gray, or black – the more brilliant or saturated the color of a pigment is.  $L^*$  is the lightness axis, on which all neutral gray tones from white to black lie. An ideal black has the lightness value  $L^* = 0$ ; an ideal white the value  $L^* = 100$ .

The  $a^*$  and  $b^*$  axes are overlaid at right angles to the lightness axis and each other. Reference is therefore made to the  $a^*$ - $b^*$  plane, which is at a right angle to the lightness axis. This results in a three-dimensional representation of all visible colors.

### Color on other materials: The tinting strength

Tinting strength is an indication of the effect a pigment has on another material such as paper due to its absorption capacity. The relative tinting strength of a color pigment in white reductions is determined by comparison to a similar pigment. The relative tinting strength is a replacement ratio and therefore provides information on the cost-efficiency of a color pigment with consideration of the price.

### Contrast over a black-and-white substrate: The hiding power

Another important characteristic value of a pigment besides the tinting strength of a color pigment is the hiding power, also referred to as opacity. The hiding power

and the wet opacity of the papers are significantly enhanced by the high absorption resulting from the use of Bayferrox® pigments. In the paper industry, opacity is determined as the contrast ratio over a black-and-white substrate.

### Dispersibility

To ensure that the optical properties of an inorganic pigment that are determined in production by particle size also come into play when coloring paper, the pigment must be broken down into primary particles to the greatest possible extent, and these particles must be evenly distributed in the pulp. This also significantly increases opacity. The use of waterborne pigment suspensions (slurries) enables good results and highly efficient metering.

### Migration resistance

Inorganic pigments are insoluble in water and therefore resistant to migration. Coloration with inorganic pigments eliminates problems associated with organic pigments, such as leaching, blooming, and inadequate solvent resistance. Inorganic pigments are also not subject to color changes due to the dissolution of the pigments at higher processing temperatures.

Because they are practically insoluble in water, they can be separated using any effective filtration or sedimentation process. The pigments are therefore assigned to the water hazard class “non-hazardous to water.”

### Bayferrox® – For outstanding lightfastness in decorative paper

The biggest proportion of inorganic pigments for the paper industry is used for the coloration of decorative papers. The pigments are used directly for mass coloration. Decorative papers are further pro-

cessed into pressing materials for decorative coatings or into decorative films and then pressed onto particle board. They are used primarily in the furniture industry and in flooring.

Calculated on the basis of dried paper, colored papers pigmented with Bayferrox®, for example, have pigment concentrations between 10 and 20 percent.

There is great demand for colored pressed materials – in particular for imitation woods. With these, a wood grain print is applied to a decorative paper having a yellowish or reddish brown base tone. Bayferrox® pigments are primarily used here. Compared to organic pigments, inorganic pigments provide outstanding lightfastness in decorative papers – an area in which they are superior to organic pigments. The same applies to opacity.

Iron oxide pigments are the leading inorganic color pigments in terms of quantity. They comprise the shades yellow, red, brown, and black. Iron oxide yellow pigments are iron (III) oxide-hydroxides and have a needle-like particle shape. Iron oxide red pigments are iron (III) oxides, and the iron oxide black pigments are iron (II,III) oxides, both with a spherical form.

The iron oxide brown grades are pigment blends of iron oxide red, black and yellow. A wide range of Bayferrox® pigments are used in paper – especially in decorative paper.

### Production of iron oxide pigments

Three processes are mainly used to produce iron oxide pigments:

#### Laux process

Nitrobenzene + iron → aniline + iron oxide black ( $\text{Fe}_3\text{O}_4$ ) or iron oxide yellow ( $\alpha\text{-FeOOH}$ )

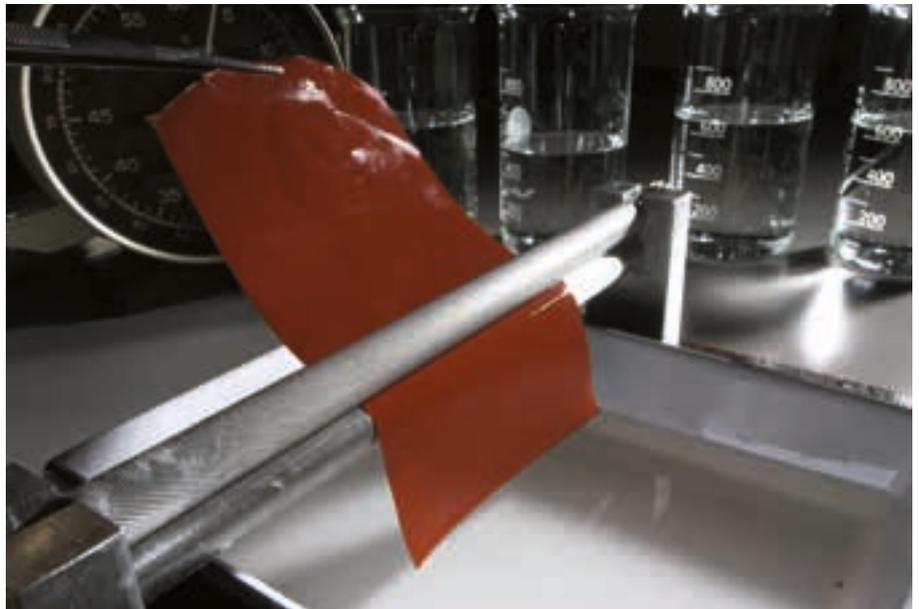
In this process, nitrobenzene is reduced with metallic iron to form aniline. The



Cut paper.



Soak paper.



reaction is controlled in such a way that a high tinting-strength iron oxide black (magnetite) is formed. This can be used directly or annealed via calcination to produce high tinting strength  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> red pigments.

The addition of aluminum chloride to the reaction mixture yields  $\alpha$ -FeOOH yellow pigments.

#### Precipitation process

Iron sulfate + caustic soda + air → iron oxide yellow ( $\alpha$ -FeOOH) or iron oxide black (Fe<sub>3</sub>O<sub>4</sub>)

With the suitable selection of the reaction conditions, yellow, black, and red pigments can be obtained from iron(II) salt solutions via an air oxidation process. The production of  $\alpha$ -FeOOH yellow pigments is the most significant. The first reaction step is the production of the  $\alpha$ -FeOOH seeds, which are the determining factor for the pigment properties. These are very fine particles. To obtain pigments with matching properties, the seed must be grown to the crystal size and shape corresponding to the desired shade in a second reaction step.

#### Penniman process

In this process, iron is oxidized in a medium containing sulfuric acid under the influence of atmospheric oxygen to form yellow iron oxide (Bayferrox® yellow 920). Iron sulfate is used as a catalyst here. In order to obtain high-quality yellow pigments, the presence of yellow seed is additionally required.

Iron + sulfuric acid + water → iron sulfate + air → iron oxide yellow ( $\alpha$ -FeOOH)

#### Proven pigments for the paper industry

Red grades: The 100-series Bayferrox® red pigments ( $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>) are produced using the Laux process with subsequent annealing. They are characterized by very high pressing temperature stability.

The blue undertone of the red shades increases with particle size. The red Bayferrox® grades exhibit a negative zeta potential across all process pH values during the process production of paper, ensuring stable coloration.

Yellow grades: Bayferrox® 420 is also produced using the Laux process. It has a higher pressing temperature stability (up to 20 degrees Celsius) than conventional yellow pigments that are produced using the Penniman or precipitation processes. Nearly all yellow products are iron oxide-hydroxide in the  $\alpha$ -FeOOH phase.

One exception with high color strength and brilliance is Bayferrox® 943. It is a  $\alpha$ -FeOOH, which differs physically from the other 900-series grades. It can be used to match the color of high-grade woods such as palisander and mahogany. Brown



Dry paper.

grades are blends of red, yellow and black to allow coloration with the specified quality.

Depending on the press temperature and residence time, the more-brilliant 900 grades may undergo a slight color change in the presence of reducing substances (melamine formaldehyde resins), but this can be reversible. For this reason, preliminary testing under practical conditions is essential.

One specialty product is Colortherm® Yellow 5, an iron oxide yellow pigment with improved pressing temperature stability and lightfastness. An inorganic aftertreatment gives it its high heat stability. The product is one of a range of high-performance special pigments, is easy to break down and distribute, and reaches its final tinting strength quickly. It does not show

migration, and also brings high light fastness and weather resistance. The product is part of the range of Colortherm® pigments, which were developed specifically for applications with demanding requirements.

Black grades: Bayferrox® 306 is an established black with a blue undertone; the grades Bayferrox® 318 M and Bayferrox® 318 MB have a greater tinting strength. Bayferrox® 360 is an innovative product with a blue undertone. Its high tinting strength makes it suitable for deep colors and nuances for all applications.

#### Application example: Laminate

Laminate offers numerous advantages: It is easy to clean, very robust, and ideal for allergy sufferers. Laminate floors are also

resistant to staining and largely resistant to chemicals and cigarette embers. Decor panels or laminate are available in numerous colors and designs, from plain and natural wood or stone finishes to futuristic metallic looks. They consist of cellulose fiber webs (paper) impregnated with thermosetting resins. The covering layer is impregnated with melamine resin and bears decorative colors or printed designs. Inorganic pigments from the specialty chemicals company Lanxess that ensure opaque, color-stable, and lightfast coloration of the paper are also available.

The most common type is DPL (direct pressed laminate) flooring. It has the following structure:

- Overlay – a resistant specialty coating and a robust, easy-to-care-for surface
- Decorative paper – visual design
- HDF or MDF wood core substrate – the heart of the laminate flooring
- Backing layer – a moisture-resistant backing for shape stabilization.

These four components are pressed directly onto the substrate under heat and pressure and are forwarded for profiling following a cool-down phase.

In HPL (high-pressure laminate), in contrast with DPL, several layers of paper are compacted with the substrate and the backing under pressure and heat.

The structure of HPL laminate flooring is as follows:

- Overlay
- Decorative paper
- Multiple kraft sheets
- HDF or MDF substrate
- Backing

These components are pressed on in two work steps under pressure and heat. In the first work step, the protective overlay, the decorative paper, and the kraft sheets are pressed under extremely high pressure to form a single layer. In the second step, the HPL layer is bonded to the HDF or MDF fiberboard. A The backing laminate is produced in the same way. The backing



Cut and fix paper.



comprising a high-quality top laminate is pressed onto the reverse of the element and improves distortion resistance.

The figure shows the typical structure of a decorative HPL pressed material.

### Spot-on color – even with decorative paper

The color location of a pigment is determined by  $L^*$ ,  $a^*$ , and  $b^*$ . However, it is not always possible to hit the exact color location during pigment production. More or less noticeable color differences due to a deviation from the color location therefore cannot be completely eliminated.

This color difference is characterized by  $\Delta L^*$ ,  $\Delta a^*$ , and  $\Delta b^*$ . Perceptibility of the deviation differs in various media, meaning that a greater deviation from the standard color location can be tolerated in some applications. This is not the case with decorative paper: Color deviations are much more pronounced in decorative paper. For

this reason, the decorative paper industry demands that the pigments meet much tighter color specifications.

Bayferrox® pigments for the paper industry therefore bear a quality marking. The colors in laminate are specified within very tight limits. This high quality is certified by the manufacturer's certificate of analysis (CoA).

Delivery in recyclable paper sacks eliminates the dusty opening of the sacks.

For the special requirements of the foodstuffs industry, grades with the special Z specification (e.g. Bayferrox® 920 Z) are available, guaranteeing a particular freedom from heavy metals. These are used for cigarette tipping papers, for instance.

### About Lanxess

Lanxess is a worldwide operating manufacturer of inorganic pigments. The Inorganic Pigments business unit provides:

- comprehensive papermaking expertise
- technical competence in laminate testing
- decades of experience with inorganic pigments
- assistance with lightfastness testing
- determination of pressing temperature stabilities
- assistance with the development of color formulations
- experience with metering and bulk handling technology, slurries
- specifications with certificate of analysis
- product release by quality control laboratory
- archiving of laboratory data
- order management in SAP
- certification to DIN EN ISO 9001, 14001 (DQS) ||| **Christoph Schmidt, Head of Market & Customer Communications, LANXESS Deutschland GmbH, Business Unit Inorganic Pigments**



Prinz von Hessen

## Stylish Wine Packaging From Metsä Board

The new packaging for the Rheingau Prinz von Hessen wines is both gift and transport packaging.

Together with the Prinz von Hessen winery, Metsä Board has developed new packaging that is both gift and transport packaging.

In its Excellence Center, the Finnish carton-board manufacturer has been accelerating material and packaging innovations since 2020 and creating a cooperation platform for customers and technology partners around the world. The current packaging for the Rheingau winery was also designed there, with which two bottles of wine and a pack of crackers were to be sent.

The Metsä Board design team developed a solution that protects the glass bottles and sensitive crackers while also being visually appealing. A cardboard insert separates the two bottles from each other and stabilizes them individually so that they are secured during transport. In addition, the team used a holder that can be positioned in front of the slim necks of the wine bottles, thus protecting the crackers. The design team manufactured all components from the

lightweight and stable virgin fibre board quality MetsäBoard Natural WKL Bright and did that completely without adhesives. The result is a unique, gleaming white box, the structure of which is based on closure flaps and which can be folded flat for recycling.

The team also deliberately avoided using varnishes and prints. Instead, they let the pure white and laminated surface of the cardboard quality come to the fore and refined it with a sophisticated hot foil stamping with micro-embossed details in the form of a vine leaf. "We wanted to create a particularly luxurious appearance," explains Marko Leiviskä, Graphic Packaging Designer at Metsä Board. "Corrugated cardboard packaging often looks functional, although the material can be used to implement many sophisticated ideas very well." |||

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Syntegon & EIT-Food

## Paper-Based Food Packaging

As part of an EIT-funded project, Syntegon has developed paper-based trays and cups for sensitive foods. Together with partners from industry and research, such as the Fraunhofer Institute for Process Engineering and Packaging in Dresden, the Colruyt Group, the Strauss Group and the University of Reading, Syntegon is implementing the EIT project "PACK4SENSE" (Paper packaging for SENSitive foods) to develop a sustainable packaging concept. EIT Food is supported by the European Institute for Innovation and Technology (EIT), an institution of the European Union.

The aim of the project is to pack even sensitive products with high barrier requirements in more sustainable materials. Syntegon uses a special paper for this which, thanks to its long cellulose fibers, is particularly elastic and tear-resistant. Sealed bowls and cups with a depth of up to 30 millimeters can be produced in this way.

An easily recyclable barrier layer made up of 95 percent mono-materials also ensures optimum product protection. So that the recyclability can be fully exploited, the paper as well as the barrier layer and the cover film can easily be separated from one another.

This advantage in terms of sustainability also harbors challenges for packaging manufacturers: Consumers should be able to separate all components to separate waste, but paper and film must not come apart unintentionally. In order to prevent this, the TPU paper forming, filling and sealing machine from Syntegon forms the paper and the barrier layer in a joint process by deep drawing and pressing. "The paper-based trays of the PACK4SENSE project are a further development of our previous paper packaging solutions," explains Matthias Klauser, project manager and sustainability expert at Syntegon.



The new paper-based trays make it possible to pack even sensitive products with high barrier requirements in more sustainable materials.

### TPU brings paper and barrier layer together

The TPU was awarded the German Packaging Prize in 2020. For the PACK4SENSE trays and cups, the paper runs straight from the roll into the feeder - the barrier layer required for sealing is applied and joined with the paper without any further conversion step. Alternatively, manufacturers can use a converter to connect paper and the protective layer of mono material without heating. A forming station then presses the materials into shape before the trays are filled and sealed. In addition to a particularly elastic paper that can withstand the formation of wrinkles during the molding process without damage, the main thing is to maintain the separability of the materials: a specially adapted geometry of the molding tools reduces the tension on the materials during the manufacturing process.

Syntegon is continuously working on the further development of paper form technology. EIT Food makes it possible to work closely with important partners and to test products together with consumers and food manufacturers. In this way, prototypes and solutions are developed that meet the product requirements and improve the sustainability of the packaging step by step. |||

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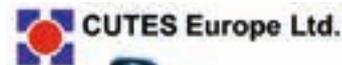
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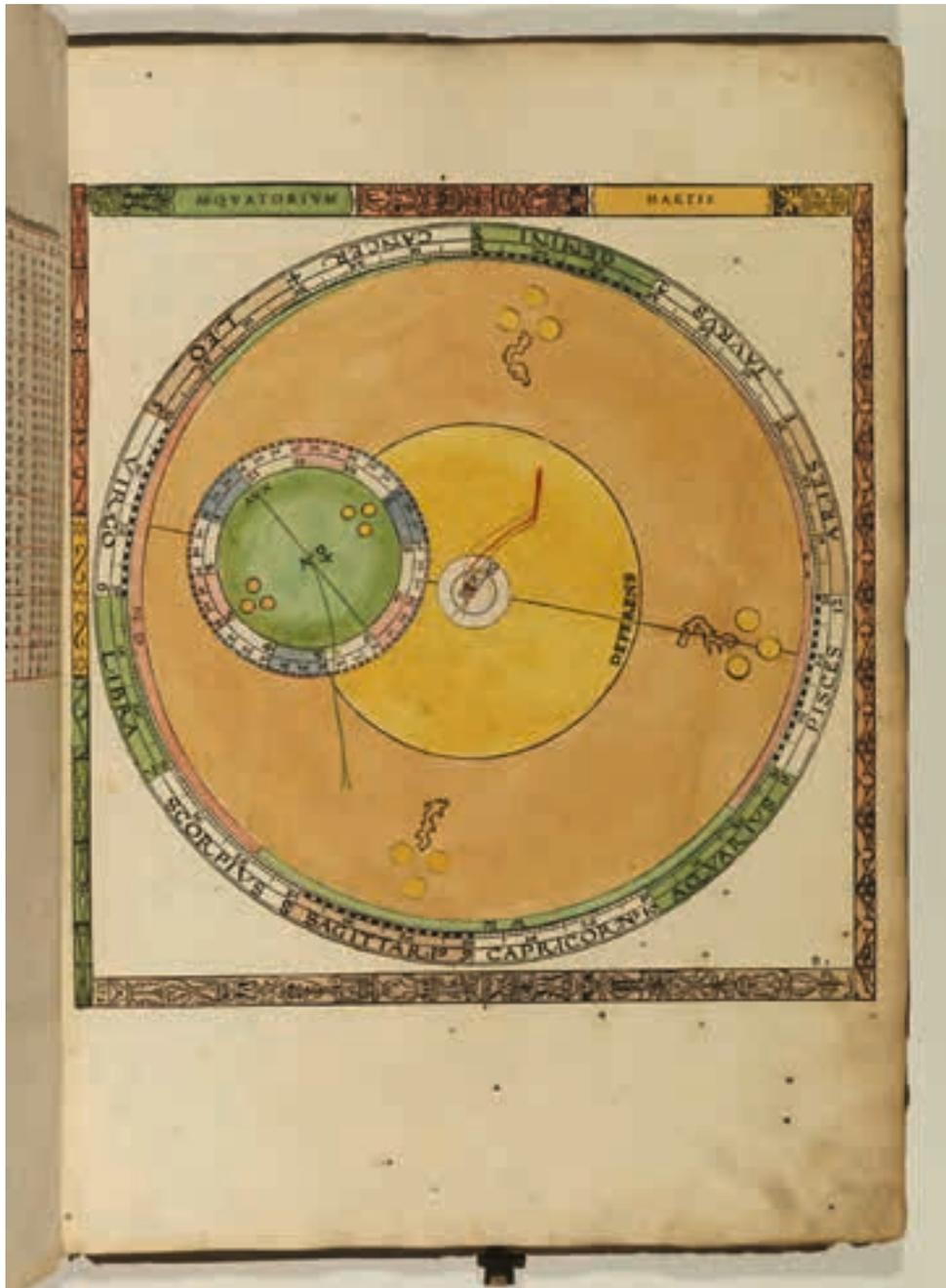
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