P3

Paper Print Packaging

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1–2|2020

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Fibre-Based Solutions for the Future

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Shaping the Digital Transformation

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Making a Difference!

Photo: private

Dear Readers,

as I write these lines, the shipping companies are still working reliably and we all hope that it will stay that way. Corrugated cardboard and all kinds of packaging are what is currently demanded from the industry. Besides that, however, the situation is difficult for many companies and a clearly structured government aid is likely to be inevitable in many cases. That said, I hope you, me, and everyone who reads this is healthy.

The current circumstances are one reason – although not the only one – why *ipw magazine* presents itself in a new form. For one thing, we thought it was time to move the somewhat antiquated layout – both online and in print – into a new decade. To us, the result looks pretty neat, and the first feedback from the industry confirms that we are absolutely right – thank you, we're delighted!

On the other hand, by shifting the focus in terms of content in the direction of our newly designed ePaper, we are taking the ongoing digitization into account, which does not stop at us either. This new approach also allows us to be more up-to-date and to focus more on the quality of our content. On the print side, this time the decision was made on a "leaflet", but stay tuned: We will also come up with something special for our next issue!

Stefan Breitenfeld

Stefan Breitenfeld
Editor-in-Chief

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online ↗ Content www.ipwonline.de/0b928513

Photo: Stefan Kiefer

Kelheim Fibres

Low Risk in First CanopyStyle Audit

Environmental not-for-profit organization Canopy, third-party auditor NEPCon, and Kelheim Fibres released the results of Kelheim's CanopyStyle Audit. The company's current supply chain is confirmed as low risk of sourcing wood from Ancient and Endangered Forests or other controversial sources.

"Canopy congratulates Kelheim Fibres for its low risk audit results," said Nicole Rycroft, Canopy's Executive Director. "Producers are increasingly hearing from brands that they will no longer source Ancient and Endangered Forest textiles by the end of 2020. This audit result is a validation of Kelheim's efforts in that direction and positions it well in a competitive market place."

"Future-oriented fibre materials cannot come at the cost of Ancient and Endangered forests and other valuable resources. Therefore, we are committed to focus on sustainability at every step from raw material sourcing and state-of-the-art closed-loops production processes," said Craig Barker, CEO of Kelheim Fibres. "As a small producer, we are proud to have accomplished low-risk audit results. We welcome the recommendations the audit report has given us for further improvements and we will actively work towards implementing them."

"NEPCon is pleased to be the independent auditing body for the Canopy-Style initiative and in particular making it possible to meet the growing demand for CanopyStyle audits throughout Europe," stated Jon Jickling, Director, NEPCon Solutions. "Kelheim Fibres was committed to this third-party assessment of their raw material sourcing."

PEFC

Revised Standards Approved

Three standards that further strengthen PEFC's Sustainability Benchmarks and assist in safeguarding forests globally have been approved by the PEFC General Assembly. The revised standards, which govern chain of custody (CoC) certification, trademark use, and conformity assessment, entered into force on 14 February 2020. Most notable are changes to the CoC standard, specifically the expansion of the definition of controversial sources. The standard lays out the requirements that a company must meet to achieve PEFC CoC certification. •

Photo: PEFC

Metsä Spring

Collaboration on new Wood-Based Product

Metsä Spring and Valmet have initiated a joint project for the development of a novel wood-based 3D product to replace similar products made out of fossil resources, especially in consumer products like packaging. The joint project focuses on fine-tuning properties of the new environmentally-friendly material and on developing a highly automated and digitalized manufacturing technology. Utilising Metsä Group's current industrial side streams as the raw material of the new product will also be assessed. The aim of the project is to jointly analyse the technical and economic performance of the new concept and evaluate the prerequisites to build, in a potential next phase, a pilot plant integrated to existing pulp or board production in Finland. •

Photo: Valmet

Valmet

New Long-Term Social Responsibility Program

Valmet initiates a new long-term social responsibility program for the company. Key themes are "Equal opportunities for wellbeing", "Towards the future with science" and "Protecting the planet for next generations".

As a first step in the program implementation, Valmet has signed a three-year agreement with Save the Children Finland to support their Child Sensitive Social Protection project in Dungarpur, India. Valmet donates € 50,000 annually to increase children's school attendance and retention and improving the care for orphans and other vulnerable children. The project will reach altogether 24,000 children and adults. It is one of the "flagship projects" for Save the Children Finland with already good track record for accomplished improvements.

"Equal opportunities for wellbeing is one of the three themes in our social responsibility work. As a global company it is important for us to enhance human rights, including children's rights, around the world, and we have been working successfully with Save the Children in the past, too. With this project we aim to provide long-term support for the education and wellbeing of Dungarpur's children. Project's location is also well matched with Valmet's operations in India," says Laura Puustjärvi, Head of Sustainability, Valmet. •

Andritz

PowerFluid Circulating Fluidized Bed Boiler for Japan

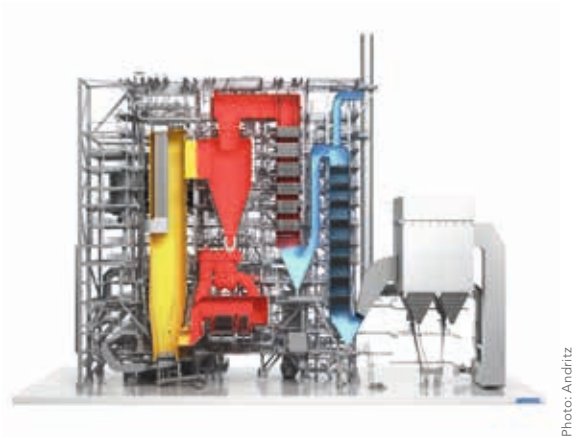


Photo: Andritz

International technology group Andritz has received an order from Toyo Engineering Corporation, Japan, to deliver a PowerFluid circulating fluidized bed boiler with a flue gas cleaning system.

The boiler will be part of a new biomass power plant to be built in Gamagori in Aichi Prefecture, Honshu Island, some 300 km southwest of Tokyo, Japan. Commercial operations are scheduled to begin in 2023.

The PowerFluid boiler to be supplied by Andritz features low emissions, high efficiency and availability, as well as high fuel flexibility. It forms an essential part of a high-efficiency biomass power plant for supply of green energy to the national grid. The biomass power plant fired with wood pellets and palm kernel shells will generate around 50 MWel of power.

This is the eighth order in two and a half years for supply of an Andritz PowerFluid circulating fluidized bed boiler for the Japanese market, and it confirms Andritz's comprehensive expertise and acknowledged competence in the biomass-fired, fluidized bed boiler sector. Andritz is one of the leading global suppliers of power boiler technologies and systems for generating steam and electricity from renewable and fossil fuels, with a large number of very successful references worldwide. •

Photo: Södra

Södra

Peter Karlsson new Interim President

Södra's CFO, Peter Karlsson, takes over as Interim President after Lars Idermark from 20 February. "I am delighted that Peter Karlsson has accepted the assignment of leading Södra during the ongoing recruitment process of a new President and CEO. For our members and employees, it is important that we can continue to develop Södra without losing pace or power of decision," said Lena Ek, Chair of Södra. •

Photo: Ametek

Ametek

Enhanced Regional Support in 2020

Ametek Surface Vision, provider of automated online surface inspection solutions, has announced a reorganization that will bring the company's sales, support and application expertise closer to customers in 2020.

Dedicated business regions in the Americas, Europe, and Asia will become the primary regional gateways to support users of Surface Vision's SmartView® and SmartAdvisor® surface inspection and monitoring solutions. By offering easy access to local sales and project teams, service requirements, technical support and application engineering, Surface Vision will respond quickly and decisively to all its customers. And by drawing on its regional team's expertise as well as an extended pool of technical and applications knowledge embedded in its global business network, Surface Vision can fully support customers through the entire lifecycle of their assets.

To drive the change, François Levac and Satoshi Suzuki have been promoted to the key roles of Americas Business Director and Asia Business Director, respectively. Responsible for developing all customer-facing functions regionally, François and Satoshi's familiarity with customers – combined with their expert technical and application knowledge – will help them develop sales and support functions that best suit local customer requirements.

Paul Stuyt and Yamina Lansari have been appointed Global Manager of Projects and Service, and Global Manager of Technical Services, respectively. Paul will develop new processes to improve the coordination and delivery of special projects and service requirements, while Yamina will manage technical support teams, improving their accessibility and responsiveness.

"Customers in every region will see significant improvements in how they access and are supported by Ametek Surface Vision," said Jason Zyglis, Division Vice President of Sales and Project Management. •

Photo: Voith Group

Digital solutions enable significant efficiency improvements and cost reductions.

Digital Papermaking

Shaping the digital transformation

Be it their Paper Webshop, virtual training tools or the DuoShake digital upgrade: Voith shapes the digital transformation.

The paper industry is facing major challenges. The current price level is forcing paper manufacturers to reduce production costs and further optimize the efficiency of their equipment. At the same time, the digital transformation offers huge potential, as new technologies allow significant improvements to be made to existing and new facilities. "For us, digitalization is the key technology to counter the challenges faced by the paper industry, achieve efficiency improvements and cut costs," says Dr. Jürgen Abraham, Digital Business Officer at Voith Paper with responsibility for the technology group's internal digitalization, e-commerce and digital products. "Digital solutions allow improved monitoring of all processes and as a result more precise control of production, which in turn leads to greater efficiency and better availabilities." Digitalization therefore plays a key role in reconciling ecological and economic requirements. But how can the digital transformation process be shaped, and what are the resulting prospects for paper manufacturers and the industry?

Data transparency

The current paper production supply chain has evolved over many years, and paper machines now have a very long service life. Great optimization potential therefore lies in the functional extension of existing solutions by means of digitalization. "By digitizing our product portfolio through Papermaking 4.0, we can offer our customers exactly what they want: a machine that produces paper in the most profitable way – during startup, but above all, throughout its entire life cycle," explains Abraham. One example of how this optimization potential is being tapped into is the new digital generation of DuoShake, the DuoShake DG (Digital Generation).

The DuoShake shaking unit has been on the market for over two decades. Hundreds of units have been installed, and it has undergone continuous improvement. The equipment optimizes fiber orientation yet is so mature that it is increasingly difficult to find ways of improving it mechanically. The digital update of the product now offers paper manufacturers new transparency with respect to production and maintenance. For example, all relevant operating parameters can now be set using a fixed operator panel on the control cabinet or via mobile devices like tablets and smartphones. The intuitive touch control interface provides a real-time overview of all the main parameters like availability, stroke accuracy and drive frequency. The software presents important information like

Photo: Voith Group

The digital upgrade of the DuoShake DG shaking unit delivers a real-time overview of all main parameters like availability, stroke accuracy and drive frequency.

air, oil and motor temperature as an easy-to-see traffic light system.

"Data transparency is at the core of digitalization. It provides us with important insights to better understand and control the paper production process," Abraham stresses. "The data visualization function of the DuoShake DG now allows us to make important decisions about efficiency." DuoShake DG records actual operating times and provides real-time data on maintenance intervals and service life of the most important machine components. Because the operating condition is known at all times, maintenance can be planned and scheduled more efficiently. "With DuoShake DG, we are turning time-based maintenance into needs-based maintenance and in doing so are extending the service life of the product," explains Benjamin Kitze, Director Global Service & Product Management at Voith Paper, who has driven the further development of the shaking unit.

An optional service that Voith offers for DuoShake DG is also designed to achieve maximum availability. The shaking unit can be connected to the IIoT platform OnCumulus via a cloud interface. On the basis of the transmitted data and trends, Voith experts can analyze the operating parameters, which ultimately improves the overall efficiency of the paper machine. "Thanks to the visualization and analysis options in combination with our service concept, we can already increase availability to almost 100 percent," says Kitze.

Digital services

Alongside data transparency, which is based on a digitalized product base, digitalization also offers other opportunities that have not yet been fully exploited, especially with respect to the interaction between suppliers and customers. "Digital solutions offer genuine added value to paper manufacturers and can deliver significant cost reductions. We see particular benefits in the area of digital services to enable fast, accurate and individualized customer support. One example is remote video support, allowing customers to quickly access expert Voith knowledge from any location. Across the board, this results in even better machine efficiency and availability," says Abraham. Apart from linking the customer with Voith, the remote video support has another decisive advantage: Paper manufacturers can connect their various plants to allow their specialists to work together quickly and easily regardless of the distances involved.

Another example is the Voith Paper Webshop. Since early 2017, the Webshop has been helping industrial clients find and order the right spare and wear parts out of tens of thousands of components. The online shop is open around the clock seven days a week. More than 100 companies are making use of this e-commerce option from the Servolution portfolio. Voith has now updated the Webshop to offer an even greater degree of personalization, with new functions and an intuitive user interface. The home page shows the customer's five most recent orders and quotations. It takes just one click to retrieve the respective order details and the latest order status.

The personalized area also helps shop users gain an overview of equipment already delivered and provides transparency through

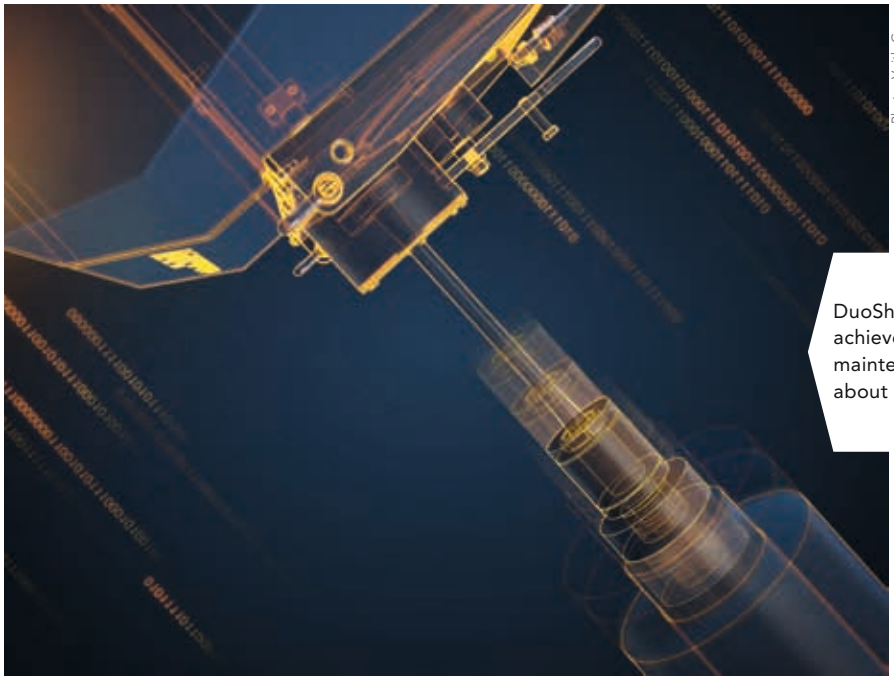


Photo: Voith Group

DuoShake DG allows paper manufacturers to achieve new transparency in production and maintenance and make important decisions about efficiency.

sophisticated search functions. Customers are able to find components they have used by entering origin, order history, operating instructions or customer-specific material numbers. "In the paper industry, an open content catalog is not enough; everything has to be personalized," says Michael Thoma, Vice President E-Commerce & Digital Supply Chain Management at Voith.

The success of the Voith Paper Webshop has also seen its range of products grow. "Around 130,000 spare parts – the ones most in demand – are directly available online," says Thoma, summing up. Customers can identify and request a million parts from Voith. Because the paper industry has recognized how the Webshop helps to reduce the administrative effort necessary for procurement, Thoma has for some time now been thinking beyond the mere product level. "In the future, we also want to offer repairs and on-site services."

Digital upskilling

With reduced administrative effort thanks to a digital shopping basket, data transparency and performance improvements via digital product solutions, digitalization is already having a fundamental impact on the paper industry and will continue to do so. "The priority for our customers is still optimum machine performance. We can achieve this through efficient processes and intelligent product solutions," Abraham explains. "Nevertheless, employee knowledge remains an important factor for the success of our customers, even in an era of digitalization. We therefore exploit the benefits of digital technologies, for example, to train specialist personnel. Our experience in this area has shown that paper manufacturers benefit from digital and virtual training options, because they enable servicing jobs to be optimized and downtimes reduced."

The training packages include virtual reality (VR) and augmented reality (AR) applications that allow trainees to conduct complicated service tasks. The VR applications used by the Voith PaperSchool, for example, provide an immersive environment for learning experiences that would not be possible in real life. When participants put on the headset, they dive into the virtual world of the paper machine and are safely guided through various tasks. The confinement of VR increases efficiency for the trainee. In contrast to a real plant, even untrained personnel can also work through potentially dangerous training exercises. What's more, it is possible to embed safety issues within a routine task that appears quite safe on the surface. This increases general awareness of safety issues. More effective training not only helps improve safety in paper mills but also increases machine availability and productivity.

"Thanks to digital product add-ons, improved data transparency and digital services, we can provide solutions to the potential benefits of digitalization and shape the digital transformation process in the paper industry," says Dr. Jürgen Abraham. Another side benefit is that digital solutions reduce interfaces for paper manufacturers, e.g., with suppliers and other points of contact. This is another way in which, as a full-line supplier, Voith is offering paper manufacturers integral added value. •

Papiertechnische Stiftung PTS

Pulp & Paper Industry-Efficiency 4.0

Energy Management, a most important competitive factor

By DI Dr. Kurt Schloffer & DI Thomas Troppenauer

This article was presented at the PTS Symposium „Fiber Technology 2019“

1. Overloading of automated control systems causes poor process control

Modern, efficient industrial process management is unthinkable without continuous process data tracking by using process control systems (DCS).

Large industrial assets often earn real profits only after their depreciation period. Because of their huge investment volumes, their productivity must be maintained for as long as possible and their efficiency has to be increased steadily.

As time goes by, process control systems are docked more and more by measuring technology, the human being loses control of the efficiency of his processes as a result of information overloading.

This leads to dummy and, as a result, to almost blindly familiarizing the automated systems without questioning, recognizing and deriving optimization measures from the possibilities of improving efficiency. Inefficiencies inevitably leave their footprints in process data. However, this fact is hardly being used. It is essential to use the right data in the right resolution if you want to make good use of the possibilities of fact-based process optimization. According to our experience less than 1% of all data is used to generate knowledge. A lot of sensor data is not taken into consideration. In the following, readers shall be sensitized that data quality is not equal to data quantity, by means of a few illustrative technological examples.

Usual DCS plot of a Sulfite batch cooking sequence Fig. 1)

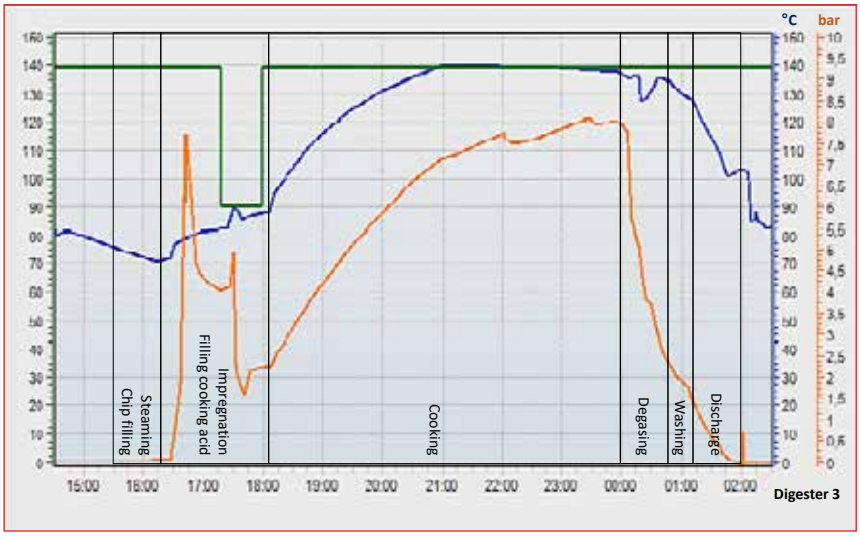
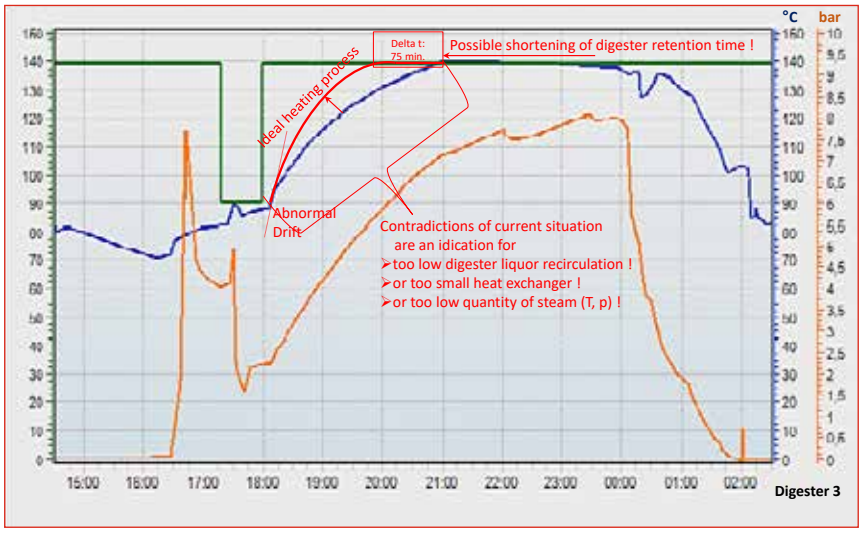


Fig. 2)



The AVI-eCustodia approach is to bring actual production state as close as possible to its optimum operating point - based on facts as performance indicators. For the assessment we are running a KPI-matrix in realtime allowing to compare independently as well as to react immediately on quality or performance deviations.

The combination with the technological expertise of AVI GmbH, which has grown over decades, opens up a new dimension of possibilities for increasing efficiency in production processes. This is a decisive competitive advantage, especially in economically difficult times.

2. Calculatory optimization potentials to increase digester production output with only low investment budget

Saving of heating time per digester: 75 minutes		
Deriving of yearly theoretical digester production:		
1 Year	**=**	**355 Production days**
355 x 24 x 60	**=**	**511.200 Production minutes/cook**
7 Digesters	**=**	**3.578.400 Production minutes**
devided by		**705 Minutes/cook**
	=	**5.076 Cooks/year theoretically**

Actual digester production:
4.497 cooks ----------> 705 min/cooking cycle
–> 75 min. time profit per cook
–> 337.274 min. Total time profit/year
–> 337.274 min. / 630 min (new cooking cycle)
= 535 cooks/year higher digester prod.
23,83 adt...pulp yield per cook
535 x 23,83 = 12.757 adt/y higher production
= +12,9% higher digester production capacity

3. It depends on the correct scan frequency

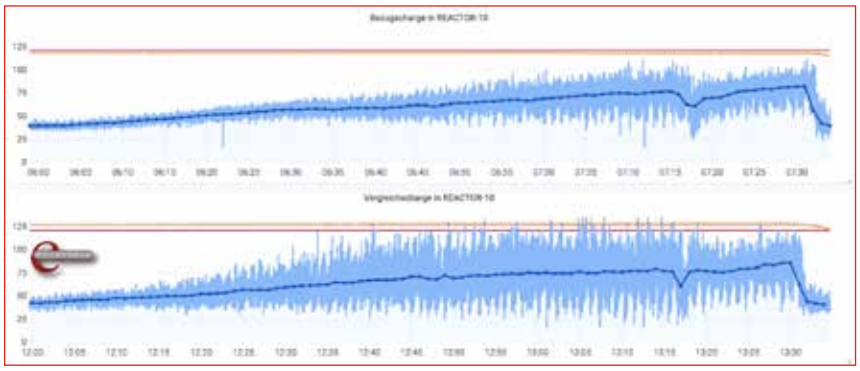


Fig. 3) Two different charges of the same chemical industrial process are showing more or less the same graph (dark blue line). Already in 1Hz-resolution, the feedback of the process is totally different. In this particular case the data scientist made a quality issue visible.

4. What are the benefits?

The benefits mostly come with a reduction of the production time, of the equipment operation time and/or an increase of the production volume in case that there is a market for the extra volume. The compliance of all quality requests is obligatory.

Other benefits come hand in hand, like the cost reduction for maintenance, energy and resource input. This benefit is very important to fulfill the common expectations in climate protection.

We could already determine a reduction of 65 % at a global acting enterprize's sub-process. Such inefficiencies occure when ‚trouble-shooting' and work-arounds got standard in the past or when the key experts left the company.

5. What needs to be taken into consideration?

AVI – eCustodia systematical industry efficiency 4.0 software box does not exist as a plug & play version for all cases. The basic module of Industry efficiency 4.0 needs to be adopted to the customers different processes and basic situations. Full compliance and active participation of the top management is the key success factor for big efficiency improvements. •

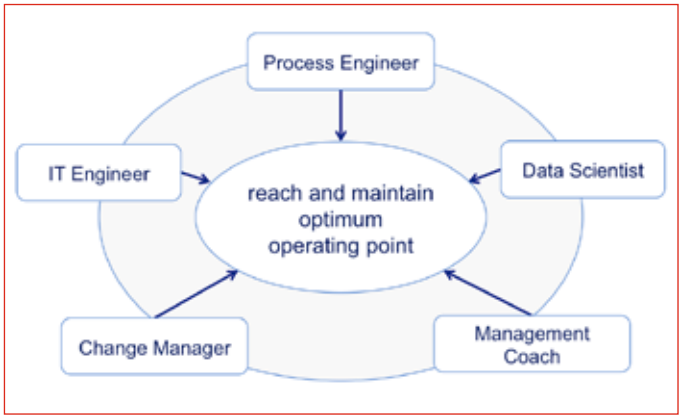


Fig. 5) shows what disciplines have to collaborate to bring the production to an optimum state. Providing these competences as external partner is an operational excellence apporach with very good results in practise.

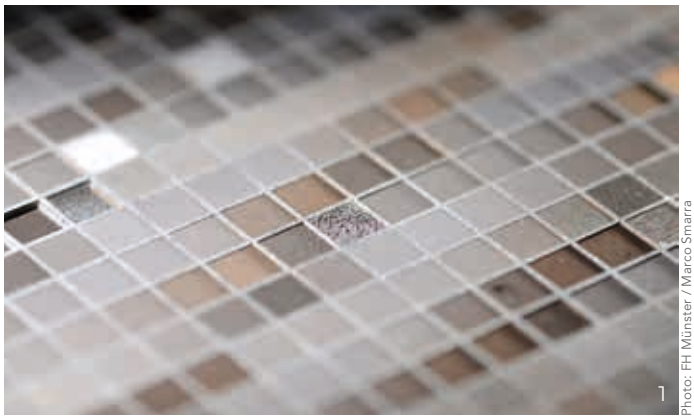


Photo: FH Münster / Marco Smarra

Photo: FH Münster / Jens Hildenhagen

Surface Research

Movero Project at FH Münster Completed

Whether supermarket baskets or shopping trolleys: little remains on the surface. And that is the explicit intention. After all, our four-wheeled helpers often feature antibacterial handles.

Only little bacteria remains on the handles of supermarket baskets or trolleys when we push or touch them. This is only possible thanks to specially treated handle surfaces, known as functionalised surfaces in the trade. "By functionalised, we mean that we have deliberately changed surface properties," explains Jürgen Gröninger, research assistant at FH Münster's Laser Centre. And since there are now all kinds of surfaces with enormous potential, research into how, and with which technologies surfaces can be changed is in full swing around the globe. Also, at FH Münster, where the German-Dutch project Movero, funded by Interreg, has just come to an end.

Surface Treatment

Movero stands for the "Use and further development of modern processes for surface structuring for interdisciplinary applications in the regional industry". In concrete terms, this means that ten companies from various branches and researchers from FH Münster and Universiteit Twente pooled, thought through, tested out and further developed ideas on surface treatment, and especially functionalisation, for more than three years. "We investigated how to treat surfaces using various technologies, above all laser and embossing processes, which gave them particular properties. For instance, so that foils can conduct light, or are able to repel dirt and water, or so that implants can ward off or attract bacteria," explains Gröninger. One of the resulting innovations: reflective foils that are simply attached to solar cells on the roof, increasing the system's efficiency by enhancing light output.

Other key activities included optical microstructures, soft-touch structures – this involved modifying the feel of the surface so that simulated wood actually feels like wood, for instance –, antibacterial surface structures, structured metal surfaces for the creation of biomedical effects, and structured polymer surfaces with self-cleaning properties.

Combined Expertise

"The project is very much in touch with the latest trends," states Marco Smarra, another research assistant from the Laser Centre. "The companies have customer enquiries by the dozen, and they all concern surfaces. Movero enabled us to combine our expertise and to develop new potential applications." Another objective was to raise awareness of the hidden potential of functionalising surfaces in the region. The following partners were involved in the project: FH Münster, TAFH Münster GmbH, DLR-Institut für Vernetzte Energiesysteme e.V., Schepers GmbH & Co. KG, Saueressig GmbH & Co. KG, Universiteit Twente, Irmato, Kamp Coating Apeldoorn BV, Materiomics, Morphotonics B.V., Duropanel BV, FMI Industrial Automation B.V. and ECM Technologies BV. •

1 Surface textures vary, which is why surfaces have different properties. The Movero project was all about deliberately changing those properties.

2 The final project meeting: Movero comes to a close at FH Münster after three years.

About the topic

Movero was co-financed within the Interreg V-A Programme Germany-Netherlands with funding from the European Regional Development Fund (ERDF), the Ministry of Economic Affairs, Innovation, Digitalisation and Energy of the State of North Rhine-Westphalia, the Ministry of Federal and European Affairs and Regional Development of Lower Saxony, and the provinces of Gelderland, Limburg, Noord-Brabant and Overijssel. A total of € 4.5 million was invested in the project.

ASV Metallized Paper feature

Surface inspection for metallized paper production

Metallized paper is primarily used in packaging, for example in labels, inner liners, gift wrap and other consumer product applications.

Photos: Ametek

1 Metallized paper may be subjected to several stages of coating to improve paper smoothing – this paper has been metallized to produce a high quality finish for wine labels.

2 Metallized paper can be manufactured in a range of different colors for various applications.

The sustainability of paper, and the superior appearance of a metallic surface, makes the manufacture of metallized paper a key application in the packaging market.

It is produced by coating paper with a thin layer of vaporized aluminum, giving the product a finish that adds decorative and protective properties.

The production process consists of several stages, during which different layers of coatings and a layer of metal are applied to the surface. A thin protective layer supports and safeguards the metallic surface appearance of the paper.

Beginning with the surface quality of the base material – the coated paper – any or all of the subsequently applied processes may introduce various defects that could affect either the visual aspect of the metallized surface, or the further processing of the final product (for example, printing). Any of these defects may seriously affect the quality of the final product.

Manual inspection within this process is costly and can only be performed periodically. Depending on the process type, it may not be possible to visually check the material until several hours after production.

This delay means that severe defects and their causes are identified too late, with several rolls of defective metallized paper potentially produced in the meantime.

A continuous, automated surface inspection system will monitor the material for defects including scratches, contamination or coating imperfections, providing effective quality control for all production stages. This continuous inspection can protect manufacturers from claims and reduce costs throughout the production process.

The metallizing process for paper

Basic paper is unsuitable for metallization, as it is naturally porous. This presents a rough base for the thin metallic layer that makes a continuous, even coverage impossible.

For this reason, metallizing-grade paper is either given a calendered or supercalendered finish to compress the fibers and smooth the finish, or given a clay coating that improves smoothness and reduces porosity.

It is then treated with a "pre-metallization" coating, an organic layer that further improves the smoothness of the paper, and seals any remaining pores.

The metallization of this high-quality paper is performed over several stages. Initially, the coated base paper is prepared with a thin layer of primer. This is essential to obtain the desired smoothness and appearance of the metallized surface.

Next, a thin layer of metal, usually aluminum, is applied to the surface, either by lamination or by vacuum deposition. Typically, this layer is only 15–30nm thick.

This is followed by one or more lacquering layers which protect the surface, preparing it for further processes such as printing.

Continuous surface inspection is essential at every stage to ensure that the paper surface meets the required quality at all times. This will detect any defects that

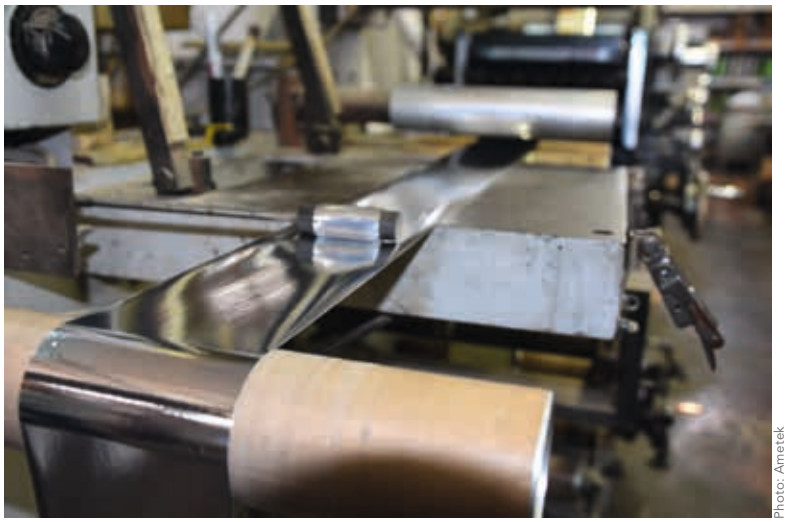


Photo: Ametek

A metallized paper production line.

may not emerge during the prior coating process, and allows action to be taken to remedy any issues at an early stage.

This, in turn, prevents defective paper going through costly processing and then having to be discarded and recycled. So, in addition to maintaining quality, waste is reduced and production costs lowered.

The benefits of surface inspection

Even though the coated paper has been inspected prior to metallizing, defects may be present which are not visible to the human eye and may not even show up under high-resolution inspection. These micro-scratches (for example, blade scratches) may only be a few microns wide.

Nevertheless, such scratches negatively affect the quality of the metallized or printed surface, and may result in obvious, clearly visible streaks on a highly reflective metallized surface.

The reflective surface at the end of the process chain amplifies any imperfections of the base substrate layer. So, even if these defects are initially invisible after the first coating layer, they will become visible to high-resolution cameras, installed at the correct angle, after subsequent coating applications.

At this stage, operators will be able to take the decision to send the material for further processing, or to improve the current process to cover such imperfections.

In addition, the coating and metallizing processes themselves might cause imperfections which are detectable with high-resolution linescan cameras.

Any contamination, splashes, streaks, or coating voids of the final protection layer can be observed and reported in real time.

This quality control helps to reduce scrap or downgraded product, improve productivity and reduce costs by avoiding the further processing of substandard material.

An effective solution for inspection

A good example of an inspection system for the paper metallizing process is Ametek Surface Vision's customizable, modular solution based around the SmartView® platform. It overcomes the difficulties of the metallizing paper process to deliver reliable defect inspection in real time, providing continuous visibility over the quality status of the value adding process chain.

This system is equipped with advanced LED illumination, highly sensitive linescan cameras, data capture computers and associated process control equipment, with powerful algorithms for detection and classification.

The compact LED lighting illuminates the material for inspection and its optical setup is designed to cope with the different appearance of the various steps while coating or metallizing, since the different layers can have different reflectivity.

Surface inspection systems are supported by software packages for continuous, automated operation. For example, the Ametek Surface Vision Synchronized View technology looks onto the surface from different angles, using brightfield and darkfield cameras, and therefore allows a reliable detection of a huge range of defects. This, combined with advanced SmartLearn classification, delivers excellent detection results in real time.

Adaptive detection tools – like adaptive thresholding, automatic light control and automatic edge detection – support the administrator's job in maintaining the different detection parameters for different surfaces.

Using an experienced surface inspection supplier is very important, as expertise in the software and optical setups required delivers the most effective solution for metallized paper production.

Solutions that scan both sides of the material are available, but the metallizing process is applied to one surface only, so a customized, modular approach is likely to be much more cost-effective than an off-the-shelf solution.

In addition, allowing customers to manage their data in an open SQL database means they can easily access the data for use in their own process control and quality control management systems.

Conclusion

Automated surface inspection systems are essential for continuous monitoring of quality in metallized paper production processes. By detecting and classifying defects, they ensure the required surface finish is met at each step.

This prevents substandard paper undergoing further processing, and protects the manufacturer against customer claims.

The result is less waste, a more productive process, and lower operational costs, while delivering more product that meets customer requirements and specifications. •

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