

P3

Paper Print Packaging

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Editorial

*Though this be madness, yet there is method in
't.*

*(William Shakespeare (1564 - 1616), English poet, playwright, actor and
theatre manager)*

Dear readers!

"Print is the future," proclaimed the Austrian *Die Tagespresse* recently, and they didn't hesitate to use the slogan as the basis for a large-scale media campaign. Sounds good, doesn't it? And do you believe it? The catch is that *Die Tagespresse* is a satirical magazine of the salacious kind. "The future of journalism is a foldable medium made of pressed wood fibers called 'paper,'" it continues. And at this point, one has to ask: Must a beleaguered industry really put up with being trampled underfoot? An industry where jobs and prospects are steadily dwindling in many (not all!) sectors; an industry that, contrary to what has been claimed for years, is not in a phase of change, but rather in a phase of ruthless consolidation? That's simply unacceptable. But as they say, misery loves company. Right?

No. Not in this case. The entire campaign is geared toward one ludicrous goal: *Tagespresse* actually wants to print! Starting in October, a print edition will be available once a month at Austrian newsstands, wirelessly and without electricity. "Better on dead trees," is the wake-up call – and despite all the joking, it's certainly a daring and hopefully well-calculated undertaking. I have no doubt it will work in the short term – but in the long run? Ideas, as we know, are like gags – they wear thin, and quickly.

Oh, by the way: The editors call their project a "bold step into the 19th century." But that's just how it should be for a satirical magazine.

Have a great read & stay safe!

Your

Stefan Breitenfeld

AUTHOR: SBR

AI Makes ISO Certification Easier for Companies



 "COMPANIES THAT TAKE THE FIRST STEP TOWARD CERTIFICATION USING OUR FREE TOOLS RECEIVE A CERTIFICATE CONFIRMING THEIR PARTIAL IMPLEMENTATION OF ISO STANDARDS."

With DICIS AG, Leipzig, a certification body has digitized the complex requirements of the three most important ISO standards for the first time:

- ISO 9001 (quality management),
- ISO 14001 (environmental management) and
- ISO 27001 (information security management).

According to DICIS, this reduces the time and costs companies spend on ISO certification by over 80 percent. Interested companies can initially test the ISO certification software for 30 days without obligation and use it to develop the basic ISO documentation, which is the heart of every successful certification, free of charge.

Digital ISO Certification Saves Time and Money

"Previously, creating the necessary as-is analysis and action plan required for ISO certification took several weeks," emphasizes Dr. Jens-Uwe Meyer, CEO of DICIS AG. "The AI assistant integrated into the certification software reduces this effort to just a few hours."

At the heart of the digital certification process is an AI-powered assistant. It guides companies step by step through the requirements of the respective ISO standard. Instead of having to work their way through extensive regulations and technical literature on their own, users receive interactive support that mirrors the approach of an experienced consultant.

AI Assistant Helps Create Documentation

The AI assistant explains the individual standard requirements in clear language and asks targeted questions about the company's organization, processes, and procedures. At the same time, the technology supports the creation of the required documentation. Guidelines, processes, objectives, risk analyses, and other evidence are automatically prepared and structured in accordance with the standard based on the user's input.

In the next step, the expert team at DICIS AG prepares companies for the requirements of the certification audit. The actual certification takes place in an online audit conducted by qualified auditors from DICIS AG. During this audit, the company's established processes, documentation, and management systems are reviewed and evaluated. If the company meets the requirements of the respective standard, the corresponding certificate is issued.

Digital Certification: Particularly Interesting for SMEs

"ISO certifications are especially important for small businesses," emphasizes Dr. Jens-Uwe Meyer. "However, the certification process has so far been tailored to the structures of large companies. Small businesses have had to invest a disproportionate amount of time, bureaucracy, and money in this process." With the digital process and AI-supported assistance, DICIS AG, according to Meyer, "is creating, for the first time, an access point that meets the needs of small businesses and opens up the same opportunities for them as for large market players."

The digital certification offering is therefore receiving a very positive response. The more than 400 certified DICIS customers demonstrate that small businesses, in particular, have a high demand for simple, fast, and affordable certification processes. DICIS AG now offers its innovative services internationally. The Leipzig-based company has already acquired its first customers in the USA, Canada, Ireland, and Norway.

Get started with digital ISO certification now

"Companies that take the first step toward certification using our free tools receive a certificate confirming their partial implementation of ISO standards," explains Dr. Meyer. They can use this certificate for marketing purposes, for example. Implementing the measures using the software is also free for 30 days to make it as easy as possible for companies to begin the ISO certification process. "Because," says Meyer, "this, in our view, is the philosophy of the digital age: Let customers simply try out a potential solution; then they can decide for themselves whether it's right for them."

Interested individuals and organizations can find more information about digital certification according to ISO 9001, ISO 14001 and ISO 27001 on the DICIS AG website (<https://www.dicisgroup.com/>).



 DR. JENS-UWE MEYER, CEO, DICIS AG.

 EDITOR: SBR

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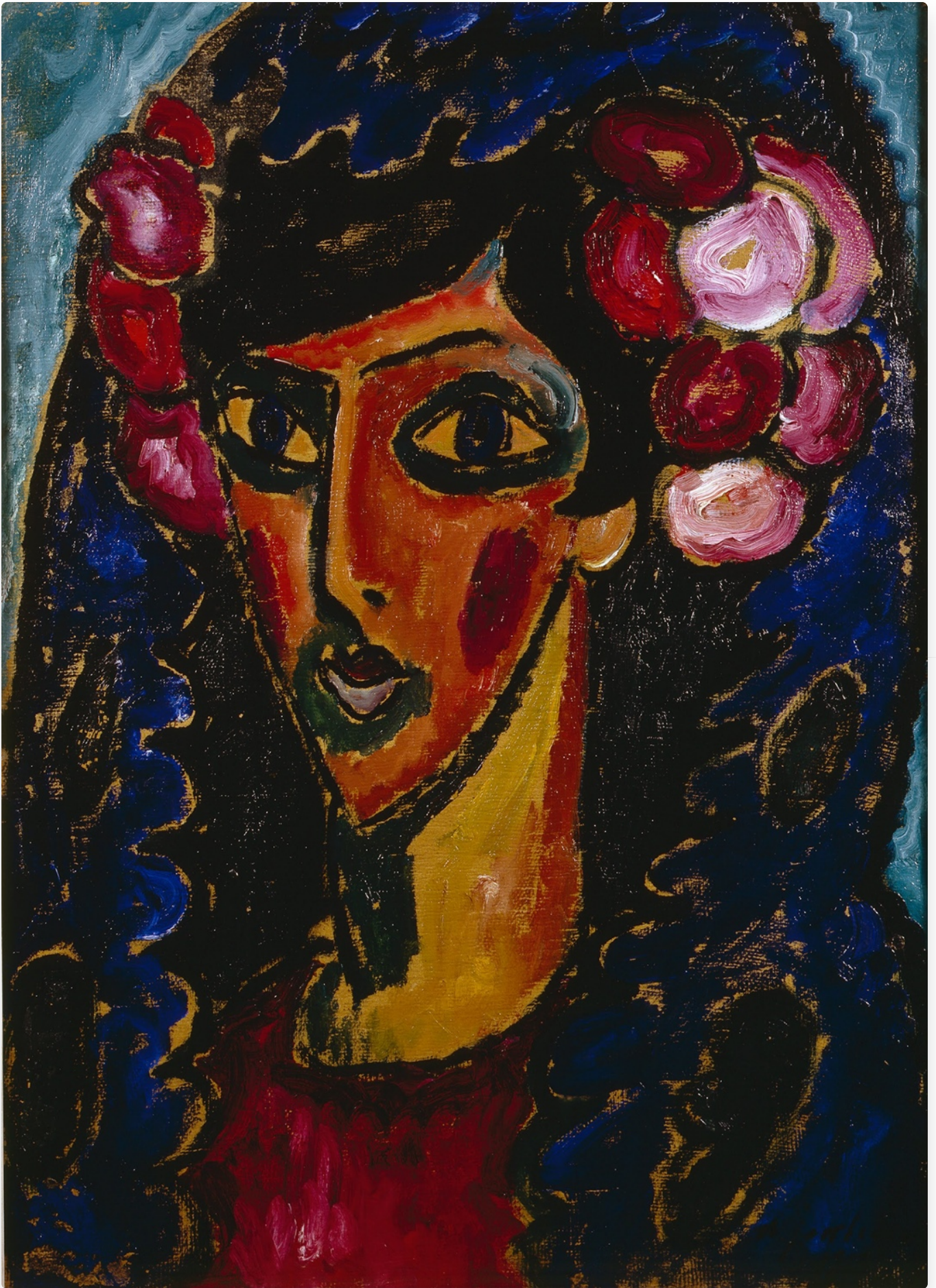


U3



ALEXEJ VON JAWLENSKY

The Blue Mantilla



Alexej von Jawlensky (1864–1941): *The Blue Mantilla*. Oil on cardboard, 495 x 685 mm. Extended loan from

the Ayala and Sam Zacks Collection. The Israel Museum, Jerusalem.

 IMAGE: PUBLIC DOMAIN, VIA WIKIMEDIA COMMONS

Why Ink Determines CIJ Success



 IN LEIBINGER'S IN-HOUSE INK LABORATORY, CIJ INKS ARE DEVELOPED, TESTED, AND PRECISELY MATCHED TO A WIDE RANGE OF SUBSTRATES, PRODUCTION CONDITIONS, AND APPLICATION REQUIREMENTS.

When companies invest in a CIJ printing system, they often focus first on the printer itself, printing speed, and total cost of ownership. Understandably. What is frequently underestimated, however, is that the ink is not simply a "consumable" – it is a critical process factor. Ink plays a decisive role in ensuring codes remain permanently readable, adhere reliably, dry quickly, and allow the production line to run stably without developing hidden issues over time.

This is relevant across industries – from food and beverage to cosmetics and extrusion applications. Changing materials, high production speeds, demanding environments (condensation, dust, heat), and increasing requirements for traceability and process reliability make ink selection a true success factor.

CIJ does not work with "just any ink" — it works with the right match

A clean CIJ print is always the result of the right combination of four factors:

- What is being printed? Text, logos, barcodes, 2D codes — and what are the requirements regarding

contrast and scanner readability?

- What is being printed on? Material class, surface characteristics, coatings, additives (e.g., plasticizers).
- At what speed and in what environment? Line speed, temperature, humidity, condensation, cleaning chemicals.
- What performance requirements apply? Abrasion resistance, drying time, washability/removability, or special functions such as UV fluorescence or color-changing properties.

Why is this matching process so important? Quite simply: set-off, smearing, and poor adhesion are often the result of ink that is not ideally matched — or of changes in the substrate or production process.

A practical example is PVC. On rigid PVC, such as pipes, coding is often relatively straightforward. In more flexible PVC applications, such as cable insulation, plasticizers make adhesion significantly more challenging. If the ink formulation is not optimized, the risk of set-off increases considerably. This clearly demonstrates that the material name alone is far from sufficient – the exact composition of the material is what matters.

What industrial CIJ inks really need to deliver and why so many variants exist

In CIJ applications, success is not about finding "a good ink," but the right combination of properties. That is why different ink classes, colors, and specialty formulations exist. At Leibinger, the portfolio includes around 70 inks – developed, manufactured, and tested with one clear objective: delivering the best possible combination of ink and coding technology for each specific application.

Typical properties that make a real difference in production environments include:

Quick-drying

For high line speeds and immediate handling. Many applications require drying within seconds – sometimes milliseconds – to prevent smearing or set-off.

High temperature resistance

For processes involving significant thermal exposure, including very high temperatures depending on pigmentation and formulation.

Light and UV resistance

To prevent codes from fading – especially important under UV exposure, during storage, or in demanding quality environments.

Condensation-resistant / washable

Essential in beverage and cold-chain applications: the ink must remain legible and firmly adhered despite condensation. At the same time, some applications require removability, for example during recycling processes or alkaline washing.

Sterilization-resistant (retort/autoclave)

For steam sterilization processes where contrast and adhesion must remain intact after treatment.

Chemical resistance

Critical when aggressive cleaning agents, alcohols, fuels, or solvents are present in the production environment.

Plasticizer-resistant

Designed for particularly demanding PVC applications, especially common in cable manufacturing.

Adhesion on films or low-surface-energy substrates

For "difficult" plastics such as PE and oily surfaces where standard inks often reach their limit.

High-contrast / Highly pigmented

Required when opaque, highly visible coding is needed on dark substrates — common in cable production and certain FMCG applications.

Fluorescent / UV-readable

Ideal for security applications or where visible codes would interfere with packaging design – particularly attractive in cosmetics and premium packaging.

Thermochromic (color-changing)

When the code itself should indicate whether a sterilization process was correctly completed.

Environmentally focused inks ("Green Coding")

Low-odor, MEK-free, low-VOC inks (VOC = volatile organic compounds) for environments where workplace safety and sustainability are priorities — including fully recyclable cartridges.

The decisive difference: Printer and ink expertise belong together

When printer and ink come from a single source, a major practical advantage emerges: the coding solution can be designed and optimized as one complete system. Leibinger develops and manufactures both CIJ printers and matching inks in-house. This means the performance of the entire solution — from droplet behavior in the printhead to adhesion and readability on the substrate — is managed as a fully integrated system.

This matters because CIJ ink must not only perform "on the material," but also inside the system under real production conditions. In-house ink development and manufacturing make it possible to test and continuously optimize printer and ink together – ensuring maximum reliability and consistently reproducible print quality in daily operation.

Leibinger printers prevent ink drying

One technical aspect that is often underestimated in practice is what happens when ink dries inside the printhead area. The issue is not only visible contamination – the real problem lies in what cannot immediately be seen.

In CIJ technology, ink droplets are electrostatically charged inside the printhead and guided via deflection plates for precise positioning on the product. To maintain permanently clean coding, this droplet control must remain stable throughout daily production.

In conventional CIJ systems, startup involves an abrupt pressure build-up to generate the ink jet. This causes the so-called "spitting effect" inside the printhead. Tiny ink particles spread across the electrostatic components in the printhead area, interfering with the charging and precise deflection of droplets. Initially, these are only small deviations, but over time they increase, leading to visibly misplaced droplets. At the same time, a second critical issue occurs: during production stops, these system-critical areas remain exposed to air in conventional CIJ printers. Ink residues dry on the nozzle, deflection plates, and return line, creating deposits. The result: print quality gradually deteriorates.

Leibinger solves this differently by design. Its automatic nozzle sealing technology hermetically seals the system during production pauses. At the same time, the system continuously circulates the ink, maintaining stable viscosity. As a result, no spitting effect occurs during startup and its associated disadvantages are avoided: no deposits on electrostatic components, no drying – and consistently high print quality from the first print to the last.

Pigmented inks? Absolutely YES — with CIJ models designed for them

Highly pigmented inks are extremely valuable when strong contrast is required on dark substrates. At the same time, pigments place greater demands on process control: sedimentation, deposits, and fluctuating viscosity can negatively affect print quality and system stability.

Leibinger addresses these challenges directly at the system level. Intelligent ink management with an automated stirring system inside the tank keeps pigments moving, reduces sedimentation and related deposits, and stabilizes viscosity. For production and technical decision-makers, this is highly relevant because it directly impacts key operational questions: How stable does the production line run? How frequently does the printer require cleaning? How reproducible are codes over weeks and multiple shifts?

The fastest way to the right ink: Don't guess – test

The reality is this: with modern materials, coatings, and additives, the "right" ink cannot reliably be selected based on instinct or a datasheet alone. That is why Leibinger follows a practical, application-driven approach:

"Send us your original samples – we print and test them free of charge! At our Application Center, we test the compatibility of substrates, process requirements, and inks under realistic conditions — including acceleration units that simulate actual production speeds and, where necessary, suitable pre-treatment methods such as corona or plasma treatment to optimize adhesion. The result is a well-founded, application-specific decision basis for a complete CIJ solution that performs reliably in everyday production.

"Planning to introduce a new CIJ system or stabilize your coding process? Send us your product or packaging samples along with your application requirements. We will provide a complete CIJ solution that does not just print — but delivers reliable production performance."

www.leibinger-group.com



🖨️ FOR MATERIALS CONTAINING PLASTICIZERS, SUCH AS CABLE INSULATION, INK SELECTION IS ESPECIALLY CRITICAL: IF ADHESION IS NOT STRONG ENOUGH, THE CODING CANNOT WITHSTAND MECHANICAL STRESS AND CAN EASILY PEEL OFF OR BE SCRATCHED AWAY.



🖨️ DIFFERENT SUBSTRATES AND PRODUCTION ENVIRONMENTS REQUIRE PRECISELY MATCHED INK SOLUTIONS. THAT IS WHY THE LEIBINGER PORTFOLIO INCLUDES AROUND 70 CIJ INKS.



 SPECIALISTS WORK TOGETHER TO DETERMINE THE OPTIMAL MATCH BETWEEN CIJ INK, SUBSTRATE, AND PRODUCTION CONDITIONS — BECAUSE CLEAN CIJ PRINTING IS NOT ACHIEVED WITH JUST ANY INK, BUT THROUGH THE PRECISE ALIGNMENT OF ALL PROCESS FACTORS.

 EDITOR: SBR

 IMAGES: PAUL LEIBINGER GMBH & Co. KG

 INKS FOR MORE SUSTAINABLE PACKAGING PRINT

Emerging Trends and Technologies



 ACCESS TO NOVEL INK FORMULATIONS OPTIMISED FOR THEIR PRESS CAN HELP CONVERTERS IMPROVE COMPATIBILITY WITH EMERGING SUBSTRATES, ENHANCE DE-INKING AND RECYCLING OUTCOMES FOR BRAND OWNERS, AND REDUCE COMPLIANCE RISK.

Manufacturers and converters today require inks that do far more than produce attractive print. Inks used must help packaging pass through recycling systems, comply with global regulations, and perform reliably on next-generation materials. As the regulatory landscape evolves, one thing is clear: the future of ink is tightly linked to eco-friendly packaging innovation.

Natasha Jeremic, Head of Piezo Inks, Domino Printing Sciences, explores the latest advancements in ink technology and how these are giving converters and brands greater flexibility, efficiency, and regulatory confidence.

Sustainable, next-generation chemistries developed for new substrates

Ink innovation is evolving to meet new sustainability demands, with formulations shifting toward renewable colourants, bio-based ingredients, and plant-oil-based formulations. These chemistries are specifically engineered to perform well on the growing volume of fibre-based, bio-based, and recyclable substrates and mono-materials entering the market, helping converters protect print quality as customers transition to more sustainable packaging.

Low-VOC, water-based, and renewable-solvent ink systems

The latest ink platforms are dramatically reducing emissions by replacing traditional solvents with low-VOC, MEK-free systems and water-based inks for corrugated and monochrome printing.

Eco-solvents, such as limonene and ethyl lactate, help improve operator safety and reduce odour, allowing converters to meet stricter air-quality standards without changing standard production workflows. Bio-based ethanol, butanol, pinene, methyl and ethyl soyate have also been noted for having excellent biodegradability.

PFAS-free and pollutant-reduced formulations

While Domino's ink formulations have been PFAS-free for a long time, many ink manufacturers are now removing PFAS from new ink ranges to meet 2026 legislation deadlines. There is also a move to eliminate persistent organic pollutants (POPs). This innovation reduces compliance risk by meeting current and future regulations, pre-empting the need for future ink reformulation, and assures converters of long-term regulatory compatibility with tightening regulatory frameworks such as PPWR and EPR.

Design for recyclability and high-performance de-inking

Several new ink technologies directly improve substrate recycling outcomes, including primers that enable UV-cured inks to be removed more easily and plant-oil-based inks that perform well in enzyme-based de-inking processes. These developments reduce the likelihood of downgraded recyclate, helping converters to deliver products that meet stricter recycling performance expectations.

Optimisation for energy-efficient curing and drying

Fast-drying aqueous ink systems, such as Domino's AQ95 inkset for corrugated printing, are formulated to dry efficiently. This reduces the number of drying modules required, cutting the press footprint, and reducing carbon emissions by lowering energy consumption. For converters, this means faster throughput, lower overheads, and improved sustainability scores.

Ink systems optimised for UV LED curing represent another technology upgrade. This shift allows converters to reduce energy consumption, remove mercury-based curing lamps, and achieve safer, more stable curing.

Future-proofing printed packaging

Converters can help brands seeking to future-proof their packaging against evolving, sustainability-driven, regulatory demands by working with a trusted equipment partner that invests heavily in in-house ink development and manufacture. Access to novel ink formulations optimised for their press can help converters improve compatibility with emerging substrates, enhance de-inking and recycling outcomes for brand owners, and reduce compliance risk.

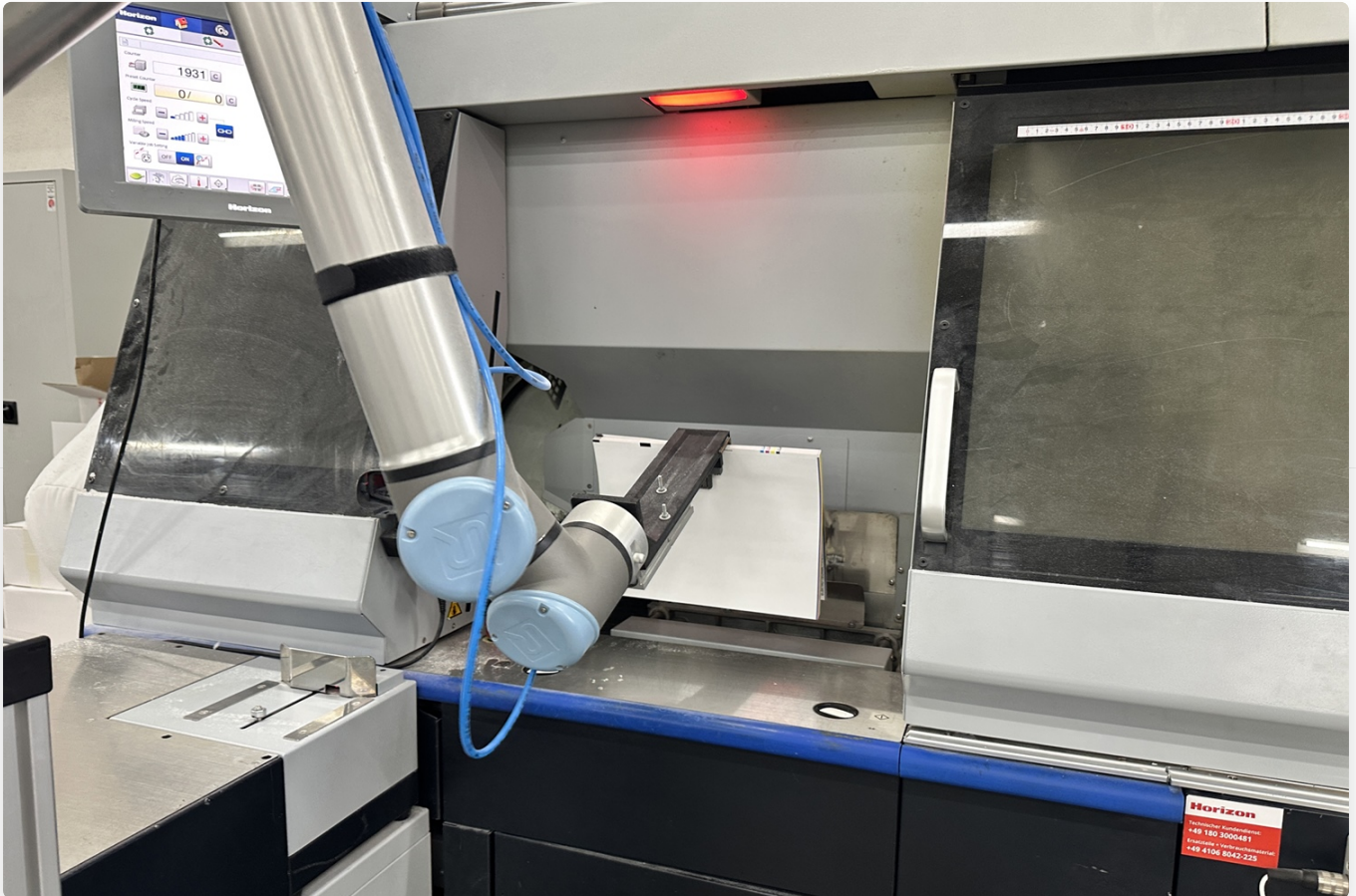


 AUTHOR: NATASHA JEREMIC, HEAD OF PIEZO INKS, DOMINO PRINTING SCIENCES

 EDITOR: SBR

 IMAGE: DOMINO

Automation as the Key to Success



 NO MANUAL INTERVENTION: THE BOOK BLOCK FEEDING ON THE BQ-480 IS ALSO DONE VIA A ROBOT ARM.

For approximately 30 years, the Digital Print Group has stood for innovative printing and media solutions. With around 50 employees, the company has developed into a leading technology provider, offering services that extend far beyond traditional printing. Its range of services encompasses small and medium print runs, personalized books, high-quality hardcover products, calendar production, large-format printing, and comprehensive fulfillment solutions. As a full-service partner, the Digital Print Group supports its customers along the entire value chain. This includes data preparation, printing, finishing, warehousing, order picking, and worldwide shipping.

The company serves both B2B and B2C customers: publishers, industrial companies, and direct customers alike benefit from flexible production options, a high level of vertical integration, and end-to-end digital processes. The demands on production are correspondingly diverse: customers expect top quality, short delivery times, and maximum flexibility. At the same time, the demand for customized products and small print runs is constantly increasing. To meet these demands, the Digital Print Group consistently relies on automation, digital workflows, and state-of-the-art production technologies.

Specialist in Book-of-One Production

A particular focus is on the production of customized books. The Digital Print Group produces around 350,000 books annually. Approximately 70 percent of these are softcover books, and around 30 percent are hardcover editions. Many orders are for small and very small print runs, down to single copies. Personalized content, custom covers, and customer-specific product variations are part of their daily business.

Whether it's a single personalized book or more than 100,000 orders per year, the Digital Print Group's production processes are designed to handle medium to high order volumes just as efficiently and reliably as individualized orders. The highly automated production environment, barcode-controlled workflows, and end-to-end digital process control ensure maximum process reliability, on-time delivery, and consistently high product quality at all times.

Horizon as a strong partner in post-press

The decision to partner with Horizon for print finishing was no accident. In a production environment that processes a wide variety of orders daily, short setup times, process reliability, and a high degree of automation are crucial factors.

For perfect binding, the Digital Print Group has relied on the Horizon BQ-480 and iCE BQ-500 perfect binders with GF-500 gauze feeders and ESF-1000 endpaper feeders for many years, connected to the HT-1000V three-knife automatic binding machine. Both systems use PUR adhesive and are optimally designed for the demands of modern digital printing and book-of-one production. The machines impress with their high reliability, short changeover times, and ability to efficiently process a wide variety of formats and order sizes. These features are crucial, especially for frequently changing orders and personalized products.

For booklet production, Digital Print Group relies on a Horizon StitchLiner 5500 with an HOF-400 digital feeder. A Horizon AFC-566FKT folding machine complements the finishing capabilities. All systems are in continuous daily operation and make a significant contribution to the high productivity and flexibility of production.

Experience Builds Trust

Marisa Dütsch is responsible for production management and process management at Digital Print Group. Her connection to Horizon extends far beyond the typical customer relationship. Before joining Digital Print Group, she worked at Horizon for 14 years, where she was responsible for perfect binding.

"I have known the machines and their development firsthand for many years. This experience helps us in our daily production. Especially with highly automated book-of-one applications, reliability, process stability, and user-friendliness are crucial. Horizon offers solutions we can rely on every day," explains Marisa Dütsch.

Technologically well-positioned

The Horizon systems are part of a highly automated production environment. For many years, the Digital Print Group has consistently invested in state-of-the-art printing and finishing technologies and has more than ten years of experience in industrial inkjet printing. Managing Director Oliver Schimek laid the foundation for today's inkjet production back in 2008 with the pioneering investment in a Canon ColorStream. Around three years ago, this was replaced by a Canon ProStream 1000, which combines the highest print quality with the flexibility and cost-effectiveness of modern inkjet technology.

Production is complemented by approximately 20 Canon sheetfed presses as well as high-performance systems from Hunkeler and Tecna for the highly automated processing of roll-to-roll printing products. Digital Print Group relies on a Müller Martini Diamant press for the production of high-quality hardcover books.

In calendar production, particularly during the year-end rush, several automated production systems from

Renz ensure the necessary capacity and process reliability to reliably and on-timely deliver high production volumes.

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In addition, four collaborative robots already support employees in the binding department, handling and transporting materials within production. Together with barcode-controlled workflows, end-to-end digital process control, and a high degree of system connectivity, efficient and stable production processes are created, ensuring the highest quality and maximum process reliability.

A successful future together

The combination of state-of-the-art printing technology, intelligent workflows, and high-performance Horizon systems enables the Digital Print Group to achieve exceptional production flexibility. Whether personalized individual items, small print runs, or industrial production volumes – the systems support economical and reliable production at the highest level.

For the company, Horizon is more than just a machine supplier. The long-standing partnership is based on a shared understanding of innovation, quality, and process reliability. Especially in an increasingly individualized print world, high-performance, automated, and reliable systems are crucial. This is precisely where Horizon solutions make a significant contribution to our shared success every single day.

* * * * *



 THE HORIZON BQ-480 AND BQ-500 PERFECT BINDERS ENSURE RELIABLE AND FLEXIBLE BOOK PRODUCTION WITH SHORT SETUP TIMES AND VERY HIGH PROCESS RELIABILITY AT DIGITAL PRINT GROUP.



 IDEAL FOR FULLY AUTOMATIC, VARIABLE BOOK PRODUCTION AND PERSONALIZED PRODUCTS: HORIZON SMART BINDING SYSTEM CONSISTING OF ICE BINDER BQ-500 WITH GAUZE FEEDER GF-500, ENDPAPER FEEDER ESF-1000 AND THREE-KNIFE FULLY AUTOMATIC BINDER HT-1000V.



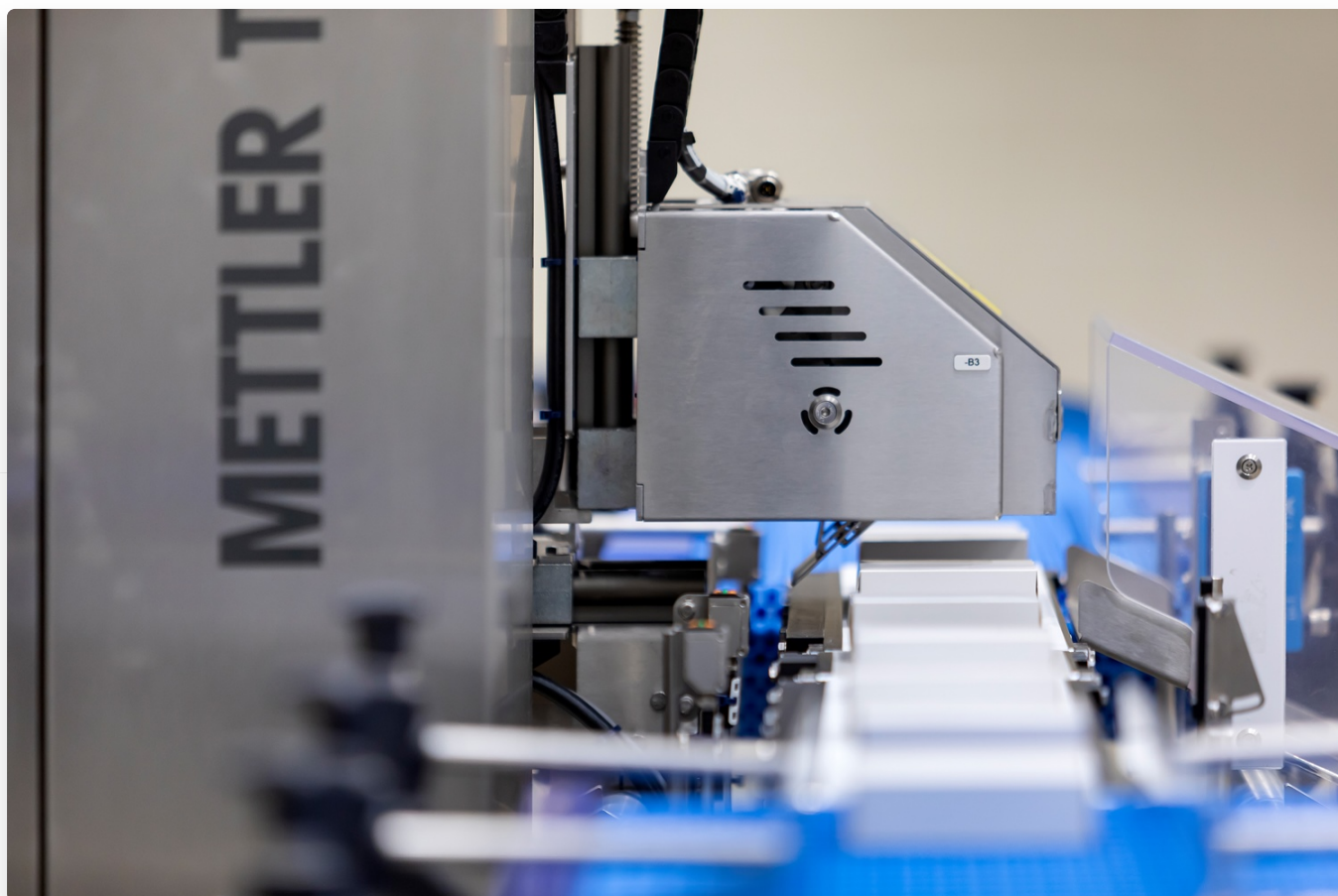
 LOOSE-LEAF COLLECTIONS ARE FED INTO THE HORIZON SMART BINDING SYSTEM VIA A COLLABORATIVE ROBOT.

 EDITOR: SBR

 IMAGES: DIGITAL PRINT GROUP O. SCHIMEK GMBH

 SMART CHECKWEIGHING SOLUTIONS

Reducing Waste



 IN-MOTION CHECKWEIGHERS ARE DESIGNED TO HANDLE A WIDE RANGE OF PRODUCT TYPES.

In the food manufacturing industry, waste reduction is vital for both economic efficiency and environmental sustainability. Manufacturers face rising demands to minimise waste, including the unnecessary disposal of products and to meet stringent regulatory requirements for product weight accuracy. With modern innovations in checkweighing technology, manufacturers can reduce waste at every stage of production, from raw materials to finished products.

From Raw Materials to Finished Products

Waste reduction begins as soon as raw materials enter the production line. Traditionally, checkweighers have been essential for preventing underfilled or overfilled products, both of which can lead to waste. Underfilled products risk non-compliance with regulations, potentially leading to costly recalls, while overfilled items waste valuable ingredients, driving up material costs.

Modern checkweighing systems, however, have transformed this process by incorporating advanced load cell technology that allows for real-time weighing adjustments. These dynamic checkweighers, capable of

processing hundreds of products per minute with exceptional accuracy, help see that every product meets its specified weight. This significantly reduces the chance of overfilling and material waste, allowing manufacturers to maintain production speed while adhering to stringent weight regulations.

In-motion Checkweighers are designed to handle a wide range of product types, from light items like snack bags to heavier products like canned goods, all without sacrificing accuracy. As products move down the line, advanced sensors adjust to each product's unique weight requirements, facilitating optimal precision and compliance with legal metrology standards.

These systems are part of a broader shift towards Intelligent Weighing Automation, using real-time data and connectivity to drive automatic adjustments in the production process. By integrating checkweighers with upstream and downstream equipment, manufacturers can unlock smarter control over fill volumes, optimise line performance and significantly reduce material waste. This technology allows adjustments to happen continuously, in real time, without disrupting output, enabling higher accuracy and efficiency across the production line.

At the heart of this automation is Feedback Control, a smart communication loop between the checkweigher and the upstream filling machine. When the dynamic checkweigher detects a deviation from the target weight, it sends immediate data upstream, prompting the filler to automatically adjust its output. This intelligent response assists with consistent product weights without the need for manual intervention or production pauses. By reducing overfill, minimising giveaway and keeping production on track, Feedback Control demonstrates how intelligent systems can drive both compliance and cost savings while maintaining high throughput.

Reducing Waste through Preventive Maintenance

Once production is in full swing, the challenge shifts to maintaining operational efficiency. Unplanned downtime or equipment malfunctions can lead to production halts, resulting in wasted products that can no longer be sold. Preventive maintenance plays a key role in reducing this risk by identifying potential issues before they become critical, from basic cleaning routines to professional equipment inspections, worn part replacements and service recommendations.

By implementing a regular preventive maintenance schedule, manufacturers can keep checkweighers and inspection systems in optimal working condition. This helps to prevent downtime, avoid inaccurate readings and reduce the risk of spoilage or product loss due to unexpected shutdowns. In high-sensitivity environments such as fresh or frozen food production, where even brief interruptions can compromise product quality, a proactive maintenance plan becomes essential. Whether you're a business owner, maintenance manager or equipment operator, investing in preventive care is a simple yet powerful way to reduce waste and keep operations running smoothly.

Tackling Environmental Challenges with Vibration Compensation

Environmental challenges, such as vibrations from nearby machinery or unstable floors, can interfere with traditional checkweighing systems. In a typical manufacturing facility, conveyor systems, packaging machines and other high-speed equipment often create vibrations that skew weighing accuracy, leading to false rejects or incorrect weight measurements.

Modern checkweighing technology addresses this issue with vibration compensation mechanisms. These systems use high-resolution sensors and advanced algorithms to neutralise the effects of external vibrations, meaning that the weighing process remains precise even in dynamic production environments. Whether it's vibrations from a passing forklift or continuous motion from upstream equipment, the vibration compensation means that weight readings are not affected.

By stabilising the weighing process, manufacturers can minimise the number of products that are incorrectly rejected due to vibrations. This reduces unnecessary waste caused by falsely rejected items while being

sure that products are weighed accurately in any production setting.

Utilising Data for Continuous Improvement

The journey of waste reduction doesn't stop once products are accurately weighed. Today's Intelligent Checkweighers serve as a central part of manufacturers' digital automation strategy, generating a wealth of data that can be used to further optimise processes. Each checkweigher continuously collects and stores performance data, allowing manufacturers to track trends, identify inefficiencies and adjust processes to further minimise waste.

This reflects the wider evolution of modern production environments under Industry 4.0, where automation, connectivity and real-time analytics are driving smarter, more agile operations. Intelligent Weighing Automation plays a crucial role in this transformation - not only by controlling performance at the machine level, but by feeding valuable insights into broader decision-making systems.

For instance, by analysing product weight data over time, manufacturers can identify if certain products are consistently on the edge of acceptable weight limits. By making small adjustments to upstream processes, such as the filling or packaging stages, manufacturers can further reduce the likelihood of underfilled or overfilled products. This fine-tuning improves both material efficiency and compliance with weight regulations.

Data insights also provide a basis for long-term improvements. By reviewing historical performance metrics, manufacturers can predict future waste levels and adjust to optimise resource use, meaning that their operations remain as efficient as possible over time.

Other Waste-Reducing Technologies

While checkweighing plays a critical role in waste reduction, it's not the only technology available to manufacturers looking to reduce waste. A holistic approach, combining checkweighing with other product inspection systems, further enhances a manufacturer's ability to reduce waste at every stage of the production line.

Metal Detection: Metal detection systems are essential for identifying metal contaminants in food products. By removing contaminated items before they are further processed or packaged, manufacturers can save both material and labour costs. Metal detection systems are particularly useful when installed at the beginning of the production line to inspect raw materials, stopping contamination before it progresses through the entire process.

X-ray Inspection: X-ray inspection systems complement metal detection by identifying a wide range of contaminants such as metal, glass, stones, bones and certain plastics. In addition to detecting foreign materials, x-ray systems also verify product integrity, checking fill levels, component counts and detecting product trapped in seals. This multi-functional capability helps reduce waste not only from contaminants but also from packaging errors. By catching these issues before products reach the end of the line, x-ray inspection helps prevent costly recalls or the reworking of entire batches.

Vision Inspection: Vision systems are there to help make sure products are properly packaged and labelled, verifying that each package contains the correct number of components and that labels are applied accurately. Packaging errors can lead to recalls or the need for reworking, both of which generate waste. By catching these errors early, vision inspection systems help reduce the likelihood of packaging waste.

Data Management Systems: Integrating checkweighing and other product inspection systems with data management software, such as ProdX™ from Mettler-Toledo, allows manufacturers to monitor all inspection activities in real time. This software tracks everything from contaminant detection to weight compliance, providing a complete overview of the production line. By analysing this data, manufacturers can continuously refine their processes, identify waste reduction opportunities, and improve traceability across their operations.

Conclusion

Reducing waste in food manufacturing is not a single-step process - it involves multiple layers of technology working together to optimise production efficiency. Advanced intelligent checkweighing systems, with their high-speed capabilities and automated feedback loops, supported by preventive maintenance programmes, play a crucial role in driving accurate weighing and waste reduction.

When these checkweighers are integrated with other inspection systems, such as metal detection, x-ray and vision inspection technologies, manufacturers can create a comprehensive waste reduction strategy. By embracing Intelligent Weighing Automation and integrating these technologies as part of a connected strategy, manufacturers can reduce waste, improve efficiency and strengthen their digital maturity journey.

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 METTLER TOLEDO COMBINATION OF CHECKWEIGHING AND METAL DETECTION SYSTEM.



 FRANK BORRMANN, MARKET MANAGER FOR THE STRATEGIC BUSINESS UNIT CHECKWEIGHING & VISION, METTLER-TOLEDO GARVENS GMBH.

 AUTHOR: FRANK BORRMANN

 EDITOR: SBR

 IMAGES: METTLER TOLEDO

PFAS-FREE COATINGS

Fraunhofer ILT Develops Laser-Based Manufacturing Processes for Industrial Functional Coatings



AS PART OF THE RePEEK PROJECT, DR. SAMUEL MORITZ FINK (RIGHT) IS WORKING WITH REBAR HAMA-SALEH ABDULLAH (LEFT) AND JULIUS FUNKE (CENTER) TO DEVELOP A NOVEL LASER-BASED METHOD FOR APPLYING PEEK TO METAL COMPONENTS.

Fraunhofer ILT is developing laser-based manufacturing processes for applying PFAS-free functional coatings to metal components, plain bearings, and elastomer rollers. The RePEEK, EPOS, LEMBAS, and pureWaterSeal projects demonstrate that replacing “forever chemicals” requires more than suitable substitute materials. Equally important are the manufacturing processes used to apply them.

Per- and polyfluorinated alkyl substances, PFAS for short, are virtually unbeatable in terms of functionality: They are extremely resistant to both chemicals and heat, and that is precisely why they are facing regulatory pressure. Yet replacing them is far from straightforward. PFAS reduce friction, protect components against wear and corrosion, prevent material build-up, and maintain emergency running properties when lubricating films fail. For these reasons, any alternative requires not only a new material but also a reliable way of applying that material to a wide variety of components.

Through the RePEEK, EPOS, LEMBAS, and pureWaterSeal projects, Fraunhofer ILT is developing laser-based processes for applying PFAS-free high-performance coatings on large metal components, plain bearings, seals, and sensitive elastomer rollers. Depending on the application, the laser can deposit coating materials, melt them locally, or selectively structure the surface. Because it delivers energy precisely where it is needed,

ded, and only for a short time, the laser enables engineers to process PFAS-free substitute materials that would otherwise require energy-intensive furnace treatments or temperatures that could damage the underlying component.

The material alone does not solve the problem

"At first glance, replacing PFAS seems straightforward: Eliminate one problematic material and replace it with another," says Dr. Samuel Moritz Fink, Head of the Thin Film Processing Group at Fraunhofer ILT. "In practice, however, the challenge is much more complex. PFAS-containing materials are often used precisely where components experience the highest mechanical loads."

Alternative materials must adhere reliably to metal, plastics, or rubber, withstand high temperatures, remain firmly bonded under load, and still be applied economically—even to very large components. "Polyetheretherketone, or PEEK, is a highly attractive material from both a chemical and a mechanical perspective," Fink explains. "However, it does not automatically match every property of PTFE (polytetrafluoroethylene). PEEK is stiffer, more expensive, and, depending on the application, more difficult to process. For many industrial components, selecting a different powder, film, or polymer is therefore only part of the solution."

The real challenge lies in the manufacturing process. How is the replacement material applied to the surface? How does it bond to the component? And how can engineers prevent heat-sensitive substrates from being damaged during processing?

"We do not see PFAS alternatives simply as a materials issue," says Dr. Christian Vedder, Head of the Surface Technology and Ablation Department at Fraunhofer ILT. "Our research focuses on laser-based manufacturing processes that allow us to build innovative coating systems selectively." These laser processes address precisely those areas where substitute materials alone cannot yet deliver the required performance. They structure surfaces, improve adhesion between the coating and the component, and locally modify coating systems without unnecessarily heating the entire part.

RePEEK: PEEK coatings using a hybrid process

In the RePEEK project, the surface engineering team is investigating how PEEK-based coatings can be applied to metal components used in heavily loaded, moving systems. They are focusing on applications in mechanical engineering, including large plain bearings, seals, pistons, and solenoid valves.

Large plain bearings used in wind turbines provide a particularly clear example of the challenge. A shaft rotates within a coated bearing shell, which is currently protected in most cases by PTFE-based coating systems. As its name suggests, RePEEK replaces PTFE with PEEK.

"Today, PEEK is often applied to large components either as a film or as a powder that is subsequently bonded by heat," says Samuel Fink. "That approach can work well for small components. With metal parts weighing several tons, however, it becomes far more complicated. The entire component has to be heated in a furnace to a high temperature and then cooled down slowly." The process consumes large amounts of energy, takes considerable time, and heats far more material than is actually required for the coating itself.

The researchers first use a laser-based deposition process to create a metallic surface layer. This deliberately rough surface provides mechanical anchoring for the polymer. They then apply PEEK powder within the same process environment and melt it locally with the laser. The polymer becomes anchored in the rough metallic surface, creating a composite coating consisting of a metallic functional layer and a PEEK-based topcoat.

The team has developed a specially designed nozzle for the PEEK powder and has already filed a patent application for the process. The cyclone nozzle greatly reduces the gas flow, allowing the powder to reach the surface at a much lower velocity instead of bouncing off it. As a result, the process uses more of the applied powder efficiently and is easier to control.

EPOS: Multilayer PEEK coatings for large plain bearings

Building on the RePEEK project, Delil Idris Demir at Fraunhofer ILT is investigating how PEEK-based coatings can be deposited reliably onto large plain-bearing components in multiple layers. Applying the coating step by step makes it possible to build up greater coating thicknesses without having to heat components weighing several tons entirely in a furnace. ACS Coating Systems contributes its extensive experience in PEEK coatings, particularly for plain-bearing applications. The company has been developing these coating systems since the mid-1990s and now produces coatings ranging in thickness from just a few micrometers to one millimeter. Managing Director Dr. Christoph Stecher is supporting the project by providing his expertise in coating design, industrial-scale application, and the transition to full-scale manufacturing.

Polymer Service GmbH Merseburg (PSM), led by Dr. Katrin Reincke, tests and evaluates the resulting coating systems. Their work focuses on the crystallinity, microstructure, and thermal condition of the PEEK layer, as well as its mechanical and thermomechanical properties. These data will help optimize both the laser process and the multilayer coating strategy so that the coating bonds uniformly to the substrate and withstands the long-term mechanical stresses encountered in plain bearings. EPOS therefore brings together Fraunhofer ILT's expertise in laser-based process development, ACS's industrial experience in coating technology, and PSM's materials science expertise.

LEMBAS: Non-stick coatings for sensitive elastomer rollers

The LEMBAS project focuses on elastomer rollers used in film manufacturing, the packaging industry, paper production, and medical technology. In these applications, even small particles released from the roller surface can quickly become a problem.

"Silicone coatings are still widely used for these applications," explains Adam El-Sarout, also a member of the Thin Film Processing Group at Fraunhofer ILT. "While they provide the required non-stick properties, they do not always offer the durability demanded by today's high-speed manufacturing processes." Together with the coating specialist Rhenotherm, the LEMBAS team is developing laser-based manufacturing processes that use high-performance polymers such as PEEK, polyamide, and polypropylene. Compared with silicone, these materials offer greater resistance to wear, improved chemical stability, and a longer service life, all without the use of PFAS.

"The real challenge is the processing window," says El-Sarout. "High-performance polymers require high melting temperatures, but elastomers such as EPDM can tolerate only limited heat. Heating an entire rubber roller in a furnace would damage the substrate." The laser solves precisely this problem by generating high temperatures only where they are needed and only for a very short time within the coating material. The functional layer melts, while the elastomer component beneath it remains largely protected from thermal damage.

To ensure long-term adhesion, the researchers are developing not only the non-stick coating itself but also an intermediate layer that protects the elastomer and strengthens the bond to the functional topcoat. They are also tailoring the optical and rheological properties of the materials to the laser process while investigating suitable coating and laser pre-treatment methods.

"A replacement material must do more than provide the required functionality," says Vedder. "It also has to be compatible with the component, the substrate's temperature limits, and the manufacturing process." If that step succeeds, the process offers several advantages: reduced wear, fewer product contaminants, less cleaning and lower solvent consumption, and significantly lower energy requirements than conventional furnace-based processes.

PureWaterSeal: PFAS-free seals for water-based lubricants

In the pureWaterSeal project, researchers at the Fraunhofer Institutes for Laser Technology ILT and for Mechanics of Materials IWM are developing sustainable seals that eliminate the need for PFAS and operate with

water-based lubricants. The project addresses two environmental challenges at the same time: PFAS persist in the environment indefinitely, while oil-based lubricants contaminate soil and water.

"Around one million tons of oil-based lubricants are consumed in Germany every year," says Matthias Laermann, Head of the Surface Structuring Team at Fraunhofer ILT. "Just one liter of oil can contaminate up to one million liters of groundwater. The consequences include polluted soils, contaminated food supplies, and damaged ecosystems. We are developing solutions that address both challenges simultaneously."

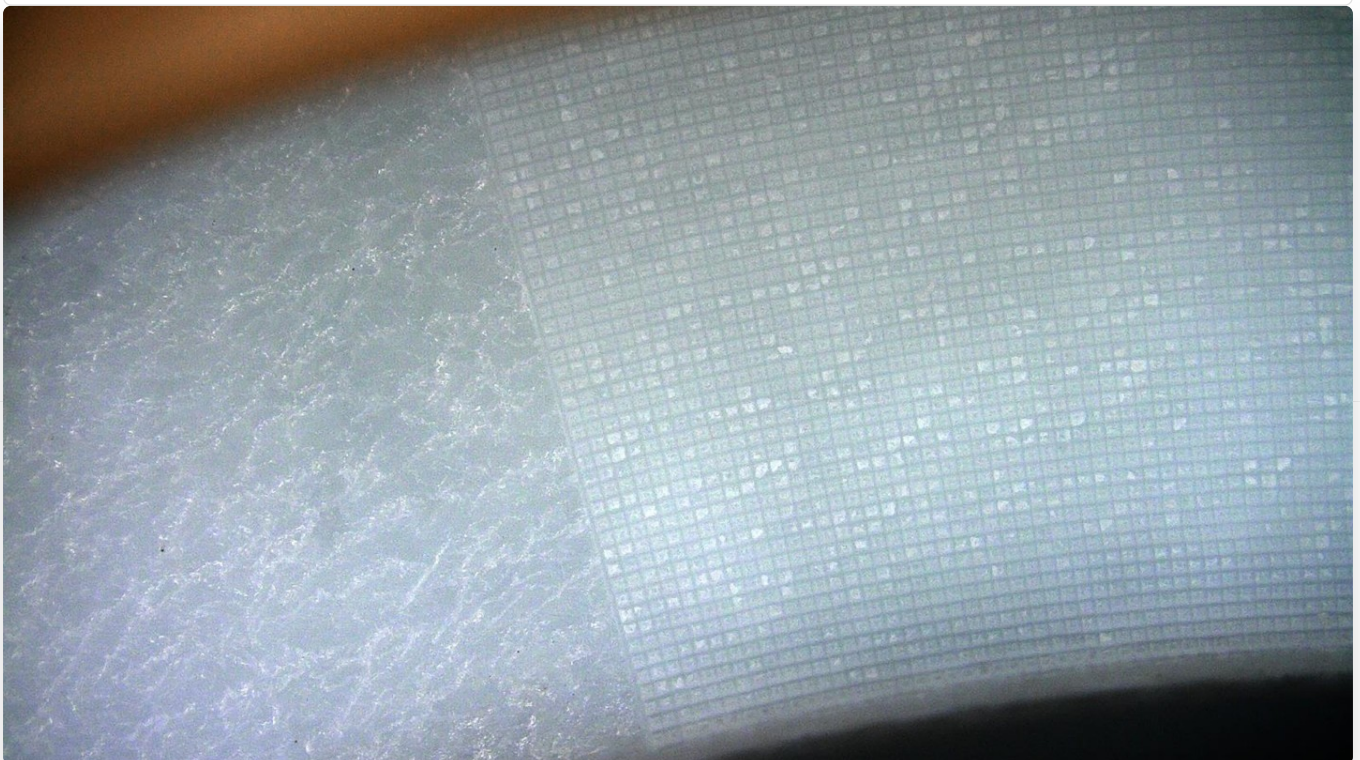
Researchers at Fraunhofer IWM have developed diamond-like carbon (DLC) coatings specifically for PFAS-free polymer components. The Fraunhofer ILT team then used a laser to structure the coating, locally relieving internal stresses and mechanical loads without compromising the stability of the coating as a whole. At the same time, the combination of the coating and laser structuring reduces friction, improves wear resistance, and extends the service life of the seals.

The first prototypes are already operating in pumps used at geothermal power plants. Together with industrial partners, the researchers are now adapting the seals for additional applications, including passenger vehicles, ship propellers, wind turbines, and agricultural machinery. At the same time, the team is preparing to scale up the technology for larger systems and industrial production.

The laser makes the material transition practical

The various projects at Fraunhofer ILT demonstrate that replacing PFAS involves more than simply substituting one material for another. It also requires manufacturing and surface engineering processes capable of applying those new materials reliably. Here, the laser plays a key role. It deposits materials locally, melts them precisely where needed, or structures functional coatings without placing unnecessary thermal stress on the underlying component.

This gives industry greater flexibility. They do not have to wait for a single replacement that can address every PFAS application. Together with industry partners, Fraunhofer ILT is developing customized coating systems for various components and requirements: low-friction surfaces for plain bearings, wear-resistant release coatings for rollers, and PFAS-free sealing systems for water-based lubricants.



 THE PFAS-FREE DIAMOND-LIKE CARBON (DLC) COATING IS SELECTIVELY MODIFIED BY LASER-BASED MICROSTRUCTURING. THE STRUCTU-

RED SURFACE (RIGHT) RELIEVES INTERNAL STRESSES AND ENABLES THE USE OF WATER-BASED LUBRICANTS.

 EDITOR: SBR

 IMAGES: FRAUNHOFER ILT, AACHEN, GERMANY / RALF BAUMGARTEN

All-Time Highs Across the Board



 "AN ENGAGED GROUP OF INVESTMENT-READY VISITORS AND SATISFIED EXHIBITORS HAVE YIELDED AN EXCEPTIONAL OVERALL OUTCOME FOR LogiMAT 2026."

LogiMAT 2026 wraps up on a high note, drawing a record number of exhibitors and visitors, filling a bigger-than-ever exhibit space, and offering an unprecedented international profile. The volume of contracts signed and orders placed further strengthen LogiMAT's brand as the industry's signature event where professionals come together to do business.

LogiMAT 2026, the International Trade Show for Intralogistics Solutions and Process Management, draws to a close after three days, hitting new all-time highs across all key performance indicators. "Given the challenging economic conditions around the world, we didn't dare hope that LogiMAT 2026 would scale new heights across the board," concedes LogiMAT Exhibition Director Michael Ruchty from Munich-based event organizer EUROEXPO. "It seems that the market has come to realize the wisdom of investing countercyclically during times of crisis, and LogiMAT has always offered a comprehensive overview of the latest innovations and state-of-the-art solutions."

"PASSION FOR DETAILS – Discover the Difference" was the theme that drew a record 1,671 exhibitors from 46

countries, including 296 presenting at LogiMAT for the first time. Together, they transformed 68,969 square meters of net exhibit space across ten fully-booked exhibit halls at the Messe Stuttgart convention center into a platform for the latest innovations in efficient intralogistics. Even before the doors opened, exhibitors had already announced over 120 global or European product debuts. The percentage of exhibitors who came from outside Germany climbed to 37% (from 35.9% last year), of which one in five came from Asia or elsewhere overseas. LogiMAT 2026 attracted a total of 69,856 visitors over three days, up 4,137 from last year and well above the previous high-water mark of 67,420 from 2024. In a difficult macroeconomic and geopolitical environment, this year's LogiMAT proved once again to be the pivotal international industry event of the year. "LogiMAT serves as a networking hub, information platform, and showcase for both the industry and working professionals," explains Exhibition Director Michael Ruchty. "Given the show's status as a bellwether of trends and the industry as a whole, these new record figures serve as a testament to the industry's resilience and a vote of confidence in difficult times."

The leading product groups this year, based on exhibitor responses with multiple responses allowed, came from the industry segments of material handling and warehousing technology (38.2%); software for simulation, warehousing systems, and inventory management (37.1%); industrial trucks and accessories (34.8%); information and communications technology (30.2%); and automated guided vehicles and autonomous mobile robots (28.2%).

An analysis conducted by independent market research institute Wissler & Partner from Basel found that more than half of visiting professionals (56%) had decision-making authority in their companies, and 35.9% came to Stuttgart with specific investment projects in mind. A total of 25.3% of visitors reported awarding a contract during the show or planned to do so immediately after the event. As a result, many exhibitors reported new sales in Stuttgart. Sensor manufacturer Sonair from Norway, for example – a winner of this year's LogiMAT BEST PRODUCT award – announced a deal for the first deployment of its innovative new ADAR (acoustic detection and ranging) sensor in a ready-to-ship autonomous robot. Wiferion announced an agreement with SEER Robotics of China to provide inductive charging technology for robots. The Brabender Group and the software provider PTV Logistics signed a partnership agreement. The Dutch systems integrator Syncore and the Stuttgart-based AI robotics company Sereact have agreed to roll out 100 AI-controlled robotic systems. "LogiMAT is not just a platform for showcasing innovations and state-of-the-art solutions, it's also a working trade show where professionals come to forge business partnerships and strategic alliances," remarks Exhibition Director Ruchty.

Broken down by sector, 55.2% of visitors work in the manufacturing sector and 14.2% in wholesale and retail. Most visitors (42%) traveled over 300 km to attend LogiMAT 2026, with over one in four (26.7%) coming from abroad – an increase in foreign participation of 3.6% that underscores the growing international character of LogiMAT attendees.

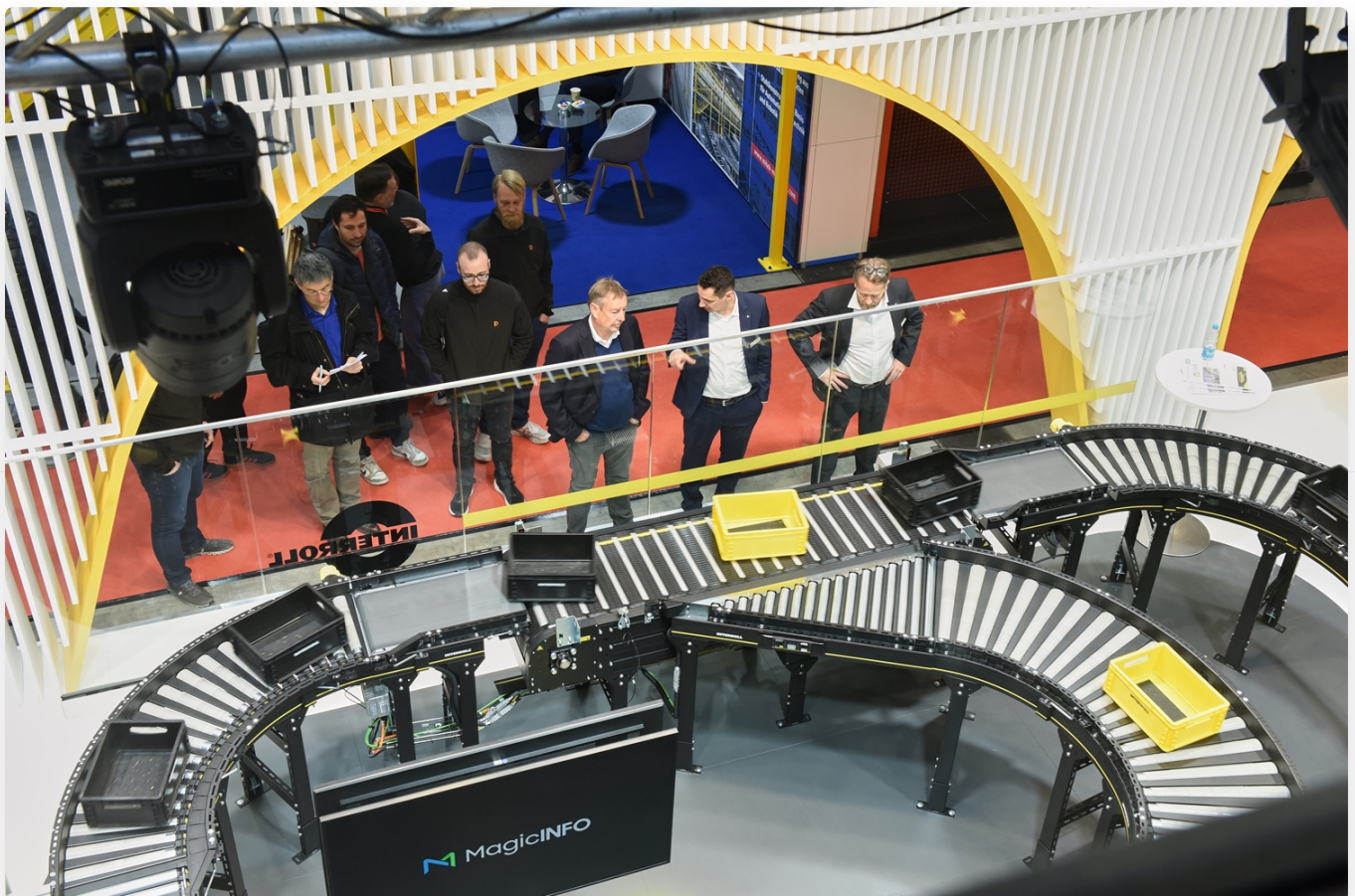
LogiMAT emerged as a trendsetter this year by incorporating the topic of "humanoid robotics" at an early stage. Several exhibitors showed off their initial developments not only as eye-catchers but also in intralogistics settings, and Fraunhofer IML even presented a recent study on humanoid robotics at LogiMAT. The topic was also featured in the accompanying program of events, which was expanded to incorporate a second LogiMAT Arena in the ICS hall. Organizers also succeeded in addressing the shortage of skilled workers with three targeted programs: The Young Innovators initiative, the introduction and pitches of the finalists in the Startup Competition, and the LogiMAT CareerDay on the final day all shined a spotlight on emerging startups, bold innovators, and intralogistics specialists. To complement the successful CareerDay, which aimed to enhance the image of intralogistics and attract young talent and people entering the industry from other career fields, a study on the world of (intra)logistics careers commissioned by LogiMAT and Die Wirtschaftsmacher was also published. Its results highlight how "intralogistics made in Germany" can drive success and boost exports.

"An engaged group of investment-ready visitors and satisfied exhibitors have yielded an exceptional overall outcome for LogiMAT 2026," concludes Exhibition Director Michael Ruchty. "This serves as an incentive for the entire EUROEXPO team to build on the factors that have fueled this success so that we can return next

year with another innovative event for the industry."



📸 EVEN BEFORE THE DOORS OPENED, EXHIBITORS HAD ALREADY ANNOUNCED OVER 120 GLOBAL OR EUROPEAN PRODUCT DEBUTS.



📸 "PASSION FOR DETAILS – DISCOVER THE DIFFERENCE" WAS THE THEME THAT DREW A RECORD 1,671 EXHIBITORS FROM 46 COUN-

TRIES, INCLUDING 296 PRESENTING AT LOGIMAT FOR THE FIRST TIME.



 AN ANALYSIS CONDUCTED BY INDEPENDENT MARKET RESEARCH INSTITUTE WISSLER & PARTNER FROM BASEL FOUND THAT MORE THAN HALF OF VISITING PROFESSIONALS (56%) HAD DECISION-MAKING AUTHORITY IN THEIR COMPANIES.



 LOGIMAT EMERGED AS A TRENDSETTER THIS YEAR BY INCORPORATING THE TOPIC OF "HUMANOID ROBOTICS" AT AN EARLY STAGE.

 EDITOR: SBR

 IMAGES: EUROEXPO GMBH

Leaders Should Also be Emotional Managers



 MANAGERS SHOULD DEVELOP A HIGH DEGREE OF SENSITIVITY TO THEIR OWN EMOTIONAL WELL-BEING.

Leaders must be able to manage their emotions and behavior to avoid personal burnout and to ensure their actions remain predictable and fair to their employees.

Companies are social systems. This means they employ many people who are connected through numerous communication and working relationships. Therefore, emotions play a crucial role in everyday work. They influence the work environment and employee motivation, and thus the quality and effectiveness of collaboration. Numerous studies confirm this.

But is it even acceptable to show emotions in the workplace? Or do companies expect their key personnel, such as managers and project leaders, to be more like:

- thick-skinned,
- seemingly endlessly resilient,
- always radiating good humor and confidence?

Emotions always play a role in human interaction

Undoubtedly, it's important that a positive atmosphere prevails in daily interactions and that people treat each other with appreciation and mutual respect. Only then will employees identify with their work and their employer in the long term, remain motivated, and present themselves convincingly to the outside world – for example, in customer interactions.

But what does a "good atmosphere" or work environment depend on? Naturally, external factors play a role; for example, whether a company is doing well financially or is under immense pressure to change. However, the behavior of managers is even more crucial. Through their decisions and actions, they largely shape the daily work experience of their employees. Therefore, leaders should be able to manage their emotions—in a way that still allows them to appear authentic to others. A forced smile is quickly exposed as insincere. It breeds mistrust rather than closeness and often achieves the opposite of what was intended.

Hard to believe: Leaders have emotions too

A key prerequisite for managing one's emotions is for leaders to first accept that we, too, are human beings with desires, needs, fears, likes, and dislikes.

This sounds obvious, but it isn't. Many leaders have internalized the self-image of "I always act and decide rationally." Furthermore, many are convinced that as a leader, you sometimes have to grit your teeth and hide your feelings. For example, when delivering unpleasant news to employees. Some leaders act like robots in such situations: They deliver facts without showing any emotion—for example, out of fear of appearing weak or getting drawn into lengthy discussions.

The result: Employees no longer perceive their leader as a human being with empathy. This strains their relationship with their manager, ultimately impacting their work motivation and engagement. Countless studies confirm that employees are more committed to their work the more they identify with their immediate supervisors (and colleagues). When the relationship is positive, they feel comfortable within the company and are more dedicated to its success.

Goal: To be fair and predictable

A prerequisite for this is that employees perceive their manager not just as a "machine" stoically fulfilling their function, but also as a person who listens to them, shows understanding, and—like everyone else—has good days and bad days. Therefore, managers should certainly display emotions in their daily interactions with their employees. However, it is crucial that they do so consciously and thoughtfully.

To achieve this, managers must first understand their own emotional reactions. Furthermore, they should know what triggers certain reactions in them. For example:

- I'm reacting irritably now because I'm under time pressure.
- I'm avoiding the issue now because I want to avoid conflict.
- I'm reacting angrily now because another situation upset me earlier.

Without this self-reflection, there's a risk that managers will react unfairly to their employees.

Showing emotions doesn't mean letting them run wild. A manager can certainly express frustration—as long as they do so in a controlled manner and are aware of the impact. Especially in challenging times, even controlled expressions of negative feelings can be a way to build rapport, foster understanding, and get employees on board. For example, when managers articulate their frustration that economic downturns, technological changes, and geopolitical tensions repeatedly disrupt their plans. Or that they themselves only have limited knowledge of what the medium- and long-term future holds.

Managers should therefore accept that their behavior is also subject to emotional fluctuations. While they may react calmly at times, the same situations can irritate them more on other days—for instance, because they are under stress or haven't slept enough.

Maintaining Emotional Balance

To a certain extent, employees consider such fluctuations normal and understandable – especially if they know and understand the reasons behind them. After all, they want to experience their manager as a person.

However, it becomes problematic when emotional fluctuations or outbursts become unpredictable. Then, the manager's behavior is often perceived as unfair or inappropriate. As a result, employees emotionally distance themselves from their manager – partly because they no longer know how to behave to avoid outbursts of anger or harsh criticism.

Therefore, managers should ensure that their emotional balance is largely maintained. To achieve this, they must be aware that their behavior at work is also influenced by their overall life satisfaction.

According to Nossrath Peseschkian's life balance model, four distinct areas can be identified in our lives. In addition to the area of "work/career," there are the areas of "meaning/culture," "body/health," and "family/relationships."

These areas are interconnected. For example, someone who consistently overemphasizes the area of "work/career" will, in the long run, lose joy in life and often also performance.

Because:

- Someone who is ill can neither enjoy life nor perform at their best.
- Someone who feels lonely is neither blissfully happy nor able to dedicate their full energy to their job.
- And someone experiencing a crisis of meaning is neither joyful nor fully productive. Because behind everything they do lies the question: What is the point of it all?

Therefore, leaders should ensure they maintain a balance between these four areas of life, also to prevent emotional impulsive reactions.

This is why leaders should strive to maintain a balance between these four areas of life, also to prevent impulsive emotional reactions.

Ensuring the Necessary Balance

In a work environment characterized by rapid change and decreasing predictability, high performers in companies, in particular, are usually unable to maintain this balance day after day, week after week, and month after month. Managers, for example, repeatedly experience periods of particularly high stress – such as when:

- projects must be completed under intense time pressure,
- the order volume is very high but staffing is limited, or
- the company is undergoing a strategic shift.

Especially during such phases, when they are particularly dependent on the support of their employees, managers sometimes react irritably or unfairly – because they themselves are operating at their limits. The result: employees withdraw and refuse to support their manager.

Therefore, managers should carefully observe their own behavior, especially during stressful periods, to avoid overreacting from an employee's perspective. They can only achieve this if they maintain a certain inner calm and know what helps them in stressful situations – and what doesn't.

Goal: Becoming a Manager of Your Own Emotions

Peseschkian's life balance model can be a helpful tool in this regard. Because the four areas of life are interconnected, managers under high professional pressure can compensate for this, at least temporarily, by ad-

opting appropriate balancing behaviors in other areas. For example, someone under significant pressure at work should ensure that personal problems don't further drain their energy. Otherwise, they can quickly become overwhelmed. It's equally important to consciously prioritize relaxation – for instance, through sports or other activities that help reduce stress and create distance.

Managers should therefore develop a high degree of sensitivity to their own emotional well-being. They should, in a sense, become managers of their own feelings. This is not only crucial for avoiding burnout or health problems in the long term. It's also essential for them to remain predictable, stable, and thus trustworthy leaders for their employees, even in difficult times – leaders whom their employees will (albeit sometimes reluctantly) follow willingly.

About the Author

Sabine Machwörth is the managing partner of the management consultancy Machwörth Team International (MTI Consultancy), Visselhövede (Germany), which supports companies worldwide in areas such as leadership development, team development, and change management.

www.mticonsultancy.com



 SABINE MACHWÜRTH, MANAGING PARTNER OF THE MANAGEMENT CONSULTANCY MACHWÜRTH TEAM INTERNATIONAL.

 AUTHOR: SABINE MACHWÜRTH

 EDITOR: SBR

 ABBILDUNGEN: ADOBE STOCK / DRAZEN [1]; SABINE MACHWÜRTH [2]

 NEW EUROPEAN STUDY

Consumers are Actively Separating Bag-in-Box Packaging for Recycling



 CONSUMERS ACROSS EUROPE ARE ACTIVELY SEPARATING BAG-IN-BOX PACKAGING COMPONENTS FOR RECYCLING.

Consumers across Europe are actively separating [Bag-in-Box packaging](#) components for recycling, according to a new study conducted in Belgium, France, Germany and Sweden by Smurfit Westrock Bag-in-Box. The findings suggest that consumers are already adopting key behaviours needed to support more circular packaging systems.

The study examined whether consumers separate the plastic bag from the cardboard box after use, an important step in ensuring that packaging materials can be directed into the most appropriate recycling streams. Across all four countries, the majority of consumers follow proper recycling practices by separating the different packaging components before disposal.

The findings come as Europe prepares for the implementation of the Packaging and Packaging Waste Regulation (PPWR), which is expected to place increased focus on packaging recyclability, resource efficiency and circularity. The results suggest consumers are increasingly willing to engage with recycling systems when packaging is designed to be intuitive and easy to sort.

The research also points to significant differences between countries, reflecting variations in waste collection systems, recycling policies, consumer education and local sorting guidance. These factors are likely to play

an important role in determining how effectively packaging materials are recovered and recycled.

"Understanding how consumers interact with packaging after use is essential," said Massimiliano Bianchi, CEO of Smurfit Westrock Bag-in-Box. "The study confirms that Bag-in-Box users are generally adopting the right recycling habits, while also showing where additional education and communication can further improve performance."

The study's findings highlight the increasingly important role consumers play in helping to improve packaging circularity and suggest that clear recycling guidance, combined with packaging designed for easy sorting, can support higher recovery rates across Europe.

More Information

[This video](#) provides a deeper look at study's findings, the differences observed between countries and information on how local recycling policies, consumer education initiatives and ongoing packaging innovations can help improve separation rates even further.

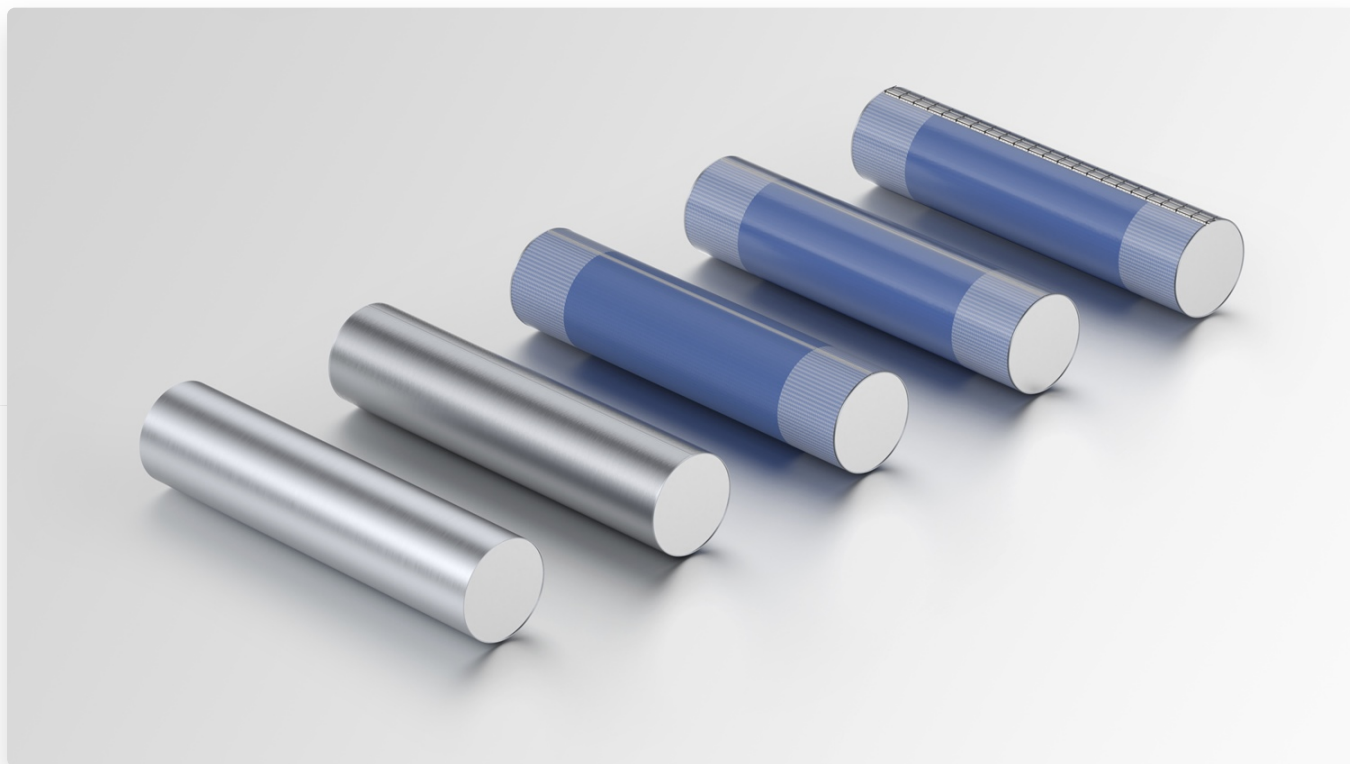
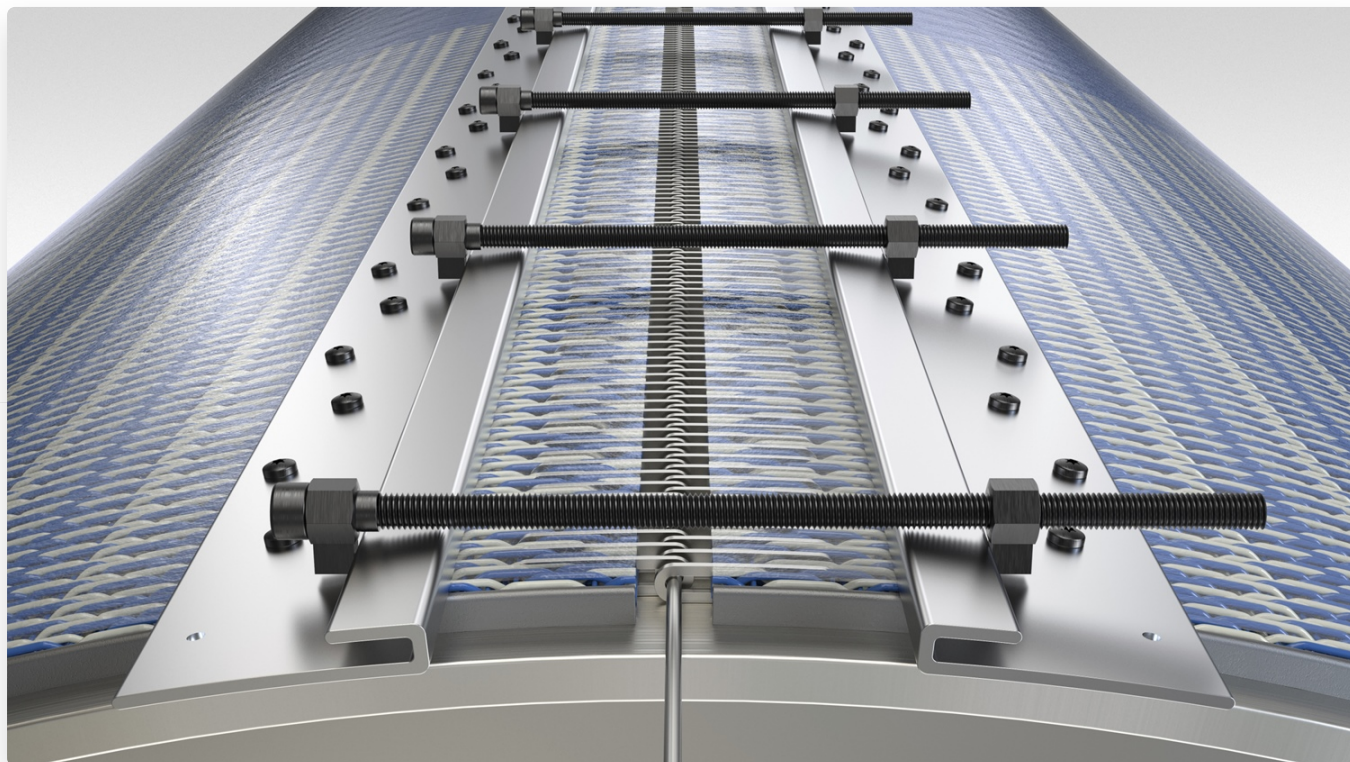


 THE RESEARCH ALSO POINTS TO SIGNIFICANT DIFFERENCES BETWEEN COUNTRIES, REFLECTING VARIATIONS IN WASTE COLLECTION SYSTEMS.

 EDITOR: SBR

 IMAGES: SMURFIT WESTROCK

 PARTNERSHIP



 ULMEX AND GKD HAVE BEEN WORKING HAND IN HAND SINCE THE BEGINNING OF 2026.

GKD Strengthens Corrugated Board Market in Italy with Ulmex

GKD – Gebr. Kufferath AG and Ulmex Industrie System GmbH & Co. KG announce the launch of a long-term partnership for the Italian corrugated board market. Starting in 2026, Ulmex and GKD will work hand in hand on the sales and associated technical service for the GKD Bluebacker heating belt and Bluebacker Eco Grip SC drum coverings. The collaboration aims to expand both companies' market presence in the corrugated board industry, ensure rapid response times, eliminate language barriers, and further strengthen on-site customer support.

Focus on Strategic Reasons and Synergies

The partnership was established to meet the corrugated board industry's demands for reliable on-site service, technical consulting, and rapid availability. By pooling their expertise, GKD and Ulmex are creating a high-performance sales and service unit in Italy that stands out thanks to short lines of communication, deep industry knowledge, and fast response times.

Ulmex is an established, respected company with extensive market access and a long-standing presence in the Italian corrugated board industry. By leveraging Ulmex's expanded sales network and locally rooted service infrastructure—as well as its ample team of technicians and sales staff—GKD is further increasing its sales and service capacity. At the same time, customers benefit from reduced operational risks, as service interventions can now be carried out much more quickly and comprehensively.

Shared Goals and Expected Outcomes

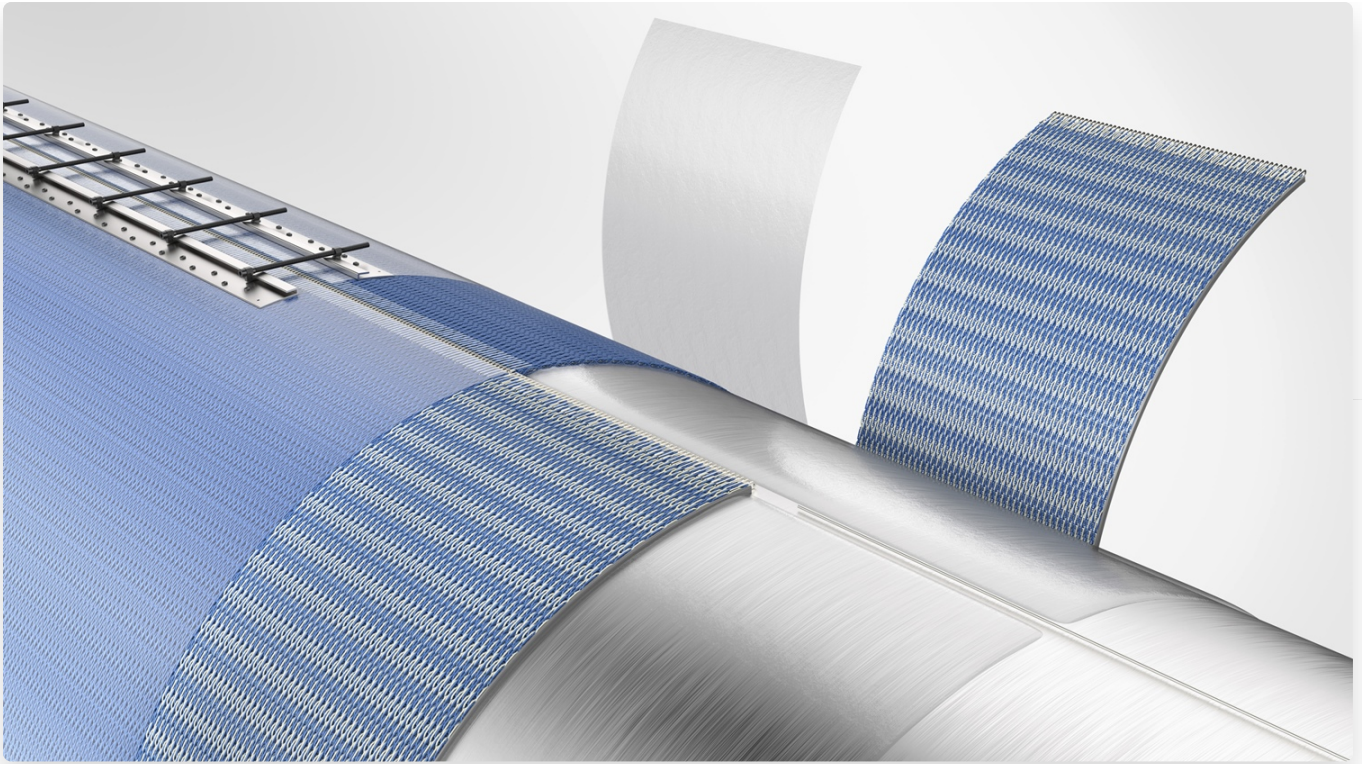
Through this partnership, both companies aim to expand their market share, foster sustainable growth, and enhance customer value. In both the short and long term, GKD and Ulmex anticipate:

- Synergies resulting from complementary product portfolios
- Increased sales and service capacity
- Technical advancements driven by joint innovation initiatives

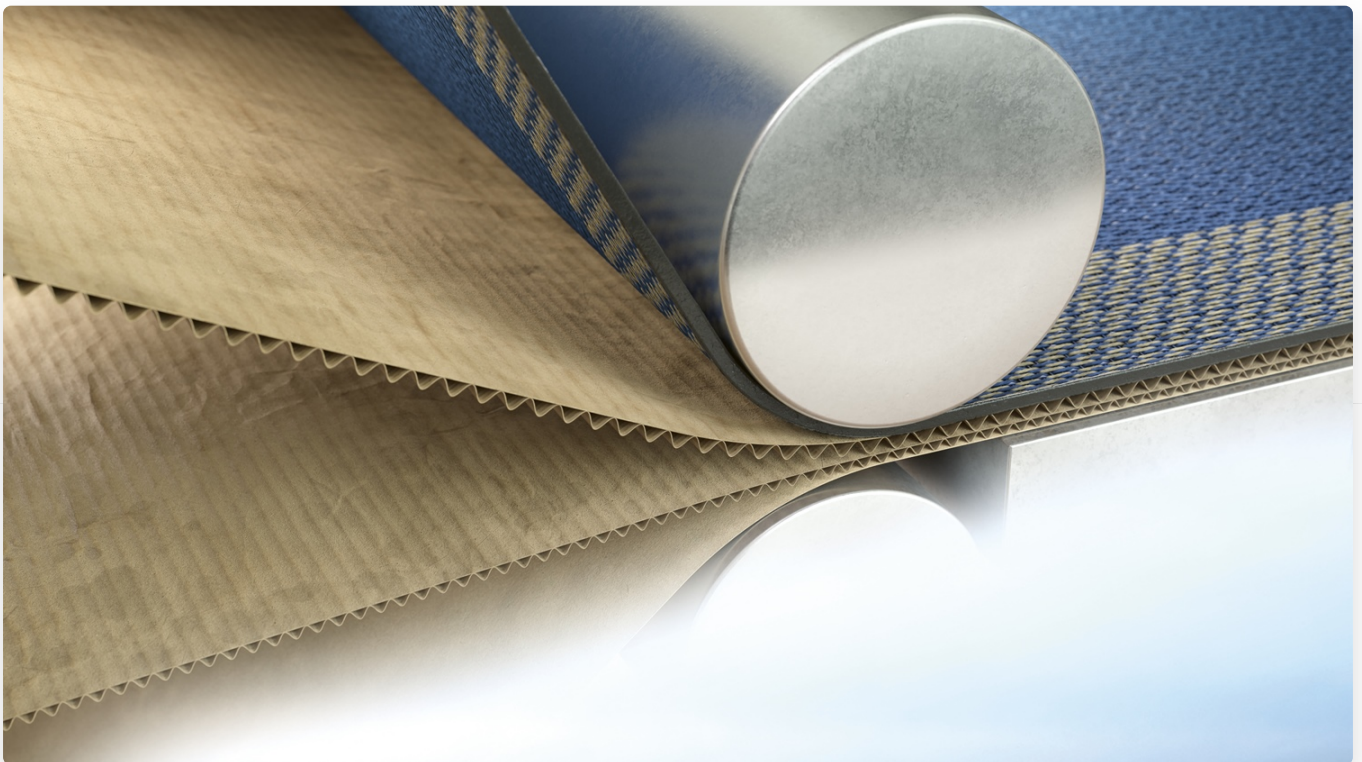
"In Ulmex, we have gained a highly renowned and experienced partner that knows the Italian market like few others. As a manufacturer of machinery and systems, the company is accustomed to providing expert advice on technical solutions and possesses a comprehensive understanding of the requirements involved in technical sales and service," says Dominik Braun, Key Market Manager for Corrugated Board & Pulp for Paper at GKD. "Our Bluebacker product portfolio is a technological leader. Through this new partnership, we ensure that customers in Italy benefit not only from the quality of our solutions but also from first-class on-site service."

"Collaborating with GKD is a significant step for us in further expanding our portfolio of high-quality industrial components," adds Angelo Maggi, Managing Director of Ulmex. "The Bluebacker and Eco grip SC coverings are pioneering products for corrugated board production. We look forward to further establishing their benefits across the Italian market in partnership with GKD."

* * * * *



 THE COLLABORATION COVERS THE SALES AND TECHNICAL SERVICE OF THE GKD BLUEBACKER HEATING BELT AND BLUEBACKER ECO GRIP SC DRUM LAGGING.



 THE COOPERATION AIMS TO EXPAND BOTH COMPANIES' MARKET PRESENCE IN THE CORRUGATED BOARD INDUSTRY.



 "THE BLUEBACKER AND ECO GRIP SC COVERINGS ARE PIONEERING PRODUCTS FOR CORRUGATED BOARD PRODUCTION."

 EDITOR: SBR

 IMAGES: GKD – GEBR. KUFFERATH AG

 EUROSAC CONGRESS 2026

Turning regulation into opportunities



 A HIGHLIGHT OF THE CONGRESS WAS THE EUROSAC GRAND PRIX AWARD, WHICH RECOGNISES OUTSTANDING INNOVATIONS THAT COMBINE PERFORMANCE, SUSTAINABILITY AND CUSTOMER VALUE.

With a record attendance of more than 160 industry experts, the EUROSAC Congress 2026 took place in Bordeaux, France, from 28–30 May. Under the theme “Turning regulation into opportunities”, participants explored how evolving legislation, sustainability requirements and circular economy initiatives can become drivers of innovation, competitiveness and business growth. One of the congress highlights was the EUROSAC Grand Prix Award ceremony, showcasing some of the industry’s most innovative paper-based packaging solutions. Gascogne claimed the Gold Award for SingleLip Paper, while Billerud secured Silver for QuickFill® Plus Xcel. The Bronze Award was presented to dy-pack for handy², and Mondi won the Industry Special Award for Ad/Vantage StretchWrap. The audience’s favourite was DosePack, another Gascogne innovation, which received the Public Choice Award.

“Regulatory, economic and geopolitical developments are creating unprecedented complexity for our industry,” said EUROSAC President Alessandro Selmin at the opening. “In this rapidly changing environment, EUROSAC is the place to be. By connecting industry leaders, sharing knowledge and engaging on key issues at the European level, we help to transform challenges into opportunities. The growing participation in our

Congress and the increasing membership of our association give us every reason to be confident about the future." During the congress, Alessandro Selmin was re-elected President of EUROSAC for another two-year term.

Positive market development continues

The European paper sack market maintained its positive momentum in 2025, with deliveries increasing by 2.7% to reach 5.69 billion units. Growth was primarily driven by building materials (excluding cement) at +2.2%, food products at +5.4% and milk powder at +6.3%. Italy remained the largest market, followed by Germany and Turkey. The first quarter of 2026, however, presented a mixed picture, with overall deliveries declining by 1.4%. Despite this, the building materials segment continued to grow, while milk powder recorded strong increases across all markets, underlining the resilience of these sectors in a challenging economic environment. A similar trend can be observed in the United States, where domestic paper sack shipments grew by 2.2% in 2025, followed by a decline of 3.6% in the first quarter of 2026.

Navigating the regulatory landscape

The congress theme was reflected in discussions on Europe's evolving regulatory framework. Roberta Colotta from Flexible Packaging Europe highlighted how the Packaging and Packaging Waste Regulation (PPWR) is accelerating the transition towards a more circular economy and creating new opportunities for sustainable packaging solutions. Her conclusion: paper sacks are already on a good path to deliver many of the characteristics that the regulation seeks to promote, including recyclability, and the efficient use of resources. While Colotta focused on regulatory developments, Bernard Lombard from CEPI broadened the perspective with insights into the geopolitical and trade developments shaping Europe's pulp and paper value chain. In an increasingly complex global environment with significantly shifting trade flows, he stressed the importance of maintaining a competitive and resilient European industry in a context of fair competition.

Supporting the industry's sustainability journey

Participants also received updates on a range of collaborative initiatives supporting the industry's sustainability ambitions, including the latest LCI and carbon footprint study, the industry's net-zero pathway, the Construction Goes Circular recycling initiative as well as a new carbon footprint calculator. The transition towards a circular economy was further explored by Arne Jost from CEFLEX, who discussed ways to accelerate the transition towards more circular flexible packaging solutions. His key takeaway: circularity starts with design. Combined with advances in recycling technologies and demand for recycled content, sustainable packaging design must continue to gather pace as a cornerstone of the circular economy.

Creating impact with communication

In her particularly lively presentation, communication expert Andrea Vilallonga highlighted that successful communication in business depends not only on what is said, but also on how messages are conveyed and perceived. In times of transformation and increasing stakeholder expectations, effective communication plays a vital role in building trust, driving change and turning ideas into action.

EUROSAC Grand Prix Award 2026

A highlight of the congress was the EUROSAC Grand Prix Award, which recognises outstanding innovations that combine performance, sustainability and customer value. This year, nine entries competed for the prestigious awards. "It is impressive to see the diversity of the submissions, each reflecting different challenges, perspectives and approaches to innovation," said EUROSAC President Alessandro Selmin. "They demonstrate our industry's ability to continuously develop solutions that meet evolving market requirements." Jury president Herbert Rode also praised the high quality, creativity and versatility of the entries, noting that selecting the winners had been a challenging task.

Grand Prix Award winners 2026

The Gold Award went to SingleLip Paper from Gascogne. Developed for the food ingredient and non-food ingredient markets, the innovative packaging solution responds to a growing demand for reduced plastic use without compromising product protection or performance. With a fibre content of 85%, the sack combines a high-performance barrier, a hermetic closure system and compatibility with existing production lines. Recyclable in conventional paper streams and free from PFAS, it offers brands a practical way towards more circular packaging solutions while anticipating future regulatory requirements. The jury was particularly impressed by its reduced plastic dependency and its potential to reclaim applications that had shifted towards alternative packaging in the past.

The Silver Award was presented to Billerud for QuickFill® Plus Xcel, a new generation of sack kraft paper combining ultra-high porosity with exceptional strength. Designed for increasingly fine filling goods such as low-carbon cements, it enables faster filling, cleaner operations and reduced material consumption without compromising performance. Higher productivity, lower packaging weight and reduced product losses contribute to lower costs and carbon emissions across the value chain, while also improving workplace cleanliness. The jury particularly valued how the innovation takes the relationship between porosity and strength to a new level, delivering both economic and environmental benefits.

With handy², dy-pack earned the Bronze Award for rethinking how heavy building materials are handled. The innovative sack concept puts ergonomics at the centre of packaging design. Its novel two-sided carrying handle with integrated folded flap allows heavy loads to be carried more comfortably and with greater control, reducing physical strain and improving workplace safety. At the same time, the design supports lighter sack constructions with lower plastic usage. The jury recognised the solution's potential to address a long-standing challenge in the construction sector by making the handling of heavy products safer and more user-friendly.

Mondi received the Industry Special Award for Ad/Vantage StretchWrap, a paper-based alternative to conventional plastic stretch film for pallet wrapping. Combining high load stability with compatibility for existing wrapping processes, the solution enables companies to significantly reduce their dependence on fossil-based plastics. Recyclable in established paper streams, made from renewable materials and offering a substantially lower carbon footprint than conventional stretch film, it supports companies in advancing their sustainability goals. The jury recognised its considerable potential to replace plastic wrapping not only in the paper sack industry, but across a wide range of industrial applications.

A clear favourite among congress participants, DosePack from Gascogne was voted the winner of the Public Choice Award. While the industry has made major advances in barrier performance, strength and recyclability, DosePack puts the end user at the centre of packaging design. Created for applications such as pet food, animal feed and food ingredients, the innovative paper sack rethinks how products are handled. Its integrated dispensing and dosing system enables cleaner, more intuitive handling while maintaining the high protection standards required for sensitive products.

Other Grand Prix entries

With its Climate-Neutral Sack On-Demand, Advanced Industries Packaging showcased a system for delivering product-specific sustainability documentation, including carbon footprint, life-cycle assessment and environmental product declaration data. Based on recognised standards and independent verification, the concept helps customers navigate increasing regulatory and reporting requirements while ensuring consistency and transparency.

Billerud also highlighted the value of transparency in sustainability reporting by introducing the Sustainability Leading Sack Kraft Paper Portfolio. Combining low fossil carbon emissions with independently verified Environmental Product Declarations (EPDs), the initiative provides customers with reliable data well below the industry average to support procurement decisions, emissions reporting and climate commitments.

1Euro-Sack from dy-pack is a paper-based collection sack designed for environmental clean-up campaigns

and recycling initiatives. Developed as a reusable and recyclable alternative to conventional plastic collection bags, the 1Euro-Sack brings together environmental protection, circular economy principles and community engagement, while supporting local social and environmental projects through an innovative fundraising model.

Addressing the growing e-commerce bicycle market, Mondi developed the re/cycle ProtectorBAG – WheelBAG. The paper-based solution protects disassembled bicycle wheels during transport while replacing multiple plastic and foam packaging elements with a single fibre-based component. The result is a simpler, more efficient and recyclable packaging system that reduces complexity throughout the supply chain.

From regulatory readiness and verified sustainability data to circular design, user-centric packaging and new fibre-based applications, the presentations and award-winning projects demonstrated how challenges can be transformed into opportunities. Together, they embody the spirit of the 2026 Congress theme: "Turning regulation into opportunities."

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 THE GOLD AWARD WENT TO SINGLELIP PAPER FROM GASCOGNE.


BILLERUD

QuickFill® Plus Xcel



 THE SILVER AWARD WAS PRESENTED TO BILLERUD FOR QUICKFILL® PLUS XCEL.



 WITH HANDY2, DY-PACK EARNED THE BRONZE AWARD FOR RETHINKING HOW HEAVY BUILDING MATERIALS ARE HANDLED.



 MONDI RECEIVED THE INDUSTRY SPECIAL AWARD FOR AD/VANTAGE STRETCHWRAP.



 MAKING PPWR EASY TO UNDERSTAND: ROBERTA COLOTTA FROM FLEXIBLE PACKAGING EUROPE OUTLINED THE CHALLENGES AND OPPORTUNITIES ARISING FROM THE PPWR FOR THE PAPER SACK INDUSTRY.

 EDITOR: SBR

 IMAGES: EUROSAC

 INTELLIGENT 24/7 FULL SERVICE SYSTEM

Maintenance and Risks in Biogas Analysis



 OF UTMOST IMPORTANCE IS THE CONTINUOUS GAS ANALYSIS FOR MONITORING THE METHANE, CARBON DIOXIDE AND OXYGEN CONTENT, AS WELL AS TRACE GASES SUCH AS HYDROGEN SULFIDE.

bio-fibreMAGAZINE

Whether in wastewater treatment plants or recycling facilities: wherever biological waste is fermented, the resulting energy should ideally also be utilized. Operators of industrial waste biogas plants can convert the biogas on-site into electricity and heat or process it into biomethane and feed it into the gas grid. However, continuous gas analysis to monitor methane, carbon dioxide, and oxygen levels, as well as trace gases such as hydrogen sulfide, is of paramount importance. Malfunctions in the plant that are detected too late and not rectified immediately can lead to extensive repairs and even immensely costly machine damage.

However, regular on-site maintenance and calibration require trained personnel; repairs and spare parts represent a recurring and frustrating annual expense for many operators. Against this backdrop, Bielefeld-based Chemec GmbH, one of the very few specialist companies in Europe, offers gas analysis systems with a fully sophisticated self-test and fully automatic calibration function, including automatic reminder notifications, remote maintenance options, and spare parts delivery with step-by-step replacement instructions on the intuitive, self-explanatory display.

Eckard Brandau is in regular contact with many biogas plant operators. For 20 years, he and his company, Chemec GmbH, in Bielefeld, have been developing gas analysis instruments as well as a continuously evolving service encompassing calibration, maintenance, and the supply of spare parts and reference gases. Consistent sustainability is the guiding principle of his company. "It's better to invest a few hundred euros once in some accessories and save yourself work than to have to spend several thousand euros every year on repairs and spare parts," is his primary recommendation.

Brandau is the managing director and a long-time developer of analytical instruments for biogas plants based on thermal conductivity and electrochemical gas sensors. The instruments are clearly laid out and modular, allowing even untrained personnel to replace components using simple step-by-step instructions and without tools. A clear, intuitive, and self-explanatory display ensures correct and error-free execution of the necessary steps. All materials used are designed for durability; the components are made of stainless steel or extremely robust plastics.

Regular calibration is essential to prevent costly machine damage

Most gas sensors must be calibrated regularly by comparing them to a reference gas and verifying their correct function. The frequency depends on the sensors used, the gases, the gas concentrations, and the measurement frequency. The accuracy of the measurement results, and therefore the calibration of the sensors, is essential to avoid malfunctions in the system, inefficient gas utilization, and, not least, damage to engines and processing equipment—potentially costing thousands of euros—caused by undetected hydrogen sulfide entering the power plants.

Calibration by a technical service can easily cost thousands of euros, but not with the Chemec auto-calibration module. While manual calibration is always possible, Chemec systems perform this automatically at user-defined intervals, reporting the results or sounding an alarm in case of deviations—because many electrochemical sensors need to be replaced after about two years. Chemec sensor modules can also be replaced by untrained personnel. "It's almost as easy as changing a printer cartridge," says Brandau. "The system recognizes the new module and integrates it automatically."

A special feature, available only from Chemec due to a proprietary patent, is the virtually maintenance-free GAS Thermograph, a sensor based on thermal conductivity measurement for determining the methane content in the gas mixture. Unlike the models of all other suppliers, this module only needs to be calibrated once every four years.

The system also automatically notifies the system before the reference gas runs low. While other gas suppliers often require several weeks for delivery or refuse to accept orders for a single cylinder, Chemec always maintains a stock of reference gas cylinders and delivers within one week.

Condensation: A killer for the entire system

Biogas leaves the digester at a temperature of approximately 40 degrees Celsius and saturated with water vapor. As it cools in the pipes, water condensate forms, which must be removed from the gas stream—for example, by cooling it to four degrees Celsius.

Even at sub-zero temperatures, condensate can still form in pipes and measuring sections. Condensation forms, which is carried along by the sample pump and enters the sensors. The water condensate impairs or destroys the pump and sensors, triggering another costly maintenance event. Therefore, Chemec installs a mechanical, and thus maintenance-free, condensate trap before each gas inlet.

Power Fluctuations Distort Measurement Results

A routine gas analysis measurement takes several minutes. Even a brief fluctuation or interruption in the power supply renders the measurement results unusable and can also permanently damage the electronics – a further serious cost trap given the increasing continuity problems in the power grid. A robust UPS modu-

le ensures that, in the event of a power outage, ongoing measurements are completed correctly and no new ones are started until the external power supply is stable again.

Option for Remote Maintenance with IT Security and Data Protection

Although remote maintenance offers a significant cost advantage over the time-consuming and expensive on-site visit of a service technician, many plant operators are reluctant to implement such a function because it would allow external access to their own IT system. Chemec addresses this conflict of objectives with a remote maintenance system via a separate computer that is not connected to the company network. The gas analysis system can perform regular automatic self-tests and send the results to Chemec's service computer via a separate connection. This ensures seamless monitoring of the system's functionality by the manufacturer, while leaving the operator's IT network unaffected.

Managing Director Brandau, who has personally completed numerous maintenance and service operations for biogas plant operators and regularly consults with them, has continuously improved and perfected both the analysis unit itself and the service system, as well as the scope of services offered to his customers. He summarizes his experience as follows: "Maintenance is essential! Over the years, it can save you many times the original cost of the system."

About Chemec GmbH

Chemec GmbH, founded by Managing Director Eckard Brandau and headquartered in Bielefeld, Germany, has been developing and manufacturing high-performance gas analyzers for approximately 20 years, based on its own technologies and patents. The systems ensure the precise analysis of process gases and are used in agricultural biogas plants as well as in industrial recycling facilities and municipal wastewater treatment plants. Chemec combines in-house development and manufacturing with consulting, installation, and service – all from a single source. The instruments are characterized by their measurement accuracy, reliability in continuous operation, and a low-maintenance, remotely manageable overall design.

Non-agricultural biogas producers include, among others, the paper and pulp industry; their wastewater and paper sludge contain a high proportion of organic matter (including starch, cellulose fibers, and organic acids) that can be converted into biogas through anaerobic processes.

chemec.de



 MOST GAS SENSORS MUST BE REGULARLY CALIBRATED BY COMPARISON WITH A REFERENCE GAS AND CHECKED FOR CORRECT FUNCTION.



 ECKARD BRANDAU WITH CALIBRATION UNIT.

 EDITOR: SBR

 IMAGES: CHEMEC GMBH