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German converters report 4% sales fall

GKV, the trade organisation that represents German plastics processors, reported another fall in turnover last year.

It said this was down to "domestic reasons" such as lower consumer spending, rising interest rates and high energy prices.

GKV said that sales fell to just over €69 billion in 2024, a decline of 4% compared to 2023. Nearly 43% of sales (almost €30bn) were from exports – around 2% lower in value than the preceding year. At the same time, domestic sales fell by more than 6%, to account for nearly €40bn.

"Our industry has the potential for growth," said Helen Fuerst, president of GKV. "The proverbial silver lining on the horizon is gradually becoming visible after two challenging years."

German plastics converting, 2024

	Sales 2024 (bn€)	% Change
Domestic	39.7	-6.1
Export	29.7	-1.7
Total	69.4	-4.3

Source: GKV

The number of employees in the industry fell by about 2%, to around 313,000, while processing volumes dipped by 5% to 12 million tonnes. Of this, 2.5m tonnes was recyclate – a 4% increase on 2024. The number of processing plants remained stable at just under 3,000 facilities.

Figures are not broken down into specific processes (such as extrusion). However, the packaging sector – which is most relevant to film and sheet extrusion – saw no change in the amount of material processed (3.8m tonnes). This equated to turnover in the sector of around €16.5bn – a fall of 1.5%, said GKV.

For companies in the sector, the prerequisites for an upturn are relief from high energy costs and a consistent reduction in bureaucracy, she said.

› **www.gkv.de**

Sabic opens PEI in Singapore

Sabic has officially launched its new US$170m Ultem polyetherimide (PEI) resin manufacturing facility in Singapore – the company's first in the region producing the thermoplastic.

The new facility is a strategic move to support Sabic's goal of increasing global Ultem production by more than 50% in response to growing demand in Asia-Pacific.

"The Ultem resin facility reflects our commitment to the region's high-tech economies and advanced manufacturing sectors, supporting the growth of advanced applications," said Abdulrahman Al-Fageeh, CEO of Sabic.

› **www.sabic.com**

RecyClass updates guidelines

Following 18 testing campaigns commissioned in 2024, RecyClass has strengthened its Recyclability Evaluation protocols and Design for Recycling guidelines to address the impact of various packaging features on recycling streams. Specifically, small-size packaging, rigid rolling behaviour, and the impact of various decorations were assessed with sorting a primary focus.

Updates include revisions within the laminating adhesive section and the inclusion of PVOH as limited compatible with the PE recycling stream for coloured flexible PE. Additionally, for rigid packaging, EVA is now recognised as fully compatible with HDPE recycling, and the recommendation on PO foamed liners has been extended to the PP stream.

Paolo Glerean, Chairman of RecyClass, said it is crucial to implement standards that enhance the recyclability of plastic packaging.

› **https://recyclass.eu**

Increase in German packaging recycling rates

Germany achieved a positive milestone in 2023 by recycling more packaging than the previous year. This was announced by the German Environment Agency and the Central Agency Packaging Register at a press conference on 21 January, where it was also revealed the German waste management sector collected, sorted, and recycled more than 5.5m tonnes of packaging waste in 2023.

Statutory recycling quotas have increased significantly since 2018, with dual systems meeting five out of the eight target rates. Some quotas have been exceeded, while for plastics there are two separate quotas: one for mechanical recycling, and another that includes both recycling and energy recovery. Figures show the share of plastic packaging undergoing mechanical recycling increased from 42.1% to 68.9% between 2018 and 2023.

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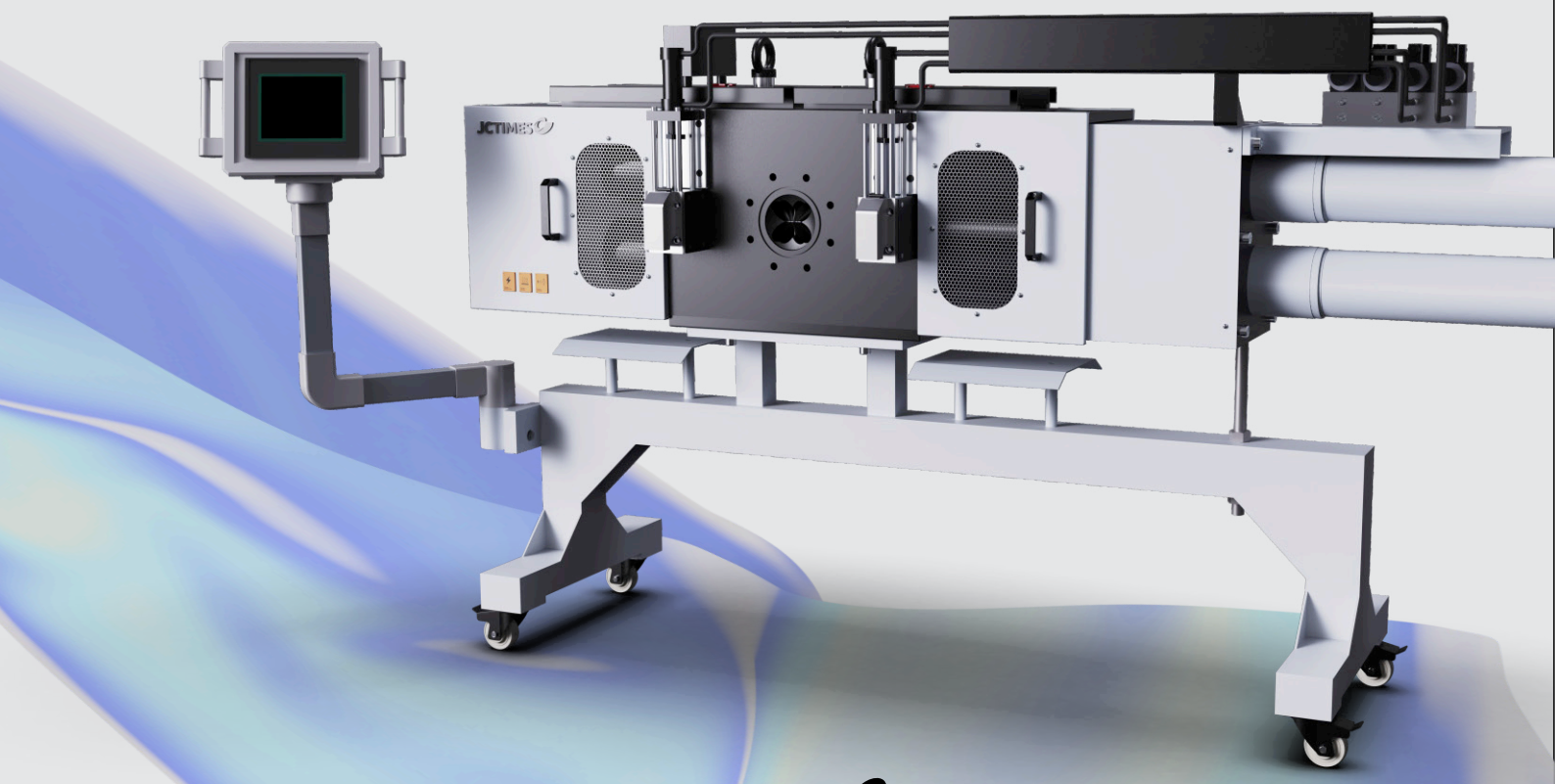


JCTIMES

Milacron gets new owner

Private investment firm Bain Capital has taken a major shareholding in plastics machinery manufacturer Milacron.

Bain will buy an ownership stake of around 51% of Milacron for US$287 million, subject to customary closing adjustments. Current owner Hillenbrand will retain a stake of around 49%.

"With manufacturers increasingly focused on supply-chain resilience and domestic production, we believe the US is entering a manufacturing renaissance that will create significant opportunities for industry leaders like Milacron," said Matt Evans, a partner at Bain Capital Special Situations.

› **www.milacron.com**

Huhtamaki sales and profits drop in 2024

Finnish packaging major Huhtamaki reported flat sales and a small rise in profits in 2024.

Sales for 2024 fell by 1% to around €4.2 billion, while profitability (adjusted EBIT) was €417m – around 6% higher than in 2023.

In the final quarter of 2024, sales picked up by 2% to just over of €1bn, while profitability (adjusted EBIT) rose by 3% to €110m.

"For Huhtamaki, 2024 was a solid year with improved safety performance and increased profitability," said Ralf Wunderlich, president and CEO of Huhtamaki.

"In the first half of the year, demand was muted in many markets, while the second half saw gradual recovery."



Wunderlich: "Demand was muted in first half of year while second half saw gradual recovery"

The company's global food service business saw a decline of 5% over the course of the year, eventually reaching just under €990m. This resulted in a similar 7% fall in profitability to around €91m. At the same time, demand for pre-packaged food in a volatile market kept the decline in flexible packaging to 1%, at around €1.3bn. However, profitability in the segment rose by 7% to reach €94m.

Business in North America was flat at around €1.5bn, though it saw an 8% boost in profitability to €203m.

Currency movements caused overall net sales to decline by €37m and EBIT by €4m.

The company also began a programme to make €100m in cost savings in 2024 – and achieved around €76m of this, it says.

"The savings were essential to compensate for cost inflation," said Wunderlich. "We expect to achieve the €100m savings target and close the programme ahead of schedule."

› **www.huhtamaki.com**

Evertis plans $100m PET film plant

PET film extruder Evertis is to build a US$100 million production facility in the US.

The plant, in Columbia, South Carolina, is scheduled to open in Q2 2026, with its first commercial sales to customers anticipated later that year.

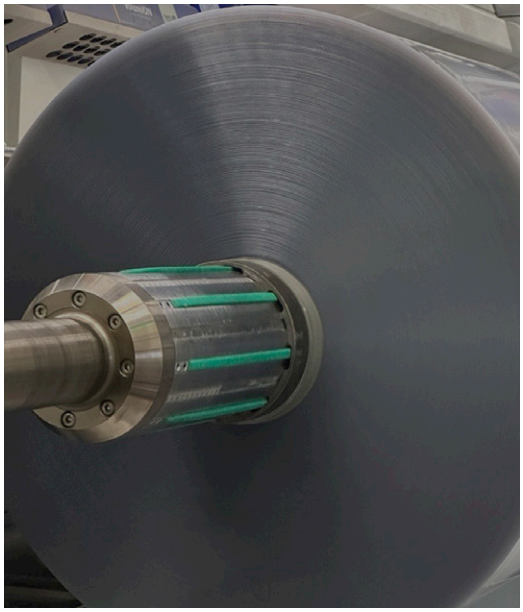
The initial phase will add 30,000 tonnes of new capacity to the North American packaging market and is estimated to create over 100 full-time jobs. In Q2 2028, a second phase will increase production capacity by another 30,000 tonnes, raising total annual capacity to 60,000 tonnes.

"This is another important milestone on our journey to deliver our packaging to the doorsteps of our customers," said Thomaz Gruber, executive VP of operations at Evertis USA. "This will enable us to offer shorter lead times and reduce supply chain risks."

Evertis is part of IMG Group, which has other plastics assets including its copolyester producing business, Selenis, which has a plant in Fayetteville, North Carolina.

Dan Kearny, chief business officer of IMG, added: "Our focus is on delivering packaging solutions to help customers minimise their environmental footprint."

› **www.evertis.com**



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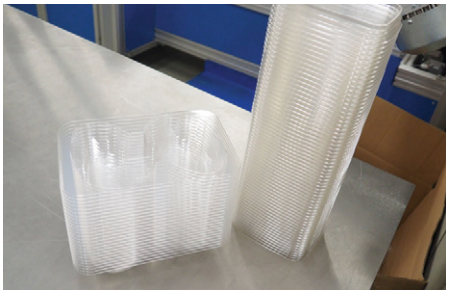

Bottom: Stacked packaging, coated with anti-block

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Dow buys equity stake in chemical recycling

Dow has taken an equity stake in Xycle, a Netherlands-based chemical recycling company.

Funds from Dow and other investors – including ING and Vopak – will support the construction of Xycle's first commercial-scale chemical recycling plant, in the Port of Rotterdam. The facility is expected to be operational by Q4 2026, with a projected plastic waste processing capacity of 21,000 tonnes/year.

Dow will receive feedstock from the facility and use it to manufacture new circular plastics, which it says are in high demand.

Xycle's technology uses low-temperature pyrolysis to convert hard-to-recycle plastic waste into pyrolysis oil, which can be used as cracker feedstock for new plastic production. It can be used to manufacture virgin-quality plastics for applications such as food-grade packaging, medical and automotive components.

"The performance and efficiency of Xycle's technology complements our diverse global portfolio of recycling solutions," said Stephanie Kalil, commercial VP at Dow Packaging & Specialty Plastics EMEA.

The modular layout of Xycle's facilities allows production to scale up or down depending on demand. In the future, Xycle plans to develop more advanced recycling facilities globally, using larger reactor sizes to increase single plant capacity to 100,000 tonnes/year.

› **www.dow.com**
› **www.xyclegroup.com**

Sealed Air posts sales loss

US-based packaging giant Sealed Air saw sales decline in 2024.

Sales dipped by 2% to US$5.4 billion – with the food segment rising 2% as the protective segment fell by 8%. Net sales fell by US$61m, around 1%, on a constant dollar basis, said the company.

Volumes actually rose by US$35m, or less than 1%. Lower prices had an unfavourable impact of US$119m, or 2%, it said.

Profit, expressed as adjusted EBITDA, was just over US$1.1 billion, almost identical to the 2023 result.

"In the fourth quarter, we completed the reorganisation into two market-focused businesses – food and protective – and had a strong finish to the year," said Dustin Semach, president and CEO of Sealed Air.

At a constant dollar rate, the company expects 2025 to range between US$5.1bn (a dip of 3%) and US$5.5bn (a rise of 4%) in 2025. Adjusted EBITDA is expected to be between US$1bn (a fall of 1$%) and around US$1.2bn (up 8%).

› **www.sealedair.com**

IN BRIEF...

Peruvian packaging major Oben is to establish a new production facility in Mexico. It has ordered "the world's first 12m BOPP line" – which has a speed of 700 m/min and an output of 94,000 tonnes/year – from Brueckner.
www.obengroup.com
www.brueckner.com

Plastics mergers and acquisitions stayed at a high level in January 2025, according to PMCF. It says 36 deals were announced – the ninth consecutive month with more than 30 deals recorded. Although transaction volumes were lower than for January 2024, they surpassed the 2024 monthly average.
https://pmcf.com

Kiefel has appointed new leaders for three divisions. Sven Engelmann, VP of technology, is responsible for the technological development of Kiefel's portfolio. Bengt Schmidt, VP of packaging, will build global sales in this area. And Bernd Stein, VP of engineering, will optimise machine and tool solutions.
www.kiefel.com

PRE's latest figures show slower capacity growth

Plastics Recyclers Europe (PRE) says the total installed plastics recycling capacity in EU27+3 countries was 13.2 million tonnes in 2023 – a 6% growth on the previous year.

This is the lowest growth since 2017, it said – as, until now, capacities had doubled in five years with an average growth of 17%.

"The challenges faced by the EU's plastic recycling sector in 2022 have been confirmed by the latest figures," said Ton Emans, president of PRE.

Polyolefin films retain the highest overall capacity, followed by PET and rigid polyolefins – accounting for more than 75% of overall European capacity. At the country level, Germany has the highest installed plastics recycling capacity, with up to 2.5m tonnes, followed by Spain with around 2m tonnes.

The figures show an overall slowdown in recycling, which PRE ascribes to higher production and energy costs for European companies, a lack of demand for EU-recycled plastics, and the increase in imports of virgin and recycled plastic from outside the EU.
www.plasticsrecyclers.eu

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Teraplast sees sales increase in 2024

TeraPlast of Romania reported a rise in sales – but flat profits – in 2024.

The company, which produces a variety of products including flexible packaging, saw a 34% rise in sales for the year, reaching nearly RON900 million (US$196m).

At the same time, profitability (EBITDA) remained static at around RON51m (US$11m). The company said this refected its strategy to increase market share, plus the impact of price pressures and contraction in some European markets.

Turnover in its flexible packaging business more than doubled, up 143% to around RON113m (US$25m), while EBITDA fell – with the division posting a loss of around RON14m (US$3m). This was mainly due to the ramp-up of the company's new Opal stretch film plant and losses from its TeraBio Pack business.

"Our evolution in 2024 reflects the mix of organic growth and growth through acquisitions, over the fluctuations in European markets," said Bogdan Crăciunaș, chief financial officer of TeraPlast.

The company also increased sales volume by 46% – with nearly 110,000 tonnes.

In 2025, it expects to grow volumes by a further 12%, sales by a similar amount and profits by nearly 70%.

"Starting in the second half of 2025, we expect the synergies generated by new subsidiaries to produce visible effects," said Crăciunaș.

› **www.teraplast.ro**



IMAGE: CONSTANTIA FLEXIBLES

Constantia Flexibles buys Aluflexpack of Switzerland

Constantia Flexibles has acquired Swiss packaging producer Aluflexpack – which employs around 1,700 people in nine countries and supplies the food and pharmaceutical sectors.

David Spratt, CEO of Constantia Flexibles, said the deal would "strengthen our leadership in product innovation and sustainability, and improve our ability to serve customers with a broader range of packaging solutions".

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Recent thermoforming innovations include a machine to boost mono PET tray recyclability, business changes at two major suppliers and a new way of making a mould in 20 minutes

Pressed into action: latest advances in thermoforming

Thermoforming is a widely used technique – especially in packaging – and can offer a rapid, relatively economic alternative to injection moulding. As well as packaging, it also finds use in a range of more industrial applications.

UK-based **Fyous** has developed a high-speed mould-making technology – which uses 28,000 moveable pins to create a mould in around 20 minutes.

The system, launched at the Formnext exhibition in Germany last November, could be used to make thermoforming tools, says the company. The product consists of the Polymorphic forming machine, pin tool (the 28k Polymorphic tool) and 3D CAD software (called Pinpoint).

The pins can be positioned to an accuracy of 0.1mm, and once locked in position can withstand 6 tonnes of pressure – making them suitable for use in vacuum forming and other techniques such as composite layup, composite bonding and moulding polyurethane (PU) products. Pin tools – each about the size of a laptop – can be used together to make bigger moulds. Once the pin tool has been used it can be reinserted into the machine to create a new mould shape with zero waste. There is no need to store the mould, just the 3D CAD model.

"With the ability to produce perfectly designed custom tooling in minutes, manufacturers can be confident of handling even the largest, most awkward or cumbersome piece, with no fear of damage," said Joshua Shires, co-founder at Fyous.

Sheffield-based Fyous says the product – which took five years to develop it – creates a part around 14 times faster than 3D printing for an equivalent-sized part. It has already been used by a dental-aligner manufacturer and medical shoe maker.

"There's no need to make multiple moulds," said Shires. "Simply store the CAD models and re-programme the machine as and when it's needed."

Main image: The PolyMorphic forming machine from Fyous makes a thermoforming mould from 28,000 pins

Electric performance

Ray Products and **Sekisui Kydex** have joined forces to develop a housing for an EV charging station using thermoformed sheet.

Traditionally, several processes are used in this kind of part, including injection moulding, structural foam, reaction injection moulding (RIM) and sheet metal for equipment covers. However, they can either fail to meet the outdoor requirements or require secondary finishing processes. ›



Right: Ray Products thermoformed this EV charging station part from from Sekisui Kydex sheet

Kydex 1100UV – the sheet material used – meets UL 94 V-0 flammability and UL 746C F1 weatherability requirements while providing UV resistance, durability in extreme conditions, and in-mould colour, which eliminates the need for painting.

The final 11-part enclosure was engineered for easy assembly with minimal attachment points, streamlining installation and eliminating the need for secondary processes. This design approach enhanced assembly efficiency and contributed to the long-term structural integrity and reduced maintenance costs for the client. Using pressure forming, Ray Products made several thousand units with consistent quality.

Foamed PP

SML says that its PP sheet lines are now equipped to make foamed sheet at high volume.

Emerging EU regulations are driving the need for innovative, forward-looking packaging solutions – such as foamed PP sheet as an alternative to EPS for food packaging, it says.

"We have optimised and upgraded specific components of our PP sheet lines for manufacturing high volumes of premium foamed sheet," said Martin Kastner, R&D engineer at SML. "We did this without compromising the lines' high efficiency and product quality with regard to classic PP thermoforming sheet."

With SML's sheet lines, the total density of PP foamed sheet that can be achieved, is as low as 0.55 g/cm³, referring to a sheet made from standard polymers with an A/B/A structure, consisting of 20% conventional PP in the outer A-layers and of 80 % foamed PP in the inner core layer (B layer). Compared with regular PP sheet, this corresponds to a reduction of 40%.

Below: SML says its PP sheet lines can now make foamed sheet at high volume

"The lower material input results in significant savings for sheet manufacturers and in lighter packaging," he added.

The PP sheet line has a coextrusion system with a 180/33 single-screw extruder as the main extruder on which the foamed B-layer can be manufactured. It achieves a plasticising capacity of up to 1,250 kg/h with a mixture of virgin PP and up to 80 % regrind. An HSE 75/37V semi-high-speed extruder serves as the co-extruder (for the A-layers). The complete extrusion system of the line delivers a maximum plasticising capacity of up to 1,850 kg/h.



For making foamed PP sheet, the screw of the main extruder was given a special design. In addition, the extrusion system has a foaming technology package customised for PP in the melt pipes of the main extruder. Small quantities of inert gases such as CO_2 or N2 – plus a nucleating agent in the melt – allows the creation of fine microcells in the core layer (B-layer) of the A/B/A sheet, says SML.

PET tray recyclability

WM Thermoforming Machines is integrating new technology into its FC/FX steel rule die thermoforming range to enhance the recyclability of mono PET trays and optimise the overall production process.

The model now integrates a gluing system, padding system and Ausil's AI-driven automated inspection system.

The gluing system improves weldability without the need for PE laminates. This addresses recyclability challenges and maintains product integrity, reducing environmental impact. Additionally, the padding station that integrates liquid-absorbing padding is a crucial feature for sectors such as the meat industry, ensuring hygienic and practical packaging solutions.

When integrating these technologies, manufacturers typically have two options: off-line and in-line applications. In-line integration is designed for high productivity, minimising space requirements and manual handling while maintaining continuous production. This approach results in better hygiene, improved quality control, and overall higher efficiency. On the other hand, off-line

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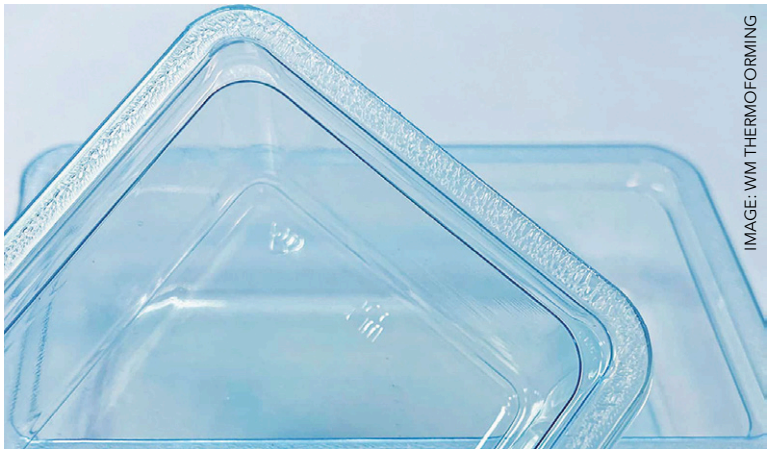

IMAGE: WM THERMOFORMING

Above: WM's upgraded FC/FX steel rule die thermoforming range raises the recyclability of mono PET trays

integration offers greater flexibility, allowing for smaller production runs and easier adjustments.

WM says the gluing technology on its machines offers several advantages over traditional PET/PE tray solutions. First, the material is fully recyclable, unlike standard laminated MAP trays. Second, the glue is applied at a lower temperature, which treats the PET more gently. Lastly, the welding time is reduced, resulting in in faster production speeds and significant energy savings.

When integrating multiple processes, an advanced inspection system is needed to maintain optimal quality. To address this, WM can equip machines with the Ausil AI automated inspection system. This monitors and controls key aspects of production, ensuring tray conformity, verifying precise glue distribution, and confirming accurate pad placement.

Business shifts

Two leading thermoforming machinery suppliers – **Kiefel** and **Illig** – are undergoing shifts in their businesses.

Kiefel – part of Brueckner – has announced a "structural reorientation" resulting in the gradual closure of its Micheldorf site in Austria. Several production units, including that for automation of thermoforming machines, will be moved elsewhere. The site closure, to be completed by the end of this year, will affect 130 employees.

Existing orders will be completed in Micheldorf, while the Sprang-Capelle (Netherlands) site will be strengthened as the centre of excellence for tool manufacturing. The same applies to the head office in Freilassing in the area of automation, it said. ❯





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Digital heating improves thermoforming

Klaudiusz Holeczek, head of R&D at **Watttron**, told delegates at last year's *Thin Wall Packaging* event in Cologne, Germany, that the company's 'digital heating' technology can improve the thermoforming process.

The company's ceramic film heaters incorporate sensors close to heat circuits for greater temperature control in processes like thermoforming. This 'pixel-wise' heating and control ensures defined heating of the plastic, with a variation of no more than 3°C.

"This produces fully reproducible thermoforming results with no time or position temperature deviation," he said.

Benefits include reduced material costs, as more material per roll is used. It can also help to reduce downtime – and the cost of energy.

The heaters can be retrofitted to existing machines, he added, with typical module sizes of 40 x 40mm (64 heating pixels) and 40 x 50mm (80 heating pixels). Modules can be added together to create an array. Holeczek cited one example of a heating surface comprising 195 standard modules, to create an area of 600 x 520mm.

"It can help to reduce material and energy consumption by 50%," he said.

■ *Thin Wall Packaging* ran in Cologne, Germany in November 2024. For more details on the next edition of the event, contact Diana Koumi (**diana.koumi@amiplastics.com**) on +44 (0) 117 311 1527.

IMAGE: ILLIG



Above: Holder: "Realigning Illig is a challenging task"

"In order to remain continuously competitive, we must make better use of the strengths of our respective production sites for our customers locally," said Matt Sieverding, CEO of Kiefel.

As part of its 'One Kiefel' strategy, the company will make cuts elsewhere – including around 100 jobs at its Freilassing site. It is looking to focus on "all segments with great growth potential and a wide customer base, such as standard automation, to make better use of market opportunities and expand the product portfolio".

Despite the job cuts, Kiefel plans to invest "in the millions" this year to strengthen the Freilassing site, such as by establishing a polymer innovation centre.

The centre gives customers access to Kiefel's latest machines, which can be used for tool and product sampling, and customer-oriented prototyping.

"We are creating a first-class development environment," said Sieverding.

For its part, Illig has changed its upper management, following its acquisition by German financial investor Orlando Capital in August last year.

Matthias Holder has become the company's chief sales officer (CSO) and chief technology officer (CTO), replacing Jürgen Lochner – who is leaving the company after four years.

Holder will head the sales, technology and service divisions, which an initial focus on the "strategic realignment of the global sales and service business in a challenging market environment".

"Realigning Illig is a challenging task," he said.

Illig's top management also includes Carsten Strenger (CEO), who is responsible for production and commercial divisions, and Thomas Schmidt – who has been chief transformation officer since the acquisition in August 2024.

Licensing deal

TaktoTek of Finland has expanded its in-mould structural electronics (IMSE) technology through a recent licensing agreement with Germany's **New Albea**.

New Albea supplies automotive, home electronics, and telecommunications industries with film insert moulding (FIM) and precision manufacturing. It is a full-service provider to all IMSE production processes including decorative and electronics printing, thermoforming, and injection moulding.

"New Albea's vertically integrated production system makes it an excellent partner for scaling IMSE mass production," said Marko Suo-Anttila, SVP of consulting and services at TactoTek.

IMSE solutions integrate electronics, mechanics, and cosmetic surfaces within light, thin, single-piece parts made using film insert moulding. Dynamic lighting, responsive touch controls, sensors, and connectivity are commonly integrated within IMSE parts.

"IMSE provides enhanced design flexibility and the ability to advance those decorative surfaces into fully functional single-piece FIM electronics solutions," said Thomas Schuller, general manager at New Albea.

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IMAGE: SHUTTERSTOCK/ITMAN_47

Additives are in the spotlight as requirements for packaging, agriculture, and other applications evolve. Innovations focus on sustainability and performance, writes ***Jennifer Markarian***

Breaking through: additives for flexible films

Flexible plastic films have a wide range of uses in packaging, stretch wrap and shrink film, agriculture, and more. With food and non-food packaging as key markets, film design and use are affected by new regulations, such as the EU's Packaging and Packaging Waste Regulation (PPWR). New and potential upcoming restrictions in multiple geographic regions on specific additive substances, such as PFAS, are also affecting film formulations.

The PPWR received final approval from the European Parliament in late November 2024, and its rules for the EU include requirements for packaging to be reusable or recyclable by 2030, minimum recycled content standards for plastic packaging, and requirements for packaging to minimise weight and volume. Design for recycling criteria are due to be established by 2028, and by 2030, recyclability will be described by performance grades (A, B, and C) based on the weight percentage of the package that is recyclable.

Design for recycling has an important role to play in guiding the industry, said Susannah Owen, **AMI** consultant specialising in flexible films, in a video **interview**. In the biaxially oriented film industry, for example, the whole value chain – including materials suppliers and equipment manufacturers – worked together to bring oriented polyethylene (OPE) films to market, where it offers a solution for monomaterial packaging. In the biaxially oriented polypropylene (BOPP) space, there are now monomaterial solutions available even for challenging applications, such as coffee and stand-up-pouches, Owen said. She added that the market is already seeing a shift toward monomaterial flexible packaging formats, such as pouches, which will help meet PPWR requirements.

New additives are providing benefits for monomaterial film structures. ›

Main image: Young melon plantation mulching

Right: Void Technologies and Berry Global launched an all-PE film designed for recycle-ready pet-food packaging using VO+ technology

Voiding agents

Void Technologies offers its patented VO+ voiding technology additive as a masterbatch to create nano- and micro-scale air pockets in machine direction orientation (MDO) or biaxially oriented blown or cast films. The voids reduce density, increase opacity, and improve yield, tensile strength and puncture resistance. The company says the technology can be used in polyolefins and polyesters. So far, it has been most developed in polyethylene films, where it can be used to make opaque, all-PE packaging in compliance with food contact standards. PE films made with this technology can be an alternative to pearlised BOPP.

The VO⁺ PE 1300 Series Voiding Agent has achieved recyclability certifications from Europe's RecyClass and the US Association of Plastics Recyclers that indicate its compatibility in PE film recycling streams.

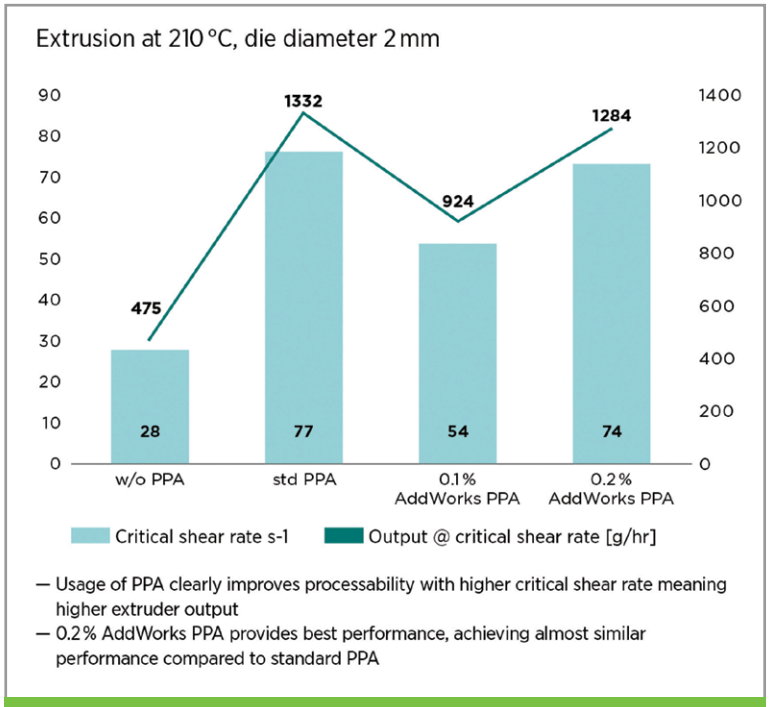
Void Technologies partnered with film producer Charter Next Generation (CNG) to introduce recycle-ready cavitated PE films for flow wrap and confectionery applications, the companies announced in early 2024. The companies said that the MDO PE films created a combination of low density and high opacity that could not be achieved with calcium carbonate cavitation agents or with titanium dioxide pigments.



IMAGE: BERRY/VOID

In December 2024, Void Technologies and **Berry Global** launched an all-PE film designed for recycle-ready pet-food packaging using VO+ technology. "Pet food applications present unique challenges due to demanding physical and organoleptic requirements, and this highlights the individual capabilities of both Berry and Void, but more importantly, the power of our combined expertise," said Caleb Triplett, Berry's director of product management, flexible packaging.

As manufacturers move to monomaterial packaging films that eliminate separate materials used as barrier layers, alternative ways to improve barrier become more important. **Milliken's** latest Ultraguard 2.0 masterbatch improves barrier performance in HDPE by up to 70%, the company reports. The company says that the additive enables "structural realignment" that slows transmission of oxygen, moisture and other permeants. Applications include cereal liner film and flexible pouches.



Critical shear rate
Source: Clariant

PFAS response

Plastic additives are regulated, but some types of additives have been in the spotlight with calls for increased regulation or even bans. In particular, per and polyfluoroalkyl substances (PFAS), are facing increasing restrictions. The fluoropolymer-based processing aids used in some film applications to prevent problems such as melt fracture or die-lip buildup during processing are set to be classified as PFAS. As a result, several additive suppliers and masterbatch producers have introduced PFAS-free processing aids as alternatives.

Most recently, **Clariant** launched the AddWorks PPA line of PFAS-free processing aids for polyolefin films. The additives are also free of silicone or siloxane, and have high thermal stability and low migration tendencies, the company reports. They are targeted at LLDPE blown films for packaging and agriculture and may also be useful in cast films. Clariant plans to create several products in the range that are specific to certain applications and regions. For example, AddWorks PPA 122 G, a processing aid masterbatch for polyolefin film extrusion that the company says is based on Clariant's proprietary organic materials, is available

in Asia-Pacific and greater China. Other new products will be launched in 2025 for EMEA and the Americas.

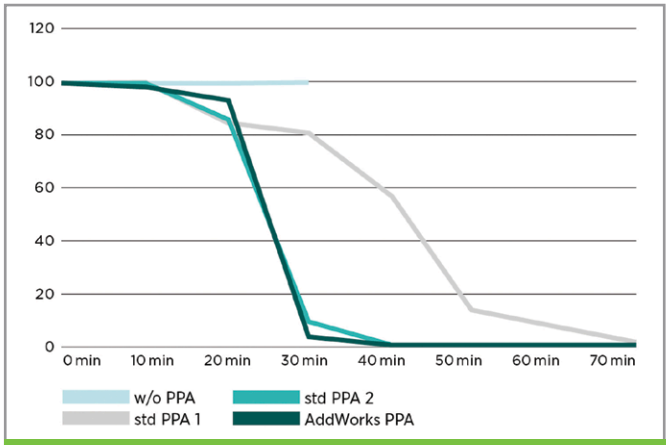
Dover Chemical announced that the European Food Safety Agency (EFSA) has published a safety assessment endorsing its antioxidant Doverphos LGP-12 (liquid green phosphite) for EU food contact. The company says that the antioxidant has a cleaner toxicology profile than traditional phosphite stabilisers and has been designed with "future compliance" in mind, as regulatory bodies increase scrutiny of human health effects from additives and their degradation products. The additive is a high molecular weight polymeric phosphite and its high phosphorus content allows it to be used at lower loading levels, both of which contribute to low migration. The additive received US FDA clearance for food contact in LLDPE in 2019 and for HDPE in 2023.

The company reports that it has submitted requests for food-contact approval from other major global regulatory bodies.

LGP-12 also acts as a PFAS-free and silicone-free polymer processing aid (PPA), showing both the ability to clear melt fracture in blown film and to reduce die-lip buildup in cast film. PPAs from Dover Chemical available in masterbatch form with an LLDPE carrier include Doverclear 840 for resins with a melt index greater than one, and Doverclear 841 for resins with fractional melt indices. The PPAs are typically used at 0.5-2.5% in the final product, and they are also available in other carrier resins.

LGP-12 has also been finding success as a stabiliser in recycle streams, where it has been shown to reduce both the size and overall amount of gels in recycled-polyethylene film applications.

At the recent *Polyolefin Additives* conference,



Percentage of sharkskin on films *Source: Clariant*

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IMAGE: BASF



Above: BASF's Tinuvin NOR 211 AR additive is a heat and light stabiliser launched to protect films used in intensive horticulture

organised by AMI, Ahmad Arefi, a product development scientist at **Ingenia Polymers**, highlighted its PFAS-free processing aids for polymers.

These are used in a range of applications such as blown film production, with properties such as improved die-lip build-up performance and food contact compliance. It has carried out film studies such as time to clear sharkskin and die build-up.

"Our PFAS-Free PPAs achieve maximum efficiency in reducing sharkskin and DLBU clearance when used independently, without the influence of other PPAs," he said.

The company offers its Superblend masterbatches with PFAS-free PPAs. These include Type A (high activity), Type B (melt-blended pastilles or pellets) and Type C (compacted pre-blends).

At the same event, Onnicha Rattanopas, polymer applications leader at **Interface Polymers**, told delegates how the company can help to overcome mixed-plastic recycling challenges using its Polarfin diblock copolymer technology.

"Unlike other compatibilisers in the market, it works as a polymer surfactant in polyolefin and polar polymer blends," she said.

This helps to improve film appearance, such as by removing flowmarks and gels, in samples such as 80/20 PE/PA blends. Loadings of up to 5% can help to improve clarity and tear strength.

In a co-development project with Flexipol, a 4% loading of Polarfin helped to increase the tear strength of a seven-layer blended film in both directions. It did not significantly affect haze or clarity, and the film – which used 30% recyclate – had excellent appearance (smooth and no gels or striations), she said.

AMI's next *Polyolefin Additives* conference runs on 2-3 December 2025 in Cologne, Germany. Contact Louella Osano on +44 (0) 117 314 8111 (**louella.osano@amiplastics.com**) for more details.

Additives for recycling

As recycled content increases, plastic compounds will need to be stabilised to withstand multiple processing cycles without creating gels that can cause holes or breaks in film webs. For example, Clariant's PKG 196, introduced at the K2022 Show, helps reduce gels and allow higher levels of recycled content in thin films and flexible packaging, the company reports.

BASF's IrgaCycle products, first launched in 2021 and including products such as IrgaCycle PS 031 G for recycled LDPE and LLDPE in films, are additive blends designed specifically for improving the properties of recycled plastics.

Nexam Chemical's Reactive Recycling technology uses reactive chemistry to improve the processing properties of recycled PE and PP. In a study conducted in 2024, the Nexamite additive was able to prevent breakdown when added to PP and to restore the molecular weight when added to a simulated post-consumer recycled PP.

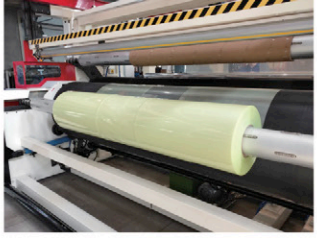
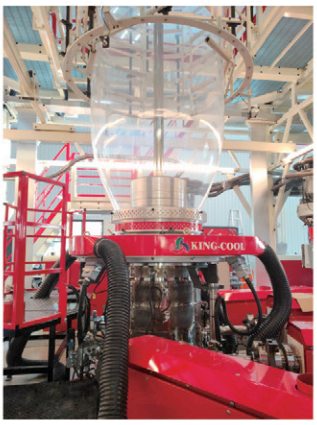
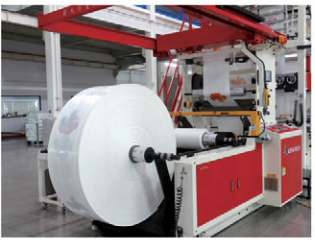
Compatibilisers also play a key role in allowing recycled content in film applications by improving homogeneity in batches with materials of different polarities and flow properties. For example, the new MaxiLoop product family from **Gabriel-Chemie** includes the MaxiLoop HP7AB4780COM Compatibiliser Masterbatch that can be used to help compatibilise edge trims from film extrusion in the production of multilayer products, which may contain both non-polar polymers (eg, PE or PP) and polar polymers used as barrier layers (eg, PA6, PA66, or EVOH).

Compatibilisers are finding use for both post-industrial and in-house recycling of barrier film scrap as well as preparing films in the post-consumer recycling stream.

Meanwhile, additives supplier Nexam Chemical and packaging company Kullaplast have teamed up to increase the share of recycled plastic in blown film. Combining Nexam's Nexamite R305 additive – which improves melt strength and process stability – with Kullaplast's film production expertise means recycled raw materials can be used to a greater extent without a loss in quality or performance.

The collaboration shows the practical application of research recently published by Politecnico di Torino, confirming how advanced additive technology can 'upcycle' recycled polymers, making them suitable for demanding applications such as blown film.

"This shows how collaboration and innovation can drive the transition towards more circular material flows," said Ronnie Törnqvist, CEO of Nexam. ›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Amcor wins Dow packaging award

Amcor's AmPrima recycle-ready coffee packaging was recognised by the 35th Packaging Innovation Awards, which are sponsored by **Dow**.

"Our AmPrima Plus was the perfect solution for Nordic coffee leader Kjeldsberg, with whom we won this award. It is a mono-PE pouch that offers a high barrier to prolong the freshness of coffee. It runs seamlessly on coffee roasters' packing machines and is readily recyclable in most European countries as certified by Institute cyclos-HTP," said Giorgio Dini, marketing manager EMEA for coffee at Amcor.

The package was designed in accordance with the Circular Economy for Flexible Packaging (CEFLEX) guidelines, and it helps brands move to a mono-material solution that allows for easy recycling.



Blockers and stabilisers

Ultraviolet (UV) absorbers or light blocking additives may be used in packaging to protect contents from UV degradation. Conventional UV blockers have included those based on benzotriazoles, but since some phenolic benzotriazoles have been added to the European Chemical's Agency candidate list of Substances of Very High Concern (SVHC), alternatives that are not on the SVHC list are being considered.

Ampacet's UVBlock 1496 is an alternative that offers UV barrier performance in the low UVA and UVB wavelength range, the company says. It is approved for food-contact applications in Europe and the US.

Agricultural applications, such as films used in greenhouses, have stringent stabilisation requirements, because the films must withstand both weathering and the increasing use of inorganic chemicals in agriculture. The latest from BASF is Tinuvin NOR 211 AR, a heat and light stabiliser to protect films used in intensive horticulture under severe UV radiation and the presence of high levels of sulphur and chlorine. These films are being designed for greater durability, which improves sustainability by reducing plastic waste.

"The Tinuvin NOR 211 AR additive solution addresses a broad variety of challenges for agricultural plastics, including sustainability requirements, increased chemical exposure, longer use durations and downgauging trends," said Bettina Sobotka, head of global marketing and development for plastic additives at BASF. "BASF's NOR [non-basic aminoether] HALS [hindered amine light stabilisers] solutions improve stabilisation by moving beyond solutions based on secondary and methylated HALS. Through collaboration with agricultural plastic producers as well as farmers, we facilitate the exchange of knowledge and expertise, creating solutions that will ultimately lead to improved crop yield."

The new stabiliser is part of BASF's Valeras portfolio, which the company says is designed to help users meet their sustainability goals. Renewable electricity is used to manufacture the additive, and the product form improves material dosing precision, among other benefits, the company says.

Clariant has introduced light stabilisers specifically for agricultural films: Addworks AGC 102G for greenhouse films and Addworks AGC 970G for mulch film applications. Eliandro Felipe, head of sales Americas for additives polymer solutions at Clariant, said that greenhouse films are being designed to last three to five years in the field, with increased UV exposure and increasing use of harsh chemicals. Addworks AGC 102G is used to help prevent premature degradation as well as to reduce haze and maintain film transparency.

Techmer PM's custom UV stabiliser packages for agricultural film are designed to allow films to last in the field for the growing season and retain tensile properties in extreme environments. The company has also designed UV products for compostable films, which are meant to be installed in the field and used for a year, with the additive tailored specifically for a region, growing season length, and film thickness. Depending on the application, UV packages are designed for various environmental exposures, including pesticide chemicals commonly used in the agricultural

industry that standard UV packages cannot survive, the company claims.

Antiblocks

Antiblocking agents, including minerals such as talc, are often used in films to prevent layers from sticking together. In PE films, talc offers a good balance of film surface roughness, transparency, and minimal slip agent interaction, says **IMI Fabi**, which introduced a new talc developed specifically for this application.

NoBlock-S is an efficient antiblocking additive characterised by easily dispersible spherical agglomerates, which provide dust-free, high flowability, the company says. The product meets stringent requirements for preventing dust development in industrial environments and in manual handling.

Cargill's bio-based Optislip is a new brand name for the company's product line, which is available in pastille, bead, microbead and powder or as a masterbatch and can be used in polyolefin and biopolymer films. The additive migrates to the surface to provide a lubricating surface layer. The company says benefits include easier processing and improved film quality, smoother film winding and unwinding, and reduced blocking in bag applications. Different products provide high slip, medium or controlled slip (particularly for laminated or coextruded films), and low slip and antiblock.

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Developments in control include ERP software updates, autonomous control in cast film, increased incorporation of AI and an IoT system that solved problems for a flexpack producer



IMAGE: W&H

AI and digitalisation add control benefits

In the age of digitalisation – and artificial intelligence – control systems have become even smarter, allowing plastics converters to automate production as never before.

TPBI, a flexpack producer based in Thailand, says it has maximised the output of its **W&H** blown film lines by integrating the company's Ruby Go system into its Varex machines.

It says the Internet of Thins (IoT) system has helped it to raise production efficiency and improve communication – as well as solving problems as they occur.

Before using Ruby, TPBI says it struggled with a fragmented data flow, but now production is both automated and optimised, it says. The platform is widely adopted across all departments, as a tool for monitoring and internal communication between production, engineering, R&D and quality management teams.

The system provides real-time access to machine parameters and production data, including detailed overviews, process data, trends, and alarm logs, which are displayed on large screens during production and management meetings. This has improved transparency and traceability, enabling better decision-making and more efficient operations, it says.

In one instance, TPBI faced a recurring issue where the running film web would oscillate briefly and miss a cut by the slitting knife, causing a quality issue. The problem occurred randomly, requiring engineers to spend 4-8 hours observing the machine in the hope of catching the issue in action. This consumed valuable time and left the root cause undiagnosed for long periods.

"Ruby Go allows us to perform faster root cause analysis, reducing downtime from 10% to 0.5%," said Surasit Dechvilai, engineering manager at TPBI. "This has been key in keeping our operations running smoothly and efficiently."

With Ruby, the process is much simpler. Instead of waiting for the issue to recur, the production team could immediately access machine data from the trend page when the problem occurred. By

Main image: TPBI has raised output on its Varex blown film lines by integrating W&H's Ruby Go system


IMAGE: CONAIR

Right: Conair has added an AI-driven feature to its ResinWorks multi-hopper drying system

analysing key data points – such as bubble size changes – the team quickly identified a malfunction in one of the ultrasonic bubble sensors. This allowed the engineering team to solve the problem without the need for prolonged on-site observation.

AI benefits

At last year's NPE, **Conair** ran a live, interactive demonstration of a new AI-driven conveying technology, which claims to "virtually eliminate" the need for human interaction or adjustments to central conveying systems.

The patented AI technology creates and maintains optimal source-to-destination material flows regardless of material characteristics, distances, or destinations and automatically compensates for common conveying problems.

"Artificial intelligence will not only optimise the process of conveying but will also eliminate labour costs – specifically the need for error-prone manual interactions with the conveying equipment," said Sam Rajkovich, VP of sales and marketing at Conair.

In addition, Conair has added an optional AI-driven feature to its ResinWorks centralised, multi-hopper drying system. ResinWorks with Optimizer automates the process of maintaining process-ready resins at the correct temperatures and varied throughputs, while preventing over-drying and delivering energy savings.

Typical ResinWorks systems rely on operators to physically actuate a manual damper to manage and balance airflows into each active hopper. While this is mechanically simple and reliable, it is generally based on the use of fully loaded hoppers and a predicted throughput rate for each material. This means that any changes or interruptions in hopper usage, resin mass flow through each hopper, or process resin demand can introduce imbalances that are difficult for operators to manually detect and correct. The system was developed to address this common challenge.

AJ Zambanini, director of product management at Conair, said: "Central drying systems are often 'up-sized' to meet maximum demand and throughput requirements. Yet, in many cases, they run at less-than-maximum levels, resulting in suboptimal airflow, potentially over-dried material, and excess energy usage and cost."

Below: Reifenhäuser says its PAM system works completely autonomously and boosts cast film quality



IMAGE: REIFENHAUSER

Film automation

Polish film manufacturer **Bogucki Folie** has invested in a new **Reifenhäuser** Midex cast barrier line – which incorporates its PAM (precise, autonomous, mechatronic) automation option.

The system, for flat dies and coextrusion adapters, claims to make work easier for machine operators, increase productivity and improve film quality. Mechatronic actuators automatically adjust the feed block and die via the system's control panel. This makes producers less dependent on a shortage of skilled workers. After recipes have been saved, even less experienced system operators can reproduce them at the touch of a button.

Wiktor Bogucki, the company's owner, said the production facilities in his company were getting "a bit aged" – prompting it to invest in new technologies to increase production capacity, lower production costs, and reduce production waste.

"We also want to achieve a higher level of automation in order to become less dependent on skilled personnel," he said. "The shortage of skilled workers is one of the biggest problems in our industry in Poland."

The company makes multi-layer food and technical packaging films and barrier films. Its traditional product is a three-layer, thin thermostretch film for beverage packs.

The company was able to test the PAM system in advance at Reifenhäuser's technical centre. The

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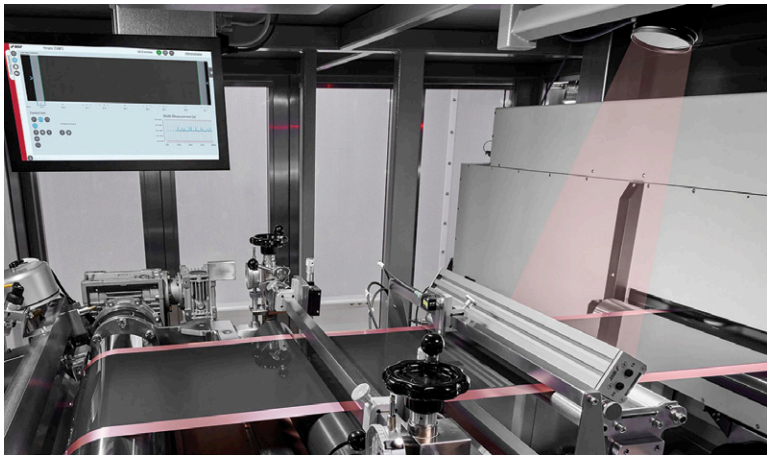

Above: BST's CoatingControl ensures alignment of coating positions using line scan or CIS camera technology

system has helped the company to reduce the time for product changes on its line to a minimum, while also reducing waste during set-up.

"Overall, PAM gives us maximum flexibility and resource efficiency thanks to the use of automated actuators instead of the usual thermal expansion bolts – which consume more energy due to the permanent power supply," he added.

Web guiding

At the **ICE Europe** 2025 – held in Munich in early March – **BST** presented a number of solutions to make production processes smarter and more efficient, with developments in web guiding, surface inspection, web monitoring and inspection.

With Commander Smart Com 100, BST presented a new, intuitive operating concept for web guiding control, allowing sensor and control units to be controlled from a single interface. Together with the new EKR CON 610 control unit, the new CLS CAM 200 line and contrast sensor offer more precise control and is more compact than its predecessor. The exact positioning of the processed material effectively minimises waste and downtime, ultimately increasing productivity, says BST.

Its CoatingControl system ensures alignment of the coating positions using line scan or CIS camera technology with minimum space requirements. Maximum control accuracy is achieved thanks to robust edge detection. Together with SlittingControl, it can help to improve precision in applications such as lithium-ion battery separator film.

SmartData is BST's intelligent solution for networked production processes – which, the company says, increases the quality of web processing, simplifies work processes and automates them across all processes. It integrates into existing prepress and MIS systems and enables centralised control and analysis of production processes. Meanwhile, its AI-based inspection system, iPQ-Check, helps customers enhance print quality. With the new iPQ-Check Digital, BST offers a solution that is designed for fully digital printing systems that enables fully automatic inspection from the first print format.

Software updates

Also at ICE, **Theurer** presented the latest innovations in its C3 ERP/MIS software, which was developed for the printing and packaging industry. One is a logistics app – a mobile solution for fully integrated warehouse management.

It allows the monitoring of stock levels in real time, document incoming goods and record stock movements directly – boosting efficiency and flexibility.

Another update is production optimisation with artificial intelligence (C3 AI) – in which an AI tool analyses production data and helps achieve optimal planning by balancing factors such as on-time delivery, setup times, lead times, and capacity utilisation. Automating planning saves time and resources while maximising capacity utilisation, it says.

In addition, the C3 web portal has been redesigned for improved usability and real-time integration with the C3 database. Customers can manage product data and orders, view stock levels and benefit from streamlined processes, as well as organise call-offs themselves and place repeat orders.

Nordson Measurement & Control says its FilmPro infrared gauge can accurately measure the thickness of film and sheet. It is engineered to deliver accurate, repeatable, high-resolution thickness measurements for film, sheet and coated products under varying conditions, including fluctuating light, temperature and humidity.

FilmPro does not require special radiation licenses, protective guarding or interlocked safety gates. It can measure various materials including clear, pigmented, voided, pearlised and coloured (including black) films. It can measure the true thickness of voided, microporous or breathable films, as well as their weight and density. It can also measure barrier materials such as nylon, EVOH and PVDC.

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IMAGE: SHUTTERSTOCK

Protected species: latest in barrier film

Recent innovations in barrier film include ways to cut the use of polyamides, details on the rise of metallised film and how appropriate coatings can help to create sustainable products

Barrier film has become more complex in recent times – especially in areas such as recycling. Speakers at a number of **AMI** events last year addressed the topic from a number of angles.

At *Speciality Packaging Films Asia* – held in Bangkok, Thailand – Esa-Matti Aalto, general manager of **Matthews Industrial Technologies**, told delegates how the latest converting and coating techniques can be used to create sustainable packaging.

"Dispersion barrier coatings play an essential role in sustainable packaging solutions," he said.

Coatings can be applied to paper, mono-material plastic and bio-plastic substrates to boost sustainability, he added.

As cellulose-based plastics are becoming more commercially interesting, there need to be ways of coating them. One solution, offered by the company, is to use a water-based PVdC system to apply a barrier using a two-head coating line. This is appropriate for applications such as chocolate, twist-wrapped confectionery and dried foods. The line to apply these coatings typically has a working width of 850-1650mm, a speed of 400 m/min and a reel weight of up to 2,000kg.

Similarly, the company can coat mono-material plastics using a four-head off-line coating line. This adds a PVdC barrier coating as well as primer and functional top coatings. The line also has four gravure coating stations and a thermal drying system. It is aimed at applications such as primary packaging for potato chips, sweets and snacks. The line is typically 1500-3000mm wide, operates at a speed of 550 m/min and has a reel weight of 3,500kg. Typical materials used are BOPP, BOPE and BOPET.

The company also supplies a coating line for label stock material.

The lines can also incorporate a Digimarc digital watermark, which helps to improve the recycling

Main image: Vacuum packaging is a common method of barrier food packaging

IMAGE: BOBST



Above: Bobst has installed multiple Expert K5s at various converters

process. Adding an invisible mark to the packaging helps to ensure that it can be identified, collected and recycled later on – making for improved sorting in the recycling process.

Humid situation

At the same event, Chris Cheetham – sales director for the eastern hemisphere at **Bobst** – gave insights into how vacuum metallising can help to create packaging for humid climates.

At its Manchester technical centre in the UK, it has carried out multiple trials, on materials including PET, BOPP and CPP using machinery like its Expert K5 – a metalliser suitable for use with both paper and plastic substrates.

In terms of sustainability, customers want to use monomaterials (such as PE or PP), compostable, bio-based and biodegradable materials (such as PLA and PHA) or paper/fibre. In addition, there are increasing demands for higher barrier properties, he added.

"The common target is to replace traditional multi-material structures with new sustainable duplex and triplex, mono-material and alternative material, high- and ultra-high barrier packaging structures," he said.

One way to do this, he said, is with Bobst's AluBond process – a patented hybrid coating technology that claims superior anchoring properties to the substrate. Adhesion between the metallised layer and the substrate is at a level that conventional 'plasma' based systems have been unable to achieve, he said – leading to improved barrier performance.

The company has carried out multiple tests, such as EAA peel test (on metallised PET, BOPP and CPP) – all of which showed a high peel force. This includes very good cross-web uniformity.

Overall, the technique promises higher metal adhesion than standard metallised film, a superior barrier (for polyolefin substrates), corrosion resistance of the aluminium layer and fewer metallising defects.

The company is now working on Alubond Gen II, which has further benefits including optimised metallising defects – for more sensitive markets – and maintaining high dyne level and dyne level retention.

Metal market

Agrani Punj, head of international business at **Supervac Industries**, said that the use of metallised film is on the rise. The market is expected to swell at a compound annual growth rate (CAGR) of 4.8% – reaching US$7.2 billion by 2033 (up from US$4.5bn in 2023).

Emerging markets like India and China are expected to drive this growth – while mature markets like Germany and the US will also grow but at a relatively slower rate," he said.

Growth rates vary between 6.1% for India, to 1.8% for Germany.

At the same time, competition continues to drive down margins – with 13% average profitability in 2014 declining to around 10% in 2018 and 6% in 2025. Rising costs – of raw materials, energy and labour – has added to this pressure.

There are other factors at work too, including over capacity – leading to excess supply and lower prices – market saturation and global economic uncertainty.

"Uncertainty, such as trade disputes and geopolitical tensions, has impacted demand and profitability in the industry," he added.

Despite these pressures, there have been a number of technical advances. These include wider web widths – up to 4000mm – and improved barrier properties.

"Better metal-to-substrate adhesion and higher barrier values in metallised films has enhanced their ability to protect products from moisture, oxygen and other external factors," he said.

Other technical improvements include evaporation boats – such as its AlphaMax system, that can handle higher optical densities and machine speeds – and more accurate measurement of film characteristics, allowing better quality control and film performance.

"Today, metallisers have higher production speeds, improved coating uniformity and the ability to handle a wider range of materials and film structures," said Punj.

■ The next *Speciality Packaging Films* conference runs in Vienna, Austria on 9-10 December 2025. For more details, contact Carole Charrade on +44 (0) 117 314 8111 (carole.charrade@amiplastics.com). ❯

PE-rich

At the later *Multilayer Flexpack* conference in Chicago, USA, Martin Antensteiner and Anvit Gupta of **ExxonMobil** explained how its materials can be used to create polyethylene-rich barrier films.

In their presentation, they said a total of 2.5 million tonnes of materials are used in flexible packaging globally. The main material is PE (accounting for 59%), while the main use is for meat packaging (accounting for nearly two-thirds of applications). This was used for lidding films, vacuum/shrink bags, MAP/CAP bags, thermoforming webs and skin packaging, in order of volume.

One potential challenge, they said, was the recycling of polyamide-containing barrier film – as it has a higher melting point than polyolefins and has a "compatibility challenge".

"Typical flexible barrier films contain 10-45% PA," they said.

EVOH, they said, can provide a similar oxygen barrier while being easier to recycle.

The presenters pointed to a number of ExxonMobil materials – such as Exceed, Exceed XP and Enable – that can be used to create PE-rich barrier packaging. They cited one example of a potential thermoformable barrier film with reduced PA content – for 180-micron cast film. Here, a reference grade – with 26% wt PA and 5% wt EVOH – can be reformulated, creating a film with 15% wt PA and 5.5% wt EVOH, using layers of Exceed and Exceed XP to add toughness, sealing performance and puncture resistance.

The film can be thermoformed, offering a 40% reduction in PA layer thickness.

A second formulation created similar film but with no PA. Here, the EVOH barrier layer constituted 5.6% wt, but the structure used more of ExxonMobil's PE grades. It could be used for deep-draw thermoforming and was comparable with earlier versions.

"Our latest performance polymers allow the creation of PE-rich solutions without compromising on package integrity, optics or machinability," they said. "Exceed XP 8346, Exceed 3812 and Exceed 4536 can provide a combination of thermoformability, stiffness, and needle puncture performance."

■ The next *Multilayer Flexpack* conference runs in Chicago, USA on 21-22 May 2025. For more details, contact Carole Charrade on +1 610 478 0800 (**carole.charrade@amiplastics.com**).

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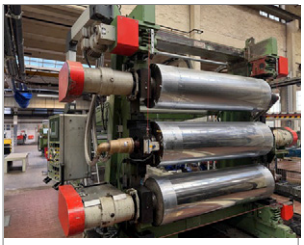
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IMAGE: MITSUBISHI CHEMICAL

Above: Mitsubishi's Soarnol can help to reduce the need for polyamide in packaging

Sustainable barrier

At the *Thin Wall Packaging* event in November, Souvik De and Yasuhiro Hirano of **Mitsubishi Chemical** presented details of how the company's Soarnol (EVOH) and Nichigo G-Polymer (BVOH) can be used to create sustainable multilayer barrier packaging.

Soarnol is already commonly used as a gas barrier within packaging structures. It can be tweaked so that it has either a higher barrier or higher flexibility – which is controlled by the ethylene content. It – along with other forms of EVOH – is a popular choice for barrier packaging because it is recyclable in many polyolefin recycling schemes.

A high-barrier version of EVOH can help to reduce the thickness of this layer within a packaging structure. At the same time, regrind from waste such as thermoforming scrap can be incorporated into a new, partially recycled barrier layer in new packaging.

"Soarnol EVOH resins with an ethylene content over 29mol% can be considered as compatible for polyethylene film recycling," said the presenters.

In addition, multilayer packaging film with up to 15 wt% Soarnol can be fully recycled in the presence of the company's Soaresin recycling additive, they added.

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DIING KUEN: BLOWN FILM



In this brochure, Taiwan-based Diing Kuen provides all the specifications of its blown film technology to produce mono, two three, five and seven layers.. The film lines are divided into four categories: HTRL horizontal top rotating; EBLR vertical top rotating; BFL fixed; and other types.

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AMUT: FOIL EXTRUSION LINES



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COLINES: BARRIER FILMS



This new brochure from Colines focuses on extrusion lines for the production of barrier films for vacuum and modified atmosphere packaging to preserve foodstuffs and medical products.

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BRUCKNER: BOPP/BOPE FILMS



Brückner Maschinenbau says its BOPP/BOPE film lines offer benefits including high stiffness and sealing strength, excellent transparent barrier, outstanding puncture resistance and linear tear opening behaviour. Find out more in this brochure.

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HAN KING



Han King, based in Taiwan, has produced this brochure outlining its machines for blown film extrusion, covering five-layer film, three-layer co-extruded film, agricultural film, geomembranes; plus other products in stretch hood, lamination and bags.

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VAN MEEUWEN: ADDITIVES



Van Meeuwen's functional additive range for plastics film and sheet producers includes anti-blocks, anti-statics, anti-fogs and specialty fluids. Suitable for plastic packaging applications, products comply with EU food contact regulations.

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Ray Products

Head office:	Ontario, California, USA
CEO:	Brian Ray
Founded:	1949
Ownership:	Private
Profile:	Roy Products, founded in 1949, began life as a producer of plastic bassinets for babies. However, it soon diversified into other products, especially custom enclosures for the early computer industry. It bought its first thermoforming machine in 1952. Since then, it has specialised in thermoformed products for industries such as medical, transport, energy and electric vehicles, as well as large parts for areas such as agriculture and heavy equipment.
Product lines:	The company specialises in producing custom thermoformed parts for a variety of industries. At one end of the scale, it can produce large vacuum-formed parts – up to 10 x 18ft in size – for applications such as entire lids for roll-off containers, stormwater retention chambers and covers for alternative fuel fleet vehicles. It also produces a variety of smaller parts, such as enclosures for equipment such as medical devices, solar racking and automotive products such as trunk trays.
Factory location:	The company has a single 48,000 sq ft production facility in Ontario that makes its entire range of products. The ISO 9001:2015 certified facility uses a range of advanced equipment, including fully robotic six axis trimming and 3D scanning measurement systems. It also has the capacity for mould making, painting, finishing and assembly. The company recently used Sekisui Kydex sheet to develop a housing for an EV charging station – using thermoforming rather than injection moulding, structural foam and sheet metal processing.

To be considered for 'Extruder of the Month', contact the editor on lou.reade@amiplastics.com



Film and Sheet EXTRUSION FORTHCOMING FEATURES

The next issues of Film and Sheet Extrusion magazine will have special reports on the following topics:

April 2025
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Film winders
Photovoltaics

May 2025
Waterproof membranes
Materials handling
Sheet materials

Editorial submissions should be sent to Lou Reade: lou.reade@amiplastics.com
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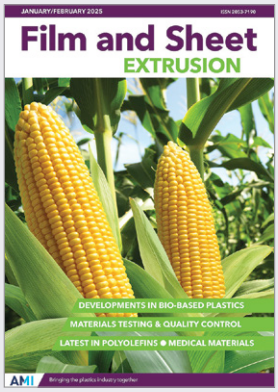

Film and Sheet
January/February 2025
The January/February edition of Film and Sheet Extrusion looks at how bioplastics producers are broadening the appeal of their offerings for film and sheet companies, plus new materials for medical applications, polyolefin-based developments and a testing/ quality control update.

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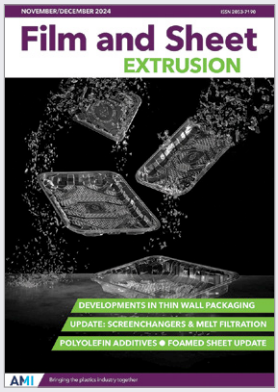

Film and Sheet
November-December 2024
In Film & Sheet Extrusion's November-December edition, the cover story reports on the views of thin wall packaging experts, while other features are on melt filtration systems, advances in foamed sheet and the latest stabiliser products.

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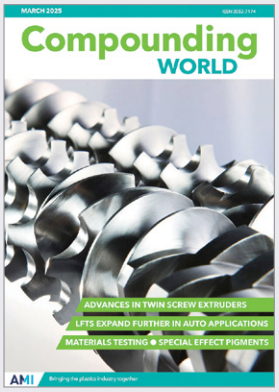

Compounding World
March 2025
The March issue of Compounding World magazine has a cover feature on technological developments in twin screw extruders, plus updates on special effect pigments, materials testing and long fibre thermoplastics.

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Plastics Recycling World
January/February 2025
Plastics Recycling World's January-February edition looks at technology partnerships in recycling flexible packaging waste, plus trends and products in pelletising and the ongoing sustainability drive of the PVC sector.

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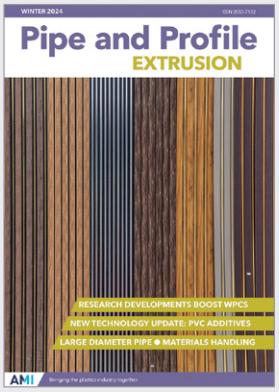

Pipe and Profile
Winter 2024
Pipe and Profile Extrusion's Winter 2024 edition has a cover feature showing how R&D is helping wood-plastic composites continue to improve, while other features are on large-diameter pipe, materials handling products and PVC additives.

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Injection World
January/February 2025
The January/February 2025 issue of Injection World provides injection moulding companies with the latest on recycling and granulator technology, recent advances in thin wall moulding and an update on reinforced thermoplastics.

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GLOBAL EXHIBITION GUIDE

2025

18-20 March	Plastics & Rubber Vietnam, Ho Chi Minh City, Vietnam	https://plasticsvietnam.com
24-28 March	Plástico Brasil, São Paulo, Brazil	www.plasticobrasil.com.br
15-18 April	Chinaplas, Shenzen, China	www.chinaplasonline.com
7-8 May	PlastTeknik Nordic, Malmö, Sweden	www.plastteknikнordic.com/en/
8-10 May	RePlast Eurasia, Istanbul, Turkey	www.replasteurasia.com
13-15 May	Kuteno, Bad Salzuflen, Germany	www.kuteno.de
14-17 May	Plastics & Rubber Thailand, Bangkok, Thailand	https://www.plasticsrubberthailand.com
20-23 May	Plastpol, Kielce, Poland	www.targikielce.pl/en/plastpol
27-30 May	GreenPlast, Milan, Italy	www.greenplast.org
24-26 June	Foam Expo North America, Novi, MI, USA	www.foam-expo.com
8-15 October	K2025, Dusseldorf, Germany	www.k-online.com
12-13 November	Plastics Extrusion World Expo North America, Cleveland, OH, USA	https://na.extrusion-expo.com/
3-6 December	PlastEurasia, Istanbul, Turkey	https://plasteurasia.com

AMI CONFERENCES

18-19 March 2025	Single-Serve Capsules North America, Tampa, USA
2-3 April 2025	Innovations in Pouches, Vienna, Austria
8-10 April 2025	Stretch & Shrink Film Europe, Malaga, Spain
21-22 May 2025	Multilayer Flexible Packaging North America, Chicago, USA
24-26 June 2025	Chemical Recycling Europe, Brussels, Belgium
15-16 July 2025	Agricultural Film North America, Tampa, USA
19-20 August 2025	Rigid Packaging Forum North America, Cincinnati, USA
26-27 August 2025	Bioplastics, Cleveland, USA
16-18 September 2025	Single-Serve Capsules Europe, Malaga, Spain
9-10 December 2025	Recycling Flexible Packaging, Vienna, Austria

For information on all these events and other conferences on film, sheet, pipe and packaging applications, see

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