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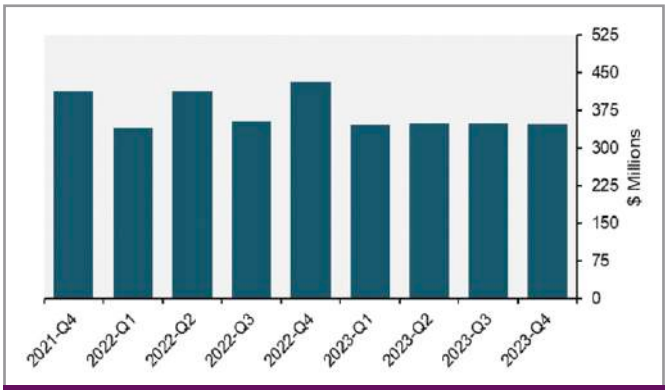
North American machine sales decline in final quarter of 2023

Sales of plastics machinery in North America saw a sharp decline in the fourth quarter of last year.

Initial estimates for the quarter indicate sales of just over US$348 million – a near-20% fall compared to the same period in 2022. However, the figure is almost identical to that from Q3 in 2023, says the Plastics Industry Association's Committee on Equipment Statistics (CES).

In primary plastics machinery, single-screw extruders saw a decrease of more than 19% compared to the previous quarter – but a near-5% increase compared to Q4 2022. Twin-screw extruder sales fell by 19% compared to Q3 – and by nearly 24% in comparison with Q4 2022. For comparison, injection moulding sales rose nearly 4% on the previous quarter, though declined by more than 21% over the full year.



Primary plastics machinery shipments
Source: Plastics Committee on Equipment Statistics

"Last year saw minimal fluctuations in quarterly plastics machinery shipments," said Perc Pineda, chief economist at the association. "The modest upturn observed in the second quarter was short-lived, with shipments remaining steady until the year's end."

He said the decline in US manufacturing activity, plus a high-interest-rate environment, contributed to a slowdown in business investment spending – including in plastics machinery.

The latest CES quarterly survey shows rising confidence in the market, with nearly 83% of respondents expecting conditions to remain steady or improve over the next 12 months. In the previous quarter, just 56% of participants expressed this view.

US exports of plastics equipment in Q4 reached US$284m, a rise of 5% compared to the previous quarter. At the same time, exports rose nearly 20% year-on-year. Mexico and Canada remained the top export markets, accounting for a combined share of more than 62%. Half of the exports (around US$124m), went to Mexico, while around one-fifth (19%) of total exports went to Canada (totalling US$53m). Overall, imports saw a near-12% increase compared to Q3 – reaching nearly US$428m – but fell around 14% year-on-year.

"While the unexpected 2.5% US economic growth in 2023 averted a recession, signs of recovery may emerge in 2024," said Pineda.

"Sustained consumer spending could prevent economic deterioration, especially if labour markets stay healthy. As interest rates begin to return to normal, business investment – including in equipment – may reverse course."

› **www.plasticsindustry.org**

Chinaplas back in Shanghai after six years

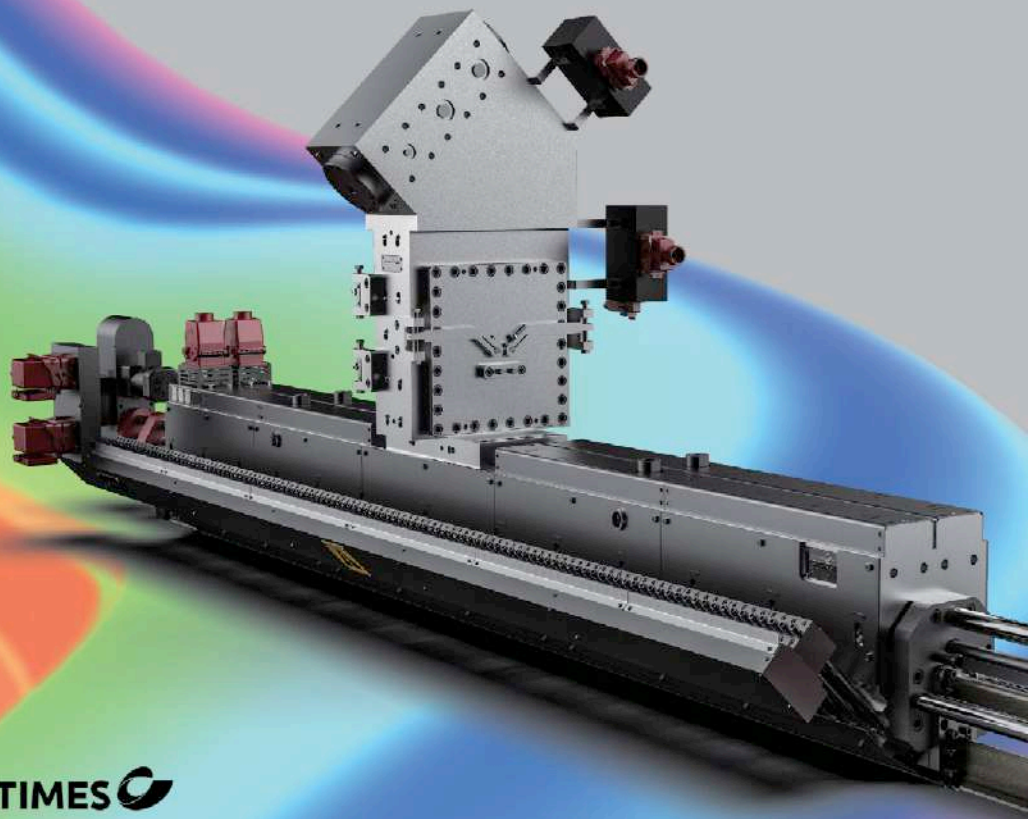
IMAGE: ADSALE

The Chinaplas exhibition returns to Shanghai this year – following a six-year absence.

The show, held on 23-26 April, will occupy all 15 exhibition halls of the National Exhibition and Convention Center (NECC) in Hongqiao, Shanghai. The organiser, Adsale, expects to host more than 4,000 exhibitors in a total exhibition area of over 380,000 sq m.

Following several years of strict regulation – in terms of entry – China has granted visa-free entry to several countries, including France, Germany, Italy, Spain, Malaysia, Thailand and Singapore. It has also introduced measures to simplify the visa application process, in an attempt to make attendance easier and more convenient.

› **www.chinaplasonline.com**



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Berry creates new firm

Berry Global is to create a 'speciality materials company' in collaboration with Glatfelter.

The new entity, which will be publicly traded, combines most of Berry's health, hygiene and specialities (HH&S) segment – including its non-wovens and films business – with Glatfelter. Berry says the new company will become a global leader in the growing speciality materials industry.

"This is the culmination of a comprehensive review of strategic alternatives," said Kevin Kwilinski , CEO of Berry. "We believe these two businesses, in combination, can drive significant value for shareholders with complementary portfolios."

The new business – expected to have a turnover of around US$3.6 billion – will be led by Curt Begle , president of HH&S at Berry.

› **www.berryglobal.com**

Huhtamaki sales and profits drop in 2023

Finnish packaging major Huhtamaki has reported a fall in both sales and profits in 2022.

Sales for 2023 fell by 7% to around €4.2 billion (US$4.5bn), while profitability (adjusted EBIT) was €393m (US$423m) – around 1% lower than in 2022.

In the final quarter of 2023, sales slipped by 6% to just over of €1bn (US$1.1bn), while profitability (adjusted EBIT) rose by 15% to €108m (US$116m).

"In 2023, we delivered a solid performance despite lower consumption across categories and geographies, driven by the impact of inflation," said Charles Héaulmé, president and CEO of Huhtamaki.

The company's global food service business saw a decline of 7% over the course of the year, eventually reaching just over €1bn (US$1.1bn). This resulted in a similar 7% fall in profitability to around €98m (US$106m). Currency movements caused the segment's net sales to decline by €32m, said the company.

IMAGE: HUHTAMAKI

Héaulmé: "A solid performance in 2023 despite lower consumption across categories and geographies"

At the same time, lower demand and volumes caused sales in flexible packaging to fall 14% to reach around €1.6bn (US$1.7bn). Profitability in the segment fell by 10% to €88m (US$95m). Currency movements caused net sales to decline by €73m, said Huhtamaki. Huhtamaki also is closing its flexpack plant in the Czech Republic – which employs nearly 200 people – by the end of March 2024.

Huhtamaki said the facility does not represent a material share of its sales or profits. It booked closure-related costs of around €35m (US$38m) in the second quarter of 2023. In time, the closure is expected to be cash positive and improve the company's competitiveness in Europe, it said.

Business in North America was relatively flat – declining just 1% to around €1.5bn (US$1.6bn). Currency movements caused net sales to decline by €37m.

"We took steps in 2023 to optimise our manufacturing footprint and improve productivity globally," said Héaulmé. "These include consolidation of manufacturing capacity in Europe and India to larger units. The improvements are expected to lead to savings of around €100m (US$108m) over the next three years."

› **www.huhtamaki.com**

TeraPlast sees contraction in performance

TeraPlast of Romania reported a decline in both sales and profits in 2023.

The company, which produces a variety of products including flexible packaging, saw a 5% fall in sales for the year, reaching RON672 million (US$145m).

At the same time, profitability (EBITDA) slipped slightly by 3% to around RON51m (US$11m). It put this down mainly to a decline in its compound business.

Turnover in its flexible packaging business rose by 15% to around RON46m (US$10m), while EBITDA fell – with the division posting a loss of around RON8m (US$2m).

According to TeraPlast, this was the only one of its divisions to post a decline in profits.

"Results reflect the challenging economic context, with a decrease of demand for some of our markets, which led to us directing our efforts to preserving volumes, market shares and margins," said Ioana Birta, CFO of TeraPlast.

The company expects revenue in the division to grow by 80% this year, due to the commissioning of a new stretch film plant.

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Bottom: Stacked packaging, coated with anti-block

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Free registration now open for AMI's European plastics expos

Free online registration has opened for the AMI Plastics World Expos, which are being held at the Brussels Expo in Belgium on 11-12 September 2024.

Taking place for the fourth time in Europe, the event is organised by *Compounding World* publisher AMI and brings together three focused exhibitions: the Compounding World Expo, Plastics Recycling World Expo, and Plastics Extrusion World Expo.

Registering in advance means visitors gain free admission to all three shows, which will together feature more than 200 suppliers, as well as free entry to each show's focused conference theatre hosting technical presentations and business debates. Attendees and exhibitors will also have the option to buy tickets for a networking party on the evening of 11 September.


IMAGE: AMI

Above: Visitors at last year's Plastics World Expo in Germany

"This event will provide visitors with a fantastic opportunity to meet and compare suppliers from around the world, as well as giving them the chance to learn from business leaders and technical experts in the conference theaters," said Jenny Amaru, Expos Business Unit Manager at AMI. "When we ran these expos in Essen, Germany last year, they attracted more than 3,000 visitors including buyers and specifiers from leading compounders, recyclers, extruders, OEMs and brand owners".

The three expos will feature a wide array of leading manufacturers of compounding, recycling and extrusion equipment, plus suppliers of a huge variety of polymers, additives and related services. There will also be special zones focused on chemical recycling and polymer testing.

The exhibitor line-up already includes: APK; B+B; Bandera; Buss; Coperion; Erema; Farrel Pomini; FKuR; Gneuss; ICMA San Giorgio; KraussMaffei Extrusion; Leistritz; LKAB Minerals; Maag; Mixaco; NGR; Nordson; Orlen Unipetrol; Piovan; Rianlon; Sachtleben Minerals; Sogapol; Sorema; Theysohn Extrusionstechnik; Unitechem; Van Werven; Vecoplan; and Wacker Chemie.

The three focused conference theatres will feature more than 60 expert speakers from leading compounders, recyclers and extruders.

To book your free ticket visit https://ami.ltd/PWE-EU-Register

Finland plans agricultural film recycling

Finland-based Rani Plast is a part of a new recycling organisation called SuMaKi, which will begin collecting used bale wrap from farms.

Planning of the system began in 2022, and – beginning in August – 2024 will be the pilot year, concentrating first on bale wrap.

"The goal is to create a system that's user-friendly for farmers and logistically efficient," said Mats Albäck, sustainability and development director at Rani Plast.

There is currently no law regulating the recycling of agricultural film, which leads to significant material loss. However, manufacturers are interested in recovering and recycling as much of it as possible, he says.

Plastic waste will be gathered through pop-up collections or directly from farms. Farmers can use the SuMaKi app or a website form to inform the organisation when waste is ready for collection. Neighbours can collaborate and pool their waste at one location for collection and recycling. SuMaKi requests that the plastic is as clean as possible, and sorted by colour, with white bale wrap in one pile and all other coloured plastics in a second pile.

"This is important, so that we can reuse as much material as possible," he said. "The collected plastic will be cleaned, re-granulated, and transformed into new bale wrap and other products. The re-granulation process will be put out to tender."

Collections will be free of charge, provided instructions are followed. The idea is for the system to generate revenue through the creation of new raw materials. The scheme will be publicised at upcoming trade fairs.

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German converters report 6% sales fall

German plastics converting, 2023

	Sales 2023 (bn€)	% Change
Domestic	42.3	-9.4
Export	30.2	-0.3
Total	**72.5**	**-6.0**

Source: GKV

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

It said this was down to "current unfavourable conditions for the German industry", such as lower consumer spending, rising interest rates and higher energy prices. In addition, uncertainty over future prospects led to a reluctance to invest.

GKV said that sales fell below €73 billion (US$78bn) in 2022, a decline of 6% compared to 2022. Nearly 42% of sales (€30bn, or US$32bn) were from exports – almost identical in value to the preceding year. At the same time, domestic sales fell by almost 10%, to account for more than €42bn (US$45bn).

"The cause of the economic crisis in Germany is predominantly of a structural nature," said Helen Fuerst, president of GKV. "We need a future-oriented growth agenda so that industry can pick up speed again in two to three years."

Such an agenda must focus on energy, bureaucracy, investments and digitalisation, she said.

Processing volumes also fell – by around 9% to 12.7 million tonnes of plastic. Of this, 2.4m tonnes was recyclate – the same amount as in 2023. In the same period, the industry's workforce declined by around 2% to just under 320,000 people. The number of processing plants remained stable at around 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 a near-10% decline in the amount of material processed (4.2m tonnes). This equated to turnover in the sector of nearly €17bn (US$18bn) – a fall of nearly 8%, said GKV.

Fuerst also called for a re-think on regulation. "Europe and Germany need an effective stop sign against bureaucracy," she said. "We demand that at least half of all regulations be abolished within the next parliamentary term of the European Parliament."

› **www.gkv.de**

Uflex announces flat sales and profits in third quarter

Uflex of India has posted relatively flat results for the third quarter of its financial year.

The company reported unaudited sales of INR33 billion (US$400 million), around 4% lower than same period in the previous year. Profit (adjusted EBITDA) for the period was stable at around INR4bn (US$51m).

However, it raised volumes by nearly 6% to nearly 148m tonnes.

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The trend to more recycled and bio-based content is driving innovation in sustainable additives for film applications, writes ***Jennifer Markarian***

IMAGE: SHUTTERSTOCK

Growing demands for film sustainability

Plastic film formulations are engineered to deliver high performance in a wide range of blown and cast applications with the key aim to enable them to be extruded at high speeds without line breaks and at ever thinner gauges while maintaining, or improving, required physical properties. Additives – including antioxidants, slips, and processing aids – are crucial to this performance.

Additive suppliers today are developing new options that meet demands from film users and processors through the introduction of bio-based additives, alternative processing aids, and solutions that help maintain film performance with ever higher levels of recycled content.

Additives also play a role in the shift to mono-material flexible packaging, which can be more easily recycled than films composed of multiple layers each containing different – and sometimes incompatible – polymeric materials or metallized components. The challenge is to create a mono-material film that can still meet the needed barrier properties.

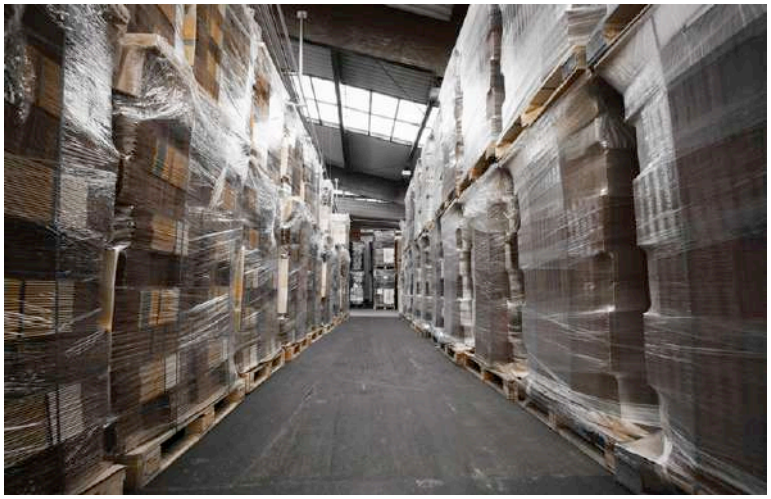
UltraGuard solutions from **Milliken** are said to have been shown to significantly improve barrier performance in HDPE, and the company says they can be used to produce recyclable, non-metallised moisture barrier packaging. This year, Milliken plans to introduce a new addition to the Ultra-Guard line in the form of a masterbatch formulated for HDPE and LLDPE flexible packaging uses.

"We are finalising a new generation of Ultra-Guard to further enable mono-material packaging solutions," said Katie Kellogg, global product line manager for masterbatch solutions at Milliken. "Brands are asking for sustainable plastic packaging options but often cannot sacrifice performance metrics of their current packaging. By enhancing the performance of blown HDPE and LLDPE film, we hope our soon-to-be-launched UltraGuard solution will make more mono-material packaging possible, thanks to increased barrier performance."

In September last year, **BASF** said that it was to offer two of its workhorse antioxidants in biomass-balanced (BMB) versions that replace fossil-based

Main image: Additive suppliers are working hard to develop products that meet end user demands for improved sustainability and reduced carbon emissions

IMAGE: SHUTTERSTOCK



Above: Growing use of recycled content calls for improved additive packs to minimise polymer degradation

feedstock with renewable feedstock. Irganox 1010 BMBcert and Irganox 1076 BMBcert have been mass balance certified by TÜV Nord according to the International Sustainability and Carbon Certification (ISCC PLUS). In this approach, ISCC-certified bio-based feedstock is used at the beginning of the value chain and "a corresponding amount" is attributed to the product, BASF explains.

The company says that the use of renewable feedstocks reduces the product's cradle-to-gate carbon footprint by up to 60%, compared to the global average product carbon footprint of conventional grades. BMB products are identical to conventional grades in all other aspects. Initially, the two antioxidants will be produced at BASF's Kaisten site in Switzerland. They are expected to also be available from the company's McIntosh site in the US from early in 2024.

"These two additives are key antioxidants for the plastics industry. As we all move towards new innovations and more sustainable applications, particularly in the automotive and packaging sectors, we must also rethink the established chemistries that enable plastics to meet the demands and goals of the end markets," said Dr Marina Leed, senior manager global sustainability, plastic additives at BASF.

Right: Milliken's Ultraguard additives can help improve barrier performance

IMAGE: SHUTTERSTOCK

Balanced offerings

"Major resin producers have been systematically certifying their production sites for biomass balance offerings: it is clear that appropriate additive solutions are needed to achieve completely non-fossil-based polymer formulations," she said. "We saw an opportunity to leverage our global and integrated production to be the first antioxidant supplier to offer these solutions to our customers. These new Irganox BMBcert offerings have a significantly lower product carbon footprint (PCF) than their conventional fossil-based grades. For brands with defined CO_2 emission targets, using lower PCF raw materials, even at low loadings, will make a significant contribution to reducing their overall Scope 3 emissions."

Taxes on carbon within the EU market are considered likely to raise interest in lower PCF materials. Leed says its recently implemented Carbon Border Adjustment Mechanism (CBAM) taxes the amount of embedded carbon emissions of a product that is transported across EU borders.

"While the initial list of impacted materials does not include plastics, it is expected that other industries and materials will be added before the final CBAM implementation in 2026," she said. "The use of lower carbon raw materials, such as Irganox BMBcert, will reduce the carbon emissions calculated for plastic films and related tax burdens compared to traditional fossil-based alternatives."

The EU's upcoming Packaging and Packaging Waste Regulation (PPWR) is also likely to further drive the need for plastic films to be designed for recycling. "BMBcert additives are fully compatible with established recycling processes and in some cases can also improve the performance of recycled plastics. It remains to be seen whether renewable content (replacement of fossil raw materials) will contribute to the recycled content targets that are also proposed as part of the PPWR," Leed said.

The ongoing drive to use more recycled content, particularly in films for single-use packaging applications, is driving demand for compounds with a 'boost' of additives to help prevent gels and other problems that could result from loss of antioxidant and subsequent polymer degradation. **Clariant**'s Addworks PKG 906 Circle, for example, is a stabiliser designed to allow increased levels of recycled resin, such as in-house trim or off-spec, to be used in both cast and blown PE and PP film production processes without loss of quality or manufacturing efficiency. The company claims it is especially suited for biaxially oriented PP (BOPP) film production, and that it can reduce gels, black spots, and film breaks.

Recycling demands

Meanwhile, **SI Group** reports increased demand for and incorporation of recycled resin into formulations across applications, as well as an increasing awareness at film recyclers regarding the importance of antioxidants to protect the polymer from severe degradation during recycling. "When dealing with post-consumer streams, it is important to prevent the gel formation as early as possible during the recycling process," said Jeroen Frederix, market development manager for circular economy at the company

SI Group's Evercycle LD-101S is said to be an easy-to-dose, non-dust-blend (NDB) for recycled LDPE/LLDPE (referred to as rL(L)DPE by SI) streams that can protect the polymer during mechanical recycling. Frederix says that if a recycler switches from using a stabiliser in masterbatch form to the NDB form, they can lower the dosage and eliminate the carrier resin, which is often virgin plastic.

Evercycle LD-104P is a masterbatch that can be applied in either – or both – of the recycling and converting steps when working with rL(L)DPE resin. The masterbatch has been shown to benefit blown film converters by improving bubble stability at higher loadings of PCR material, Frederix says. In cast stretch film extrusion, the masterbatch helps improve mechanical performance and allows increased recycled content. In particular, for adding post-industrial recycle to stretch film formulations, the company says the masterbatch has been found to improve the final stretch film performance when added during film extrusion.

Roberto Nunez, market development director for special additives at **Baerlocher** in the US, says that Baeropol T-Blends are a family of products intended to be added during film recycling to alleviate some of the problems experienced when using post-consumer recyclate (PCR). The additives are said to reduce additional gel formation and provide a more stable melt flow, for example. T-Blends are available as a 100% active-content, dust-free pastille that can be dosed alone or dry-blended with masterbatch or polymer.

To prevent gels and stabilise melt flow in compounds that contain recyclate, **Dover Chemical** recently introduced DoverClear 800, a recycling-grade antioxidant based on its Doverphos LGP12 – a liquid secondary antioxidant that was introduced as an alternative to TNPP more than a decade ago. Shawn Cook, technical manager for plastic additives at the company, says the additive is optimally added during compounding of the recycled material to prevent gels in the subsequent film extrusion step.

Data shows that LGP12 can prevent or reduce large gels that can cause tears in films. In a large trial, LGP12 was shown to near eliminate gels in a compound made with post-industrial recycle (PIR) and significantly reduced them in a compound made with PCR [Figure 1]. In addition to acting as an antioxidant to prevent polymer degradation, the additive has a lubricating effect that can further prevent larger gels by reducing material-hangups in dead-spots, Cook says. DoverClear 800 is offered as a masterbatch of up to 8% loading, with typical final product loadings of 0.5-4%. It has FDA food-contact approval in LLDPE and HDPE.

Polymer processing aids (PPAs) are widely used to prevent melt fracture during film processing.

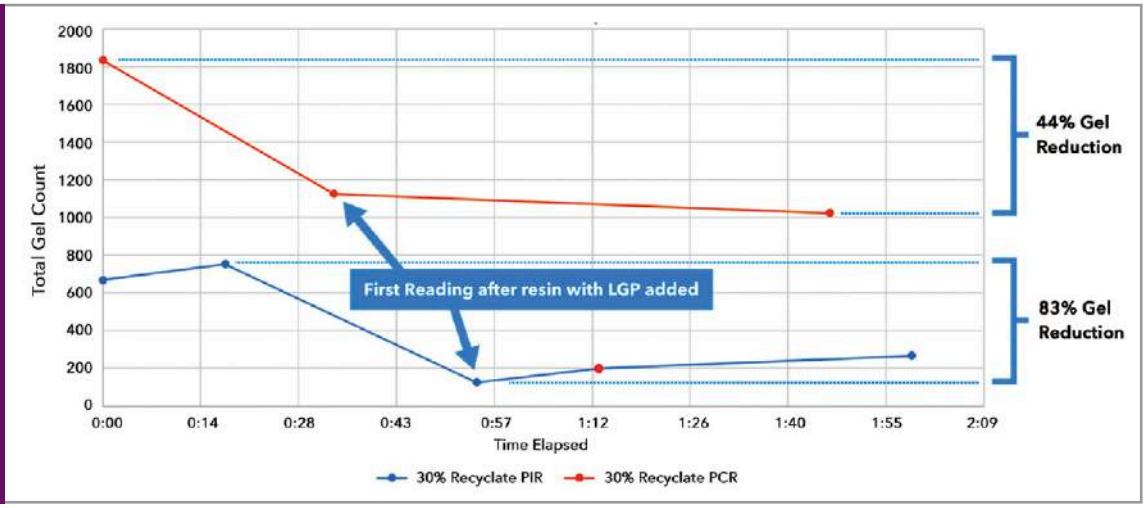
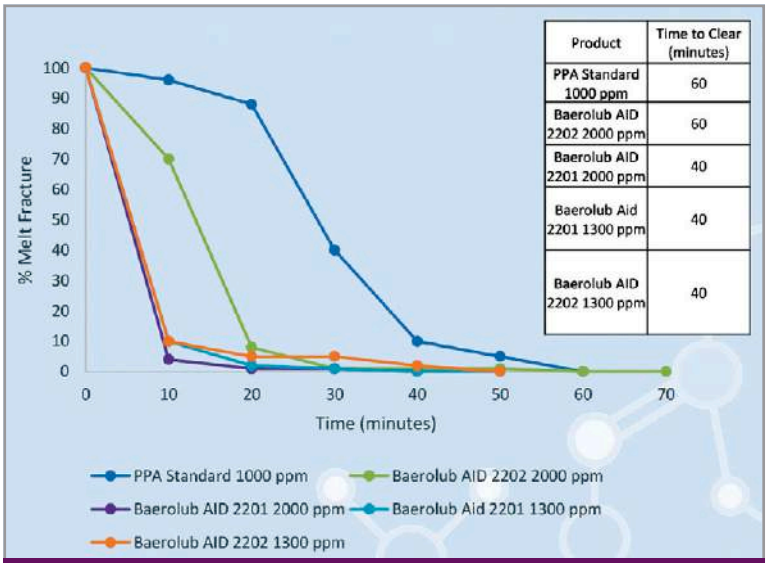


Figure 1: Chart showing reduction in total gel count using Dover Chemical's LGP12 antioxidant in production of PE film with 30% PIR and PCR content

Source: Dover Chemical



Product	Time to Clear (minutes)
PPA Standard 1000 ppm	60
Baerolub AID 2202 2000 ppm	60
Baerolub AID 2201 2000 ppm	40
Baerolub Aid 2201 1300 ppm	40
Baerolub AID 2202 1300 ppm	40

Figure 2: Time to clear melt fracture in blown film production for standard processing aid against Baerlocher's new PFAS Baerolub AIDS 2201 and 2002 products

Source: Baerlocher

However, due to the potential threat of European and US regulations restricting the use of fluorinated materials in the future, both plastics processors and additive suppliers are seeking alternatives.

Grouping concern

Fluoropolymers are significantly different from the per and polyfluoroalkyl substances (PFAS) that have been identified as a concern. However, regulators are currently grouping all materials together and potential exceptions are yet to be determined. In addition, short-chain oligomers in siloxanes have been categorised as substances of very high concern (SVHCs) by the European Chemical Agency (ECHA). With an eye on pending regulations, many additive suppliers are developing "PFAS-free" PPAs as well as "siloxane free" PPAs.

Dover's latest DoverClear PPAs, which are offered as masterbatches, do not contain PFAS or siloxanes. Doverclear 840 in an LLDPE carrier is recommended for resins with a melt index greater than one while Doverclear 841 is recommended for resins with fractional melt indices. Both the LLDPE grades have FDA food-contact approval. The PPAs are typically used at 0.5-2.5% in the final product and they are also available in other carrier resins.

The OMS (organo-modified siloxane) line of processing aids from **Evonik** includes two non-fluorine PPA masterbatches for films: Tegomer 6810 for PE films and Tegomer 6850 for PP films. These OMS PPA masterbatches prevent sharkskin and die buildup at a loading level of 0.5-2%, said Chris Roland, technical service polymer chemist at Evonik in North America, in a presentation given at AMI's North American Compounding World Expo last November.

Advantages of the OMS PPAS when compared to fluorinated PPAs are said to include shorter set-up and cleaning times, no corrosive wear to the extruder, and high heat-resistance for use in cast film. The masterbatches have US FDA food-contact approval, and they are under review for food-contact approval with other agencies globally. The Tego XP 21051 grade already has food contact approval globally, including FDA approval for up to 0.2% in the final product.

Evonik also recently introduced a new PPA – Tego XP 21052 – which is both non-silicone and non-PFAS and can be used in PP and PE blown and cast film. It has global food-contact approvals and is now available for sampling.

Alternative PPAs

The Baerolub Aid family of PPAs, from **Baerlocher**, is formulated without PFAS or siloxane. The company said that tests have shown that the new PPAs perform well in blown film, with rapid clearing of melt fracture and reduced die build-up in LLDPE and high molecular weight HDPE. ❯

"In the US, brand companies are driving replacement of PFAS PPAs in packaging, particularly in metallocene-catalysed LLDPE films, which require PPAs for good processability," said Baerlocher's Nunez.

"They want to know how quickly and at what cost the conversion can be made – not if it can be made. The good news is that we have found our new solution clears melt fracture even faster than conventional fluoropolymer PPAs in many conventional blown film formulations and processes."

Baerlocher says it has been working on the platform for more than two years and that positive results have been repeated in many trials. The company says that four polymer producers have reached production stage as they introduce PFAS-free resins into the market.

Two product grades are available. Baerolub AID 2201 is said to be best for the fastest time to clear melt fracture in metallocene LLDPE [Figure 2]. Another option for certain conditions is Baerolub AID 2202, which the company says provides very good melt clearing times compared to traditional PPAs. The additives have global food contact approvals, and Nunez says that Baerlocher is prepared to scale up quickly and supply the product globally.

ProVital + Permstat is a non-migratory antistatic masterbatch from **Ampacet** that provides permanent antistatic properties for polyolefin films used in pharmaceutical applications, such as packaging for powdered pharmaceutical ingredients. The antistat is added to the external layer of packaging films so that electrostatic charges can dissipate. Another new product from the company is Permslip 1409, a non-migrating permanent slip solution for flexible packaging conversion.

Ampacet has also introduced PFAS-Free PPA masterbatches for blown film extrusion that can be used at the same let-down ratios as Ampacet's other common fluoropolymer-based PPA masterbatches, providing a solution for resin producers accustomed to using very low concentrations. The line includes an FDA food contact-compliant PFAS-free PPA, a globally-compliant PFAS-Free PPA, and one that is globally compliant and siloxane-free. The additives eliminate melt fracture, reduce die buildup for less downtime and offer increased throughput, similar to fluoro-based PPAs.

Below: Ampacet has developed a line of PFAS-free PPAs for blown film production

IMAGE: AMPACET

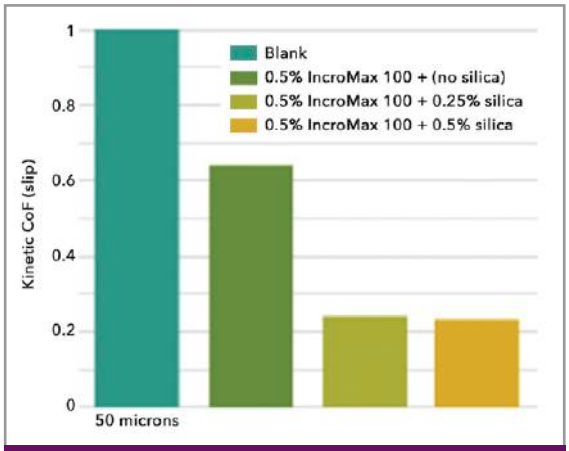


Figure 3: Coefficient of friction of cast PET film produced with no slip additive compared against samples containing IncroMax 100 and silica
Source: Cargill

In cast PET film production, **Cargill**'s IncroMax 100 additive can be used in combination with silica to optimise coefficient of friction. The company says that in very thin cast PET film extrusion, the slip additive must bloom quickly to fill the large surface area. It says its studies have shown that its organic, bio-based IncroMax 100 additive is compatible with the inorganic silica often used in such formulations, and that the silica helps carry and disperse the additive efficiently.

"[The] IncroMax additive may replace or complement other slip additives commonly used in cast PET formulations," said Emile Homsi, R&D manager for polymer additives at Cargill. "IncroMax 100 additive is designed to provide controlled and consistent slip performance while minimising negative effects on other properties of the polymer. Its compatibility with silica likely contributes to its ability to enhance slip in cast PET without compromising other essential attributes of the material [Figure 3]."

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More pressing matters: latest in thermoforming

IMAGE: PERSTORP

Advances in thermoforming include a PET grade that allows hot filling – even with the inclusion of recyclate – and several ways to boost the use of polypropylene in packaging

Main image: Perstorp's new Akestra grade enables hotfilling capability

At the *Thin Wall Packaging* conference in Germany last year – organised by **AMI** – delegates learnt some potential advantages of polypropylene and polyester thermoformed packaging.

Jivan Ibrahim, business development manager of **Perstorp** in Sweden, told delegates how recyclable hot fill packaging can be achieved using a range of its materials. These include its Akestra thermoplastic polyester, Holtac PVC co-stabiliser and a number of polyols for use as antioxidants, UV stabilisers and processing aids.

Benefits of PET in this area include energy efficiency and circularity – with several advances in PET recycling such as advanced sorting techniques and new ways of cleaning and decontaminating the material.

He said that a key benefit of its new Akestra grade compared to standard PET is that it has hotfilling capability – where standard PET does not.

He cited the example of a three-layer thermoformed container with a middle layer of rPET and outer layers of Akestra. It can contain up to 80% recyclate and is heat-resistant at 85-90C. Sheet used to make the container can use existing extrusion techniques.

"It has tunable heat resistance regardless of PCR content," said Ibrahim.

Here, he said PCR content has been varied between 30% and 90%, leading to a material with a maximum heat resistance of 75-95C.

He also cited possible carbon footprint reduction compared to polystyrene. While 100,000 tonnes of PS packaging would emit around 365,000 tonnes of CO_2, he said Akestra with 30% PCR would cut this by 24%, while Akestra with 80% PCR would reduce it by 56%.

"This is a flexible solution to tune heat resistance performance based on PET while keeping transparency and rigidity benefits," he said.

Mono material

Andreas Goeldel, commercial technology director at **Grupa Azoty Polyolefins** in Poland, said there are many innovative applications of polypropylene (PP) in thin wall packaging.

He pointed to the ability to make mono-material packaging using PP – citing the example of an all-PP takeaway coffee cup. Ordinarily, he said, this might comprise a cardboard sleeve, cardboard body – with polyethylene (PE) liner, and polystyrene (PS) lid.

"This makes things easier to separate and select during the recycling process," he said.

Similarly, a food container needs a coating in order to protect the contents – unlike, say, a cardboard tray, which may require this for protection against wet or oily contents. ›

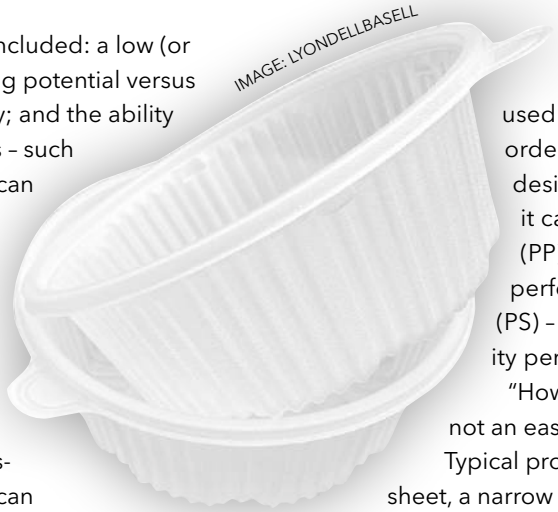
IMAGE: LYONDELLBASELL

Right: LyondellBasell's Moplen EP490H is a PP grade used to make extruded foamed sheet

Claimed benefits of PP included: a low (or competitive) global warming potential versus other polymers; low density; and the ability to process it at high speeds – such as using thermoforming. It can also be separated easily during sorting and cleaned relatively easily.

"It's also the best feedstock for advanced recycling processes," he said.

In some modern processes – such as dissolution – it can achieve 'close to virgin' quality, he said.

The company already offers thin wall injection moulding grades – and is in the process of developing high-end thermoforming PP grades.

PP sustainability boost

Luan Gaviao – global market development manager – and Synco de Vogel, technical service representative at **Synthomer**, told delegates that innovation in thermoformed packaging can help brands to hit sustainability targets.

The company's additive products can be used to modify polymers in order to make mono-material designs possible. Here, it says it can modify polypropylene (PP) to have equivalent performance with polystyrene (PS) – but with better sustainability performance.

"However, thermoforming PP is not an easy task," they said.

Typical problems include sagging sheet, a narrow temperature window, slower production cycles and the risk of uneven shrinkage. The way around this was to add its Plastvalence T to PP "so that it behaves like PS". This included making PP stiffer and giving it a wider processing window and medium ductility.

In a trial, it was processed at high speed on a Battenfeld-Cincinnati sheet extrusion line then thermoformed on a Hassia P500 form-fill-seal machine. It was used to make 0.5mm thick PP sheet, using a Sabic sheet grade and 16% Plastvalence T. This compared with a 0.6mm PS sheet

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made of HIPS. Thermoformed cups showed no reduction in performance – and actually had several benefits compared to a PS cup, such as a higher top load, better haze and gloss, easier recyclability and 38% less weight. This helped to halve CO2 emissions, while saving around one-third on material costs per year.

In a second trial – to replace PET – a similar sheet was compared with 0.4mm thick transparent A-PET sheet. Thermoformed cups had a 30% higher top load, slightly better haze and gloss, superior barrier properties and 38% less weight – with lower density. This helped to cut CO2 emissions by 55%, while saving around 8% on material costs per year.

"This shows it is possible to convert to PP without changing machinery – and meeting brands' sustainability targets," said the presenters.

Foamed future

Gabriella Sartori, marketing manager at **Lyondell-Basell**, presented details of the company's new Moplen EP490H – a new PP grade for extruded foamed sheet.

The heterophasic copolymer is designed specifically for foam applications. It is produced with a non-phthalate catalyst and is free of plasticisers and BPA. A complete foaming solution is available in combination with its Polybatch chemical blowing agent masterbatches.

Benefits include: high melt strength, for good foamability; good processability – with no gels; and high impact resistance for optimal food preservation.

"Moplen EP490H has a high melt strength that enables the formation of a fine and uniformly dispersed cell structure," she said.

She claimed that the material has a lower density and higher foamability than "any conventional PP". The process, using an annular die and physical foaming, claims to produce sheet with a density of 200 kg/m^3 – compared with flat die/physical foaming (450 kg/m^3) and flat die/chemical foaming (550 kg/m^3).

The subsequent thermoformed sheet can be used to make lightweight final products, she added.

Other benefits include increased impact resistance and good dimensional stability, enhanced aesthetics (smooth surface) and easy recyclability.

"The PP trays can be combined with PP lids of film for a monomaterial packaging design," she said. "The typical chemical and temperature resistance of PP makes it suitable for washing systems."

Light PET

Delegates at an earlier Thin Wall Packaging event – held in the US – also heard of innovations in both polyester and PP. In a joint presentation, **Kiefel** and **SML** presented details of how C-PET can be used to create thin-wall packaging.

C-PET can be used to replace PS and PP in food packaging, having a heat resistance of 180-230 C. In addition, C-PET light is heat-resistant up to 100 C and can be processed in a single step. It is transparent and uses a patented tool technology.

The speakers cited a C-PET light cup, which could be made using recyclate. It is suitable for steam sterilisation. The fact it can be made in a single step helps to raise output.

C-PET light sheets combine virgin PET, skeleton regrind and rPET from bottle flakes – as well as a nucleation accelerator and a colour-correction pigment. Critical attributes for processing include its intrinsic viscosity (IV) and crystallisation speed. The material's properties are determined by the production process: because it undergoes both strain- and temperature-induced crystallisation as it cools, this helps to raise its physical properties (such as heat resistance). This is achieved by close control of process conditions – which also lead to precise sheet thickness and uniformity.

The companies carried out optimisation trials on more than 30 different formulations, testing around 30 tonnes for A-PET and PCR. ›

Thick sheet with crystal clarity

IMAGE: SML

Separate to the conference, SML says calendering is critical for producing extra-thick APET sheet for thermoforming large cups with a one-litre (32 ounce) capacity.

"If a glass-like quality is required for thermoforming APET sheet in the range from 1,200 to 2,000 microns, manufacturing becomes relatively demanding," said Rupert Becker, product manager at SML.

For high transparency, intrinsic viscosity (IV) of the melt is a key to successful production. A highly viscous melt is essential for making crystal-clear, extra-thick APET sheet. Using raw materials with an IV value higher than 0.78 g/dl – combined with pre-drying and single screw extrusion – minimises IV loss for the melt throughout production.

A slanted roll stack allows the viscous melt to stabilise before entering the nip. Disturbances or interruptions can be largely excluded. This contributes towards the formation of highly transparent APET sheet. To prevent scratches, dots or dents on the sheet surface, the surface of each roller – from roll stack to winder – must have a premium surface.

Crystal clear, extra-thick APET sheet also needs a relatively dust-free environment, as it has a propensity for static charges. Otherwise, dust will be sucked towards the sheet during production – which can create scratches.

"Dust might seem to be a tiny issue, but all the measures mentioned above are null and void if the production environment is not relatively free of it," said Becker.

C-PET light sheet was also processed on a Kiefel KMD thermoforming machine, in two different ways: one with a half hot/half cold tool, which has a lower output; or with a hot forming tool and a cold BFS tool – which has higher output because it uses the whole of the forming area.

Crystal benefits

John Mara, technical director of **Amfine Chemical**, explained how new beta-nucleating agents can be used to produce superior grades of PP – for applications such as thermoformed cups and containers.

"Demand is increasing for home delivery packaging – and there is a trend towards thinner packaging from the perspective of resource saving," he told delegates.

There are two crystalline forms of PP: the alpha form is more stable and has higher density and high flex modulus. The beta form, though less common, has higher elongation and impact strength.

"In PP products, the fraction of alpha crystals predominates over beta crystals," he said. "Beta-nucleating agents can be used to increase the fraction of beta crystals, thereby modifying properties."

The properties include higher ductility, lower yield and higher elongation and impact strength. These help to improve the draw (stretch) ability of extruded sheet.

"Beta-nucleating agents can also widen the processing window, allowing sheet to be uniformly drawn – minimising thickness variation," he added.

The company's NA-B99 nucleating agent was blended with PP and tested against a conventional rival. Firstly, it showed high nucleation ability from a low loading and exhibited higher beta-crystal formation. Impact strength more than doubled, and elongation at break showed a large improvement.

"NA-B99 shows high beta-crystal formation from a low loading amount," said Mara. "It enhances impact resistance and elongation of HPP/ICP."

■ The next *Thin Wall Packaging* conference takes place on 26-27 November 2024 in Cologne, Germany. For more details, contact Rebecca Weir (**rebecca.weir@amiplastics.com**) on +44 (0)117 314 8111.

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Building a wall: developments in barrier films

Recent advances in barrier film include several improved formulations, refinements to production processes, a new type of active packaging and a bright future for metallisation

IMAGE: KP FILMS

Main image: KP's Flexible range aims to make protein packaging more easily recyclable

While barrier film remains a key element within packaging, it must – along with all other plastic products – be able to show better sustainability.

Klöckner Pentaplast (KP) says that a new range of films aim to make protein packaging easier to recycle.

It says that its new Flexible range – comprising FlexiLid EH 145 R, FlexiFlow EH 145 R and FlexiVac R – shows how flexible packaging can be created with recyclability in mind.

"While sustainability has been topping the priority list for many food businesses, flexible films for the protein market have had a tougher road to packaging circularity," said Christophe Rossé, marketing director for flexibles at KP. "For a long time, the plastic film packaging used with fresh meat products has been non-recyclable – destined for linear waste streams and, ultimately, incineration or landfill."

FlexiVac R is a recyclable vacuum film that "represents a major engineering achievement in multi-layer recyclable packaging", says the company. Developed with Dow Chemical, using its Fusabond technology, FlexiVac R offers high clarity, puncture resistance and food protection through its hermetic sealing performance. It is available in thicknesses of 70-300 microns.

FlexiFlow EH 145 R barrier flow wrap film gives high levels of product protection while reducing plastic weight by 75%. The high barrier film extends shelf life, preserves product quality and – for supply chain versatility – is compatible with all FFS and vertical flow pack machines.

FlexiLid EH 145 R claims to be one of the world's thinnest barrier lidding films. It contains more than 90% PE content and offers high barrier properties, anti-fog features and easy printing. Its high sealability ensures performance even when sealing through contamination.

Flexible adsorption

Aptar CSP Technologies has teamed up with **ProAmpac** to develop a new type of active packaging.

ProActive Intelligence Moisture Protect (MP-1000) combines Aptar CSP's three-phase Activ-Polymer technology with ProAmpac's flexible blown film technology in a patent-pending moisture-adsorbing flexible packaging solution.

It is the first in a series of active microclimate management packaging solutions to cut the risk of degradation, maintain potency and improve product performance, say the developers.

Activ-Polymer helps to protect sensitive drug products, probiotics, medical devices, drug delivery systems and foods. By adding it into a flexible film structure, MP-1000 delivers high-quality moisture protection without the need for add-on desiccant sachets. The solution not only adsorbs excess moisture within a package, but also shields

Right: MP-1000 combines Aptar's Activ-Polymer with ProAmpac's flexible blown film technology

the contents from any moisture that passes through the packaging.

Available in rollstock or pre-made pouches, MP-1000 has excellent seal characteristics and runs on high-speed form-fill-sealing equipment, ensuring product integrity and compatibility with existing flexible packaging equipment.

"The goal of this collaboration is to transform the way active packaging is delivered and fulfill unmet needs by providing the market with a fully integrated, flexible, multi-layer film solution," said Badre Hammond, vice president of global commercial operations and general manager APAC for Aptar CSP Technologies.

IMAGE: BUSINESS WIRE

HDPE for MDO

ExxonMobil has developed an HDPE grade for machine direction oriented (MDO) PE film applications.

The grade, HD7165L, can help converters create mono-material laminates, which can be easier to mechanically recycle. Offering good optical and mechanical properties, the material can be used to make mono-material packaging for products such as nuts, crackers and potato chips.

"The development of HD7165L has been driven by market demand for all-PE packaging – which in turn has created a need for print webs made of blown MDO-PE films," said Nilesh Savargaonkar principal customer and application development engineer at ExxonMobil.

The grade can help converters produce blown MDO-PE films with 60-70% HDPE, for enhanced stiffness and high heat resistance. Output rates above 400kg/hr are possible, while bubble stability is maintained.

MDO stretch ratios as high as 7:1 with very high stiffness can be achieved. Haze is less than 10% and gloss is higher than 60%. Used as a print web of a PE-PE laminate, it offers high heat resistance and stiffness – for a lack of extensibility.

In blown MDO-PE film applications, it offers high, uniform orientation, gauge stability, and low gels for easy processability, said the company.

BOPE grade

SCG Chemicals has developed an HDPE resin, which it says can be processed into biaxially oriented PE (BOPE) using tenter frame technology.

"It requires a unique balancing of processing and film properties," said Kanyanut Narkchamnan, full PE research and development leader at SCG Chemicals in Thailand

Its S197F multi-modal technology is available with low molecular weight (for stiffness and processability), high molecular weight (for toughness) or very high molecular weight – which adds higher mechanical properties and stretchability.

"BOPE film made of S197F provides high heat resistance and good mechanical and optical properties – suitable for printing and coating in multi-layer structures," she said.

The films can be used to replace BOPA and BOPET, she said – and are appropriate for moisture barrier applications.

In one case study – showcased at ProPak Asia – the

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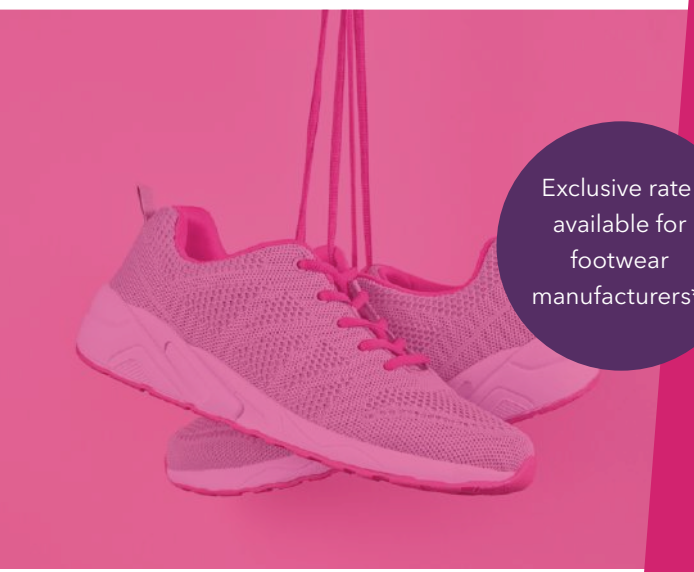

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IMAGE: ADAPA

Above: Adapa says its SkinFresh Top Expert films have a new formulation that improves processing

BOPE film showed good dimensional stability and could maintain high line speed during the printing process. Seven-colour printing could be performed at a line speed of 100 m/min. The film was also used to make a recyclable, all-PE stand-up pouch – for applications such as liquid detergent or for packaging food. The structure comprised a 25-micron HD-BOPE layer, ink and adhesive, and a 120-micron PE layer. This compared with a previous structure, in which the BOPE layer was a 15-micron BOPA layer.

Skin improvement

Adapa (formerly Schur Flexibles) says it has revised its SkinFresh Top range of films – and now offers SkinFresh Top Expert.

The company says it has developed a new formulation that allows for improved processing. The new range includes transparent, glossy and printable PE-based films – with high barrier – that enclose products tightly but without tension. They can be used for food products of various heights and are also suitable for packaging products with bones.

The high-performance skin films are available in thicknesses of 80-150 microns and seal reliably to PE sealing layers or APET and PP mono films and trays. For material- and resource-saving applications, it has been possible to reduce film thickness further while maintaining performance.

Users can see how the films perform at Adapa's PackScience centre in Kempten, which demonstrates them on tray sealers and thermoforming machinery.

Blister coating

Solvay has introduced Diofan Ultra736, a high-barrier PVDC coating for pharmaceutical blister films.

The coating allows an ultra-high water vapour

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Right: Tosaf's UV9389PE EU film additive protects food from degradation by UV radiation

barrier that allows carbon footprint reduction, it says. As an aqueous dispersion, it is fluorine-free, meets regulatory requirements for direct pharmaceutical contact and supports the design of sustainable films with thinner coating designs.

The coating was engineered to maximise the water vapour barrier without sacrificing its oxygen barrier, chemical resistance or transparency. It has good thermoformability, enabling smaller pack sizes with higher pill density compared with other coating solutions, says Solvay.

"This new coating can help packaging film manufacturers achieve superior barrier properties with thinner structures, leading to a significant carbon footprint reduction of the blister film," said Federico Baruffi, global marketing manager for packaging at Solvay Specialty Polymers.

UV barrier

Tosaf has developed a film additive that protects food from degradation by UV radiation.

UV9389PE EU offers a high blocking effect against UV in the 200-380nm wavelength range, even at low thickness.

This protects foods from discolouration, and loss of vitamins and flavours – thus helping to prevent food wastage due to premature spoilage.

The optical properties – especially transparency – of films using UV9389PE EU are almost completely retained, says Tosaf. Further advantages are the high efficiency – even at low dosages – and the minimal influences on behaviour during production and further processing of the films, including printing and lamination.

The range of applications extends beyond foodstuffs to other industrial film applications where protection of sensitive goods from UV radiation is required.

Sustainable balance

AMI recently ran its Specialty Packaging Films conference in Bangkok, Thailand. Chris Cheetham, sales director for the eastern hemisphere at **Bobst**, told delegates how the company's Alubond process can improve the barrier properties of polyolefin substrates.

Modern barrier packaging must pay more attention to sustainability than ever before, he said, citing three pillars of sustainable flexible packaging: mono-material olefins; compostable, biodegradable and bio-based; and paper/fibre-based. At the same time, barrier requirements remain as tough as ever.

IMAGE: ALEKSANDAR KARANOV

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

Its Alubond process is a hybrid coating technology that claims improved adhesion between the metal layer of the coating and the underlying substrate – equivalent to what conventional 'plasma' systems have been able to achieve. This helps to improve barrier performance, he said.

The process is typically used to metallise PET, BOPP and CPP, leading to a structure with a high peel force. This gives a higher adhesion than standard metallised film, he said.

Bobst has been working on an optimised version of the technology – dubbed Alubond Gen II – which has several improvements. These include optimising metallising defects for more sensitive markets and further enhancing barrier performance.

"After in-house testing, we are looking for external partners for controlled and selective production field testing," he said.

Right: Solvay's Diofan Ultra736 is a high-barrier PVDC coating for pharmaceutical blister films

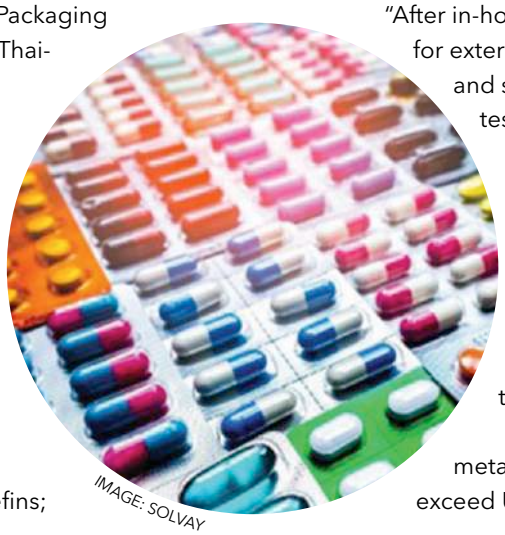

IMAGE: SOLVAY

Metal future

At the same event, Agrani Punj, head of international business at **Supervac Industries** in India, highlighted recent – and future – trends in metallisation.

He said the market for metallised film is expected to exceed US$7 billion by 2033 – a

compound annual growth rate of nearly 5%.

"Emerging markets like India and China are expected to drive this growth," he said. "Mature markets like Germany and the US will also experience growth, but at a relatively lower percentage."

He expects the CAGR in India and China to be around 6%, while in western Europe and North America it will be 2-4%.

Stiff competition and rising raw material costs are expected to affect margins and profitability in future. There is also overcapacity and market saturation – coupled with economic uncertainty.

However, he said technical advances continue. For instance, web widths of up to 4000mm (and more) can now be metallised, while barriers continue to improve.

In addition, more accurate measurement of film properties – such as thickness and density – has enabled better quality control.

Metallisers are adding energy-efficient ways to cut energy consumption, which includes optimising equipment and using renewable energy, he said.

An increasing focus on sustainability will also lead to an acceleration in the use of mono-material and biodegradable substrates, he said.

"Technological advancements enable manufacturers to achieve higher quality and efficiency in the metallising process," he said.

"Companies that innovate and are quick to adapt to changing times will be well positioned for success."

■ The next AMI conferences relevant to packaging are Innovations in Pouches (Barcelona, Spain, 23-24 April), Stretch & Shrink Film (23-25 April, Valencia, Spain) and Multilayer Flexible Packaging North America (25-26 June, Chicago, USA). For more details on these and other events, visit **www.amiplastics.com**.

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Our upcoming recycling and sustainability events, please click on the title of the event to find out more and purchase your ticket.

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Chemical Recycling
12-13 March 2024
Houston, TX, USA

Feedstocks for Plastics Recycling
4 June 2024
Bangkok, Thailand

Chemical Recycling
4-6 June 2024
Brussels, Belgium

Plastics Recycling World Expo
11-12 September 2024
Brussles, Belgium

Bioplastics
17-18 September 2024
Cincinnati, OH, USA

Plastics Recycling Technology
23-24 October 2024
Vienna, Austria

Plastics Recycling World Expo
13-14 November 2024
Cleveland, OH, USA

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10-11 December 2024
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Monitoring of the extrusion process – from coating weight measurement to control of various ancillary equipment – helps to drive ongoing improvements in production

Control measures: keeping tabs on plastics extrusion

Control functions on extrusion machinery can have a wide variety of functionality – ranging from direct oversight of production to sophisticated data-gathering to help improve ongoing operations.

German film producer Neemann, for instance, uses the Ruby Go IoT system from **Windmöller & Hölscher** (W&H) to document hygiene and quality specifications.

Ensuring and documenting customer specifications in accordance with required norms and standards is an essential part of its daily work. To meet increasingly stringent requirements, it relies on Ruby.

"It is an excellent source of data from which we can derive information – for documentation requirements as part of our numerous certifications, for transparency and for optimisation in our supply chains," said Wilfried Hoppen, manager of engineering at Neemann.

For some time, the company has also relied on the Ruby Check extension. In combination with W&H's Vision inspection system, the software carries out defect detection and analysis. It helps to identify printing defects – which can be properly identified and located.

This analysis helps the company to review and evaluate machine settings afterwards. It an define causes of defects and avoid them in future. It can also look at different linked parameters over time, such as the connection between web tension and print deviations.

"From this, we derive measures such as the proactive replacement of wear parts to reduce downtime," said Marco Kleemann, manager of flexoprinting. "We have already detected defects in machine operation through Ruby and minimised waste in orders."

Next, it plans to use Ruby to monitor its energy usage – as well as using the Ruby app, which will allow Kleemann to keep an eye on production while on the move.

Coat weight measurement

NDC – part of Nordson – has developed CW 9000, a compact coat weight system for adhesive measurement of flexible packaging made on coating and laminating lines.

"It allows accurate and fast adhesive coat weight and mix ratio measurements," said Mark Rainville, product manager for film extrusion and converting at Nordson. "We worked with line manufacturers and flexpack customers on this new system." ›

Main image: Riverdale's gravimetric system now has an operator-friendly touchscreen interface IMAGE: RIVERDALE

Operators can quickly see key quality indicators. Coat weight and mix ratio profiles are available after a single scan – providing immediate information needed to confirm quality and make any necessary adjustments. A trend display shows if the coating strays outside tolerance.

The system is built on Nordson's Pro.Net Total Distributed Intelligence system. It includes the new compact CW 9000 sensor combined with the new LPS 1000 Scanner. The LPS 1000 is a self-contained Low-Profile Scanner that fits inside the frame of compact coating machines. It can perform fast scans and operate in a single point to analyse machine direction variations. The enclosed scanning frame prevents dirt from the scanner from falling onto the coating. It is easy to maintain and easy to remove from the coating frame. The precise motor/drive system delivers optimal positioning.

Controller update

Riverdale Global has updated the controller on its RGS Riverdale Gravimetric System.

A new operator friendly touchscreen interface gives quick access to process settings such as throughput, shot size, let down ratio, and weight per gallon. Current settings/recipes can easily be saved, reducing any input error. The system automatically adjusts to screw recovery time and extruder output and can automatically re-calibrate to new colour – so no additional setup is required. Onscreen runtime graphical performance reporting allows real-time information for precise metering rates.

The new controller now comes with an optional barcode scanner or RFID reader for automatically reading process settings to avoid operator mis-keyed input. A USB port allows data download, data printout and software update capability.

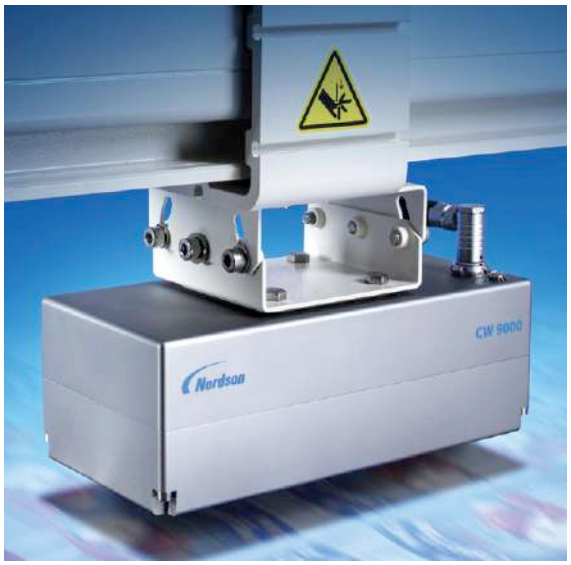

IMAGE: NDC

Right: NDC's CW 9000 allows fast, accurate adhesive coat weight and mix ratio measurements

Staying on track

At NPE this year, **Maguire Products** will introduce its Tracker monitoring and reporting software, which is designed specifically for plastics.

Tracker is a cutting-edge, web-based equipment and software solution that gives customers comprehensive monitoring and control for all Maguire WSB blenders, MGF feeders, Ultra dryers, and FlexBus conveying systems.

With high accessibility – via any internet browser – it can ensure real-time insights and secure data transmission for downloading data into a third-party database for reporting and analytics. This enables integration with ERP or other software systems for higher operational efficiency.

"Tracker represents a significant advancement in process optimisation, quality control and cost management for our customers," said Frank Kavanagh, vice president of sales and marketing at Maguire. "It provides invaluable support for ISO reporting, material validation including post-consumer recycled (PCR) usage, and equipment status monitoring – ultimately facilitating smarter decision-making."

Tracker includes a Maguire MT Hub capable of connecting an unlimited number of Maguire units using regional hubs, if needed, over a customer's existing network. A software subscription includes secure encrypted cloud-based data storage, rolling software updates, and remote technical support after initial start-up for 90 days.

Operators can perform various tasks, including sending recipes, monitoring material usage, reviewing system setup, and addressing alarms and process interactions – all from a single web-based platform – using any device. In addition, it enables remote monitoring of dryer parameters, material status and conveying operations.

On login, users can configure their Maguire auxiliaries based on their specific operational needs, organising equipment by type, plant location, or production cell. The dashboard interface provides two access levels – operator perspective and production view – allowing users to remotely interact with Maguire blenders, feeders, and Ultra dryers. Maguire GT also enables customers to connect with conveying controls remotely.

Coating control

BST says that its BST Coating Control system can help to improve efficiency in the production of battery separator film. The system automatically optimises web-running processes within a small footprint – combining intelligent control technol-

ogy and precise measuring instruments with line or CIS camera technology.

"In battery production, the smallest deviations lead to rejects," said Florian Kortekamp, project and business development manager at BST. "BST Coating Control delivers competitive advantage by increasing plant efficiency."

Reliable real-time measurement of the coating layers reduces the number of line stops, it says. In combination with the Frame Guide web guiding system, it maximises control accuracy through robust edge detection via a central control unit and closed-loop image processing algorithms.

Thanks to continuous coating positioning, no further manual offset correction by the machine operator is required.

"The accuracy of the entire system is twice as high as that required by the industry," said Kortekamp.

This is the second generation of Coating Control and provides live camera images of the coating as well as an intuitive user interface, says BST. The system detects minimal production defects and takes immediate action to reduce reject rates.

Shorter printing

Isra Vision has developed ViewStar, a web viewing system for printing applications. It offers the possibility of shortening the work step with its RegisterControl module. This function ensures automated setting of the flexographic printing units in the register. The system uses print marks to check the position of the respective colour printing unit and adjusts it for optimum register accuracy. Automated adjustment saves labour time as well as material and energy – leading to higher efficiency and sustainability in production.

Transparent production

Reifenhäuser, in collaboration with start-up company RE, has provided digitalisation solutions to a number of its plastics processor and packaging customers – helping them to raise production efficiency.

In one example, one FFS-PE bag manufacturer operates a heterogenous production site with more than 30 extrusion machines from various vendors and generations. Third-party OEM tools display data for eight machines separately at each HMI. Other operational data is entered on paper and processed later in a back office. Data synchronisation between systems like ERP and MES occurs sporadically through paper printouts or labour-intensive file exports and imports.

Because employees such as machine operators make decisions based on intuition and past experience, the result is inefficient processes leading to high wastage, high maintenance costs, and other avoidable expenses.

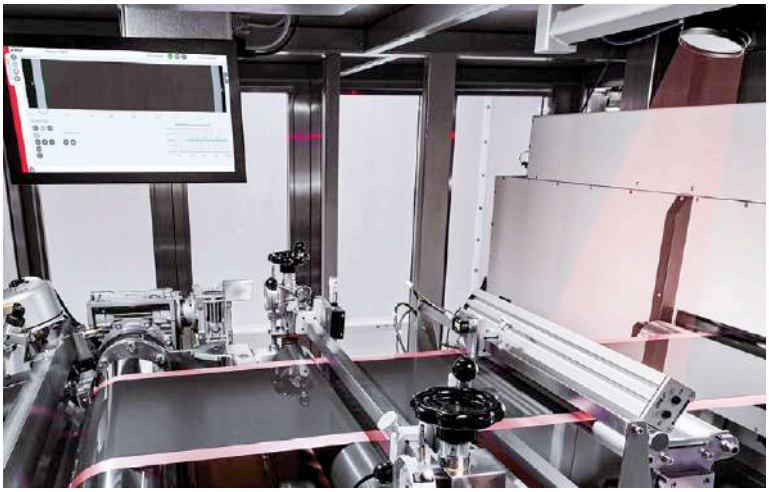

IMAGE: BST

Above: BST's coating control system can raise efficiency in the production of battery separator film

The solution was to introduce c.Hub Middleware – which connects all assets, peripheral devices, and other units – regardless of vendor, age or type. It captures and harmonises all process parameters in real time, which ExtrusionOS then visualises in clear live trends. Anyone from the team can access the data from anywhere, gaining new insights into the production process and its challenges.

Assuming that production costs for a machine are US$7.2 million, increasing process efficiency by just 1% can save US$72,000. The more machines connected to c.Hub – and the more process steps optimised – the greater the savings.

Installing c.Hub Middleware also helped a manufacturer of PET films for food applications to meet increasing demands from customers and regulatory authorities – in order to ensure product quality. Here, quality assurance was inefficient and expensive. This is partly because searching for errors in the process is time-consuming, and adjustments do not lead to the desired increase in overall equipment efficiency (OEE). The c.Hub Middleware helped to capture all relevant process parameters from production. Because it can monitor all key parameters and associated thresholds in real-time, it makes the production's quality status transparent to all user groups at all times.

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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

Built on more than 50 years of plastics expertise, Amut's range of extrusion lines for production of foil and sheet covers a broad range of applications. They can produce mono or multi-layer sheet as thin as 150 microns and as wide as 3.3m at rates up to 4 tonnes/hr or more.

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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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If you would like your brochure to be included on this page, please contact Claire Bishop claire.bishop@amiplastics.com. Tel: +44 (0)1732 682948

Sumer Plastik

Head office:	Istanbul, Turkey
Chairman:	Mustafa Tacir
Founded:	1965
Ownership:	Private
Profile:	Sumer Plastik, founded in 1965, manufactures a wide variety of plastic film and packaging, including bags, laminates, printed products and both polyethylene (PE) and cast polypropylene (CPP) film – including barrier products. It also offers products made from biobased and biodegradable materials. The company also carries out R&D, in areas such as new product development and improving production efficiency.
Product lines:	The company offers a wide range of film products. Its CPP films are suitable for printing and lamination and are used as flexible packaging in areas such as pet food, medical products and frozen food. They films have high mechanical strength and optical properties. Its PE films are used across an even wider range of end markets. The company also offers barrier films, made by co-extrusion with polyamide or EVOH. It can print film in up to 10 colours thanks to its flexo printing capabilities, as well as providing laminates using materials such as BOPP, BOPA and polyester. It also converts films into bags – for applications such as bread packaging.
Factory location:	The company makes all its products at its facility in Sultanbeyli, Istanbul – which replaces its original factory in nearby Topkapi. The 12,000 sq m plant has an annual production capacity of 35,000 tonnes – of which around 40% is exported to Europe, the Middle East and Africa. Sumer recently took delivery of a seven-layer Polyblown film line from Colines of Italy, allowing it to produce higher quality film.

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:

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Film and Sheet
January/February 2024
The January-February issue of Fim and Sheet Extrusion has a cover feature reporting on developments in bio-based plastics for film and sheet, plus other features on medical plastics and new polyolefin grades for biaxial orientation and thermoforming.

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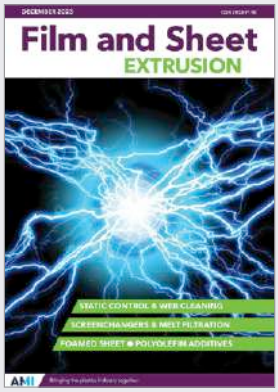

Film and Sheet
December 2023
The December 2023 edition of Film and Sheet Extrusion magazine looked at web static control, the latest developments in stabilisers and developments in foamed sheet production. Plus a review of the most recent melt filter introductions.

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Compounding World
March 2024
The March 2024 issue of Compounding World looks at the most recent innovations in long fibre thermoplastics, as well as the latest developments in twin screw extruders, special effect pigments, and materials testing equipment. Plus news from the global compounding industry.

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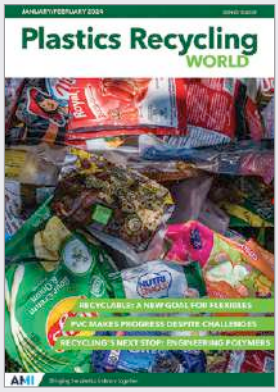

Plastics Recycling World
January/February 2024
The January/February edition of Plastics Recycling World looks at the latest developments in recycling of flexible films. This first edition of 2024 also explores progress in recycling of PVC and engineering polymers and reviews some new innovations in pelletising technology.

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Pipe and Profile
November/December 2023
Pipe and Profile Extrusion's November-December 2023 edition has a front cover feature looking at wood-plastic composites in an expanding number of application areas, while other features are about pipe joining, mixing technology and dealing with extruder wear.

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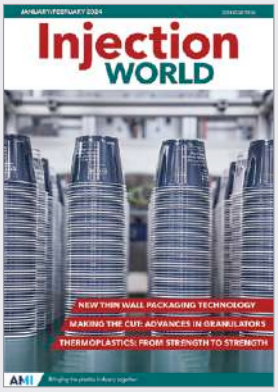

Injection World
January/February 2024
The January-February 2024 issue of Injection World magazine has a cover feature on machinery groups raising the performance of thin wall moulding technology, plus other features on new granulators and thermoplastics in demanding automotive applications.

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6-10 May	NPE 2024	www.npe.org
15-18 May	Plastics & Rubber Thailand, Bangkok, Thailand	https://www.plasticsrubberthailand.com/
21-24 May	Plastpol, Kielce, Poland	www.targikielce.pl/en/plastpol
4-7 June	FIP, Lyon, France	www.f-i-p.com
11-12 September	Plastics Extrusion World Expo Europe, Brussels, Belgium	https://eu.extrusion-expo.com
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24-28 September	Taipeiplas, Taipei, Taiwan	https://www.taipeiplas.com.tw/en/index.html
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17-18 September 2024	Bioplastics, Cincinnati, USA
8-9 October 2024	Polyolefin Additives, Barcelona, Spain
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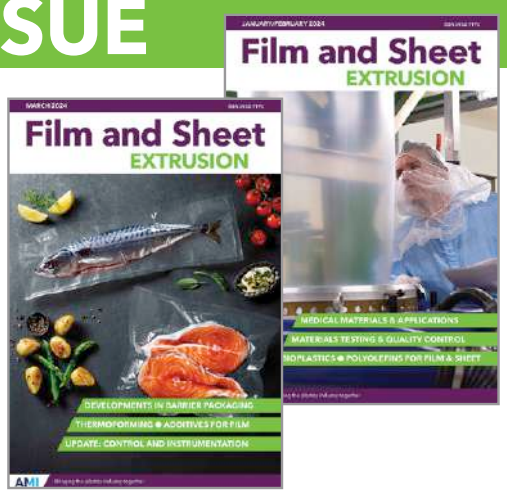

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