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Film and Sheet EXTRUSION

SHOW PREVIEW

PLASTICS EXTRUSION WORLD EXPO

Essen, Germany
29-30 September

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PREVIEW: PLASTICS EXTRUSION WORLD EXPO

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Book your place

IMAGE: AMI

Getting back to business

Travel and live events are back at last. While Covid has certainly not been consigned to history, the highly successful vaccination, testing, and mitigation strategies implemented by national authorities mean our industry's business activities can now, finally, begin to return to a sort of normality. And as a first step towards that, I'm pleased to be able to invite you to join me and my colleagues at one of our two **Plastics Extrusion World Expos**, which take place in Europe and America later this year.

Organised by *Film and Sheet Extrusion* publisher AMI, the first of these 'real world' events will be held in Essen in Germany on 29-30 September 2021, while the second takes place in Cleveland, Ohio on 3-4 November 2021. Both are free-to-attend and mark a return to 'face-to-face' networking and learning for the plastics industry (you and any of your colleagues can register for free tickets **here**).

Whether you join us in Europe or North America, you will benefit not only from a focused plastics extrusion expo, but also be able to visit the co-located Compounding World, Plastics Recycling World and Polymer Testing World Expos. Altogether, each location will include more than 200 exhibitor companies.

See the current European exhibitor list here
See the current American exhibitor list here

Aside from the exhibitions, you will also be able to participate in the five free-to-attend conference theatres running at each event. These include dedicated plastics extrusion sessions with panel discussions exploring the future of the plastic pipes industry, plus technical talks on developments in processing and materials technologies, as well as sustainability issues. Extrusion visitors can also join any of the compounding, recycling and testing theatres. Altogether, you can choose to listen to and learn from any of 100 expert speakers at each location.

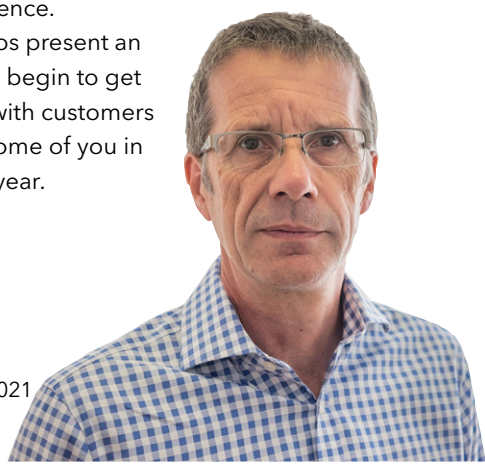
View the European conference programme here
View the American conference programme here

Of course, these two expos will be different from their predecessors. International health experts and governments have made great progress in managing Covid, but it is certainly not defeated. Hygiene and infection mitigation measures will be evident across the venues, during your travel, and at your accommodation. All of us at AMI take the health and safety of our expo exhibitors and visitors very seriously. You can rest assured that we are working with our venue partners to ensure all necessary precautions are in place and these will be clearly communicated to all registered attendees before and on arrival at each expo to make sure you have a safe, effective, and enjoyable experience.

The Plastics Extrusion World Expos present an ideal opportunity for our industry to begin to get back to business and to reconnect with customers and suppliers. I really hope to see some of you in either Essen or Cleveland later this year.

Chris Smith
Editor-in-Chief
AMI Magazines

Main image: The scene is now set for a return to face-to-face business activity such as this (show floor from the 2019 expo in Cleveland, US)



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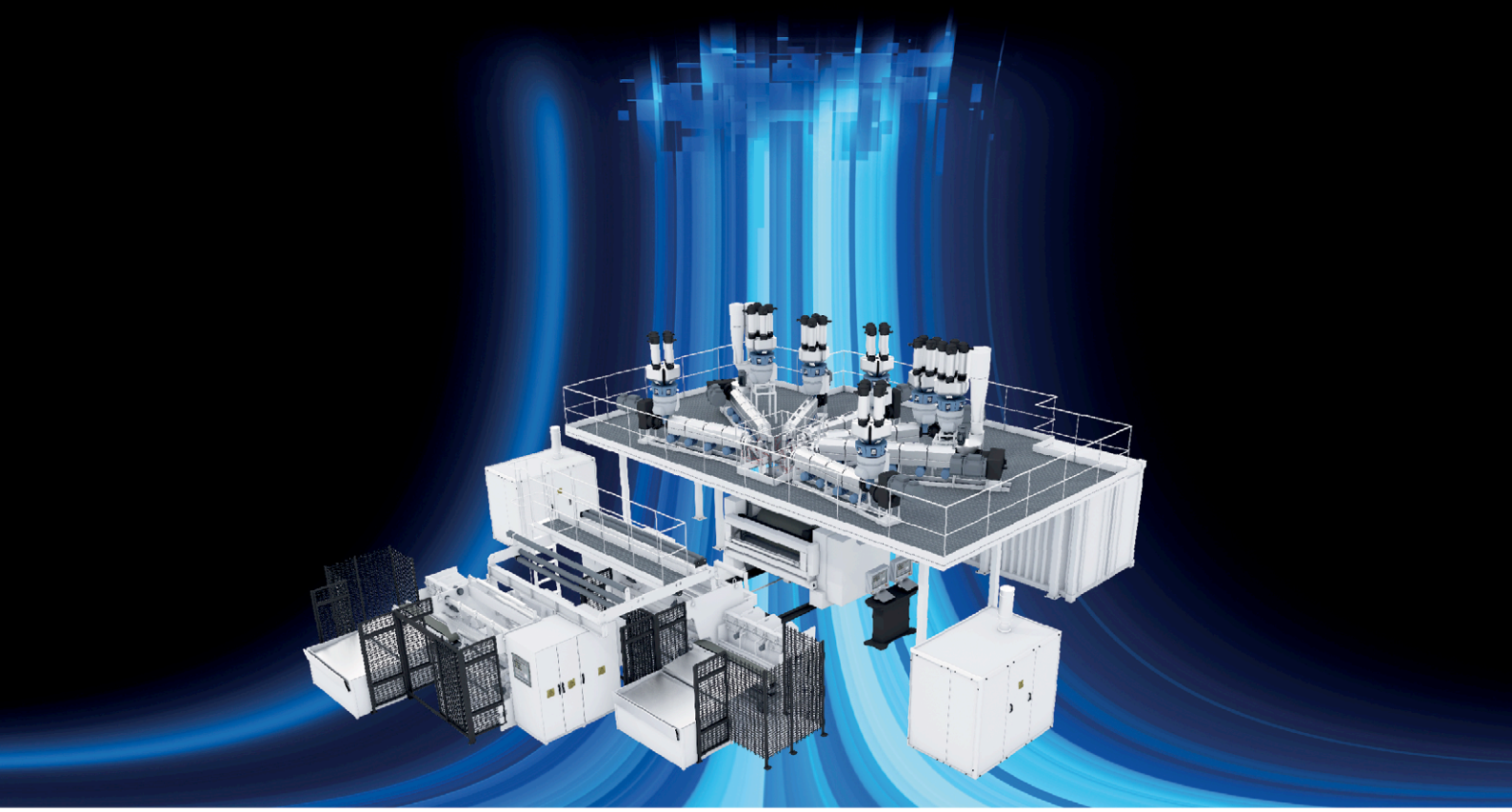

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Amcor sales increase by 3% as profits rise by 8%

Packaging specialist Amcor has reported a rise of 3% in full-year sales.

The company reported revenue of more than US$12.8 billion to the end of June 2020. In addition, profitability – in the form of EBIT – rose 8% to exceed US$1.6bn.

"We delivered record full-year earnings in 2021, and increased EBIT margins," said Ron Delia, CEO of Amcor. "We ended the year with good momentum and expect another strong year in fiscal 2022."

Sales in flexible packaging – which accounts for about 80% of the company – exceeded US$10bn, while rigid packaging sales rose by around 4% to more than US$2.8bn.

Volumes were 1% higher in flexible packaging – with strong growth in India and China – and 5% in rigid packaging, with broad growth across the Americas.

The company says its ongoing integration of Bemis – which it bought in June 2019 – has been successful, with around US$75m of "incremental cost synergies" realised this year.

"The integration is essentially complete and we will exceed our original US$180m cost synergy target," said Delia.

› **www.amcor.com**

IMAGE: RKW

RKW adds five-layer line in Echte

RKW is investing "a seven-figure sum" at its Echte site in Germany, boosting production in industrial packaging – and using more recyclate.

The company is installing a new five-layer extrusion line, which makes its FFS and ProVent sacks, valve box sacks, transport packaging and garbage bags. The line will be used for industrial packaging.

"We want to offer more sustainable industrial packaging with new formulations," said Markus Brinkmann, site director at Echte. "This includes using a growing proportion of recycled plastics."

› **www.rkw-group.com**

Thai PLA plant to go ahead

NatureWorks has received final authorisation from its parent companies to build a new PLA manufacturing complex in Thailand.

The company plans to invest more than US$600m to build the complex, which will include production of lactic acid, lactide and polymer. NatureWorks says it will be the first fully integrated PLA facility.

Work on the new manufacturing complex – at the Nakhon Sawan Biocomplex – will begin in the second quarter of 2022. It is expected to open in 2024, and have an annual capacity of 75,000 tonnes – producing the full portfolio of Ingeo PLA grades.

"Thanks to the ongoing support of our parent companies, our plans for a second Ingeo PLA manufacturing location continue to progress," said Rich Altice, president and CEO of NatureWorks.

› **www.natureworksllc.com**

ProAmpac expands with buy in Ireland

US-based packaging manufacturer ProAmpac has acquired Euroflex, a flexible film producer based in Ireland.

Terms of the deal were not disclosed. ProAmpac says the acquisition expands its capabilities in printed film, lamination and pouching solutions in Ireland.

"Euroflex is an exciting addition to the ProAmpac family in Europe," said Greg Tucker, CEO of ProAmpac.

Euroflex makes a range of flexible printed film, lamination and pouching packaging with a focus on protein packaging – for products such as meat, cheese and dairy products. It also supplies markets such as coffee, pet food and nutrition supplements.

Derek Richardson, CEO of Euroflex, added: "Our expertise in high-barrier applications will complement ProAmpac's broad offering of high-quality flexible packaging products."

With the addition of Euroflex – and its plant in County Donegal – ProAmpac now has 44 sites globally, and nearly 5,800 employees.

› **www.proampac.com**

Italy machine sales improve in 2021

Italy's machinery sector has moved ahead in the first half of 2021.

Figures from trade association Amaplast show an 11% increase in sales. Domestic sales have remained high, while foreign sales are mainly for replacement parts, it said.

Companies also saw improved order books, recording a 46% growth compared to the first half of 2020. This has been driven mainly by demand from Italian customers (up by 134% in the last quarter alone) – but there is also positive demand from abroad, for both machinery and replacement parts (up by 58%).

"Given this trend, an average of 6.4 months of production are already assured," said Amaplast.

Amaplast has also completed a national statistical survey among nearly 350 of its members. The companies employed 13,000 people and produced revenues of €3.7 billion (US$4.2bn) in 2020. Most are small companies: three-quarters of them generate less than €10m (US$12m) in revenues. Large companies, which represent 26% of the total by number, generate 77% of the turnover.

For machine types, extruders represent the largest turnover for the sector with 17% of the total. For comparison, this is followed by ancillaries (12%), injection moulding (11%) and blow moulding (7%). Recovery and recycling lines, and rubber processing machines, each account for around 6%.

› **www.amaplast.org**

Nordson takes over NDC

US-based Nordson has acquired NDC Technologies – which supplies measurement systems for plastics extrusion.

Nordson says the move will expand its test and inspection capabilities into new end markets and adjacent technologies. The cash transaction is valued at around US$180 million.

"NDC will bring new capabilities and expertise to our test and inspection platform," said Jeffrey Pembroke, executive vice president at Nordson Advanced Technology Solutions.

Marti Nyman, president of NDC Technologies, added: "We are excited to join the Nordson family. The combination will allow us to continue to deliver innovative measurement and process control solutions."

› **www.nordson.com**
› **www.ndc.com**

Pregis expands blown film with new $32m investment

US-based flexible packaging specialist Pregis is to invest US$32 million in blown film extrusion technology at its site in Grand Rapids, Michigan.

The investment will add 55,000 sq ft of manufacturing, warehousing and office space – taking the size of the facility to 205,000 sq ft. It comes on top of a previous US$37m capital expenditure programme between 2016 and 2020.

Initially, it will house additional Windmoller & Holscher (W&H) lines, with room to add further equipment in future. The multi-layer polyethylene lines are expected to become operational by the end of September.

"We are seeing increased demand for higher quality films, driven by our customers' needs to meet more challenging flexible packaging applications," said David Timm, president of Pregis' performance flexibles operations.

› **www.pregis.com**

IMAGE: PREGI

Cosmo ups profits in first quarter

India-based Cosmo Films has reported increased sales and profits for the first quarter of this year.

The company posted a 43% increase in sales, to INR6.9 billion (US$103 million). Profit (EBITDA) rose by 53% to INR1.4bn (US$21m). Higher sales of speciality products and better margins helped towards the profit rise, said the company.

The company added that planned capacity expansions in specialised polyester would help to drive growth in future.

"We are enhancing our speciality films portfolio and have launched many innovative products – making the product pipeline even stronger," said Pankaj Poddar, CEO of Cosmo Films.

› **www.cosmofilms.com**

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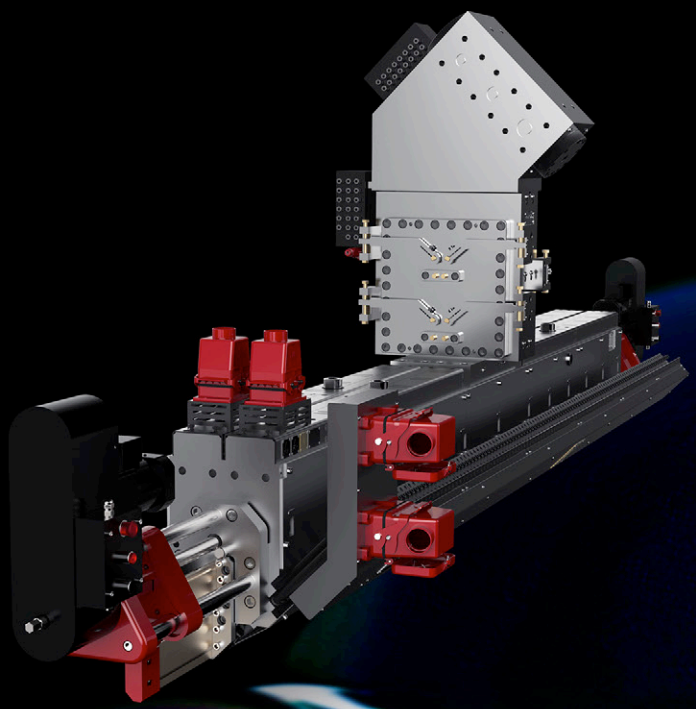

www.jc-times.com

Simona interim sales and profits increase

German plastics extruder Simona – whose products include plastic sheet – saw sales and profits increase in the first half of the year.

The company reported sales revenues of nearly €260 million (US$307m), an increase of 30% compared to the same period last year. It put this down to a general recovery in the global economy – and enjoyed a particularly strong second quarter (sales up 51% to €138m, or US$163m).

Profitability (EBIT) for the first half of the year rose by more than 80%, to €27m (US$32m).

"Buoyant global demand for plastics led to a considerable increase in the cost of raw materials, which we were able to offset to some extent by raising prices," said the company.

Schönberg: "Simona products in high demand in construction, chemical plants and semiconductor factories"

Another reason for the increased sales was the inclusion of revenue from newly acquired businesses such as Simona Plastech in Turkey, which is active in digital printing and construction applications.

Overall, sales in Europe rose by almost 34% to reach €175m (US$207m). In North America, sales rose by around 18% to €66m (US$78m), while Asia saw a 50% increase in sales to around €19m (US$22m).

"Our products are in high demand within construction and are also used in the expansion of chemical plants and semiconductor factories," according to Matthias Schönberg, CEO of Simona.

Based on these results, Simona has raised its revenue guidance for the year as a whole to €495-505 million (US$585-597m).

› **www.simona.de**

VDMA's growth in China

VDMA, which represents Germany machinery manufacturers, says that its members are expanding their workforces in China.

The results were revealed in VDMA's latest personnel and salary survey.

Most responding companies said they had recovered well from the 2019 crisis. As in earlier years, members with less than 8% turnover of senior staff performed better than participants in the German Chamber's annual survey.

While English has improved, the biggest challenges remain the recruitment of qualified staff and rising labour costs.

› **https://www.vdma.org/plastics-rubber-machinery**

Hospital surfaces kept pathogen-free

A project carried out at a Swiss hospital has shown that anti-microbial adhesive film helped to reduce the level of pathogens on surfaces.

The study, at University Hospital Basel, looked at how effectively a coated plastic adhesive film from Hexis – using additives from Sanitized – acted against pathogens that can cause hospital-acquired infections.

The film was applied to frequently touched surfaces – such as overbed tables and toilet seats. Half the surface was left exposed as a 'control'. Over several months, normal cleaning routines were carried out. Swabs were taken from the treated and untreated surfaces twice a week from a 25 cm² area and examined for microorganisms.

The treated film led to a reduction in total viable count of more than 98% across all surface types.

IMAGE: SANITIZED

Above: Anti-microbial adhesive film helped reduce pathogen levels at a Swiss hospital

"Antimicrobial-treated surfaces can prevent the spread of multidrug-resistant pathogens in hospitals," said Andreas Widmer, who led the study.

"Even daily disinfection of surfaces cannot prevent recontamination within a few hours – but antimicrobial-treated surfaces can close this gap."

The results were published in a recent edition of the journal *Antimicrobial Resistance & Infection Control*.

› **www.sanitized.com**

› **www.hexisgroup.com**

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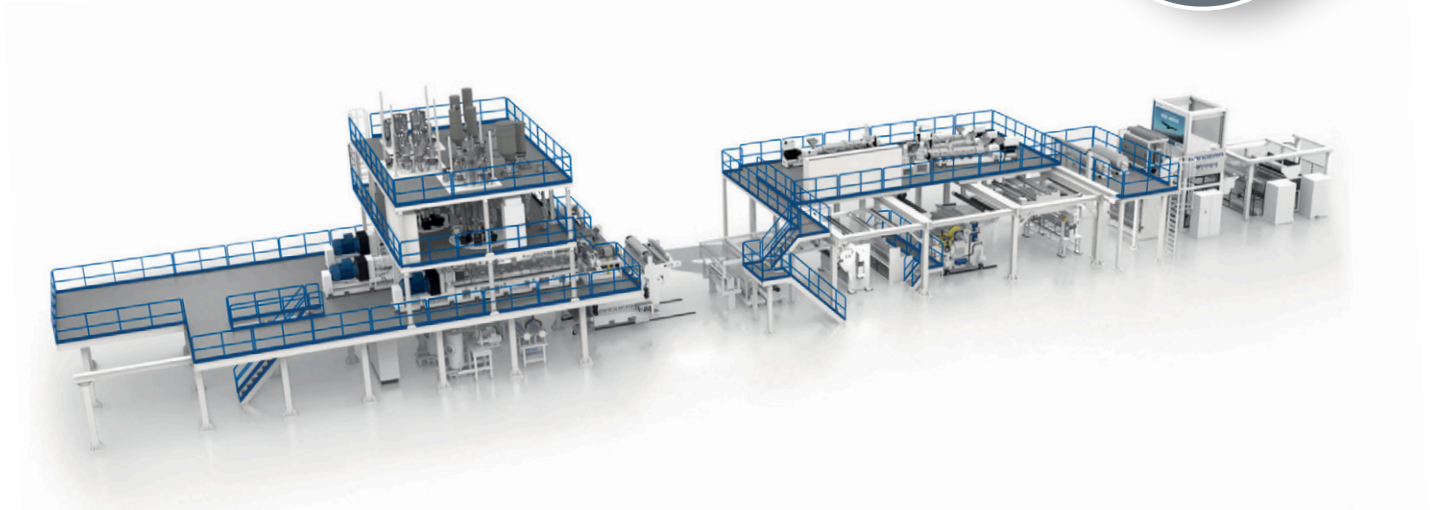

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AMI Bringing the plastic industry together.

Huhtamaki grows H1 sales and profits

Finnish packaging giant Huhtamaki grew both sales and profits in the first half of this year.

Sales rose 2% to nearly €1.7 billion (US$2bn) for the period. At the same time, profitability (adjusted EBIT) rose 9% to around €157m (US$186m).

Its food service business in Europe, Asia and Oceania (EAO) performed best – with sales up by 15% to €443m (US$526m) for the period. Sales in North America fell by 5% to €551m (US$654m), while flexible packaging sales rose 1% to €538m (US$639m).

In terms of profits (adjusted EBIT), food service EAO rose by 59% and flexible packaging fell by 4%. Profits in North America grew by 2%.

"Our second quarter results were strong – although with mixed performance across the different regions and businesses," said Charles Héaulmé, president and CEO of Huhtamaki. "However, the global food packaging market remains volatile with significant challenges in many countries still heavily impacted by the pandemic."

The company's most recent acquisition – that of Chinese Jiangsu Hihio-Art Packaging – was completed in June.

In addition, the company has invested in new manufacturing facilities in Malaysia and Russia.

› **www.huhtamaki.com**

Collect all flexible packaging waste in Europe, says Ceflex

Ceflex, the large-scale European consortium for flexible plastics packaging recycling, has issued a new position statement regarding collection of waste.

This position statement is part of an ongoing alignment on key issues among the Ceflex stakeholders. More than 300 stakeholders took part in a process from September 2020 to February 2021 involving two webinars, interviews and two-day workshop, to agree the statement.

There are four main elements in the Ceflex position statement regarding collection in European countries:

- All flexible packaging must be targeted for collection and sorting, including on-the-go packaging; especially in those few countries where it is not yet collected, like the UK
- Flexible plastic packaging should be collected as a separate stream or with other light packaging and not mixed with paper, board or glass, to maximise recycling quality
- Additional sorting of flexible packaging from mixed waste is likely necessary to access all flexible packaging materials and enable circularity
- Ceflex and its stakeholders aim to work with the national authorities and Extended Producer Responsibility schemes to develop effective collection systems that allow for these materials to be sorted and recycled.

IMAGE: CEFLEX

› **https://ceflex.eu**

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Multiple benefits: recent projects in multi-layer film

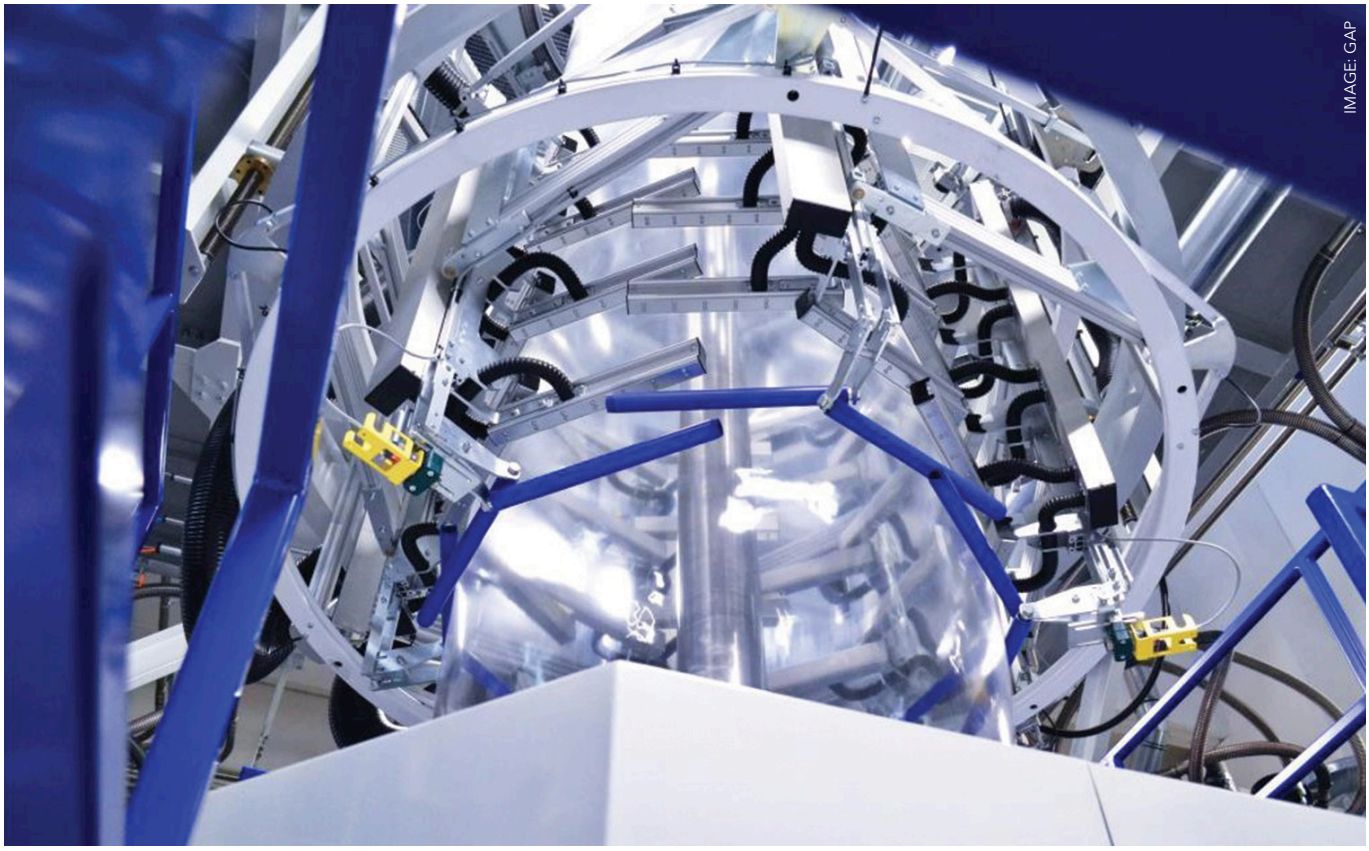

IMAGE: GAP

New developments in multi-layer film include resins with a higher moisture barrier, PET lidding with a high percentage of PCR and two cost-saving projects to recycle internal scrap

Multi-layer film is increasingly moving from simple three-layer laminates to far more complex structures. Whatever the structure – and the end use – it is vital for converters to be able to make this film quickly and efficiently. This is aided by developments by both machinery and materials suppliers.

Gap of Italy, for instance, recently installed a 27-layer blown film line at its research and development centre in Trecate.

The 27-layer bubble film line uses microlayer technology to create structures with improved mechanical characteristics and reduced thickness – which helps to save material.

The line is made up of nine extruders and a 27-layer coextrusion die that has a diameter of 400mm. The width of the machine is 1600mm. The line also has an automatic air-cooling ring control and software control systems. It can use multiple combinations of materials to create different coextruded film structures.

Gap has tested several structures on the new line, both with blocks and alternating layers. Thanks to the laminar flow structure, it has managed to raise mechanical performance and reduce thickness by up to 25%.

Microlayers allow thin layers of polymer to be oriented more easily. For instance, layers of PP can be inserted between layers of PE to increase rigidity and decrease pin holes. Gap has inserted EVOH layers to improve the barrier effect and recyclability.

Gap will also install a series of three-layer bag production lines – incorporating 100mm die and IBC – at its R&D centre. The lines have been

Main image: GAP has installed a 27-layer blown film line at its research and development centre

IMAGE: CAMVAC

Right: Camvac's new Extrapet lidding film is made from 60% PCR

designed for low-range and high-flow production. Some machines include in-line printing and welding to increase production yield. The machine consists of four heads with an output of 6,400 bags per minute.

Better barrier

Nova Chemicals says that its latest Surpass grade of HDPE resin offers a high level of moisture barrier performance for multilayer flexible packaging.

Designed for blown-film applications the grade claims to deliver a 20% increase in water vapour transmission performance in multilayer coextruded film structures compared to its earlier HPs167-AB grade. As well as its moisture barrier, Surpass HPs267-AB offers high stiffness and heat resistance, allowing packaging engineers to design more recyclable PE film structures. Potential advantages include longer shelf life, reduced material costs through downgauging and the ability to create more recyclable packaging – with a mono-material solution.

"Our barrier product development team has created an HDPE resin with a novel molecular structure," said Eric Vignola, food packaging market manager at Nova Chemicals. "It sets a new standard for moisture barrier performance that extends beyond what most industry experts thought was possible."

All-PET lidding

UK-based **Camvac** has developed a PET barrier lidding film made from 60% post-consumer recyclate.

The new film, Extrapet PCR, has been developed to meet growing demand for more sustainable lidding film. It has an all-PET structure and has high gas barrier performance – to both oxygen and moisture, as required for MAP and CAP packaging applications. Applications include processed and fresh meat, pasta and baked goods, where presentation and fresh appearance are critical.

Available in peel or weld seal laminate structures, the mono-material lidding film offers good sealing properties and barrier performance. At the same time, its appearance is not hampered by using PCR, says the company – with no yellow hints visible.

"Extrapet traditionally provides packaging solutions in peel and non-peel, anti-fog, and high barrier options," said Gary Chalkley, development director at Camvac. "A PCR-based film boosts the film's environmental attributes."

The peelable Extrapet PCR is available as an adhesive laminate of 12-20 micron polyester. Total PCR content makes up 62% of the laminate structure. Because the ExtraPET range is all-polyes-

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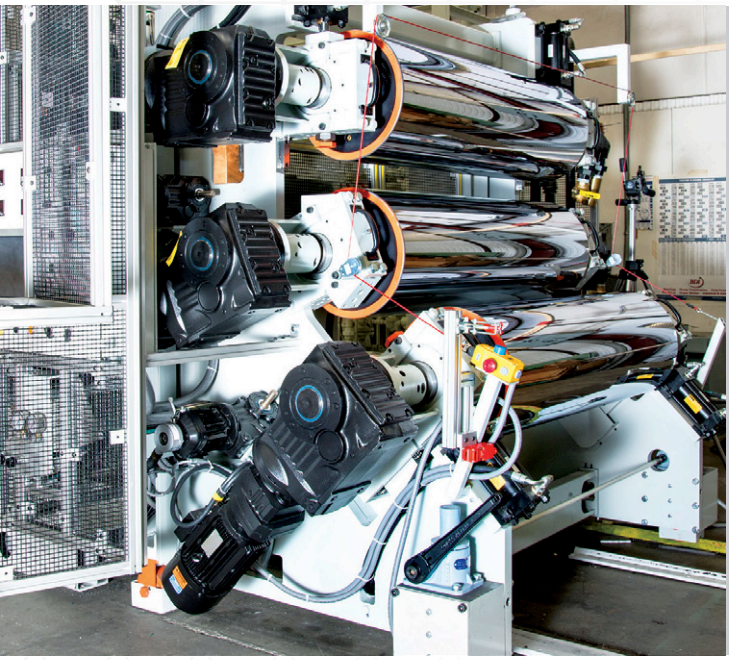

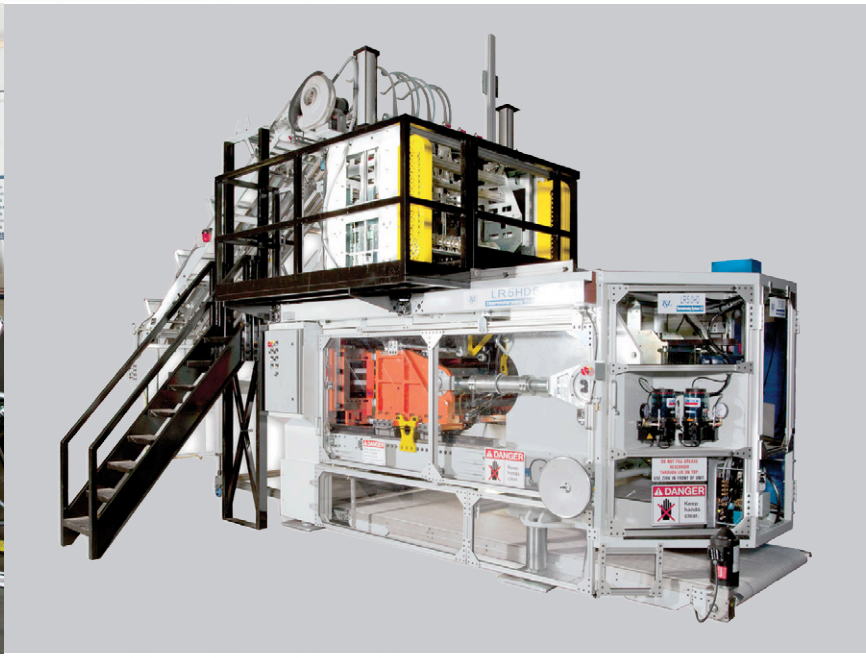

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IMAGE: NUREL/SP GROUP

Above: SP has used Nurel's Inzea biopolymer to develop a multi-layer compostable barrier film

ter, it can be recycled like normal PET. The recyclable lidding film can be used on various tray structures including PET trays. A PET tray with ExtraPET film lid is a mono-material packaging solution that is recyclable.

PA6 works in PE waste stream

Multi-layer film with up to 30% polyamide 6 can be recycled in the polyethylene stream, according to research commissioned by **BASF**.

The tests were carried out by **Institute Cyclos-HTP**, which assesses and certifies the recyclability of packaging. BASF says the result will form the basis of a review of the German Packaging Act – which lists PA6 as an 'incompatible' component in the LDPE packaging waste stream.

"It is time to correct the categorisation of polyamide 6 and the related PA6/6.6 co-polyamides as 'incompatible' contaminants and to put it on a solidly updated basis," said Rolf-Egbert Grützner, senior manager technical support for Ultramid extrusion polyamides at BASF.
Cyclos-HTP has also classified PE/PA6 multi-layer films as fully recyclable when using compatibilisers in PA6-containing film structures – in addition to the PA6 content of up to 30% in original packaging films. This allows homogeneous mixing of the polymers – which are typically incompatible in these concentrations, it said.

The compatibility of the PE/PA6 systems that were tested applies to both new injection moulding and blown film applications.

Roland Bothor, who is responsible for ecodesign and development projects at Cyclos-HTP, said: "For us, it was surprising what positive contribution the PA6 content made to the properties of the industrial polyethylene recyclate used as a reference."

Compostable barrier

SP Group and **Nurel Biopolymers** have developed a multi-layer film structure with a high oxygen barrier, which is also compostable.

Many barrier film structures cannot be recycled because of their complexity, say the companies.

The new films have been used to package products such as salmon, and the partners are testing its effectiveness for other products such as energy bars, nuts and salt.

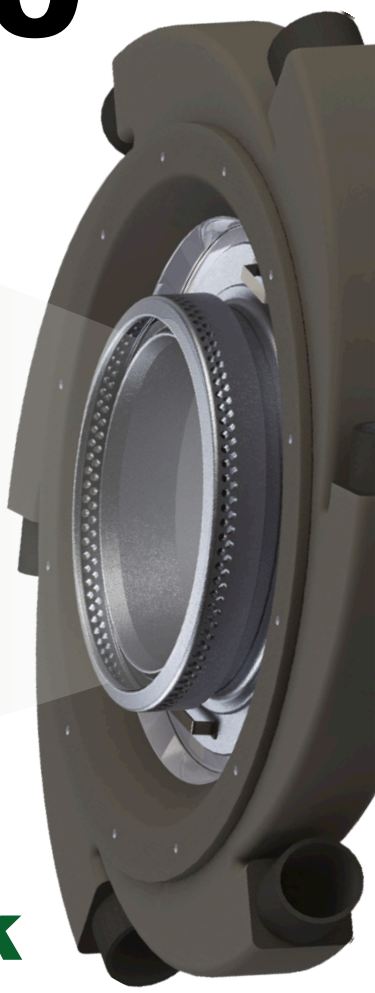
The films, which were made using Nurel's Inzea biopolymers, can be processed in conventional facilities, are transparent and sealable, have a high bio-based content and are suitable for food contact. At the end of their life they can be managed together with the organic waste.

"This film meets all the quality requirements for packaging foods such as smoked salmon," said Maria de Guía Blanco, R&D project engineer at SP Group. "Processing has been very simple, and oxygen permeability results are comparable to EVOH high barrier structures."

A challenge in the project was to achieve a compostable material that could be processed without difficulty on a conventional blown film extruder, while maintaining transparency and providing high oxygen barrier properties.

SP targets these films at packaging applications of fresh, dry or refrigerated products that require a high oxygen barrier. ›

MacroCool D10



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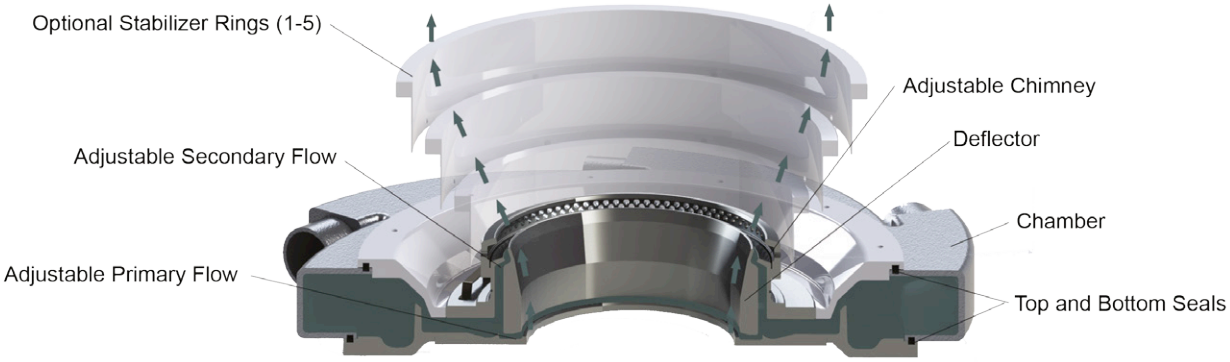

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Recycling film

Delegates at *Multilayer Flexible Packaging* – a virtual conference hosted by **AMI** earlier this year – learnt about multi-layer film recycling.

Simon Jay, sales director of Plasmac – part of Erema – began by telling delegates about a customer project to help a customer handle multi-layer film recycling in-house. The customer, a supplier of nine-layer blown films to the food packaging industry, wanted a system that could easily recycled its inline trims and scrap rolls.

"They needed a compact system that could handle all its structures," said Jay.

The customer's process involved conveying inline trims to baskets, then compacting and selling them to trade recyclers. Scrap reels were also collected, packaged and sold. The customer produced a number of different structures – using many materials, including EVOH, PA, PET and PS.

"The customer wanted a solution that could handle all these materials and allow its reuse in its films – where food contact legislation and brand owner acceptance allowed this," said Jay.

Recycling inline – where the structure allowed it – meant that trims and scrap could be recycled directly back into the main product. If not allowed, the material could be reused in non-food packaging applications – or sold as added-value pelletised material.

The customer wanted to cut material costs by 20%, boost profitability by 10% and keep operator interface to a minimum. Plasmac's proposed solution was to used an Alpha 60 Eco HC system, with trim basket and water-cooled pelletiser to recycle the customer's materials. Its short screw technology makes the machine highly efficient – allowing the customer to minimise costs.

Return on investment was just over nine months, said the company

IMAGE: PLASMEC

Above: Plasmac recently extended its Alpha range of recycling machinery with the Alpha XS

■ The next Multilayer Flexible Packaging conferene takes place in Barcelona, Spain on 23-25 November. For more details, contact Jessica Jones on +44 117 314 8111 (**jessica.jones@ami.international**).

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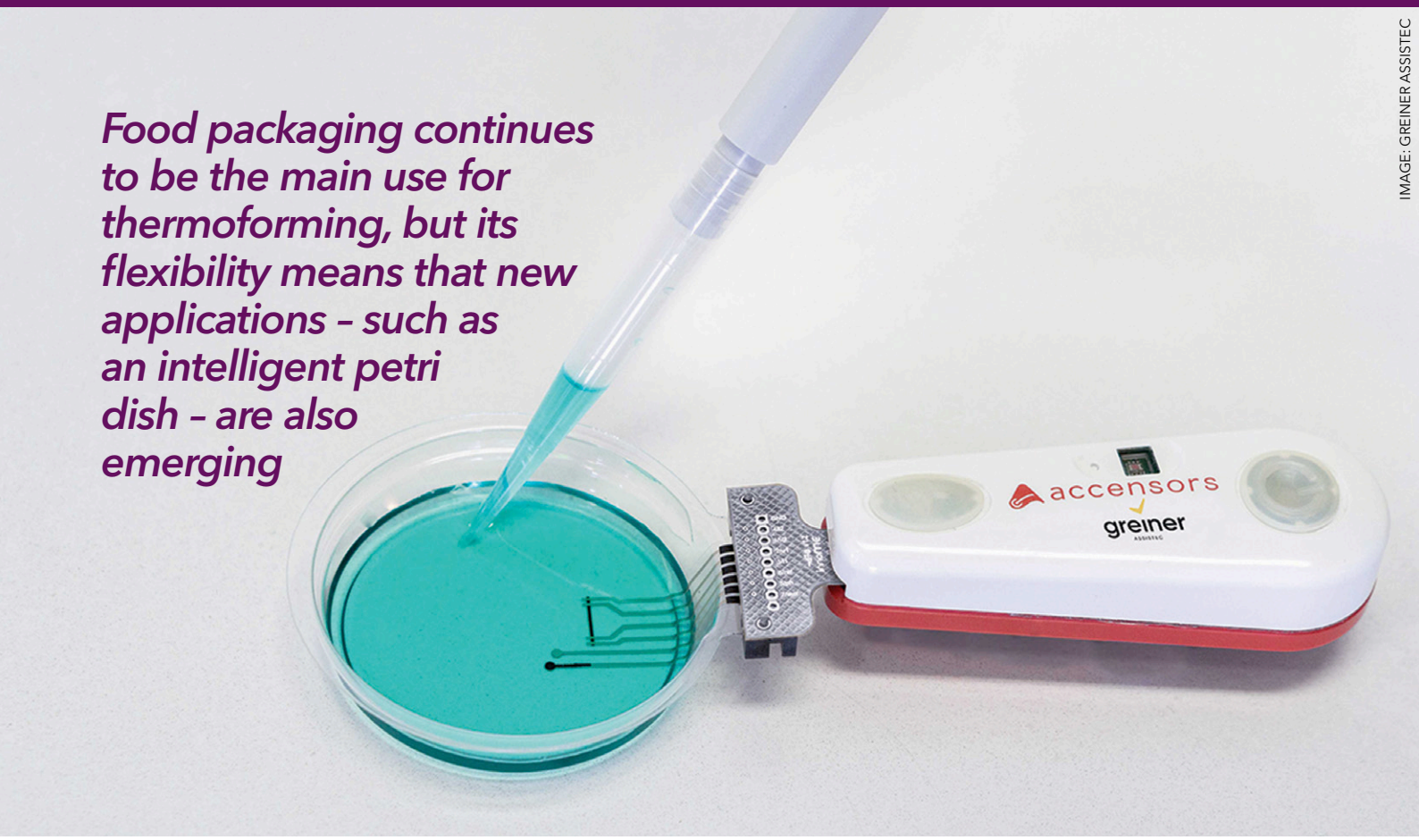


IMAGE: GREINER ASSISTEC

Food packaging continues to be the main use for thermoforming, but its flexibility means that new applications – such as an intelligent petri dish – are also emerging

Pressing engagement: latest in thermoforming

The majority of applications of thermoforming are in food packaging – but there are other uses of the technology.

Increasingly, engineering and medical applications are also making use of the technique.

In one recently example, **Greiner Assistec** is helping Accensors – an expert in film sensor technology – to develop an 'intelligent petri dish' using thermoforming.

The aim of the partnership is to offer customers the option of buying thermoformed plastic parts with printed sensor systems. As part of the pilot project, an initial demo prototype has now been developed, taking the form of a smart petri dish. This involves printing two sensors on PET film before putting it through a thermoforming process. The prototype can check the pH value and the temperature of the medium in the dish, using an Accensors scanner and an app. The data obtained can be used to gain new insights in research and development.

The intelligent sensor systems can be produced and printed onto the films at an affordable cost and in high volumes. During thermoforming, the film printed with the sensor technology is formed into a three-dimensional shape while retaining sensor functionality – so the petri dishes can be monitored as effectively as possible.

"The development of this smart petri dish has yielded a promising outcome and highlights one of many different possibilities for transforming plastic parts through the use of printed electronics," said Natascha Andraschek, technology manager at Greiner Assistec.

Eike Wilhelm Kottkamp, CEO of Innome – the parent company of Accensors – added: "The implementation of thermoformed film sensors in 3D geometries is a key milestone on our roadmap. At the moment, we are holding preliminary discussions with parties interested in specific applications in the biotech, smart manufacturing, and agricultural sectors."

Main image: Greiner Assistec has used thermoforming to make an 'intelligent petri dish'

Utah expansion

Plastic Ingenuity, a large US-based thermoformer, is to open a new production complex in Utah. ›

The project is expected to create 96 new jobs over the next 15 years.

"We have been searching for the right location to accelerate our growth for quite some time, and believe we have found the ideal match in Tooele, Utah," said Sakif Ferdous, chief marketing officer of Plastic Ingenuity.

The company has six existing facilities – four in the USA and two in Mexico. It is primarily a custom thermoformer, making products for the food, healthcare and consumer goods industries. Plastic Ingenuity is eligible for tax credits – of up to 15% of the state taxes paid – as long as it meets the criteria of its contract with the state.

PCR barrier

Despite the growing number of non-food applications, the food industry remains the main use of thermoformed packaging. For instance, US-based **Placon** has begun to manufacture high-barrier, multi-layer laminated sheet for food applications.

The laminated materials include a sealable barrier sheet – which prevents moisture ingress – and a sealable high-barrier sheet with an added EVOH layer to repel oxygen. The initial offering is laminated to Placon's EcoStar post-consumer recycled (PCR) PET – which helps to boost sustainability, it says.

EcoStar laminated sheet structures provide an optimal solution for perishable food. The package also includes, a peelable seal and a PE-based sealant. Placon recommends the non-barrier sheet for use as a moisture-preventing container with peelable film-seal lids. The finished structures of both sheets are designed to accompany airtight seals in high-speed automation machines.

"Customers are looking for sustainable, plastic packaging options – and barrier sheets made with post-consumer content helps them meet their sustainability goals," said Brian Hodek, sales director for food at Placon.

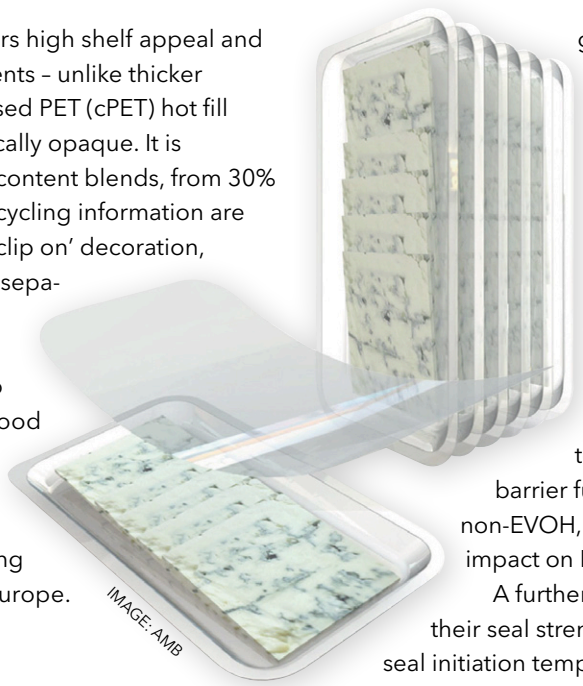
Hot stuff

Waddington Europe, the European thermoforming division of Novolex, has added a hot fill option to its range of TamperVisible packaging.

TamperVisible Hot Fill can withstand temperatures of up to 266F (130°C), making it an option for foods such as sauces, soups and ready meals – as it can also be microwaved. Made from high clarity

rPET (recycled PET), it offers high shelf appeal and a clearer view of the contents – unlike thicker polypropylene or crystallised PET (cPET) hot fill containers, which are typically opaque. It is available in four recycled content blends, from 30% to 100%. Branding and recycling information are displayed via a patented 'clip on' decoration, allowing easy and correct separation and recycling.

"Our new TamperVisible Hot Fill line makes no trade-offs – we combine food safety and hot packaging performance with recycled materials," said Eduardo Gomes, managing director at Waddington Europe.



Left: AMB has developed a mono material PET film for use in thermoformed MAP packaging

Mono-material PET

AMB of Italy has developed TotalMono PET – mono materials for use in thermoformed MAP packaging applications.

The PET top and bottom film solutions offer high barrier protection for sensitive foods. The ability to reduce thickness leads to a wide range of possible gauges – and weight reduction without affecting performance.

AMB base and rigid films are available at all standard gauges from 200my to 800my with a low or high barrier and including a possible downgauge from APET/PE. Lid films are available at gauges from 37my up to 60my – with a low or high barrier function. All barriers are non-EVOH, as EVOH has a negative impact on PET recycling stream.

A further feature of these films is their seal strength. They offer a lower seal initiation temperature and the ability to adjust sealing temperature compared to multilayer solutions. Sealing is provided by a lacquer – which also acts as an antifog, so there is no need for antifog lacquering. Despite downgauging, the material offers robust tear resistance during processing, says AMB.

›

IMAGE: REIFENHAUSER

Above: A Reifenhäuser sheet line will help extruder Day Young cut energy and raw material costs

Brown acquires GN

US-based **Brown Machine Group** (BMG) has acquired Canadian machinery manufacturer **GN Thermoforming Equipment**.

GN, which primarily makes equipment for the food industry, has significant sales outside North America – including a service and sales centre in the Czech Republic. It will continue to operate and manufacture under its current name, and remain headquartered in Chester, Nova Scotia.

BMG says the takeover will expand its thermoforming product offering and give it greater access to new markets in food packaging.

"GN's unique technology and talent increases the scope of BMG's offering to reach small and medium size thermoforming customers," said Greg Wolf, CEO of BMG. "BMG has significant sales in North America, whereas over half of GN's sales are outside North America. This acquisition greatly expands market access and growth for both entities."

Clear result

Mayzo says that its 'Beta Technology' – a beta nucleating masterbatch – can help thermoformers to use less polypropylene (PP) during production.

This can help to offset rising resin costs, transportation difficulties, supply disruptions and sustainability imperatives, said the company.

"Thermoforming customers achieve two substantial advantages through the use of Beta Technology," said Philip Jacoby, retired VP of technology at Mayzo. "They are achieving down-weighting of at least 15%, meaning that less PP resin is required to make the same amount of end product. They are also realising a productivity improvement of up to 25%."

The faster cycle rate is particularly valuable for customers in rigid food packaging, he said. Other benefits include a reduction – or even elimination – of TiO2 pigments used to make white containers.

Smart delivery

Day Young, a Taiwanese producer of takeaway packaging such as lids, trays and containers, recently took delivery of a new line from **Reifenhäuser**.

The new line, used to make A-PET films for thermoforming, will help the company expand production. It is equipped with a Mirex MT-V polishing stack and twin-screw extruders, and allows for direct extrusion. Reitruder twin-screw technology, combined with efficient vacuum units and venting system, processes up to 100% PET flakes directly.

Throughput is up to 1,100 kg/h PET – or up to 900 kg/h PLA with net film widths of 710-860mm. Reifenhäuser calculates that, with the planned capacity utilisation of the line, the company will save around €2 million in energy costs within 10 years. This equates to around 40% in energy savings.

"The high energy efficiency of the line goes perfectly with our commitment to sustainable production," said Jacky Lee, general manager of Day Young. "The line also increases the competitiveness of our plant."

Another advantage of the Reitruder twin-screw extruder is the processing of high proportions of additives and fillers – which are continuously added to the melt instead of finished compounds.

This creates a homogeneous melt and high quality PET film. The film made on the line has high tear resistance, allowing it to be made thinner. Much less scrap is then produced in the next production step – when thermoforming the cups, trays and containers. In addition, the use of additives and fillers instead of finished compounds cuts raw material costs by up to 30%.

Shortly after starting the line, Day Young received a major order – due to the high quality of its PET sheet.

Although the Reifenhäuser line was around twice the cost of a locally made line, Day Young said that it was a worthwhile investment for the future.

"To be successful on the international market, our production had to be become more economical and sustainable," said Lee.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.greiner-assistec.com**
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IMAGE: SHUTTERSTOCK

Sustainability and renewability look to be the keywords in PVC plasticiser development programmes today. Peter Mapleston finds out more

Green moves in plasticisers

Wherever you look in the plastics industry today, materials and additive suppliers are developing next-generation products based on renewable or recycled materials. With such a focus on sustainable development, it should be no surprise that many of the latest innovations in PVC plasticisers also have a 'green' tint to them too.

Swedish chemical company **Perstorp** is a typical example. In recent years, it has significantly expanded its portfolio of 'Pro-Environment' products made from renewable and/or recycled raw materials. "Perstorp is continuing on its path to become finite material neutral and sees an increasing demand for bio-attributed plasticisers in the construction and automotive segments," says Martin Hansson, who is the company's Business Manager for C10 Plasticisers.

The latest Perstorp innovation is Emoltene 100 Pro – a durable DPHP plasticiser based on renewable materials. The first grade, launched in May of this year, contains 14% renewable content. A second grade with 71% renewable content will be available in the near future, the company says (for both grades, renewable content is determined to the mass balance concept which applies physical and chemical traceability).

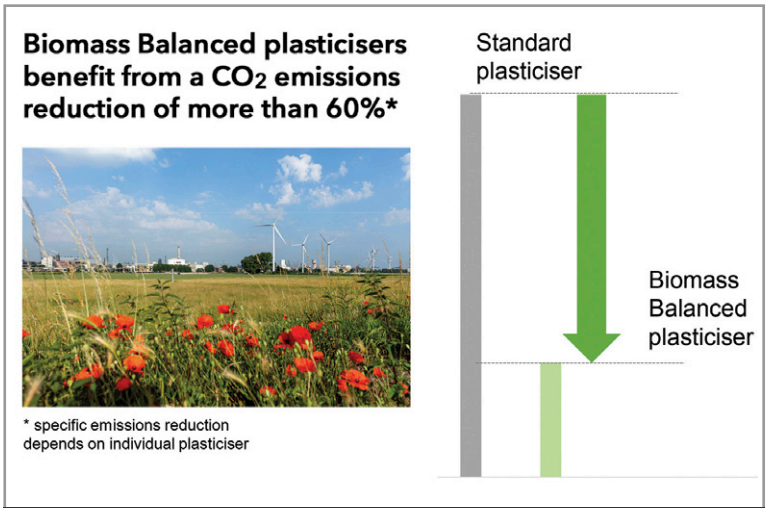
Like Perstorp's other renewable plasticiser, Pevalen Pro polyol ester (introduced two years ago), Emoltene 100 Pro is **ISCC** PLUS certified. "Being ISCC PLUS certified means that our sustainable raw materials are ISCC compliant in all parts of the value chain back to the point of origin. On top of this, Perstorp has chosen both physical and chemical traceability throughout the value chain and transparency by GHG calculations," says Hansson.

"With the ongoing transformation of the construction industry shifting to more sustainable building standards, traceability equals credibility. For example, it is essential to provide reliable GHG

Main image: Higher performance, reduced emissions and the choice of renewable or recycled 'green' sourcing are key priorities in current plasticiser development

IMAGE: PERSTORP

Left: Perstorp now offers two renewable plasticiser lines – Pevalen and Emoltene



Claimed CO_2 emission savings for BASF BMB plasticisers
Source: BASF

data to Environmental Product Declarations (EPDs), and that is where we can help," he explains.

And traceability demands extend beyond construction. "The automotive industry demands high traceability throughout its value chains. Also here we can offer accurate and reliable GHG data together with a strict control of our suppliers of renewable raw materials," Hansson says.

Circular moves

Part of the **BASF** plasticiser portfolio is also now based on sustainable inputs, which the company refers to as "circular feedstocks." In this respect, either renewable or chemically-recycled feedstock is used at the beginning of the value chain instead of fossil resources. In common with Perstorp and others, this alternative feedstock is allocated to the sales product according to a mass balance approach.

"The mass balance approach enables us to process renewable and recycled feedstocks together with fossil raw materials in our existing efficient production network and to allocate their share to specific products," says Diana Brunnenkant, Head of Marketing Plasticisers EMEA at the company.

BASF has launched a number of biomass balanced (BMB) plasticisers based on renewable raw materials under the names Hexamoll DINCH BMB, Palatinol N BMB, Palatinol 10-P BMB and Plastomoll DOA BMB. In place of fossil resources, an amount of bio-naphtha or biogas derived from organic waste or vegetable oils is used in their production. The company says that its biomass balanced plasticisers offer a lower carbon footprint than conventional alternatives. Both its mass balance approach and the BMB plasticisers are certified according to the REDcert2 certification scheme.

With its newly introduced Hexamoll DINCH CycledTM, BASF is also offering a version of its well-known non-phthalate plasticiser based on chemically recycled feedstock. In this case, pyrolysis oil obtained from non-recycled plastic waste replaces fossil resources (the oil is supplied by partners as part of BASF's ChemCycling project). The allocation to CycledTM sales products is also done using a third-party certified mass balance approach.

"CO_2 emissions are saved when manufacturing plastics [and other chemical products] based on pyrolysis oil instead of naphtha. The lower emissions result from avoiding the incineration of mixed plastic waste," according to Matthias Pfeiffer, Head of Technical Marketing Plasticisers Europe at BASF. "Pyrolysis of mixed plastic waste emits 50% less CO_2 than incineration of mixed plastic waste."

Certified recycled

A similar approach is being adopted at **Eastman**. It is introducing three new plasticisers with certified recycled content. The plasticisers offer identical performance to the company's legacy products but with a 20%–59% recycled content.

Eastman 168 Renew 20 non-phthalate plasticiser – which has 20% certified recycled content – is intended for use in end markets such as roofing, wallpaper and flooring. Eastman DOA Renew 20 plasticiser also offers a 20% certified recycled content. It provides flexibility at low temperatures and is especially suitable for food contact applications. Eastman Triacetin Renew 59 – with a 59% certified recycled content – is intended for use in food packaging adhesives and food wrap film applications.

The new plasticisers have food contact clearance from the US FDA and the European FSA and all three are described as drop-in replacements for legacy petroleum-based products (Figure 1). As

IMAGE: SHUTTERSTOCK

Right: Eastman's DOA Renew 20 plasticiser contains a certified 20% recycled content and is especially suitable for food contact

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such, Eastman says there is no need to change formulations or certifications. "Best of all, we offer them at scale–right now," it claims.

Eastman says it will produce the plasticisers using its Carbon Renewal Technology, a chemical – it uses the term 'molecular' – recycling technology that uses hard-to-recycle mixed plastic waste as the raw material and is claimed to reduce consumption of fossil fuels and lower greenhouse gas emissions. The claimed recycled content is achieved through a mass balance allocation process certified by ISCC.

"Eastman is just getting started with sustainable plasticisers," says Henry Li, Market Development Manager Plasticisers Technology. "We're creating a wide range of plasticisers that could contain even higher percentages of recycled content and an even lower carbon footprint to meet the growing demand for sustainability."

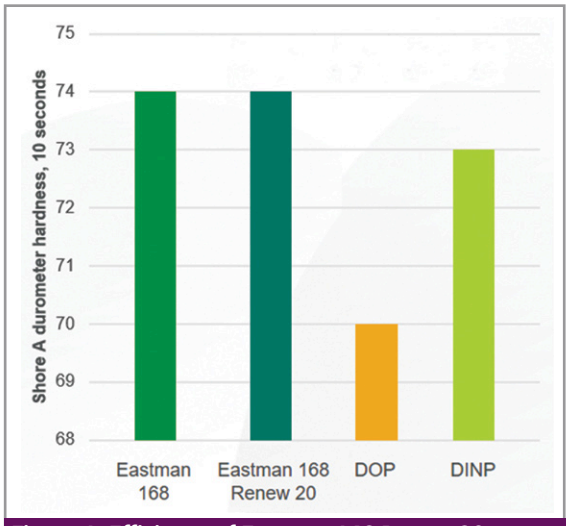

Figure 1: Efficiency of Eastman 168 Renew 20 plasticiser determined by Shore A durometer measurement compared with existing Eastman 168 grade and DOP and DINP (60 phr addition)
Source: Eastman

Low impact chemistry

Chemical products from **Matrìca**, a joint venture between Eni chemical company Versalis (which operates in the basic and intermediates sectors, plastics, rubbers and chemistry from renewable sources) and bioplastics specialist Novamont, are derived entirely from renewable sources. Matrìca makes use of what it describes as low-environmental-impact technology that enables the transformation of vegetable oils into mono and dicarboxylic acids and esters. Applications span biopolymers, biolubricants, cosmetics and animal feed, as well as plasticisers.

The company recently developed new aliphatic diesters with a high renewable content that it says show very interesting properties when considered as PVC plasticisers as an alternative to traditional phthalates. They are said to provide "excellent" compatibility and plasticising efficiency with PVC, especially where very good low temperature performance is required. The products are also said to show better migration resistance and less extractability than other aliphatic diesters.

At Belgium-based **Proviron**, which develops and produces chemicals mainly for medium-volume niche markets, Proviplast Plasticiser Business Manager Koen Engelen says development of a bio-based plasticiser range continues. "We are getting good results to replace DINP, DOTP and DINCH in traditional applications like flooring and coated textiles with a modified epoxidised plasticiser," he says.

"Since the beginning of this year, we have seen a change of mindset at many companies, and we see more commitment to really start this change for more sustainability and reducing carbon footprint. A few years ago, only R&D people were really interested, but we now also notice that many companies are changing their strategy to go for more 'green'," he says. "We are also finishing tests with a product that can withstand the most demanding requirements for applications in automotive (low VOC, fogging, colour stability). We expect this product to be available in 2022."

Bio-based approval

The Santicizer Platinum G-2000 plasticiser from **Valtris**, an epoxy soyate ester with 85% certified biobased content, has recently gained the US Department of Agriculture (USDA) Certified Biobased Product label. "Santicizer Platinum G-2000 is an excellent general purpose plasticiser with performance comparable to other non-phthalate general purpose plasticisers such as DOTP or DINCH," says Mark Holt, Business Director, Polymer Modifiers at Valtris.

Holt says that, along with the significantly bio-based content, the G-2000 grade also offers good processing performance, low temperature properties, and very good heat stability. Formulators can combine it with other Santicizer Platinum grades in their recipes.

Away from the bioplasticiser sector, Valtris also recently launched Santicizer Platinum P-1800, the latest addition to its line of non-phthalate fast-fusing plasticisers. Based on cyclohexanoate technology, it is said to combine high solvating ability with low volatility and excellent migration resistance.

"Santicizer Platinum P-1800 can lower both formulation and production costs while improving final product properties," says Holt. "Formulators

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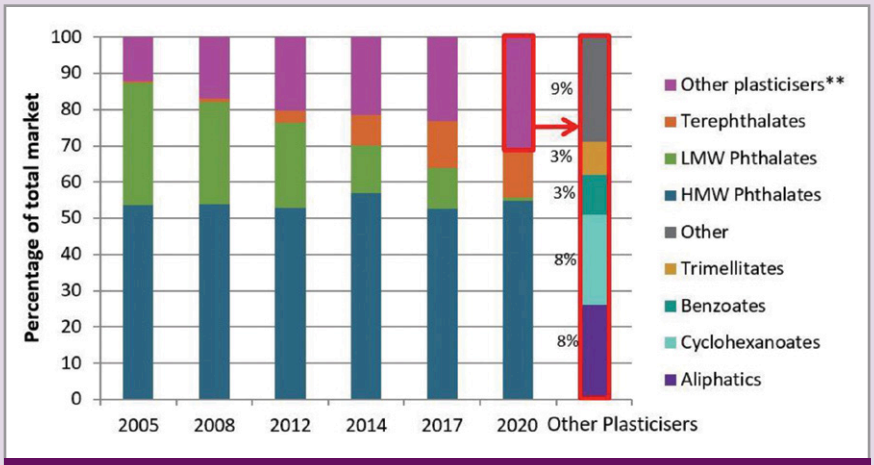
Science and regulatory update

This brief update on some of the latest research into plasticiser safety and snapshot of the current European regulatory position is based on information supplied by European Plasticisers, which is part of the European trade association Cefic.



Global plasticiser consumption data covering the past 25 years shows that low molecular weight phthalates have been substantially replaced by high molecular weight ortho-phthalates and other chemistries that do not fall into the EU category of Substances of Very High Concern (SVHC)
Source: CEFIC/IHS

Plasticiser modelling

A scientific project aimed at developing a physiologically-based pharmacokinetic (PBPK) model for plasticisers was initiated in 2017 by European Plasticisers and co-funded by VinylPlus, the sustainability initiative of the PVC value chain. Its objective is to assess the safe use of plasticised PVC and support scientifically-solid risk assessments, rather than those which use in-vitro studies (which the association argues are not representative of the complex metabolism in whole organisms).

The project's first PBPK **model for DINCH** was published in a peer-reviewed journal in 2019. A **model for DINP** was published in August 2020. PBPK models for DEHTP, DPHP, DEHA, DINA and DBA are currently under development and the respective studies will be submitted for publication in scientific journals.

DINP evaluation

Last year also saw the publication by the University of Edinburgh in the UK of a study titled: 'Systematic comparison of the male reproductive tract in foetal and adult Wistar rats exposed to DBP and DINP in utero during the masculinisation programming window.' According to European Plasticisers, **the study** provides evidence on the clear differences between the effects occurring with DBP – a low molecular weight phthalate – and DINP, confirming the latter does not cause adverse reproductive effects and is not an endocrine disruptor.

Risk assessment

European Plasticisers says an updated EU risk assessment of the phthalates DBP, BBP, DEHP, DINP and DIDP for use in food contact materials (FCM) – which concluded that "current exposure to these five phthalates from food is not a concern for public health" – has yet to lead to adoption in the 16th amendment to the Plastic Food Contact Material Regulation. In October 2020, EFSA published "Part 1 of a two-part mandate on a re-evaluation of the risks to public health related to the presence of phthalates, structurally similar substances, and replacement substances from food contact materials (FCMs)". The outcome of this Risk Assessment is expected by end of May 2022.

› **www.europeanplasticisers.eu**

can now choose from Santicizer Platinum P-1400, Platinum P-1700 and now P-1800 to dial in the specific efficiency and permanence to match their end use application."

Holt says formulators also frequently combine Santicizer Platinum non-phthalate plasticisers with other general purpose non-phthalate plasticisers to create optimised solutions for their specific processing needs.

"When using Santicizer Platinum P-1800 in combination with general purpose plasticisers, manufacturers will see improved efficiency and processing speed without sacrificing emissions or migration," he adds.

HMW advantage

With the introduction of Jayflex L9TM, **ExxonMobil** has expanded its portfolio of high molecular weight plasticisers. The new addition is a trinonyl trimellitate based on linear and branched C9 alcohol. According to the company, "careful selection of the degree of linearity of nonyl alcohols to make nonyl trimellitate esters provides useful advantages in flexible PVC."

Flexible PVC materials used in demanding applications such as automotive cables, wind turbine tray cables (WTTC), and car interior leather applications are required to meet extreme performance specifications at low and high temperatures

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The European recycling industry is preparing for larger volumes of post-use flexible polyolefin films becoming available. AMI Consulting writes about its new market report

A new report from AMI Consulting published in June 2021 presents a comprehensive analysis of the state of play and future outlook for the recycling of flexible polyolefin films in Europe. It analyses the industry's operating environment, and the particular challenges involved in the collection, sorting and recycling of flexible films.

In preparing the report, AMI's detailed in-house data on virgin polymer demand, polymer end use applications, and recycling capacities was combined with an extensive research programme including conversations with a wide range of industry participants.

The quantitative analysis includes a focus on volumes of post-use flexible polyolefin films generated as waste by end use sector, and an assessment of the volumes of post-use films available to EU+3 recyclers as inputs into the recycling extrusion process. The latter data point is of particular importance given it marks the new calculation point for the EU's recycling targets. Data is provided for the years 2019, 2020 and 2021, with forecasts for 2025 and 2030.

The report also identifies the top six countries in terms of recycling capacity for flexible polyolefin films in Europe, as well as the region's top ten film recyclers. This is complemented by a detailed analysis of existing and emerging end use applications for the outputs of the recycling process, providing data for 2020, 2025, and 2030.

The quantitative analysis is accompanied by a detailed assessment of the industry's changing operating environment and the implications these changes have for the industry's future development.
AMI's report analyses the evolving legislative environment and explores the current collection and sorting processes for different types of flexible polyolefin films and how they impact upon volumes and quality of post-use films available for recycling. It also looks at definitions of 'recyclability' and the solutions market participants across the value chain are working on to achieve it. Technological innovations and the role chemical recycling can play to increase recycling rates for flexible films form further parts of the analysis.

With deadlines for meeting EU recycling targets approaching the recycling industry needs a clear commitment to investments into Europe's collection & recycling infrastructure for flexible films. There is significant potential to increase the volume of post-use films made available for recycling, and to produce higher quality recyclates suitable for a broader range of end use applications.

For further information please contact:
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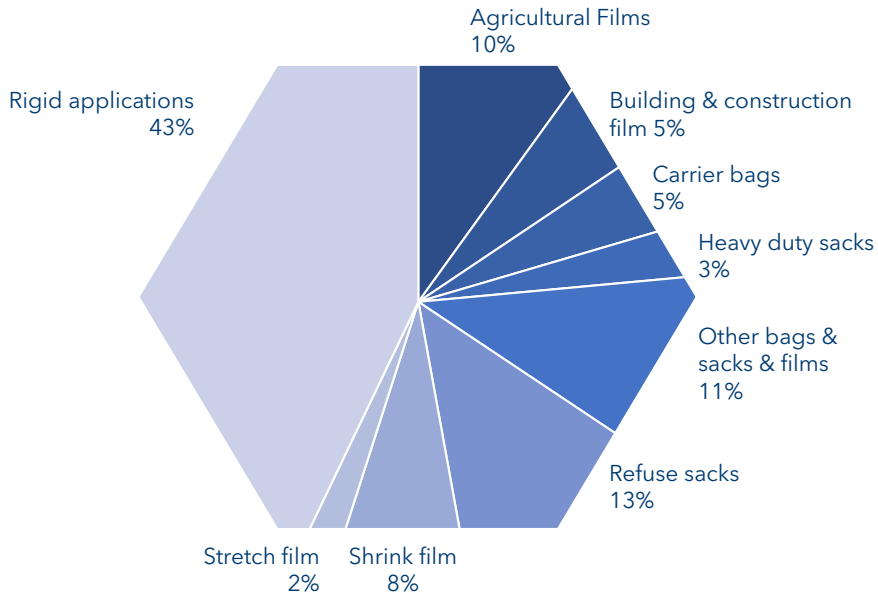
Consultant Recycling & Sustainability,
AMI Consulting
+44 (0)117 311 1532
silke.einschuetz@ami.international

End use application shares for recyclate produced from post-use flexible polyolefin films 2020



while offering migration and extraction resistance.

Branched trimellitates such as TOTM (tris (2-ethylhexyl) trimellitate) typically exhibit poorer cold temperature performance than general-purpose plasticisers, says ExxonMobil's Global Plasticiser Technical Advisor Didier Naert. "For these applications, linear trimellitates are preferred. The new Jayflex L9TM is ideally suited for such applications and replaces the conventional Linear C8 or Linear C8C10 trimellitates."

According to Naert, the new plasticiser shows excellent resistance to high temperatures, very good cold temperature flexibility, great resistance to migration and low fogging, while having better plasticising efficiency and process ability than branched trimellitates. "Its low volatility would help, for example, meeting automotive cable Class C requirements (3000h 125°C)," he says.

In contrast to some of the more linear plasticisers, which exhibit a phase transition (cold crystallisation followed by melting), Jayflex L9TM exhibits no crystallisation peak around 0°C. It displays cold temperature properties similar to those of a linear trimellitate of similar average molecular weight, such as L810TM.

Discussing the use of trimellitates in PVC plastisols, Naert says that to fulfil the plastisol spread coating requirements in terms of production output, adequate plastisol viscosity and gelation is required. "The use of trimellitates in PVC plastisols results in a substantial increase in the process temperature required over general-purpose plasticisers to reach the final gelation. L9TM, combining branched and linear structures exhibited similar gelation temperatures as L810 TM."

Jayflex L9TM is now registered under REACH and will be commercially available in Europe, North America and Asia Pacific. "With the introduction of Jayflex L9TM, ExxonMobil continues to develop its already wide range of high molecular weight plasticisers for PVC," Naert says.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.perstorp.com**
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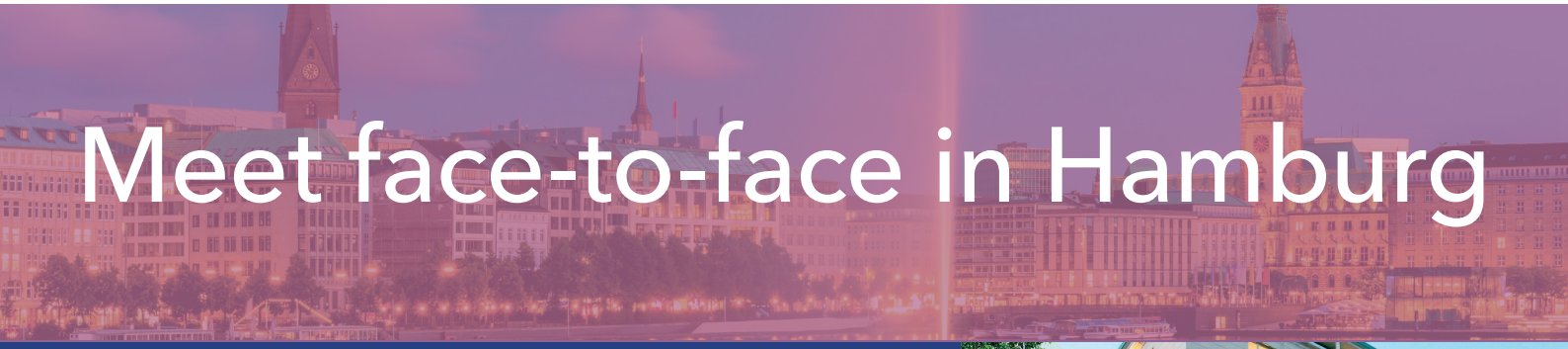

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IMAGE: AMI

Plastics extrusion expo makes its Essen debut

We look ahead to the Plastics Extrusion World Expo which is taking place at Messe Essen in Germany later this month

The Plastics Extrusion World Expo makes its European debut at Messe Essen in Germany on 29-30 September 2021.

Organised by AMI, the free-to-attend exhibition and its focused conference are running alongside the Compounding World Expo, Plastics Recycling World Expo and Polymer Testing World Expo. In total, there will be more than 200 exhibitors and 100 speakers across the four expos and five conference theatres.

It will be Europe's first major plastics industry event for 18 months and will provide an opportunity to reconnect with suppliers and customers, as well catch up on what's been happening and discuss what lies ahead. To register for your free ticket click **here**.

"When we launched the Compounding World Expo and Plastics Recycling World Expo in Essen in 2018, we had over 4,000 visitors, including large numbers from extruders of pipe, profile, tubing, film and sheet," said Andy Beevers, events and magazines director at AMI. "So when we next ran the exhibitions in the USA, we added the Plastics Extrusion World Expo, which proved very popular. We're now pleased to bring it to a European audience".

Over the following pages we preview the free conference programme and look at a selection of just some of the companies you'll be able to see at Messe Essen. Click **here** to view the full list of all 200+ exhibitors.

Main image: Panel debates are a key part of the conference programme

Register for free

It is free to attend the Plastics Extrusion World Expo and its conference theatre. You will also have access to the plastics compounding, recycling and testing exhibitions and their conference sessions, which are running at Messe Essen on the same dates. To register for your free ticket visit: **https://www.ami.ltd/ami-plastics-expos-eu**

PLASTICS EXTRUSION WORLD EXPO

Dates: September 29-30
Entry is free

Venue: Messe Essen, Essen, Germany

Opening hours:
9am to 5pm on both days

Online registration:
CLICK HERE

IMAGE: AMI

US-based **Advanced Blending Solutions** (ABS) designs and supplies material handling, blending, and controls for the plastics industry. With representatives throughout the USA and the world, ABS is a fast-growing company committed to providing the best products and services to meet the unique needs of its customers.
› **https://adv-blend.com**

AGC Chemicals Europe is a fluoropolymer manufacturer and leader in ETFE production. It produces Fluon PTFE and ETFE as well as marketing other fluorinated products, including Fluon PFA and AFLAS fluoroelastomers. The product range offers protection against heat, chemicals and corrosion, and has applications in a range of industrial areas – including automotive, aerospace and oil and gas.
› **www.agcce.com**

Alok Masterbatches, a leading masterbatch provider based in India, has created innovative, reliable and responsible applications for the plastic industry over the past 25 years. Its core product offering is its Chromanox range of single-pigment concentrates and mineral-filled masterbatches. In addition, it recently introduced an anti-microbial product, in a collaboration with Microban.
› **www.alokmasterbatches.com**

AMI is the leading provider of market intelligence, databases, magazines and events for the global plastics processing industry. Its teams of consultants, researchers, writers and event organisers understand the global plastics processing industry – including how markets have changed, and where they are heading. It helps to identify market opportunities, new customers and innovative technologies to help business growth, with reports, conferences and magazines.
› **www.ami.international**

Amut specialises in extrusion and recycling. Its extrusion division provides extruders, downstream equipment and turnkey lines for producing foils, stretch film, sheets, waterproofing membranes, pipes and profiles. Amut Ecotech offers material recovery facilities from post-consumer waste, plastic recovery facilities from post-consumer plastics, industrial and household waste sorting and recovery facility and equipment.
› **www.amutgroup.com**

Catch up at the conference

There will be a free-to-attend, focused conference at the Plastics Extrusion World Expo at Messe Essen on 29-30 September 2021. The busy two-day programme has been put together by AMI, which has extensive experience of organising plastics conferences.

Charmaine Russell of **AMI** will give the opening keynote presentation on trends and opportunities in flexible packaging; her colleague Andrew Reynolds starts the second day with a talk on global trends in film extrusion.

One of the conference highlights will be an industry debate on the future for flexible packaging, featuring senior representatives from **Bischof + Klein**, **Cofresco**, **Klöckner Pentaplast** and **Sealed Air**. There will also be a panel discussion on trends in agricultural films with speakers from **Grupo Armando Alvarez** and **Coveris Flexibles**.

The conference programme for the Plastics Extrusion World Expo also features technical talks on topics such as process optimisation, materials technologies, quality control and sustainability.

There will also be plenty of interest in the four conference theatres in the other co-located expos that are focused on recycling, testing and compounding. For example, there will be a debate on the future of packaging recycling in the Plastics Recycling World Expo, while the Compounding World Expo is hosting talks on polymer stabilisation, and the Polymer Testing World Expo has presentations on film structures and the analysis of defects in films.

Download the conference brochure featuring the full conference programmes for all five conference theatres **here**. And register for your free ticket at **https://www.ami.ltd/ami-plastics-expos-eu**

Conference speakers include (left to right): Andrea Questa (Sealed Air), Zeljko Cancarevic (Bischof + Klein), Andrew Reynolds (AMI), Andres Garcia de Tunon (Grupo Armando Alvarez), Jan Torsten Vollmer (Coveris) and Charmaine Russell (AMI).

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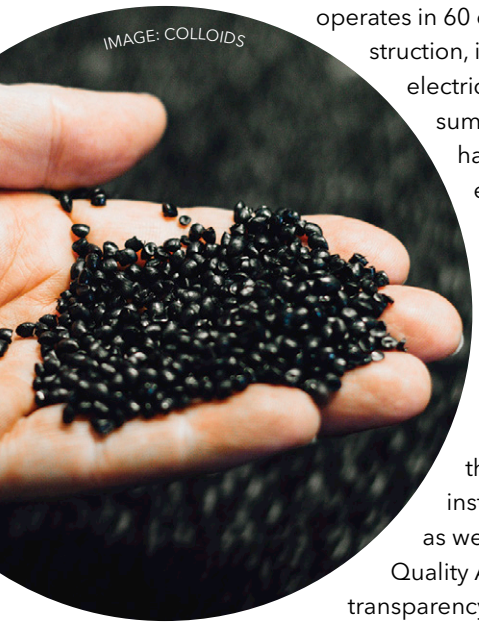
Avient, which in 2020 posted revenues of US$3.8bn, provides specialised and sustainable material solutions. Its offerings include polymer formulations (such as vinyl powders), polymer additives and colorants, thermoplastic elastomers and advanced composites. In addition, it distributes more than 3,500 grades of engineering and commodity resins.
› **www.avient.com**

Baerlocher is a leading supplier of additives for the plastics industry, with a history stretching back nearly 200 years. It employs more than 1,150 people in its production sites and joint ventures, which are located across the world. The company is a global partner for all PVC processing needs – with leading-edge technology for solid calcium-zinc and calcium organic stabiliser systems.
› **www.baerlocher.com**

Benvic is a European leader in PVC compounds, biopolymers, bespoke polymeric materials, medical compounds and components. Founded in 1963, it operates in 60 countries for applications in construction, infrastructure, packaging, medical, electric and electronic appliances, consumer and automotive. The company has eight production sites – and 470 employees – across Europe.
› **www.benvic.com**



Above: Colloids is well known as a supplier of masterbatches

Brabender develops, produces and distributes instruments and equipment for testing a range of material properties. The range extends from laboratory equipment through to small-scale production. Its instruments are used in quality control as well as R&D. An example is its Film Quality Analyzer, which measures the transparency and optical quality of blown or flat films at laboratory or production scale.
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Brenntag is a global player in chemical and ingredients distribution. As well as marketing process chemicals, it is focused on speciality products, value-added services and customised solutions. Its Polymers division offers customers in thermoplastics processing a portfolio of high-performance polymers, engineering thermoplastics and polymer additives. Core competencies are developing, producing and marketing of customer-specific material solutions for applications in many end markets.
› **www.brenntag.com**

Cabot is a US-based producer of speciality chemicals and performance materials. It is a leading producer of black masterbatch and conductive compounds. Its unique formulations – and extensive expertise – helps its customers to differentiate themselves. Cabot formulates highly dispersed carbon black solutions to satisfy application requirements such as UV protection, tinting strength, colour and shade.
› **www.cabotcorp.com**

Collin Lab & Pilot Solutions develops intelligent pilot and laboratory lines in modular system for plastic processing companies and research institutes. The owner-managed company has been in business for more than 45 years and sets worldwide technical and quality standards. Collin solutions are used for the development and production of plastic products, material analysis, test series and pilot tests – which allow scale-up to production scale.
› **www.collin-solutions.com**

Colloids is a UK masterbatch company that offers advanced polymer solutions for the engineering sector. Its has bespoke and standard solutions for colouring polymers such as automotive interiors and under-bonnet applications. Selecting the correct polymer and colour formulation allows functional properties such as anti-friction, electrical conductivity, UV protection and chemical resistance to be enhanced.
› **https://colloids.com**

Dr. Gupta Verlags is a family-run specialist publishing house for the polymer industry based in Ratingen, Germany. The portfolio includes German-language and international trade magazines for the industries related to polyurethane, rubber and thermoplastic elastomers. In addition, Dr. Gupta Verlags offers specialist books and various services on request.
› **www.gupta-verlag.com**

Dynisco has more than six decades of experience in helping customers provide a true "window into the process" with its range of products and solutions for indication and control for critical plastic process measurements including, pressure, temperature and polymer rheology. Harnessing these parameters help plastics processors to reduce lot-to-lot variations, cut scrap, raise productivity and integrate recycled materials into their process without sacrificing product quality.
› **www.dynisco.com**

IMAGE: EREMA

Above: Erema's Intarema ZeroWastePro is used to recycle PE and PP film

EngView Systems provides solutions for the PVC and aluminium extrusion industry. It specialises in quality control and measurement systems for inspecting profile geometry. Scan Fit & Measure is a 2D flatbed scanner system for automated measurement and inspection of profile geometry for both aluminium and plastic extrusion. MCaliper is an innovative way of adding traceability to measurements done with the most commonly used manual tools in manufacturing.
› **www.engview.com**

Erema, based in Austria, specialises in developing and manufacturing plastics recycling systems and components. Founded in 1983, the company has supplied around 6,500 recycling systems worldwide. With subsidiaries in the USA, China and Russia, and around another 50 representatives elsewhere, it has a network to implement custom plastics recycling solutions around the world.
› **www.erema.com**

Eurochiller, founded in 1990, was acquired in 2019 by Atlas Copco – operating under its Oil Free Air division in the Compressor Technique business area. Eurochiller's headquarters in Italy house both production and a customer centre. It has another product company in Slovakia and two customer centres in France (Eurochiller France ECF) and in the UK (IsoCool). The company designs, manufactures and services industrial cooling products and temperature control units as well as related systems used in industrial manufacturing processes. It is a specialist in providing cooling solutions in industrial processes, especially in the plastic sector.
› **www.eurochiller.com**

ExxonMobil Chemical is a leader in the technology, innovation and supply of petrochemical products, and among the largest producers of performance polymers. Its Vistamaxx products are a cost-effective way of allowing greater use of low-cost, recycled content – while targeting high-value applications.
› **www.exxonmobilchemical.com/rethinkrecycle**

FB Balzanelli produces automatic and semi-automatic coilers. These include automatic solutions for packaging pipes, as well as automatic palletising systems (which can serve more than one line). These are developed according to its commitment to technology, innovation, quality and customer care. Constant innovation offers a technical solution to each pipe coiling, packaging and palletising need. A focus on customer care helps to ensure correct, reliable operation of all systems.
› **www.fb-balzanelli.net** ›

Filtec is a family company, founded in 1993 and based in Italy. It develops and sells solutions for polymer pelletising. Its range of products includes water ring and underwater pelletisers, screen changers, water filters, horizontal and vertical centrifuges and vented vibrating screens. Its CA range of screen changers – with single or double plate – filter molten plastic in a range of applications including the processing of tubes and profiles.
› **www.filtec.it**

Gabriel-Chemie specialises in the refinement and colouring of plastics. In 2020 it celebrated its 70th anniversary as a masterbatch provider on a national and international level. When developing new products, it focuses on sustainability and innovation for the production of durable plastic articles. It has 630 employees in nine European locations.
› **www.gabriel-chemie.com**

› **Gamart** produces and distributes innovative products and technologies in the plastics industry. It was established in 1996 in Poland and has expanded to more than 120 engineers and specialists. Its activities are based on four areas: large-sized PE fittings (including bends), with diameters of 315-1200 mm; advanced rainwater collection systems that boast high quality; production and renovation of machinery for plastics processing (including extrusion lines and plastification systems); and distribution – via 15 stores in south-east Poland, through which it offers products from local and international partners.
› **www.gamart.pl**

Inoex is an integrated solution provider of measuring and control technology for pipes, tubes, film and profiles. Since its foundation in 1984, the company has gone through constant growth. The company delivers smart, innovative solutions and services that create added value

Above: The Warp series of products from Inoex uses radar sensor technology to make inline pipe measurements

for customers. An example is its Warp series of products that use radar sensor technology to make inline pipe measurements.
› **www.inoex.de**

Kuhne Maschinenbau is a family business that sets benchmarks and provides plastic converters worldwide with equipment for sheet and flat film extrusion and several other extrusion processes. If required, Kuhne can be a single-source supplier of a production line – from the extruders all the way downstream to the packer.
› **www.kuhne-group.com**

Labtech Engineering is a Thai-based laboratory equipment manufacturer for polymer processing. It specialises in high-performance equipment with attractive quality/price correlation. Labtech has established a subsidiary in Europe to reinforce the contact, sales and service to customers in that region.
› **www.labtechengineering.com**

Luigi Bandera supplies complete extrusion lines for blown film (packaging and converting sector) and flat die foil and sheet (rigid thermoformed packages). The company is a leader in PET rigid film dry-less extrusion technology and in agri-geo blown film technology. Its R&D centre, completed

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E/ emily.nicholson@ami.international

Right: NGR's recycling machines boast high throughputs for processing internal plastic waste

in 2014, was recently expanded by 3,000m². Industrial tests and complete line wet trials are now available at the company headquarters in Busto Arsizio, Italy. Bandera aims to maximise the efficiency of the recycling processes concerning extrusion and pelletising including pre- and post-treatment of the flake with the option to incorporate additives or fillers. The capability of upgrading material characteristics to a comparable virgin material level is one of the priorities towards circular economy needs.

› **www.luigibandera.com**

Maag is a leading manufacturer of gear pumps, pelletising systems, filtration systems and pulverisers for demanding applications in plastics and other industries. It develops, manufactures and distributes innovative, customised solutions for complete pump and pelletising systems. It also has expertise in plastics recycling, through its Ettlinger subsidiary.

› **https://maag.com**

Motan-Colortronic is a global manufacturer of peripheral units and systems for handling bulk solids. Its offering is based on in-depth expertise spanning the while process chain. The company develops solutions for plastics compounders, processors and for the chemical industry. Its systems are tailored to real-world applications, which helps to improve customers' efficiency, productivity and competitive advantage.

› **www.motan-colortronic.com**

NGR machines are used to recycle the waste generated by plastics processing companies and give the plastics a 'second chance' at the end of their life. The company has been building plastics recycling machines in Austria for more than 20 years. The machines turn plastics waste into high-quality pellets. A network of distribution partners and service representatives help customers to extend the lifetime of NGR machinery.

› **www.ngr-world.com**

Right: Motan-Colortronic offers a wide range of materials handling technologies

Nordson is an expert in polymer processing solutions and its systems are used worldwide to melt, extrude and pelletise polymers. It has designed its products – from gear pumps to valves and coextrusion dies – to enhance the performance of polymer processes. Its BKG and EDI products and solutions help to enhance efficiency in polymer extrusion.

› **www.nordson.com**

Plastic Systems produces advanced plastic solutions – including dryers, dosers, granulators and mixers – for a wide range of industries and applications. For instance, its VLM series of single-phase feeders convey plastic granules to processing machines. It also offers several types of doser – including volumetric, single-gravimetric and loss-in-weight – and dryers in a variety of sizes.

› **www.plasticsystems.it**

Pontacol develops and sells thermoplastic adhesive films for industrial applications in the textile, composite, electronics, ballistic protection and personal care markets. The company extrudes and produces technically sophisticated adhesive films – not just for its own needs, but also as a contract manufacturer for third-party companies.

› **www.pontacol.com**

Scholz Dosiertechnik is an expert in continuous gravimetric and volumetric feeding of granulates,

powders, recycled material and liquids. It is a medium-sized company, based near Frankfurt, that offers problem-solving expertise. Its equipment is modular, flexible and reliable. The company offers short delivery times, reasonable prices and comprehensible solutions.
› **www.scholz-dosiertechnik.de**

Solvay is a world leader in stabilisation solutions for high-value, durable applications that meet demanding requirements. Its UV and thermal stabilisers play a key role in helping polyolefins to process more effectively, perform better and last longer. The stabilisers prolong the life of durable items, which reduces plastic waste and facilitates reuse and recycling.
› **www.solvay.com**

Starlinger Recycling Technology is a market leader in the field of machinery and process technology for woven plastic sacks. For more than 30 years, it has supplied machinery for the recycling and refinement of many plastics, including PE, PP, PA, PS, BOPP and PET. Its PET recycling systems produce food-safe rPET and are approved for use in food applications by many brand owners, as well as various national and international authorities.
› **www.starlinger.com**


IMAGE: STARLINGER

Above: Starlinger is a leader in machinery and technology for woven plastic sacks

Tecnova specialises in the production of extrusion lines for plastic recycling, including in-house, industrial scraps and post-consumer scraps from washing lines. It can offer solutions for all the main thermoplastics materials, in whatever form they appear – such as film, regrind, fibre or foam. The quality, reliability, ease of use and simplicity of maintenance of its machines have helped it become a global reference.
› **www.tecnovarecycling.it**

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Industry speakers include:

Paul Niedl
Commercial Head
Starlinger & Co.

Adrian Griffiths
CEO
Recycling Technologies

Silke Einschuetz
Consultant – Recycling & Sustainability
AMI

Giorgio Santella
General Manager
CMG Granulators

Lucy van Keulen
Commercial Director
Umincorp

Thomas Baldt
Sales Representative DACH
ZenRobotics

IMAGE: AMI

New expo puts focus on polymer testing

The first Polymer Testing World Expo takes place in Essen this month. We take a look here at some of the highlights at the free-to-attend conference and exhibition

The Polymer Testing World Expo makes its debut at Messe Essen in Germany on 29-30 September 2021. The free-to-attend conference and exhibition is intended to provide a new forum for scientists and researchers that develop, test, and analyse polymer materials, formulations and finished products.

Organised by *Film and Sheet Extrusion* magazine publisher AMI, the Polymer Testing World Expo runs alongside the Compounding World Expo, Plastics Recycling World Expo, and Plastics Recycling World Expo. In total, there will be more than 200 exhibitors and more than 100 speakers to choose from across the four exhibitions and their five focused conference theatres.

"When we ran the Compounding World Expo and Plastics Recycling World Expo in Essen in 2018 we had 4,024 visitors, and more than 40% of these – 1,722 to be precise – were involved in R&D and materials testing," says Andy Beevers, AMI's Events Director. "We therefore decided to add an area within the event focused specifically on polymer testing and analysis, where visitors can explore new lab technologies and stay up to date with best practices and the latest standards."

Conference programme

The dedicated conference programme for the Polymer Testing World Expo features two days of expert presentations covering a range of developing testing technology topics and providing useful practical advice and tips.

Speakers from some of Europe's leading research centres will lay out their latest findings in the area of lifetime prediction and failure analysis for plastic materials and components. For example, Christoph Zekorn from **IKV** will discuss failure analysis of plastics with a particular reference to instrumental techniques. In addition, Arjen Boersma from **TNO** will focus on assessing degradation behaviour of polymers and its impact on their lifetime. Accelerated ageing of polymers will be covered by Wilma Hahn from **SKZ**, who will speak about high-pressure autoclave testing, while Kim Bini from **Elastocon** will focus on developments in

Main image: The free conference theatres at the Essen expos are expected to prove popular

Speakers at the Polymer Testing World Expo conference include (clockwise from top left): Christoph Zekorn, Head of Microscopy at the IKV Centre for Analysis and Testing of Plastics; Wilma Hahn, Project Manager at SKZ; Kim Bini, Laboratory Manager at Elastocon; Jessica Wiertz, Applications Manager at Brabender; Fresia Alvarado, Sustainable Plastics Researcher at Wageninger Food and Biobased Research; and Ole Jan Myhre, Market Manager at Norner

stress relaxation and lifetime estimation of rubber.

Quality control testing will be another major focus of the Polymer Testing World Expo conference programme. Testing of plastics according to specific ASTM and ISO standards will be addressed by Georg Font from **Schütz + Licht,** while the use of optical inspection and measurement techniques for polymer quality control will be detailed by Oliver Hissmann and Oliver Kraushaar from **OCS Optical Control Systems.** Gilad Roter from **Inspection Technologies** will explain an innovative solution for in-line sorting of pellets and **Aimplas** will cover combined analytical techniques for analysis of foreign particles and defects in plastic parts and films.

Two presentations will cover some of the most recent developments in polymer characterisation. Alexander Sagidullin from **Oxford Instruments** will focus on advances in bench-top NMR instruments, while Marco Grundler from **ZBT** will examine methods for the characterisation of compounds with high thermal and electrical conductivities.

Testing of biobased materials is another topical subject being addressed. Jessica Wiertz and Matthias Mayser from **Brabender** will be looking at product and process development of biobased polymers using lab-scale extrusion systems, while Fresia Alvarado from **Wageningen Food and Biobased Research** will cover the use of in-line rheology in development of starch-based mixtures.

Staying in the area of sustainability, the analysis of recycled plastics will be another major theme of the conference. Ole Jan Myhre from **Norner** will present on quality analysis and improvement strategies for recycled material, while Michael Soll from **Frontier Lab** will look at analysis of recycled materials, covering polymers, additives and RoHS relevant contaminants. The sensor-based polymer identification of PET flakes will be addressed by Michael Perl of **Sesotec**.

A number of speakers at the Polymer Testing World Expo will discuss the testing of specific materials for particular applications. For example, Amir Khamsehnezhad from **TWI** will present a paper covering improved specimen geometries for evaluating the performance of butt-fusion joints in PE pipes. Moritz Grünewald of **SKZ** will explore the latest research into oil-filled microcapsules for self-lubricating plastics, while Kees van Leerdam from **Nouryon Chemicals** will focus on polymer film structures.

To download the full conference programme for the Polymer Testing World Expo, plus details of the speakers in the additional conference theatres focused on plastics compounding, recycling and extrusion, please click **here**.

Exhibitor line-up

Exhibitors at Messe Essen will include suppliers of a wide variety of materials testing and analysis products. Examples include Aboni, Brabender, Dynisco, Fontijne Presses, Frontier Lab, Konica Minolta, Lauda Scientific, Nouryon, OCS Service, Oxford Instruments, PSL Rheotek, Richard Hess MBV and Schütz + Licht.

In addition, a number of Europe's leading research and testing organisations have booked stands at the expos and will be available to discuss their capabilities and projects. These include IKV/RWTH Aachen, Kunststoff-Institut Lüdenscheid, London South Bank University, Norner, SKZ and TNO. Several exhibitors will also be highlighting lab-scale processing equipment, such as extruders and compounding lines. These include Collin Lab & Pilot Solutions, Eurotech Extrusion Machinery and Labtech.

You can view the full list of the 200-plus exhibitors at the Essen expos **here**.

Register for your free ticket

To register for your free ticket to the Polymer Testing World Expo, which will also give you access to the other three expos and all five conference theatres, please visit: **www.ami.ltd/ami-plastics-expos-eu**

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IMAGE: COPERION

Lab-scale testing is critical for the development of film and sheet products – and can range from the extrusion process itself to other issues such as foaming, coating and recycling

Scale practice: latest in laboratory extrusion

Running new formulations at a laboratory scale helps film and sheet extruders to perfect line conditions before they scale up to full production. As well as focusing on extrusion conditions such as line speed, laboratory lines can help converters understand more about processes such as coating and foaming – and even chemical recycling.

Collin Lab & Pilot Solutions recently delivered a laboratory-scale film line to German film producer Bischof + Klein.

The 400mm-wide line has been installed in the company's new innovation centre in Lengerich. The combined five-layer blown & flat film line will help in the development of new films, as well for customer demonstrations and sample production runs.

The line combines a blown film line – including platform and turning bar – with a flat film line. In blown film mode, a Collin quintuplicate radial spiral mandrel distributor die is used. Flat films are made using a Collin five-layer feedblock, connected with a flat film die at a chill roll. In addition, the combi-line is equipped with two winding stations – a central and a gap winder, with different winding modes.

The whole line is controlled by Collin's Fecon software, which collects and evaluates process parameters in real time.

"Bischof + Klein is in a position to produce films with a width of up to 400 mm and five layers," said Andreas Vogt, head of sales at Collin.

Fast material changes and low raw material input during film development were the two main reasons for choosing this line. Also, it will allow the company to develop new concepts without affecting normal production – meaning there will be no extra downtime due to production stops.

Stephan Mund, development engineer at B+K, added: "This line allows us to develop new recipes, test materials or produce samples independently of the production. We also use it for presentations and customer demonstrations – and it provides an excellent test and development environment for IoT projects."

Main image: Coperion says its ZSK twin screw extruder is well suited to chemical recycling of mixed plastic waste

Pilot line boost

Machinery manufacturer **SAM North America** has used an EDI feedblock from **Nordson** to boost speed – and reduce coat weight – on a pilot extrusion coating line.

The combination of technologies has made it possible to cut coat weight by 40% while increasing throughput, thanks to 'edge encapsulation'. SAM North America's co-extrusion coating and laminating laboratory handles web widths up to 36in (914 mm).

The encapsulating inserts – added to Nordson's co-extrusion feedblock – allows extra material to be

IMAGE: BISCHOFF + KLEIN

Above: Collin's new combi-line will help Bischof + Klein develop and test new films

extruded along either the edge of the extruded PLA. Encapsulating PLA with edges of LDPE made it possible to offset PLA deficiencies – especially its low melt strength – that can affect performance.

"Using LDPE edge encapsulation on our pilot line, we have achieved speeds in excess of 1200 ft/min (366 m/min) with PLA, against less than 600 ft/min (183 m/min) with PLA alone," said Ed Lincoln, vice president of extrusion sales at SAM North America.

The high melt strength of LDPE has made it the most widely used polymer in extrusion coating.

Saving through foam

Meaf Machines has added a Promix physical foaming installation to its in-house extruder test and demonstration line, which it says can help save on material costs.

The set-up will allow customers to gain experience with the equipment using their own polymer grades.

In film and sheet extrusion, raw materials typically account for 70% or more of production costs. Ways of reducing this include using more recycled material – such as regrind skeletal waste or bottle-flakes – or by using filler components such as calcium carbonate. Another way is by using foaming.

"Physical foaming offers significant material-saving potential for extrusion processes," said Roald de Bruijne, sales manager at Meaf.

Adding Promix equipment to the line can lead to density reductions of 5-30%, says Meaf. The process – which uses carbon dioxide or nitrogen as a blowing agent – can reduce the cost of plastic raw material by 20% compared to conventional packaging, due to the weight saving.

The micro foam process offers high rigidity, insulation and insensitivity to scratch marks, and a low energy consumption per kg. Processors can work with multiple types of materials in one extruder, including PET, PE and PLA. Foamed and non-foamed sheets can be produced on the same line, even allowing for multilayer A/B/A sheet (where the A-layer is a non-foamed and the B-layer is a foamed material).

Chemical recycling

Coperion is supplying a laboratory extrusion system to the Laboratory for Chemical Technology at **Ghent University** in Belgium, allowing it to carry out research and development into the chemical recycling of mixed plastic waste.

The system, based on a ZSK 18 MegaLab twin screw extruder, was designed specifically for chemical recycling of post-consumer waste. It has a throughput range of 1-10 kg/hr and includes a feeder and a vacuum unit.

Chemical recycling is a potentially promising method for recycling plastic waste – especially packaging, as it can be hard to collect, sort and clean.

Coperion says that its twin screw extruder technology is well suited to chemical recycling of plastics. Shredded or compacted post-consumer waste is added to the process section by the feeder, which leads to a homogeneous, devolatilised melt with a temperature of up to 350°C. Further materials, such as catalysts, can be added. In some cases, residual water or chlorides from PVC can be extracted via vacuum devolatilisation on the extruder's process section.

The ZSK twin screw extruder will be part of a new setup for chemical recycling at Ghent University. It will be among several machines coupled to a vortex reactor – allowing molten plastic to flow directly into the reactor. Different technologies for the converting plastic waste into chemicals – such as catalytic pyrolysis and thermo-chemical processing (cracking) – may be applied.

"We are proud to support Ghent University in their chemical recycling research," said Jochen Schofer, manager for recycling and direct extrusion at Coperion. "We see it as a trailblazing process for reclaiming raw materials from mixed plastic. As soon as this recycling system is in operation at Ghent, it will be available to our customers for testing."

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.collin-solutions.com**
- **www.sam-na.com**
- **www.nordson.com**
- **www.meaf.com**
- **www.coperion.com**
- **www.lct.ugent.be**

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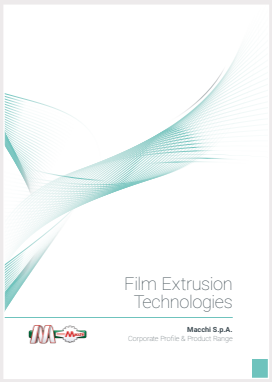

This 28-page brochure from Macchi covers the company's wide range of film extrusion technologies including coextrusion lines, wide webs, die heads, take offs, winders, trim recovery and control systems.

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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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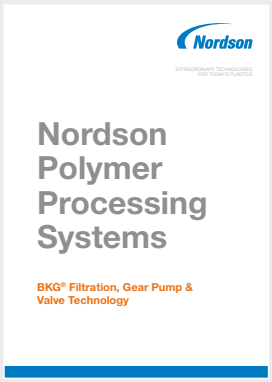

The BKG range of filtration systems and screen changers from Nordson Polymer Processing Systems are detailed in this six-page brochure which also features products from BKG's ranges in gear pump and valve technologies.

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PALSGAARD: PLANT-BASED ADDITIVES

Palsgaard produces an extensive range of sustainable, plant-based additives that can be used to enhance the performance and processing of many polymers. Find out more about its products and how to use them in this brochure.

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GLOBAL COLORS GROUP

Find out about Global Colors Group in this brochure showcasing the group companies, their vision and focus on quality, R&D, technology and sustainability. Its portfolio includes colour, white and black masterbatches.

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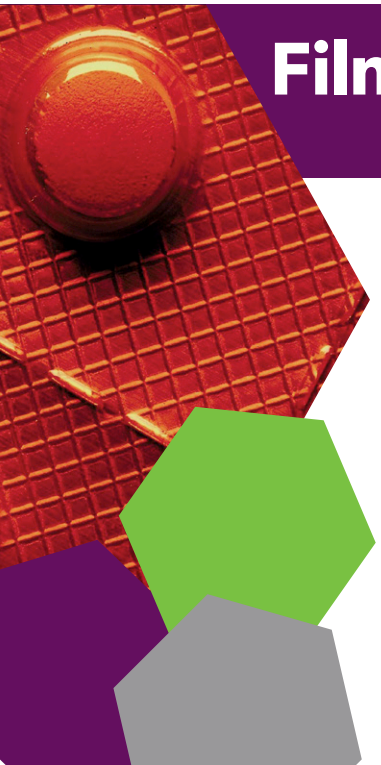
If you would like your brochure to be included on this page, please contact Claire Bishop claire.bishop@ami.international. Tel: +44 (0)1732 682948

Plastic Ingenuity

Head office:	Cross Plains, Wisconsin, USA
President:	Tom Kuehn
Founded:	1972
Ownership:	Private
Employees:	Around 450
Profile:	Plastic Ingenuity is a custom thermoformer that was founded in 1972 – in a 1,300 sq ft garage. Its services include every stage of packaging design and manufacturing, from initial proposal to finished product. Its in-house expertise includes design, extrusion, mould-making, tooling, and thermoforming. The company serves a number of industries, including food, healthcare and consumer goods.
Product lines:	The company has a range of product lines, as it provides customer solutions. These are targeted at food, healthcare and consumer goods. In food, it supplies both the food processing and food service industries. – with products ranging from a takeaway snack packaging to high pressure processing (HPP) packaging. Its healthcare packaging is designed to protect products such as pre-filled syringes, pharmaceuticals and laboratory consumables. Its consumer goods products include easy-open and tamper-evident packaging. The company prides itself on its environmental performance – in areas such as recycling materials internally, to the increasing use of bioplastics.
Factory locations:	The company has six facilities in North America – with four in the USA and two in Mexico. Earlier this year, it announced plans to establish a new facility in Tooele, Utah. The new plant, which gives the company a new base in the western USA, is expected to create nearly 100 jobs over the next 15 years.

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



Film and Sheet Extrusion FORTHCOMING FEATURES

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

October 2021
Materials recycling/granulators
Extruder developments
Biaxial film
Mineral fillers for film

Nov/Dec 2021
Screenchangers/melt filtration
Foamed sheet ● Polyolefin additives
Static control/web cleaning
Plastics Extrusion World Expos: review

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

For information on advertising in these issues, please contact:
Claire Bishop: claire.bishop@ami.international Tel: +44 (0)1732 682948

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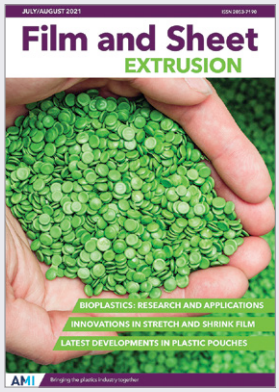

Film and Sheet
July/August 2021
The July-August issue of Film and Sheet Extrusion magazine has features on research and development work in bio-based polymers, re-engineering plastic pouches for sustainability and what's new in stretch and shrink film.

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Film and Sheet
June 2021
The June 2021 edition of Film and Sheet Extrusion magazine looks at the latest innovations in film printing technology. It also explores developments in blown film cooling rings, additive and functional masterbatches, and downstream equipment.

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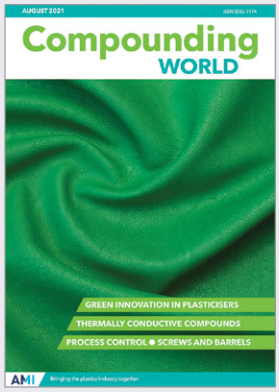

Compounding World
August 2021
The August edition of Compounding World looks at the latest developments in PVC plasticisers. It also explores the latest innovations in thermally conductive compounds, process control and performance alloys and coatings for screws and barrels.

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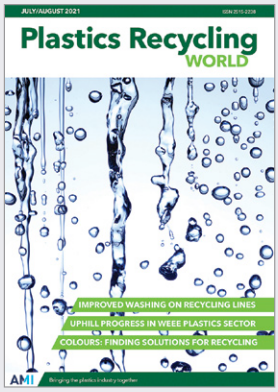

Plastics Recycling World
July/August 2021
The July/August edition of Plastics Recycling World looks at the latest developments in washing systems technology and waste water treatment. It also explores investments and innovation in recycling of waste electrical equipment (WEEE) and investigates colouring of recycled materials.

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Pipe and Profile
September 2021
In the September edition of Pipe and Profile Extrusion, the cover feature looks at the latest developments in PEX pipe. Other features are on improving downstream handling and window profile technology. Plus a preview on the Plastics Extrusion World Expo in Essen.

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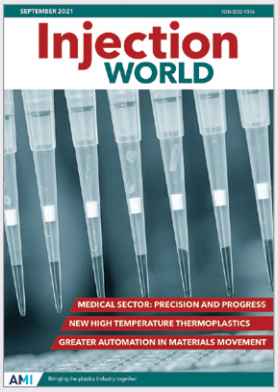

Injection World
September 2021
The September issue of Injection World has a cover feature on medical moulding technology and how it suppliers are helping moulders meet the demands of the medicare sector. Other features cover new high temperature thermoplastics and materials handling.

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Pipe and Profile EXTRUSION
Injection WORLD
Plastics Recycling WORLD

GLOBAL EXHIBITION GUIDE

2021	**14-17 September**	Equiplast, Barcelona, Spain	www.equiplast.com
	21-23 September	Plastics, Printing & Packaging, Dar-es-Salaam, Tanzania **POSTPONED**	www.expogr.com/tanzania/pppexpo
	29-30 September	Plastics Extrusion World Expo Europe, Essen, Germany	https://eu.extrusion-expo.com
	12-16 October	Fakuma, Friedrichshafen, Germany	www.fakuma-messe.de
	25-27 October	Plastic Print Pack Nigeria, Lagos, Nigeria	www.ppp-nigeria.com
	3-4 November	Plastics Extrusion World Expo North America, Cleveland, USA	https://na.extrusion-expo.com
	8-12 November	Plastico Brasil, Sao Paolo, Brazil **CANCELLED**	www.plasticobrasil.com.br
	15-18 November	Arabplast, Dubai, UAE	www.arabplast.info
	1-3 December	Plast Print Pack West Africa, Accra, Ghana	www.ppp-westafrica.com
2022	**25-28 January**	Interplastica, Russia, Moscow	www.interplastica.de
	17-21 February	PlastIndia, New Delhi, India	www.plastindia.org
	8-11 March	Plastimagen, Mexico City	www.plastimagen.com.mx
	5-8 April	FIP, Lyon, France	www.f-i-p.com
	26-30 September	Colombiaplast, Bogota, Colombia	www.colombiaplast.org
	3-7 October	Plastex, Brno, Czech Republic	www.bvv.cz/en/plastex
	1-3 December	Plastic Print Pack West Africa, Accra, Ghana	www.ppp-westafrica.com

AMI CONFERENCES

27-28 Sep 2021	Chemical Recycling, Dusseldorf, Germany
27-29 Sep 2021	Biax Film Europe, Madrid, Spain
8-10 Nov 2021	Agricultural Film Europe, Barcelona, Spain
8-10 Nov 2021	Waterproof Membranes Europe, Cologne, Germany
23-25 Nov 2021	Multilayer Flexible Packaging Europe, Barcelona, Spain
29 Dec - 1 Dec 2021	Thin Wall Packaging, Nuremberg, Germany

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

www.ami.international