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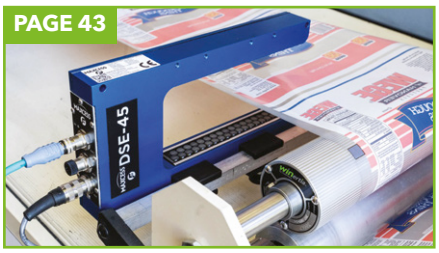

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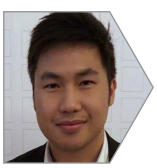

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# Huhtamaki profits up despite sales decline

Finnish packaging major Huhtamaki has reported a dip in sales in 2020, which it says is due to the Covid-19 pandemic. Despite this, it managed to raise profits.

Sales for 2020 decreased by 3% to €3.3 billion (US$3.9bn), while profitability (adjusted EBIT) was €302m (US$360m) – a 3% increase compared to 2019.

In the final quarter of 2020, sales fell 7% to €813 million (US$969m), while profitability (adjusted EBIT) was €73m (US$87m) – a 2% decrease compared to 2019.

The company's global food service business was hit particularly hard, declining 13% to €829m (US$989m). This resulted in a 29% decline in profitability to around €61m (US$73m). Sales in its flexible packaging business performed better – growing by 3% to reach around €1.05bn (US$1.25bn). However, profitability in the segment declined by 2% to around €81m (US$97m).

IMAGE: HUHTAMAKI

**Héaulmé: "Overall demand for flexible packaging remained good across most markets"**

Overall, net sales decreased due to lower demand for foodservice packaging, but demand continued for food on-the-shelf products.

"In our flexible packaging segment, overall demand remained good across most markets," said Charles Héaulmé, president and CEO of Huhtamaki. "However, pandemic-driven supply chain disruptions impacted demand, and the ability to serve the market – particularly in India and the Middle East in the second quarter of the year."

Looking ahead, the company said trading conditions are expected to improve compared to 2020, but with "continued volatility in the operating environment".

› **www.huhtamaki.com**

## Plast 2021 exhibition postponed

Organisers of Italy's triennial Plast trade show have announced that the 2021 show has been postponed due to the ongoing Covid pandemic and its likely limitations on travel.

A new date is yet to be set for the event, which was originally set to run at the Fiera-Milano fairground in Milan on 4-7 May, then re-scheduled to 22-25 June. However, the organisers said in a statement it will be "certainly after the end of 2021".

The previous edition of the trade fair took place in 2018. It included 1,510 exhibitors and attracted more than 50,000 visitors.

› **www.plastonline.org**

# VinylPlus Med targets PVC recycling

A new project called VinylPlus Med is bringing together hospitals, waste managers and recyclers across Europe to increase recycling of single-use PVC medical devices. The collaborative project is led by VinylPlus, the European PVC industry's voluntary commitment platform.

The project will focus on sorting and recycling of non-infectious PVC waste and builds on the success of the VinylPlus-funded RecoMed recycling scheme for PVC masks and tubing. "Starting with a pilot project in Belgium, we are excited to make medical plastics more circular together with our partners," said Brigitte Dero, Managing Director of VinylPlus.

IMAGE: SHUTTERSTOCK

**Left: VinylPlus Med will recycled single-use medical devices such as dialysis bags**

The Belgian project is a partnership with the Europe Hospitals group in Brussels and will focus on high-quality PVC waste of three dialysis facilities. Partners also include Renewi waste management group and PVC recycler Raff Plastics based in Houthulst in western Belgium.

All Belgian VinylPlus Med partners are located within a radius of 120 km to minimise transport distances and mitigate the project's carbon footprint.

› **www.vinylplus.eu**
› **www.renewi.com**
› **www.raffplastics.be**

# Zeus extends its European reach

Zeus Packaging of Ireland has acquired Petruzalek – an Austrian food packaging company – from Sirap-Gema.

The company says that the takeover expands and strengthens its geographic presence across 12 European countries.

In 2020, Petruzalek's sales were around €58 million (US$69m), with a profitability (EBITDA) of €2.5m (US$3m). The acquisition – for an undisclosed sum – completes a three-year, €40m (US$48M) acquisition strategy for Zeus. It is the seventh business incorporated into the Zeus family during the past 18 months.

"This acquisition is the largest in our strategic expansion and is an integral part of our long-term growth strategy," said Keith Ockenden, CEO of Zeus. "Petruzalek's product range utilises low environmental impact renewable, recyclable and compostable materials, enabling us to further deepen our focus on sustainability in 2021."

The Petruzalek acquisition brings Zeus' headcount to 670 people in 26 countries. Its turnover was €208m (US$248m) in 2020 and is expected to reach €280m (US$334m) in 2021.

Brian O'Sullivan, founder of Zeus, added: "Zeus remains on track to become the largest independent packaging distribution business in Europe."

› **www.zeuspackaging.net/ie/**

IMAGE: ZEUS

**O'Sullivan: "We remain on track to be Europe's largest independent packaging distribution business"**

# Balcan buys Nelmar

Packaging specialist Balcan has acquired fellow Canadian firm Nelmar.

Nelmar produces extruded film, fill-form-seal (FFS) films and plastic valve bags, in addition to its security packaging. Its film and heavy-duty shipping sacks are used in a variety of applications.

Nelmar recently installed a new film extrusion line from Windmoller & Holscher, raising output of tamper-evident packaging by more than one-third.

During February, Balcan also bought Covertech, a Canadian producer of insulation, film and flexible packaging products.

Both deals were advised by Mesirow.

› **www.balcan.com**
› **www.nelmar.com**
› **www.covertechflex.com**
› **www.mesirow.com**

# Brown Machine takes over 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."

BMG offers a number of thermoforming brands, including Lyle, Nalle, Freeman and Axatronics.

■ Read more about new thermoforming technology and materials on **page 15**.

› **www.brownmachinegroup.com**
› **www.gncanada.com**

# Asia films programme confirmed

AMI has confirmed the programme for Specialty Packaging Films Asia, its virtual event that takes place on 23-25 March 2021.

Companies confirmed to speak include Dai Nippon Printing, the Thai Packaging Association and UFlex.

This three-day virtual programme will address key issues including sustainability, enhanced barrier properties in multilayer structures and food packaging safety.

The event includes: a presentation on mono-material packaging from Dai Nippon Printing; information on high barrier films, presented by Max Specialty Films; an update on food contact materials in ASEAN, from the Thai Packaging Association; using 'green' films to achieve sustainability goals, from UFlex; and a report on flexible packaging industry trends in South East Asia, presented by Rabobank.

In addition to the programme, the event offers interactive Q&A sessions, access to a virtual exhibition and networking opportunities.

The full agenda is available to view **here**.

› **www.ami.international**

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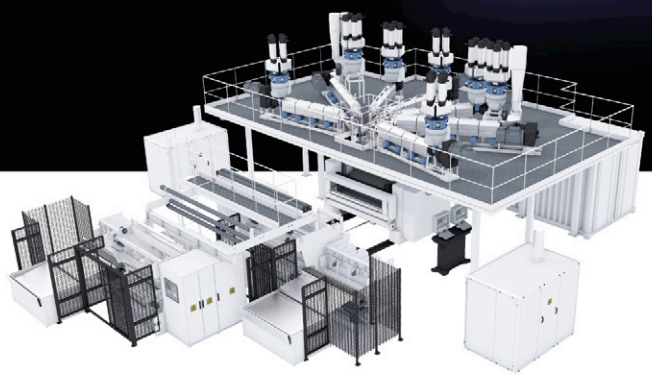

Get yourself into the next generation of film production and supply chain

A few days ago, due to the worldwide Pandemic, the Plastics Industry Association Board of Directors decided to cancel the in-presence NPE show, which is something understandable: we are aware that the priority always has to be the everybody's health and safety. Anyway, even in such a situation, the show must go on! Don't worry, we have come up with a contingency plan: we are putting together a virtual event which will allow you to enjoy the same show that you would have experienced "phisically" at the NPE in Orlando.

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# North American machine sales rise in third consecutive quarter

North American sales of primary plastics machinery rose by double-digits in the fourth quarter of last year – making it the third consecutive quarter of growth.

Statistics from the Plastics Industry Association's Committee on Equipment Statistics (CES) reveal that the preliminary estimate of shipment value from reporting companies reached almost US$377 million. This was an increase of almost 23% on the previous quarter – which had shown a near-16% increase on the quarter before that.

Sales in the fourth quarter of 2020 also exceeded those from the same period in 2019 by more than 19%. Sales of both single- and twin-screw extruders rose in the final quarter of 2020 – by more than 31% and 4%, respectively.

"The three consecutive quarters of double-digit increases underscores the importance of plastics machinery – not only in the plastics industry but in the manufacturing supply chain of the economy, considering that most plastics are used in manufacturing," said Perc Pineda, chief economist at the association. "We were hoping to see an increase in shipments of machinery in the fourth quarter as the economy stayed in the recovery cycle and that's exactly what we got."

In its fourth-quarter survey of plastics machinery suppliers, CES said that 96% of respondents expect market conditions to improve or hold steady compared to a year ago. In the previous quarter, just 76% of respondents gave the same answer. For the next 12 months, 86% expect market conditions to be steady-to-better – slightly lower than the 90% in the third-quarter survey.

**Pineda: "We were hoping for an increase in shipments in Q4 and that's what we got."**

Deliveries in December fell by just over 1% (compared to the same period in 2019) – a vast improvement on the 11% year-on-year fall from April 2020, said Pineda.

"The growth momentum in plastics end-markets that began in the second half of 2020 is expected to continue through 2021 – which should sustain a steady demand for plastics materials and machinery," he said.

Plastics machinery exports in the fourth quarter reached nearly US$361m, an increase of almost 21% from the previous quarter. Imports rose 16% to US$876m, resulting in a US$515m trade deficit. That was almost 13% larger than it was in the previous quarter.

Canada and Mexico remained the top export markets for US equipment suppliers in the fourth quarter. The combined exports to the USMCA trade partners exceeded US$173m – representing 48% of total US exports in Q4.

› **www.plasticsindustry.org**

# German converters report 5% sales decline

GKV, the organisation that represents German plastics processors, reported a dip of more than 5% in turnover last year.

It said that sales fell to €61.5 billion in 2020, a decline of 5.6% compared to 2019. Within the results, domestic sales fell by a similar amount to just over €38bn, while exports fell by more than 6% to just over €23bn.

As well as a reduction in turnover, processing volumes fell by nearly 3% to 14.2 million tonnes of plastic. In the same period, the industry's workforce saw a 4% reduction, which took headcount to around 322,000 by the end of 2020.

**German plastics converting, 2020**

| | Sales 2020 (m€) | % Change |
|---|---|---|
| Domestic | 38.1 | -5.5 |
| Exports | 23.4 | -5.5 |
| **Total** | **61.5** | **-6.1** |

The number of processing plants also fell slightly, to just over 3,000 facilities.

The statistics are not separated into specific processes (such as extrusion). However, the packaging sector – which is likely to account for most film and sheet extrusion activity – held up well, with no change in the amount of material processed (4.4m tonnes). At the same time, turnover in the sector declined by 2.4% to around €14.4bn, said GKV.

Construction was the least affected of all sectors, with a sales decline of just 0.2%. For comparison, turnover of technical parts fell by nearly 12% and consumer products by nearly 9%.

In a survey of members, carried out at the start of this year, GKV said that 52% expect to increase sales in 2021, while 33% anticipate a decline. At the same time, one-third of companies expect profits to increase this year, while half of those surveyed expect profits to fall in 2021.

› **www.gkv.de**

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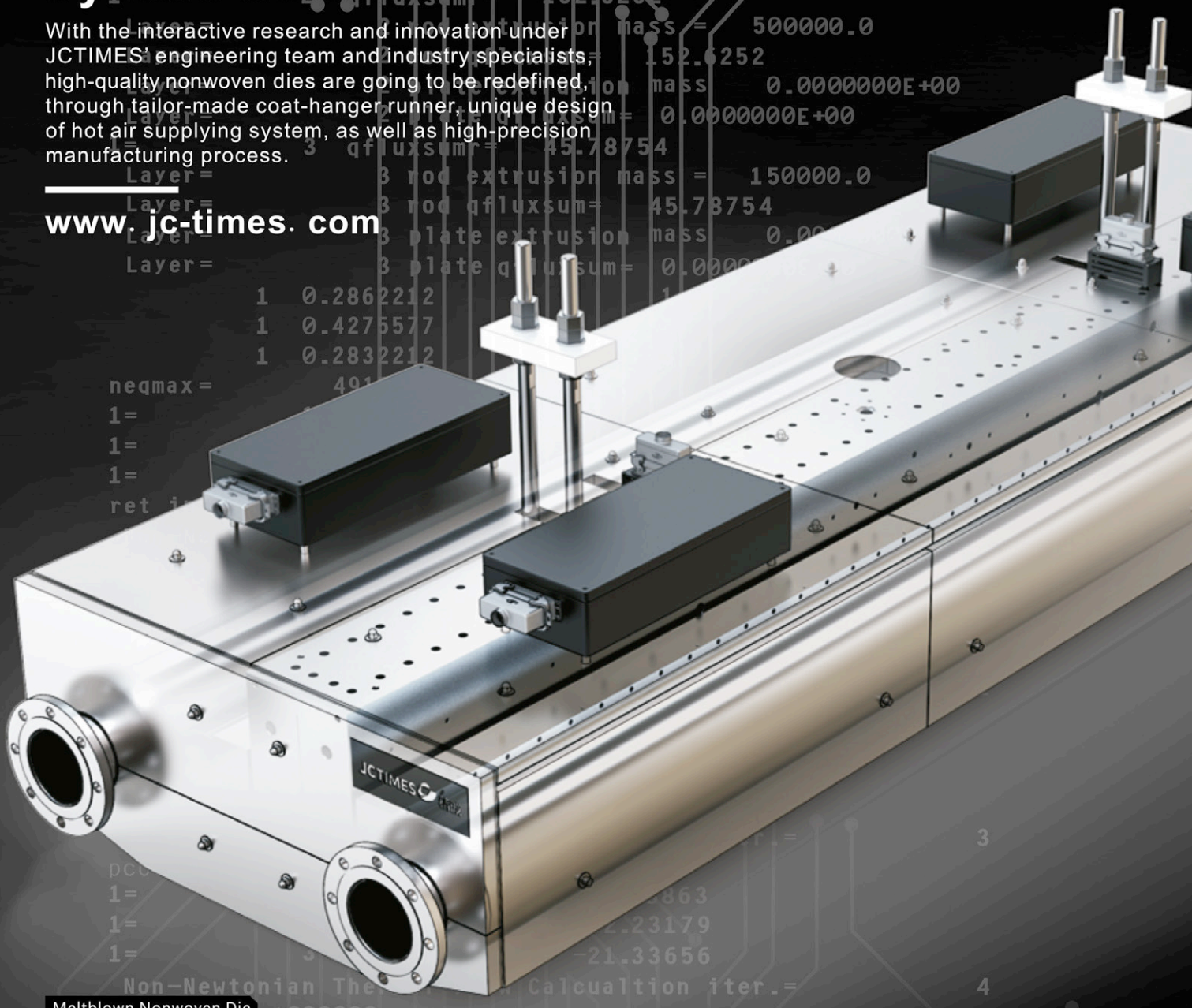


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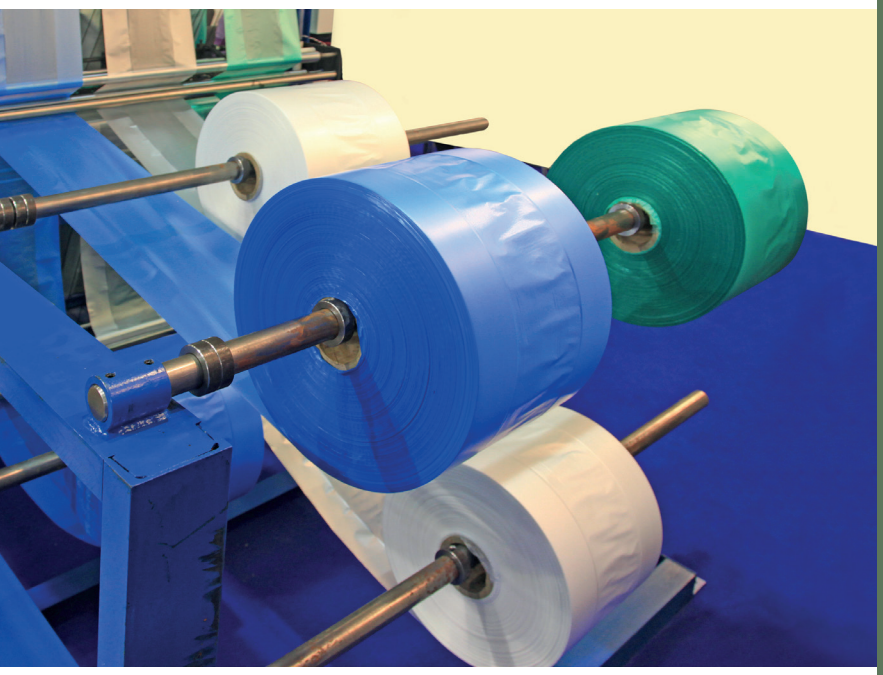

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# LCAs questioned for chemical recycling

A study commissioned by BVSE, Germany's association of mechanical recyclers of plastics, criticises claims that have been made for chemical recycling.

The study of life cycle assessments for chemical recycling processes shows these LCAs as "not very credible", according to BVSE in an announcement.

The study criticises a number of issues in the LCAs, including creating an impression that chemical processing requires little or no external energy, when it is associated with high energy expenditure.

The output of chemical recycling is not the same quality as new plastic, as claimed in LCAs, and only a small part can be used for end products, according to the study.

The material losses in the chemical treatment process are not mentioned in the LCAs and the toxicity values are not examined in detail, it said.

The authors of the study concluded that LCAs can easily be open to misinterpretation.

In particular, they criticised inadequate disclosure of the database for the preparation of the life cycle assessments, as it makes an independent review of the LCAs impossible.

› **www.bvse.de**

IMAGE: ANCHOR

**Anchor says its new plant will add 45 jobs in Paragould, Arkansas**

# Anchor expands output

US thermoformer Anchor Packaging has begun expanding one of its manufacturing facilities.

The company has broken ground on a 90,000 sq ft extension to its facility in Paragould, Arkansas. The US$21.5 million expansion is expected to add 45 new jobs over the next 30 months.

The expansion will house several new thermoforming lines, with installation beginning in late 2021.

This expansion is in addition to new lines starting in Q2 in Paragould and Jonesboro. The extra output helps meet increased demand for foodservice containers, says the company.

Anchor employs over 1,000 people and operates two million sq ft of production and distribution across six facilities in Paragould, Marmaduke, and Jonesboro.

› **www.anchorpackaging.com**

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# Duraco expands in speciality film sector

Duraco Specialty Tapes, a US-based manufacturer of pressure-sensitive tapes, has acquired Filmquest – a converter and supplier of PET and speciality films. Terms of the transaction were not disclosed.

Filmquest coats, converts and metallises PET film for use in flexible packaging, under its Questar and Soft Touch product lines. It employs more than 50 people, and will continue to be led by its President, John Felinski, as part of Duraco.

Duraco has been owned by private equity firm OpenGate Capital since June 2019. It made its first acquisition by buying Infinity Tapes in February 2020. Duraco will continue to seek further acquisitions in both speciality tape and film.

"Filmquest is a testament to our focus on add-on investments as an accelerator for growth," said Andrew Nikou, founder and CEO of OpenGate. "The combination of Filmquest's product offering with Duraco's strong operating expertise will drive continued commercial growth into new markets."

› **www.duraco.com**

IMAGE: OBEN

**Oben produces a number of films in Peru, including BOPA**

# Peruvian packager buys Spanish film manufacturer

Oben, a Peruvian packaging manufacturer, has bought Spanish film maker Poligal from Grup Peralada.

The acquisition includes Poligal's bioriented polypropylene (BOPP) and cast polypropylene (CPP) production plants in Portugal and Poland, offices in Germany and a sales and distribution network across Europe.

Oben says it will now be able to offer a complete portfolio of packaging films, including BOPET, BOPA and BOPE. It has 11 production plants in six Latin American countries, with a total capacity of more than 550,000 tonnes/year.

In February, it installed a 52,000 tonnes/year BOPET line in Barranquilla, Colombia, which will begin production in July 2021.

Grup Peralada says it sold Poligal as part of a 'strategic realignment'.

› **www.obengroup.com**

› **www.grupperalada.com**

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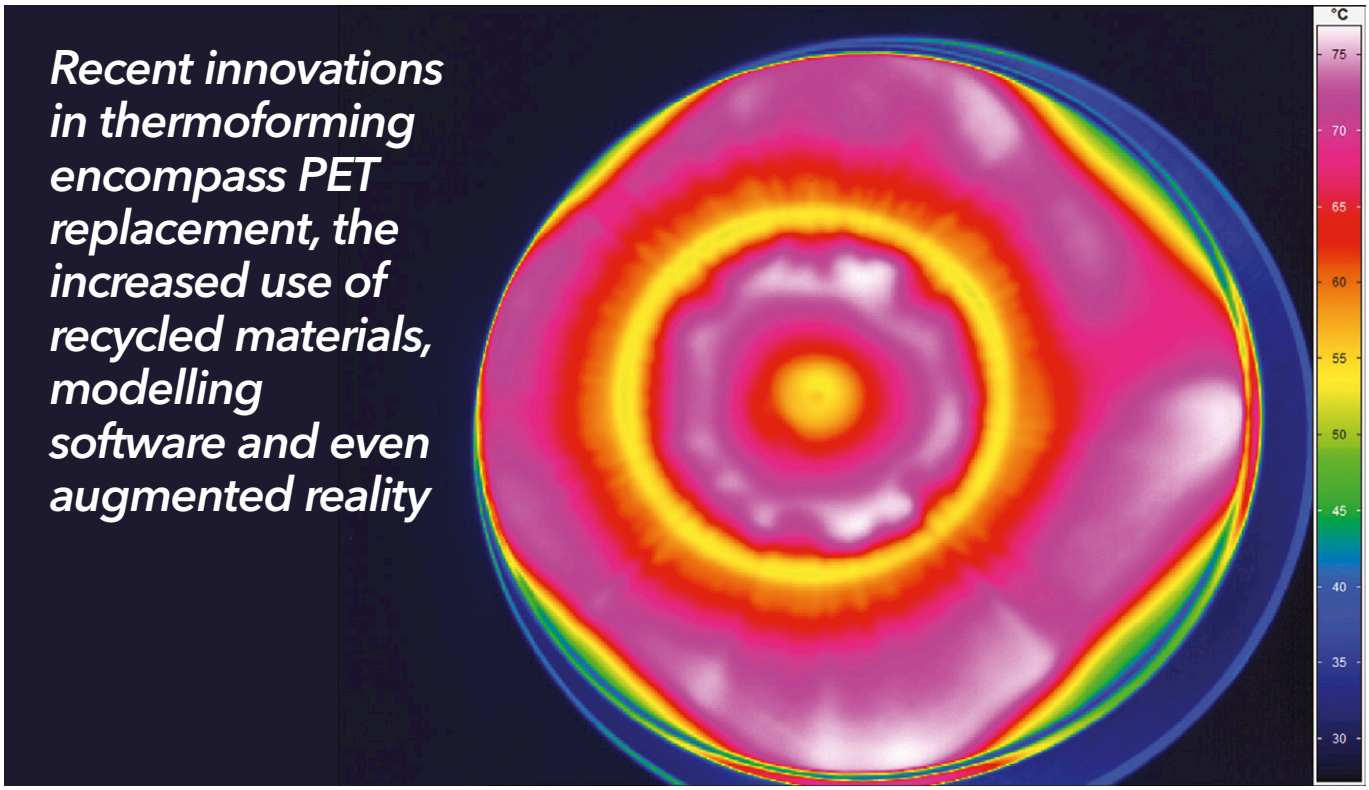


IMAGE: FRAUNHOFER IVV

***Recent innovations in thermoforming encompass PET replacement, the increased use of recycled materials, modelling software and even augmented reality***

# Press briefing: latest advances in thermoforming

Thermoforming continues to become a more sophisticated production process – evidenced by the greater use of software packages that model parts made using the technique.

The **Fraunhofer Institute for Process Engineering and Packaging** (IVV) in Dresden, Germany is using computer simulation to improve the quality of thermoformed parts.

It is using forming-air impact technology (Fit) to control the thermoforming process – in particular the material thickness distribution of finished parts. The two-year project, called Fit 2.0, is just coming to an end.

"An inhomogeneous material thickness means that higher material usage is needed to meet the mechanical stability requirements," said IVV.

In the Fit process, the substrate or semi-finished product is subjected to both mechanical and thermal impact. It is homogeneously heated, then formed via a targeted local flow of forming air from a nozzle system. The process enables a defined material thickness and distribution to be realised. This helps to optimise material usage, improve quality parameters and raise thermoforming efficiency.

To reduce the time and cost of designing this technology, Fraunhofer IVV is developing a parameterisation tool. This also addresses shortcomings with other existing technologies for customised control of the forming process, it says.

"Current technologies are maintenance-intensive, costly, difficult to parameterise and often suffer from continuous worsening of the product quality during the course of the manufacturing process," said IVV.

Developing the parameterisation tool meant evaluating various approaches such as the Fluid Structure Interaction (FSI) model and machine learning – and analysing their potential application for tool parameterisation in thermoforming.

In addition, the researchers have gathered information about the interaction between fluid flow, temperature distribution and the quality of the final formed part.

"We are interested in the extent to which the airflow affects the cooling of the plastic and thus its forming behaviour," they said.

The project aims to develop a concept for industrial use of Fit for a controllable, compressed air

**Main image: By controlling cooling during thermoforming, Fit helps to improve part quality and reduce material use**


**Above: Ampli will use augmented reality to improve simulation of the thermoforming process**

forming process. The challenge is to understand the dynamic nature of the thermoforming process – and the interaction between fluid flow and part forming.

"Fit has huge potential for packaging manufacture," said IVV. "The project focus on the interaction between the cooling and forming opens up numerous other uses, such as in medical technology and the automotive industry."

## Film/foam combo

Researchers at **Case Western Reserve University** (CWRU) in the USA have evaluated the thermoformability of a multi-layered structure of film/foam.

In a paper presented at last year's virtual Antec event, the researchers revealed details of how multi-layer coextrusion was used to produce structures with 16, 32, and 64 alternating foam and film layers. The film was based on ethylene-vinyl alcohol (EVOH) copolymer, while the foam was based on low-density polyethylene (LDPE).

The researchers used scanning electron microscopy to characterise the cellular structure of the material. Stress-strain behaviour and thermoformability were also evaluated. Two separate extruders were used to create the two separate material layers. Multiplication elements were then used to create the multi-layer structures.

The extruded samples were cut into 60 x 60cm squares, which were then thermoformed. The researchers found that optimum forming capacity was achieved at 60°C.

The full-length paper appears in the latest issue of SPE Thermoforming Quarterly, published by the thermoforming division of the **Society of Plastic Engineers**.

■ The SPE's thermoforming division has issued a call for nominations for this year's Thermoformer of the Year award – which recognises a person who has made a significant contribution to the industry.

The nomination deadline is 31 March 2021. The winner will be announced at this year's SPE thermoforming conference in September.

"We are approaching the 40th anniversary of this award, and prior honorees continue to inspire us," said Juliet Goff, a board member of the SPE's thermoforming division. "We are seeking candidates who possess the same exceptional qualities and will inspire the next generation."

The 2019 award was presented to Thomas Haglin of Lindar.

## Augmented reality

Ampli is a one-year collaborative project that plans to extend the use of augmented reality (AR) in simulation software for thermoforming.

Partners include white goods manufacturer Whirlpool, Innovation Plasturgie Composites (IPC) and virtual prototyping company **ESI**.

The project will combine the advantages of simulation and augmented reality to provide manufacturing workers with real-time knowledge and information. The project says it will bring "a step forward in the digital transformation of European factories".

The project has three main targets: to improve manufacturing efficiency; to eliminate skill shortages, by capturing knowledge; and to increase the attractiveness of working on the shop floor.

The approach is to embed and enable physically realistic virtual objects in a real environment to be interactive. It is based on the improvement of AR mechanisms and usability.

ESI will integrate the final output based on an existing AR tool. IPC will simulate current thermoforming process using ESI's Pam-Form software. Whirlpool, as the plastic converter, will provide a pilot thermoforming line to test and validate the product on an industrial scale.

"Ampli will bring to the market a new product with AR integrating both plastic domain knowledge and simulation," said the organisers. "In the medium term, benefits will be transferred to other manufacturing processes."

The project team aims to have the new solution on the market by mid-2022.

## PET replacement

**Braskem** has developed a new grade of polypropylene (PP) that it says can replace PET in consumer packaging applications such as ready meal packaging.

The company say that the PP thermoforming grade, part of its Inspire series, has optical properties that approach PET – as well as thermal properties that exceed those of PET and traditional random copolymer polypropylene. ›

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# SK buys into thermoforming packaging

**SK Capital**, a US-based private equity firm, has taken a majority stake in **Lacerta** – which designs and manufactures specialist thermoformed packaging.

Lacerta's co-founders, Ali and Mory Lotfi, will retain a "significant ownership stake" in the company. Terms of the deal were not disclosed.

Founded in 1993, Lacerta mainly supplies the food sector. It offers customer PET packaging, including its tamper-evident 'Fresh N' Sealed' products.

Most of its products are recyclable, and can be made using recycled materials.

"This is an exceptional business with a best-in-class reputation for customer service, innovation and sustainable products," said Jack Norris, managing director of SK Capital. "We look forward to continuing its extraordinary growth."

Ali Lotfi, president of Lacerta, added: "This marks the beginning of an exciting new chapter for Lacerta. We chose to partner with SK Capital given its track record of successfully supporting the growth and improvement of family-owned businesses."

› **www.skcapitalpartners.com**
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The new grade is suitable for thermoformed applications that demand a balance of clarity and heat resistance, such as store and restaurant pre-prepared and ready-to-heat meals. The higher heat resistance allows the containers to be used in the dishwasher for continued re-use.

"Inspire resins offer a balance of performance and sustainability with a simplified pellet management solution," said Alexandre Elias, vice president of polyolefins at Braskem America. "They allow thermoformers to use a single pellet for a wide-range of applications that require varying levels of stiffness, clarity or impact – creating a simplified inventory approach. This grade is designed as an ideal solution to replace PET because of its recyclability and unique properties."

Earlier this year, Braskem completed construction of its new PP production line in La Port, Texas in the USA. The new facility has a capacity of over 450,000 tonnes/year of homopolymer, impact copolymer and random copolymers.

## Adding US capacity

**Klöckner Pentaplast** has added capacity of thermoformed food trays at its plant in Beaver, West Virginia in the USA.

The trays will be made from 100% recyclate and will mean upgrading existing extrusion machinery – such as by adding 'super cleaning' technology. The investment will convert thousands of tonnes of PCR bottles into food safe packaging, said KP.

Adam Barnett, president of the food products division at KP, said: "This responds to the growing demand for sustainable post-consumer recycled content PET packaging in modified atmosphere packaging (MAP) and vacuum skin packaging (VSP) in the fresh protein market."

The expansion will add 21 jobs to the facility and should be fully operational by mid-2021.

**Below: Starlinger and partners have developed a yoghurt cup made from recycled PET**


IMAGE: STARLINGER

## Recycled cups

**Starlinger Viscotec** and two research partners have developed a white yoghurt cup made completely from recycled PET – which can later be recycled back into yoghurt cups again.

The other project partners are PET sheet producer **PET-MAN** and dairy producer **Biohof Zauner**.

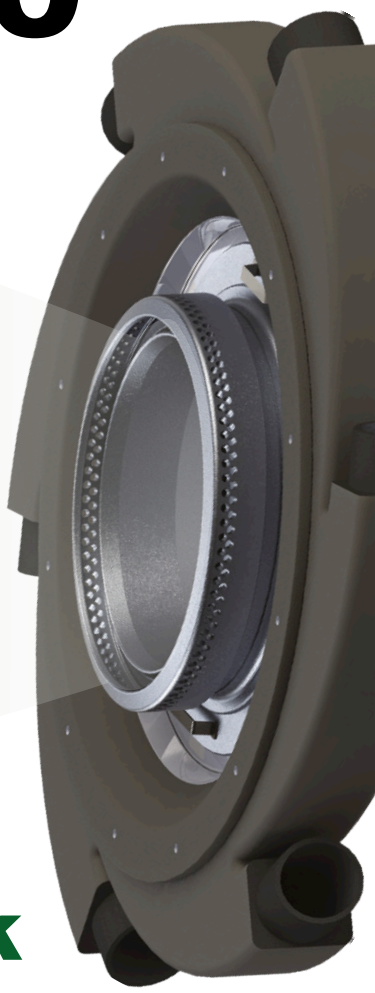
Zauner runs an organic dairy and wanted to pack its products as ecologically as possible. It previously used glass containers, but these were heavy – and washing them required a lot of water and detergent.

In Europe, dairy products are typically packed in polypropylene (PP) or polystyrene (PS). At the moment, these cannot be reprocessed into recycled material for food contact, according to the European Food Safety Authority (EFSA).

Once the rPET cup has been used, the consumer removes the cardboard banderol and peels off the seal made from aluminium. What remains is the rPET cup – which is not printed or laminated with other types of plastic.

"Print colours and multi-layer material would contaminate the material and impede recycling for food packaging applications," said Starlinger. ›

# MacroCool D10



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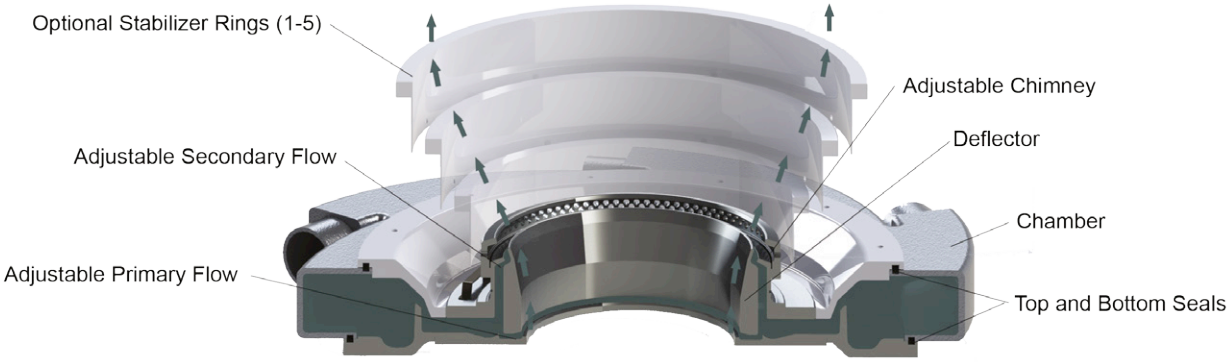


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**Right and below: Coexpan has extruded rigid PS sheet, using recyclate, to create food-grade yoghurt cups**

IMAGE: COEXPAN


Collection is crucial for recycling, so the partners initiated a regional collection system for the white rPET cups – by installing collection points at recycling centres and supermarkets. Thousands of cups have since been collected and reprocessed, to close the recycling loop.

## Recycled PS

**Coexpan** of Spain has created and tested a yoghurt pot that uses up to 100% recycled polystyrene (PS).

The company is a partner in a project called **SCS** (Styrenics Circular Solutions) – which is looking to develop applications of recycled PS. It aims to validate post-consumer PS mechanical recycling and use processes similar to those used on PET recycling lines – including sorting, washing, flake sorting, super cleaning and melt-filtration.

Two types of form-fill-seal (FFS) sheets were produced on a pilot extrusion line: an ABA structure, with a middle layer of 50% recycled PS between outer layers of virgin PS; and a monolayer structure with 100% post-consumer recycled PS.

The materials were then tested on FFS yoghurt packaging lines, for quality, optics and both mechanical and functional properties. Results showed high purity levels of the recycled material (around 99.9%), and high processability in both extrusion and thermoforming.

Other members of SCS include Greiner Packaging, Tomra and Ineos.

## Hot fill APET

**SML** has developed a process to make foamed APET sheet with a heat resistance up to 140°C – making it suitable for hot fill applications.

"Inspired by customer-feedback, we have used our pilot sheet line to further develop the production process of foamed APET sheet for thermoforming, in cooperation with Kiefel Packaging," said Max-Phillip Lutz, product manager at SML.

As well as having a heat resistance of up to 140°C, the thermoformed sheet shows good heat insulation and dimensional stability. Hot fill applications, thermoformed from this material, can be used for heating in microwave ovens as baking in conventional ovens.

"It is no problem to hold a fully filled cup with 140°C hot oil in the hands for a couple of minutes," said Lutz.

In addition to improving the heat resistance of foamed APET sheet, SML is carrying out trials on a new type of foamed PP sheet.

## Reduce migration

Milliken has developed a new version of its Hyperform nucleating agent, which it says uses "cleaner chemistry" to reduce migration in thermoformed PP food packaging.

Hyperform HPN 909ei has one Specific Migration Limit (SML) less than the previous generation product. A lower number of SMLs means there is one less substance that must be monitored and tested for, reducing customers' compliance burden, says Milliken.

It adds that the new grade delivers improved stiffness (flexural modulus) while maintaining impact performance. It also provides isotropic shrinkage (similar shrinkage in both directions, to reduce warpage) and a higher heat-deflection temperature. This gives improved heat resistance for hot-fill and microwaveable applications. It also helps to override the nucleation effects of pigments, thereby reducing design complexity, says the company.

"The new grade yields products with excellent optical properties, including lower haze, reduced yellowing and an overall cleaner look," said Bhavesh Gandhi, global product line manager at

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Milliken's chemical division. "This can further enhance sustainability by replacing other resins with highly recyclable polypropylene."

## Castable plugs

**Trelleborg** has developed a range of castable Syntac thermoforming plug assist materials for making thermoformed food, beverage and pharmaceutical packaging.

The Syntac range of materials is designed for fabrication of plugs and other tooling used in thermoforming, where the plastic substrate is moulded over the plug using pressure forming, to create a thin-gauge end product.

The CIS, HTS and STS ranges of Syntac plugs are easier to machine and faster to hot-swap than alternative materials, says Trelleborg. By casting plugs instead of machining them, customers can reduce the amount of wasted material and save time by removing the need for CNC-machining.

"Our Syntac range is available off the shelf with shorter lead-times than before," said Kerry Lyons, business development manager at Trelleborg's applied technologies operation.

CIS and HTS plugs are made from epoxy resin and hollow glass microspheres, while STS plugs are made from a thermoset polymer matrix.

"As part of the development process, our Syntac materials have been engineered to be lightweight, durable and tough, offering a cost-effective alternative to traditional materials," said Lyons.

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IMAGE: MILLIKEN

**Above: Milliken's latest nucleating agent reduces migration in thermoformed PP food packaging**

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***Additives are being used to produce films more efficiently, as well as making them more effective for their end-use and for re-use in the circular economy. Jennifer Markarian reports***

IMAGE: SHUTTERSTOCK

# Adding performance to films

Polymer films rely on an extensive variety of additives to enable them to be processed faster and made thinner, and that ensure good surface properties and high strength that lasts as long as necessary. In such a competitive and demanding area such as film production, additive suppliers and masterbatch producers have become experts at listening to the voices of their customers to identify where additives can be tweaked to help even more for a particular application. From greenhouse films to high barrier packaging, new and improved additives are playing their part in more efficient production and enhanced performance. And, because films are often components of single-use packaging or other disposable products, they are also being used to improve recycling and to enhance the processability of recycled materials.

Greenhouse films depend heavily on additive technologies, including antifogs and stabilisers, to deliver optimal film performance that creates the right conditions of light for plants while holding up under harsh environments where the film is exposed to weather and chemicals. Additives that protect the films from degradation due to ultraviolet light include UV light absorbers (UVA) and hindered amine light stabilisers (HALS).

Film applications in "plasticulture" continue to grow, according to **BASF**, which cites uses such as netting and substrate bags in addition to greenhouse and tunnel films. In November last year, the company completed construction of a new manufacturing plant for its high molecular weight NOR technology thermal and light stabilisers for agricultural films at its existing site at Pontecchio Marconi in Italy. The new facility will use digital technologies such as remote maintenance and troubleshooting and has been designed for energy efficiency. The Pontecchio site produces HALS and NOR HALS additives, as well as being the location for BASF's global testing hub for agricultural applications and its regional weathering center.

During AMI's Agricultural Film Virtual Summit in October last year, Hanna Schwartz, R&D Manager at **Kafrit Group**, explained that greenhouse films must have high chemical stability to resist degradation when in contact with pesticides and fumigants. In field trials, the company has examined the resistance to sulphur, commonly found in agrochemicals, of several UVA masterbatches and said it has found that its proprietary UV masterbatches showed equivalent or better performance to typical NOR or nickel and HALS-based UV stabilisers. She said it had also seen good results using experimental UV masterbatches for PE films designed to

**Main image: "Plasticulture" applications such as greenhouse films are driving demand for performance enhancing polymer additives**

withstand chlorine-based insecticides and outdoor weathering (Figure 1).

Schwartz said that some specialised greenhouse films require only partial UV absorption. She cited, for example, growing of plants that require UV for colour development or for greenhouses that use bees for pollination. The company's new masterbatches – UVA 00021 LD and UVA 07920 LD – are designed for such uses (the 07920 LD grade is said to be based on a novel technology).

Meanwhile, a new long-lasting antifog masterbatch from Kafrit Group – AF 00854 LD – is recommended for production of the core and internal layers in three-layer greenhouse film structures. Accelerated testing simulating both hot and cold climates predicts that the antifog effect will prove durable for at least two seasons, which the company says is among the longest currently on the market. The masterbatch also has lower haze for more transparent films.

## Oriented to quality

Biaxially oriented polypropylene (BOPP) is widely used in flexible packaging, and ongoing demands for "faster, cheaper, thinner" continue to be the drivers for improvements. "Quality and consistency of quality is one of the most important criteria, because BOPP are very thin films manufactured at very high speed," says François Thibeau, **Ampacet**'s Strategic Business Manager, Films in Europe.

One specialised need in the BOPP area is additives that enhance cavitation, which Thibeau explains as "the process of delaminating polypropylene at the interface with particles under the action of stretching."

Ampacet's PEARL portfolio of cavitation masterbatches for BOPP includes both organic and inorganic options. PEARL 368 is a new organic cavitation masterbatch that yields consistent cavitating efficiency across the full web width of the widest BOPP line, according to Thibeau. "It was designed to enable extended run times between die cleanings and requires lower addition rates than other organic cavitating masterbatches," he says. Organic cavitation masterbatches are said to offer higher gloss and better mechanical properties and enable higher film yields (square metres of film for a defined weight) compared to inorganic alternatives such as calcium carbonate.

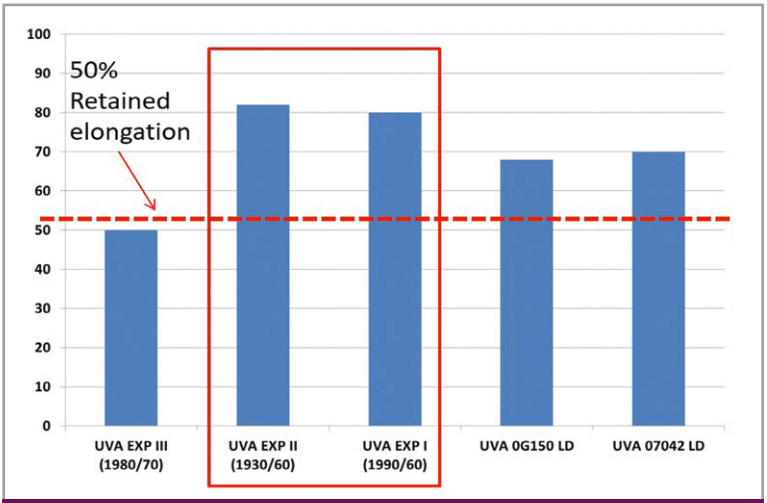


**Figure 1: Outdoor weathering performance of 100 micron PE films containing different Kafrit UV stabilisers exposed to monthly hypochlorite or acetamiprid insecticide spraying measured by retained elongation (UVA EXP I and UA EXP II are experimental grades)** ***Source: Kafrit***

IMAGE: BASF

**Above: BASF has expanded capacity for production of its high molecular weight NOR light stabilisers at its Pontecchio Marconi location in Italy, which is its global testing hub for agricultural applications**

Matt compounds for the outer layer of a BOPP film are supplied as compounds rather than masterbatches as they must provide a high level of homogeneity to ensure the matt finish is uniform after stretching. Sealing properties are also critical. Ampacet's latest MATIF matt compound – MATIF CSR 330 – is designed for producing good cold seals for packaging heat-sensitive products. The silicone-free compound provides good release performance, including smooth unwinding and prevention of transfer of adhesive to the wrong side of the film.

Biaxially oriented polyethylene terephthalate (BOPET) films are used as part of multilayer, multimaterial packaging structures because of their good tensile strength and high gas barrier. These multimaterial films are difficult to recycle, however, so some companies are seeking to replace them with mono-material alternatives. Biaxially oriented polyethylene (BOPE) films are making an entrance in all-PE constructions, in some cases replacing BOPET or BOPP as brands and packaging companies look to improve recyclability. ›


IMAGE: TOSAF

**Above: Stand-up pouch with a paper-like feel and good printability produced in a mono-material PE laminate using Tosaf's latest MATT masterbatch**

## Mono-structures

Masterbatch suppliers have introduced a range of products to support the manufacture of BOPE mono-material film structures. **Tosaf** has introduced a portfolio of BOPE masterbatches that include slips, antiblocks, antistatics, and antifogs. "We have several products for monomaterial all-PE solutions that give the same optical, mechanical, and chemical resistance as BOPP/PE laminates," says Michal Schreiber, Product Manager for Flexible Packaging Applications at the company.

"We're seeing BOPE and machine-direction oriented (MDO) PE in both blown and cast films being used, and we have masterbatches for each of these specific types," Schreiber says. She adds that some film processors are switching from BOPET structures to structures with two PE film layers, which in some cases use a layer with a matt surface for reverse printing and then laminating.

Tosaf's latest matt additive for polyolefins is a blend of polymers that is used to create a thin skin layer on a film. "A matt surface has a paper-like feel and is associated with luxury products," says Evgeni Zelikman Chief innovation Scientist at Tosaf.

"We can reach a higher level of quality and transparency with this blend of polymers than with mineral-based matt additives," Schreiber adds. She also says that the thermal resistance of Tosaf's MATT allows its use as an external layer without being laminated to BOPET or BOPP. The matt additive also results in a high surface tension that supports printing and adhesion of a clear lacquer layer.

**Right: Many film additives are used to modify surface properties such as coefficient of friction and wetting, says Tosaf**

## Optimised surfaces

Surface properties are important for many aspects of film performance. For reliable processing in packaging machinery, for instance, a consistent coefficient of friction (COF) is highly desirable. Tosaf has developed a permanent, non-migrating slip additive mastertbatch that is intended to provide better control of COF than migrating, plant-based alternatives, according to Zelikman.

"The unique proprietary chemistry is a combi-batch of antiblock and a slip that provides a stable COF specifically for PE films. A synergistic effect is created during masterbatch production," he says. The masterbatch is said to be finding use in heavy-duty bags, where sealing is critical, and also in antifog films. "Obtaining a low COF in an antifog film is a challenge because traditional slips compete with the antifog on the surface. This masterbatch provides good COF without damaging the antifog effect," Zelikman says.

Antistatic additives for films are available in a wide range of migrating and non-migrating chemistries. One of the challenges for conventional migrating antistatic technologies is that they may require a certain relative humidity to function. Tosaf claims that its latest migrating antistatic masterbatch for polyolefins – ST0249PE – works even with low humidity levels, has long-lasting activity, and works at a low loading. It is described as an amine-free product, which the company says makes it non-corrosive and suitable for electrical part packaging.

Films used in building and construction (under roofing, for example, or in protection film between walls and rooms, in carpet backing or house wrap) require flame retardancy and low smoke emission to meet appropriate standards. Tosaf Flame Retardant Business Manager Oren Moshe says in such applications it is important that UV and flame retardant additives do not interact negatively with each other. The company has introduced a dual-action flame retardant masterbatch that is designed to act as both as a UV and halogen-free flame retardant (HFFR) for PE and PP films for outdoor uses, FR8906PE EU.

Also targeted at construction industry applications, **Ampacet**'s Halofree HFFR masterbatches,

IMAGE: SHUTTERSTOCK

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including its new Halofree 709 and 229 for PE films, offer halogen-free flame retardant performance in PE films. Initially developed for European applications, the products are now available globally, according to the company.

## Multi-layer recycling

Although seeing growing interest in BOPE monomaterial films, which Ampacet is targeting with it BIAX4CE portfolio of masterbatches, the company's North American Strategic Business Manager for Flexibles, Jim Morrison, says there will continue to be a need for high barrier multi-layered films. These films are more difficult to recycle because they contain combinations of non-polar and polar polymers, such as EVOH and PA.

Morrison says Ampacet's ReVive portfolio of compatibilisers combines a synergistic blend of functional additives designed to enable efficient recycling of such films. ReVive is said to allow post-industrial recycled film (edge trim, for example) to be recycled into the PE layer of a multi-layer film or to be used as PCR.

"As CPGs [consumer packaged goods companies] continue to push for greater recycle incorporation in all plastic packaging, the challenge for multi-layered films will be to maintain strength and barrier functionality. The value chain continues to develop more advanced materials, from resins to innovative additives, to meet these objectives," says Morrison.

AddWorks PKG 906 Circle stabiliser from **Clariant** is designed to allow higher levels of recycled content to be incorporated into polyolefin films. Reground scrap from BOPP film production or any PE or PP blown or cast film process can be reintroduced without affecting quality or processing, according to the company, which says the stabiliser reduces gel and black speck formation, allows manufacturers to maintain high line speeds, and minimises film breakage. It reports that up to 20% BOPP regrind could be added in one commercial trial, with up to 30% shown to be possible in Clariant's own in-house testing.

IMAGE: SHUTTERSTOCK

**Above: Halogen-free flame retardant systems are making headway in films for the construction industry**

## Easier processing

Processing aids are also an effective additive tool to improve processing of film formulations containing recycled resins and can help ensure a good film surface and, in some cases, can reduce die build-up, according to David Seiler, Americas Business Manager, Industrial and Fluoropolymers Global Advisor at **Arkema**, which manufactures the Kynar line of polyvinylidine fluoride (PVDF) polymer processing aids (PPAs).

Seiler says PPAs lessen start-up and processing variability, which are potential problems with reprocessed resin due to the variability in recycled material streams. "Before considering processing aids, the manufacturers often added large amounts of virgin LDPE to make the films. Now, with processing aids, they can use no or less virgin resin and can run faster at higher shear rates," he explains.

Films made from recycled resins often run more slowly than virgin resins, but the addition of a PPA can improve this. "If converters are pressure-limited, using a PPA, which reduces melt pressure, improves their output," says Robert Lowrie, Field

**Right: Clariant's AddWorks PKG 906 Circle stabiliser allows higher levels of recycled content to be incorporated into polyolefin films**

Sales Engineer at Arkema.

Trials performed in Arkema's processing labs have evaluated Arkema's PPA in three representative samples of recycled LLDPE from a commercial film converter. They found that PPAs helped relieve processing variation and also reduced degradation and discolouring problems. "Melt fracture is really flow instability," says Lowrie. "PPAs can eliminate melt fracture and improve flow stability and surface finish." Lowrie will present results of the company's studies at the upcoming AMI Polyethylene Films **conference** in the US.

PPAs are typically added by the film converter as a pelletised masterbatch containing 1-6% of the additive. Alternatively, they can be dosed using a liquid masterbatch. Seiler says that having some residual PPA content in the recycled resin itself is not a concern when adding PPA to a film formulation. "There is no harm in having 300ppm of PPA in the material versus 1,200ppm," he says. However, he does add that levels above 2,500ppm may result in blooming.

Seiler also says that Arkema eliminated the use of PFAS (perfluorinated alkylated substance) in its production of Kynar PPA fluoropolymers several years ago. PFAS use is being regulated or phased out in many regions of the world due to its persistence in the environment.

## Natural approach

**Palsgaard** of Denmark recently expanded capacity of its Einar plant-based polymer additives by opening a new 10,000 tonnes/year pellet line.

Einar products include anti-fog and anti-static additives in several grades tailored to film and other processes. Other parts of the portfolio include slip additives, ageing modifiers, mould release agents and dispersing aids. All products have FDA and EU food-contact approvals.

"We see growing demand for more natural materials to reduce fossil depletion and waste,"

IMAGE: CLARIANT

said Ulrik Aunskjær, global industry director for non-food business development in Palsgaard's polymer additives division. "Our expanded production capacity boosts the availability of food-grade plant-based surfactants and modifiers."

The expanded pellet line also addresses the needs of compounders and processors who want to use Einar products directly, rather than as part of a masterbatch formulation. This applies especially to anti-static additives for food and other packaging applications, where pelletised products offer a clean, straightforward process.

Palsgaard is making other investments – in spray cooling, and in reaction, distillation and esterification plants – that will double production capacity at its Juelsminde plant by 2024. In total it expects to invest 750 million Danish Kroner (€100m, or US$119m) in the expanded capacities.

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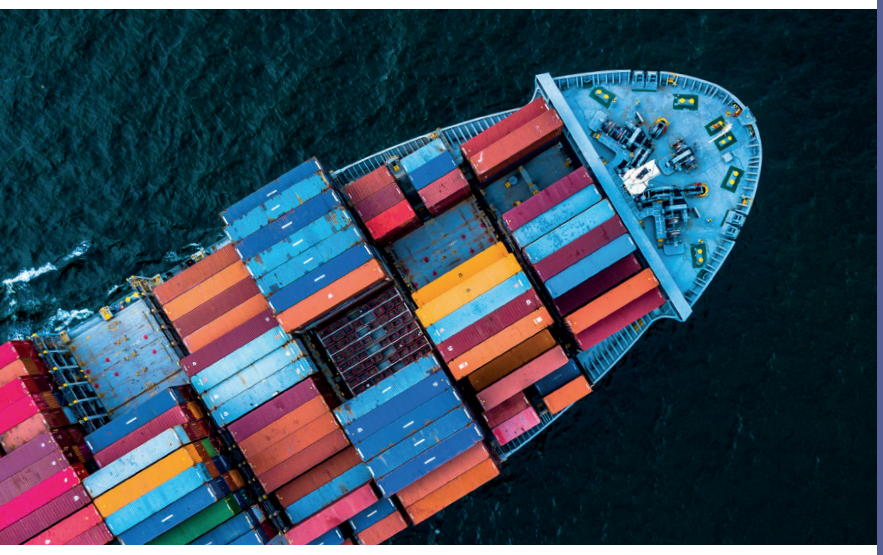

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IMAGE: NUREL/SP GROUP


*New materials and processing techniques mean that barrier packaging can be more sustainable – such as by making it compostable or more easily recyclable*

# Protection factor: latest news in barrier packaging

Barrier film has long been a key achievement of the packaging industry, protecting delicate and sensitive items – especially food. However, the increased focus on the environment means that this must be achieved in a more sustainable way.

In response, many companies have developed new ways of providing moisture and oxygen barriers – and made packaging more easily recyclable.

**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. Nurel offers its Inzea F18C material for co-extrusion applications of films that require transparency, sealing properties, oxygen barrier and compostability. ›

**Main image: SP has used Nurel's Inzea biopolymer to develop a compostable barrier film**

**Right: RKW and SAES have developed high-barrier, mono-material PE films for food packaging**

## Barrier expansion

US-based **Inhance Technologies**, best known for its Enkase barrier technology, is to open a new production site that will double its manufacturing capacity.

The new facility, in St Louis, Missouri, will replace the company's existing site, and open in "early spring", says the company. It will increase Inhance's warehouse space by 250% and double its manufacturing capabilities in the state.

"The expansion in St Louis is a great moment for us and a sign of our ambition in sustainable solutions for plastics," said Patricia van Ee, chief commercial officer at Inhance. "Demand for Enkase has increased dramatically over the last few years. We look forward to the site opening in the coming weeks."

The facility will provide Enkase – Inhance's recyclable barrier technology for packaging – and DuraBloc, a barrier for fuel systems.

The opening of the new facility follows Inhance's move to a new headquarters in Houston, Texas in 2020. In December, the company opened a science and technology centre there.

"This facility hosts a laboratory with the latest analytical equipment, expanded pilot facilities and increased testing capabilities," said Prakash Iyer, senior vice president of research and development at Inhance. "It will allow us to expand our global technical support and enable customers to develop superior products and solutions in the most demanding applications."

IMAGE: RKW/SAES

## Coated mono-material

Packaging film producer **RKW** and coating manufacturer **SAES Coated Films** have developed high-barrier PE films for food packaging.

While many current products use multi-material solutions that are difficult to recycle, mono-material PE-based packaging overcomes this problem.

The new high-barrier PE film aims to combine high performance with recyclability. The first customers have already produced recyclable mono-material pouches, including products that have a zip.

The base film is RKW's MDO-PE, which combines processability, high temperature resistance and the use of recycled materials. It can replace stiff films such as polyester or nylon – which are commonly laminated with PE in multi-material packaging – to enable the design of mono-material PE packaging.

To ensure high barrier performance, SAES applies Coathink, a combination of water-based deposition and metallisation that reduces oxygen and water vapour permeation to rates below 1. The barrier material represents less than 1-2% the weight of the packaging, as recommended by the main international guidelines on recycling.

**Below: DSM, SABIC and other partners have developed a multi-layer barrier casing for meat, using recycled plastics**


IMAGE: DSM

## Multi-layer casing

**DSM**, **SABIC** and several partners have developed a multi-layer barrier casing for meat products that uses post-consumer plastics.

Produced by Viscofan, the casing comprises several layers of different sustainable polymers. DSM supplies its Akulon polyamide (PA) while SABIC supplies the polyethylene from its Trucircle portfolio.

Both products are based on used and post-consumer plastics which would otherwise be landfilled or incinerated. Instead, the used plastic is converted into new feedstock, which then enters the production chain to make new virgin-quality materials.

"By introducing Akulon CRC-MB, DSM is taking the next step in its sustainability journey," said Jason Zhang, VP of the performance polymers business line at DSM Engineering Materials.

Upstream partners are Cepsa – which makes certified circular phenol – and Fibrant, which uses the phenol to make caprolactam, a precursor of polyamide. Finally, Viscofan combines the two polymers to produce the multi-barrier film used to create casings for a variety of meat products.

Óscar Ponz, chief plastic business officer at Viscofan, said: "In our sustainable casings programme, next to this achievement, we're also in a position to offer bio-based alternatives to our customers."

›

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**Above: German start-up Gipfelpuls used Innovia's Propafilm Strata to wrap its new snack bar**

Multi-layer barrier films offer strong sustainability advantages by helping to reduce preventable food waste – which accounts for 8% of total global greenhouse gas emissions – according to the partners.

## High resistance

**Innovia Films** has developed a new film in its Propafilm Strata range of transparent, high barrier packaging films.

The film, SLF, has high barrier levels to oxygen, moisture, aroma and mineral oils. It has been designed with a wide sealing range making it applicable to high-speed, horizontal form-fill-seal packaging of biscuits, bakery and confectionery type products.

"With SLF, we have developed a new barrier film that has an outstanding oxygen and aroma barrier, and an enhanced moisture barrier over standard polypropylene films," said Alasdair McEwen, global product manager for packaging at Innovia Films. "This means there is an opportunity to increase product shelf life and reduce food waste. It is the perfect replacement for PVdC coated films."

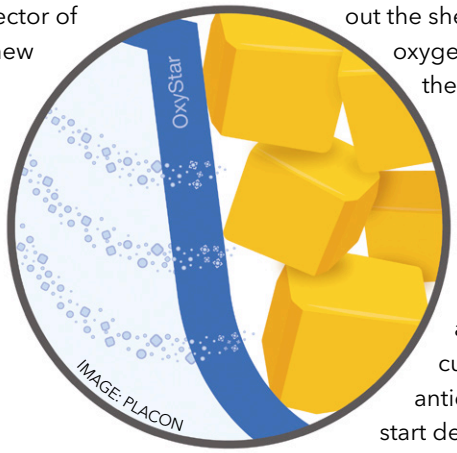
Like other Propafilm Strata films, SLF provides a high barrier to aroma and oxygen even at high relative humidity levels.

It is printable, glossy and is food contact compliant globally.

"We have incorporated a wide sealing range polymer into the formulation of SLF, so it has been designed specifically for use on high-speed horizontal packaging lines," McEwen added.

Prior to the launch of the SLF film, German start-up company Gipfelpuls used Propafilm Strata to wrap its new snack bar.

Andreas Meyer, executive director of Gipfelpuls, said: "We created a new nut snack in a compact spherical shape with over 55 % nuts and seeds in combination with selected berries and fruits. Innovia's Strata film was the best solution, providing an excellent aroma and gas barrier to keep our nut product in perfect condition."




**Left Placon describes OxyStar as "the world's first recyclable PET barrier material"**

## Oxygen PET barrier

US-based **Placon** has developed a recyclable oxygen barrier material called OxyStar, for use in thermoformed PET packaging.

The company describes it as "the world's first recyclable PET barrier material". Most barrier solutions today are classified as a #7 recycle symbol that cannot be recycled – but OxyStar has a #1 recycle symbol, allowing it to be put back into the PET recycling stream, says Placon.

OxyStar uses an active oxygen barrier that stops oxygen ingress through a free radical chain reaction within the packaging sidewalls. Throughout the shelf life of the active agent, the oxygen ingress will be near zero, says the company.

"OxyStar brings a sustainable solution to the barrier packaging space that we have not seen before," said Brian Hodek, food processor sales manager at Placon. "We have already started working with key customers across the USA and anticipate more enquiries as we start developing new custom food packaging."

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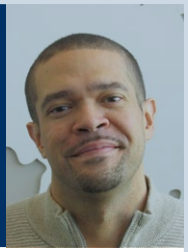

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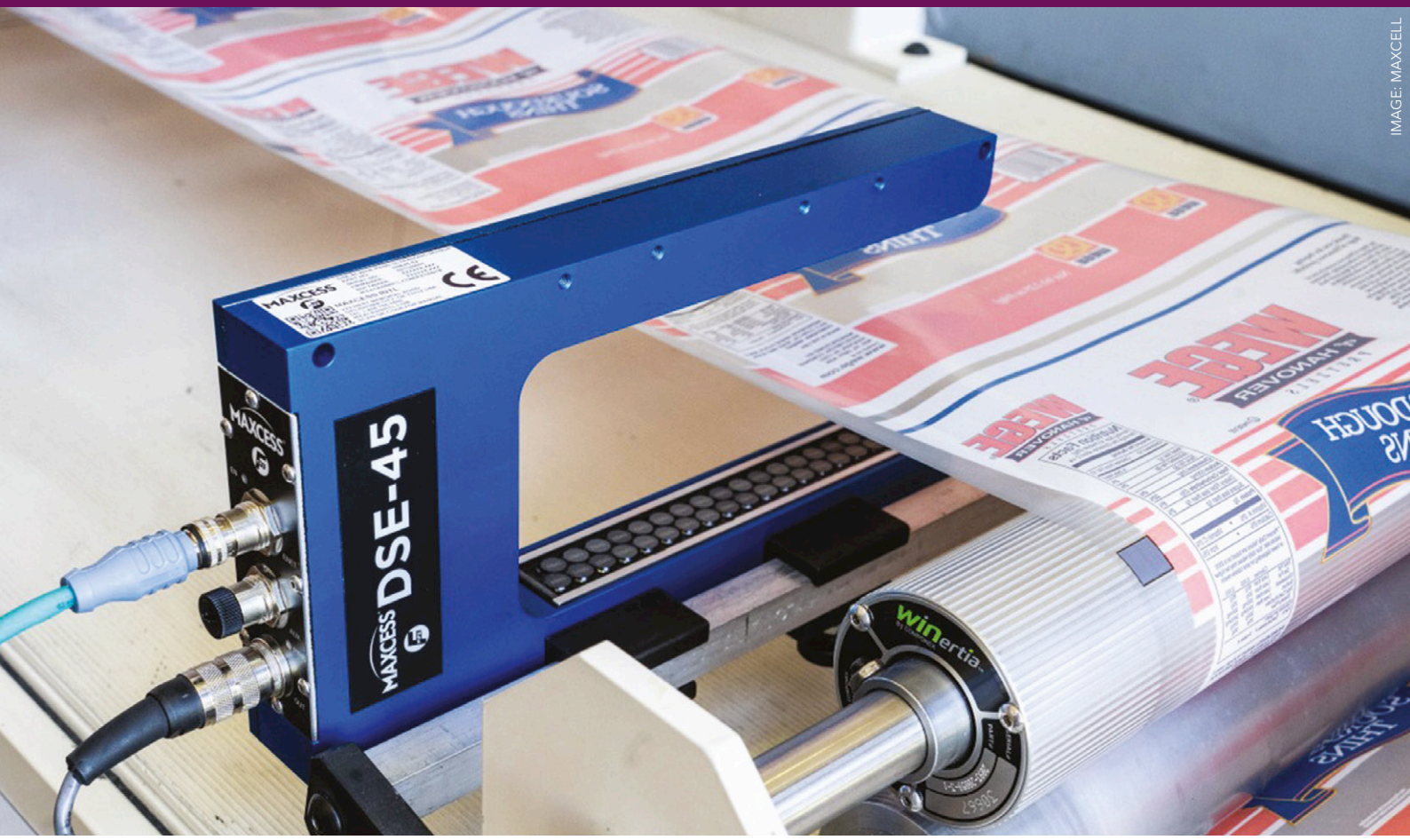


IMAGE: MAXCELL

# Keeping control of film production adds quality

## *A variety of control systems – which keep a check on physical parameters or surface imperfections – help to raise the quality of extruded film*

Controlling factors such as web width, film thickness and surface defects are all critical in ensuring the highest product quality in film manufacture. These types of system are becoming more widespread as film extruders are under pressure to raise quality while running their operations as efficiently as possible.

In one example, Jaya Nurimba – an Indonesian manufacturer of linear low density (LDPE), cast polypropylene (CPP) and metallised films – recently installed process control technology from **NDC** to help it improve product quality.

Its products are used to package a wide range of foods, including snack foods, biscuits and cookies, meat, oil, frozen foods and household products.

The company wanted to gain better process insight and improve product quality on its CPP lines. To do this, it installed an integrated measurement system from NDC, comprising an FG710e on-line near-infrared (NIR) gauge, AccuTrak O-Frame scanner and 8000TDi process controller.

The system provides high-speed gauging performance and offers versatile measurements of basis weight and film thickness across a range of products. The gauge is unaffected by changes in process and ambient conditions, such as light fluctuations, temperature, relative humidity, air quality, web flutter and batch-to-batch substrate variations. NDC's 8000 TDi process visualisation software can be configured for a range of applications – including fixed-point or multi-scanning.

Since installing the measurement system, Jaya Nurimba has seen several benefits, including improved product quality, higher productivity, less

**Main image: The Fife DSE-45 digital wideband sensor is aimed at applications with variable web widths**

scrap and shorter change-over times.

"We chose NDC's complete on-line solution because of their reputation for quality measurements in the flexible films industry," said the company.

## Variable sensing

**Maxcess** has developed a new sensor, which it says it ideal for applications with variable web widths.

The Fife DSE-45 digital wideband sensor can sense multiple webs and web width changes without requiring manual or automated repositioning – which helps to increase uptime, throughput and profits.

Offering IP65 protection and backward compatibility, DSE-45 can operate in harsher environments using existing mounting and cable systems, while eliminating the need to remove it for machine washdowns.

Due to its digital Industry 4.0 connectivity and high resolution and accuracy, it can alert the operator to faults, so that corrections can be made without the need to stop the line.

"The DSE-45 offers a versatile solution for variable web width applications without the need to reposition or change sensors," said Darren Irons, global product manager for Fife Guiding. "It also offers the ability to sense up to 16 web edges at one time, allowing a customer to use one sensor where multiple sensors would typically be required."

## Portable inspection

US-based **Unilux** says that its latest range of portable UV inspection strobes – called UVX – improve quality control for security packaging and printing.

UVX does this by illuminating a larger area of UV-visible inks and optical brighteners so that defects can be seen at full production speed, anywhere on the press.

Quality can be confirmed without slowing production and the cause of defects can be corrected before a print run is ruined. By spreading the usable illumination more evenly, UVX strobes provide a truer representation of print or coating quality by eliminating hot spots, says the company.

"UV LED technology has improved since we introduced the first LEDUV inspection strobes," said Mike Simonis, president of Unilux. "With UVX, we've leveraged the improvements using experience that comes from decades of solving problems in security printing, cold seal, laminating and coating."

Portable LED9 and LED12 UVX strobes allow inspection anywhere on the press. They have quick-change batteries for added convenience. Stationary inspection systems provide full-width inspection and feature Smart Assist controls, which make it easier to daisy-chain multiple units for the simultaneous inspection of standard and UV-visible inks and coatings, says Unilux.

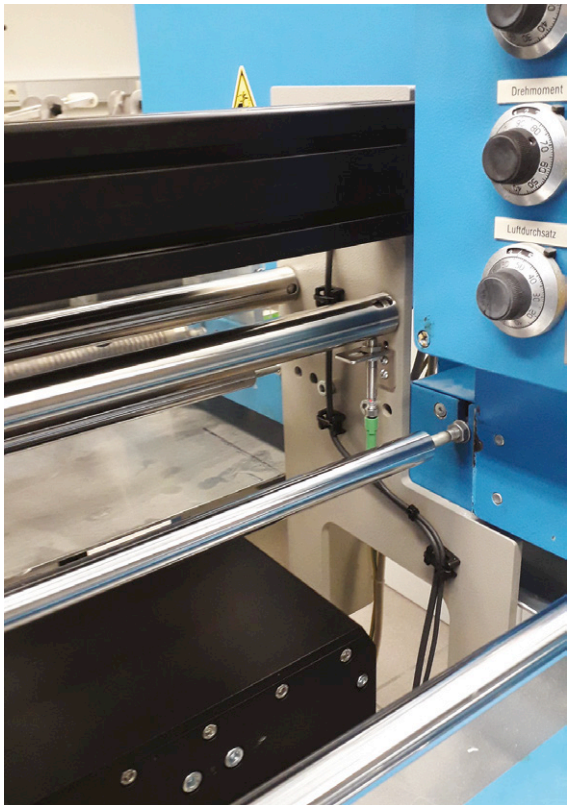


IMAGE: OCS

**Right: OCS says its FSA100EXT film surface analyser can be retrofitted to third-party extrusion lines**

## Third-party retrofits

**Optical Control Systems** (OCS) of Germany says that its FSA100EXT film surface analyser is available as a retrofit on third-party extrusion lines.

Upgrading an existing extrusion line with the FSA100EXT optimises quality control in the polymer production process, it says – to improve product quality. The customised frame allows easy and quick adaptation into the existing plant.

State-of-the-art camera technology is concealed in the customised OCS frame. The V2 camera technology consists of a high-resolution dual-line CMOS camera and a user-specific high-performance LED. This combination enables optimal defect detection in transparent, opaque and coloured polymer film, says OCS.

With the OCS FSA100 software, measurement results are analysed according to customer specifications and defects are classified accordingly – providing information about the film quality.

**CLICK ON THE LINKS FOR MORE INFORMATION:**

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- **www.ocsgmbh.com**

RECYCLING

# Films made from recyclate

Nova Chemicals of Canada has developed a series of customisable films that use post-consumer resin (PCR).

The film structures use recycled low LDPE and LLDPE in a range of applications including heavy-duty sacks, collation shrink and stretch film, agricultural film and food packaging.

"This is one of several initiatives we are pursuing to make it easier and more practical for the industry and our customers to incorporate PCR into new packaging and products," said Greg DeKunder, vice president for polyethylene marketing at Nova.

Last year, Nova entered into agreements with Merlin Plastics and Revolution to supply PCR that Nova will sell to its customers.

› **www.novachemicals.com**

MASTERBATCH

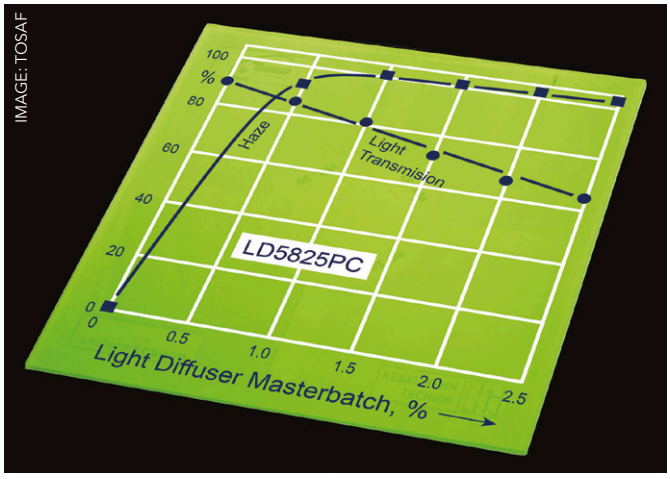
# Light diffusing microfillers prevent lighting hotspots

Tosaf has developed a range of light-diffusing (LD) masterbatches that can prevent 'hotspots' on backlit surfaces.

The company says that many LED light sources have a problem creating uniform diffused light, which causes the hotspots.

The masterbatch contains micro-fillers, whose performance has been optimised following laboratory trials. The trials addressed properties such as material, refractive index, transparency, geometry and dimensions. As a result, only small amounts of masterbatch – around 1-2% – are needed to scatter the light in a transparent material, usually PMMA and polycarbonate.

At the same time, light transmission and mechanical properties of the base material have been largely retained. In addition to colour-neutral grades, combinations with specific colourings and other functional properties such as UV stabilisers are available.




LD masterbatches give extrusion companies more flexibility without the need to keep diverse stocks, says Tosaf – adjusting the targeted light scattering properties for each application and material thickness by varying the quantity added.

"Producers of extrudates for lighting technology are not usually able to incorporate the light-scattering additive themselves, because of the large amount of apparatus needed," Rudolf Reinhart, product manager at Tosaf Color Service. "Our easy-to-process LD masterbatches open the way for them to achieve flexibility, because they are designed for products without streaks or other defects."

Examples of light scattering parts include backlit decorative elements for interior and exterior automotive parts.

› **www.tosaf.com**

POLYSTYRENE

# PS recovered using dissolution process

Ineos Styrolution has collaborated with Polystyvert to develop a process that converts post-consumer polystyrene (PS) into a new, high quality resin.

Polystyvert uses a patented dissolution technology to process PS waste into high quality recycled material. The method takes plastic waste in solid form and dissolves it in a solvent. Once dissolved, the process can mechanically and chemically separate contaminants and additives, before separating the original polymer from the solvent. The end-product is then a cleaned polymer that may be used as new raw material resin again.

The technology can eliminate a range of contaminants such as pigments and brominated flame-retardants. Recycled PS pellets can then be used to make various products, including those for food-grade applications.

"The purification capacity of Polystyvert's technology is unique," said Ricardo Cuetos, vice president for standard products at Ineos Styrolution Americas. Cuetos continues, "The high quality of the final recycled PS is essential to achieving a truly circular economy in key markets like food service packaging."

› **www.ineos-styrolution.com**

› **www.polystyvert.com**

MATERIALS HANDLING

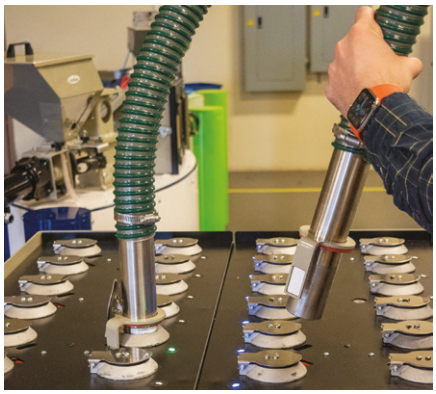
# Colour coding eases material transfer

Conair says that its new wireless RFID line-proofing technology simplifies the process of resin distribution within plastics production.

It does this by translating source/destination connections from the conveying control and HMI into operator instructions guided by colour-changing LEDs on the resin selection tabletop.

Other features of the system include an LED-guided line purging option and full compatibility with Conair's Wave Conveying technology.

The RFID line proofing system works with Conair's SmartFLX conveying control and an RFID-capable Resin Selection System (RSS) table. Each material port on the modified RSS table connects to a specific resin



supply. All resin sources, along with their RSS ports and unique RFID antenna addresses, are tracked in the material source/destination database in the SmartFLX control.

Above the RSS table, the flex tubes to destination receivers have steel connection handles that contain and protect uniquely coded RFID chips, whose addresses are associated with destination receivers and stored in the SmartFLX database. Wireless signals between the flex-tube RFID chip and the antenna at each RSS port are used by the SmartFLX control to proof each connection.

When an operator initiates a material change using the RSS table, the SmartFLX control consults a database to identify one or more RSS ports linked to the correct resin source, and one or more flex tubes linked to the desired destination. As correct connections are displayed on the HMI screen, the control translates them into light-guided instructions using LEDs in the surface of the RSS table.

› **www.conairgroup.com**

HEAT PUMPS

# High-capacity melt pumps increase process efficiency

Nordson has updated its portfolio of high-capacity melt pumps by harmonising designs originally developed by its Xaloy and Kreyenborg arms.

It says the new pumps enhance process efficiency and end-product quality while reducing the total cost of ownership (TCO) in comparison with its previous models.

The new BKG BlueFlow melt pumps are available in five sizes, with capacities from 1,164 to 4,900cc per revolution. Nordson has previously aligned its range of smaller melt pumps with capacities from 33 to 716cc per revolution.

The new harmonised design reduces TCO in several ways: it improves product consistency by maintaining constant pressure and adapting to process variations; it raises productivity by rheologically optimising the core components and polymer flow through the pump; and it saves energy, due in part to a 10% increase in the size of the heat-exchange area, said the company.


"These high-capacity pumps repay their initial cost through improved productivity, enhanced product quality and energy efficiency," said Christian Schröder, global product line manager at Nordson.

"Customers benefit from streamlined processes, along with consistent global technical information and support services."

› **www.nordson.com**

GEOMEMBRANES

# Raising TPO line output

Amut of Italy is to supply a new extrusion line to Polyglass, helping it to increase production of TPO membranes.

The new plant, commissioned in December 2020, has a capacity of 10 million sq m per year and will be used to make the full range of Mapeplan T, a flexible polyolefin synthetic waterproof membrane. Amut will deliver the line in the second half of this year, so it can be up and running by November.

The plant includes a system for direct in-line dosing of raw materials and flame retardant additives.

› **www.amutgroup.com**

# Download these new product brochures

**Simply click on the brochure cover or link to download a PDF to your PC or smartphone**

## SCANFILL: GREENER PACKAGING


Based on a novel polymer/ mineral mix, the Scanfill range of packaging resins can minimise environmental impact by reducing polymer consumption, non-renewable energy use and greenhouse gas emissions without sacrificing barrier performance. Find out more in this brochure.

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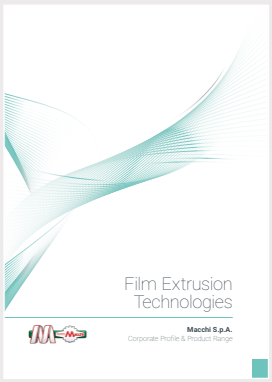
## MACCHI: FILM EXTRUSION




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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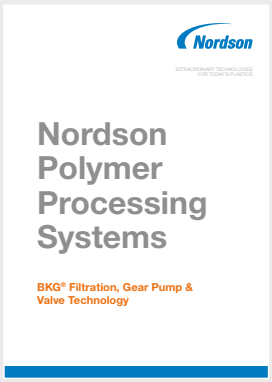
## NORDSON: FILTRATION SYSTEMS




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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## STRUKTOL: INNOVATIVE ADDITIVES


Struktol manufactures a wide range of additives that benefit performance and processing of resins and compounds. Its portofolio includes additives for PVC, wood-plastic composites, recycling, odour control and more, as this brochure shows.

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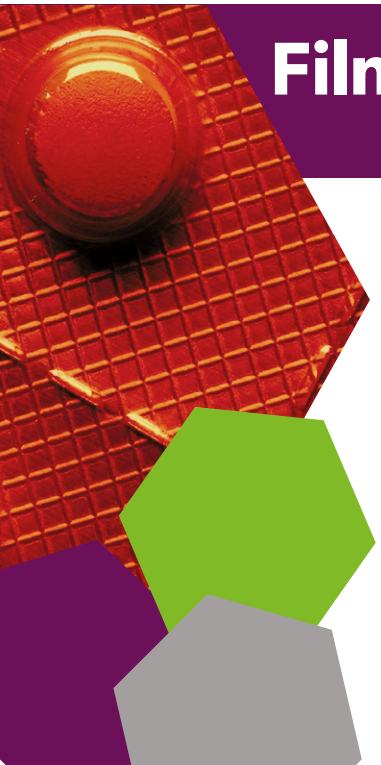
**If you would like your brochure to be included on this page, please contact Claire Bishop claire.bishop@ami.international. Tel: +44 (0)1732 682948**

# Gulf Packaging Industries

| | |
|---|---|
| **Head office:** | Jubail, Saudi Arabia |
| **CEO:** | Nader AlDakheel |
| **Founded:** | 1989 |
| **Ownership:** | Private |
| **Employees:** | Around 240 |
| **Profile:** | Gulf Packaging Industries, which was founded in 1989, says it was the first producer of bioriented polypropylene (BOPP) film in the Gulf region. It specialises in films for packaging, lamination and labelling applications. These are used widely across the food industry, in application including baked goods, confectionery, snacks and ice cream. The company, which has sales and distribution centres in Italy, Egypt and the USA, is 100% owned by the Saudi Al Rahji group. |
| **Product lines:** | The company has a diverse product range, including plain, transparent and metallised films. Its transparent, heat sealable films are designed for flexible packaging and are available for use as monoweb or in laminates on HFFS, VFFS and overwrap equipment. Its metallised BOPP films offer a high-performing, low-weight packaging solution for many foods that require a long shelf life. It can be combined with modified atmosphere packaging (MAP) to create a barrier to moisture, light and oxygen. |
| **Factory location:** | Gulf Packaging Industries has a 15,000 sq m plant in Jubail, which has an annual output of around 115,000 tonnes of BOPP film. It runs three Bruckner extrusion lines, and also has three metallisers – with a metallisation capacity of 25,000 tonnes/year. It recently ordered a fourth Bruckner line, which is 10.4m wide and customised to its needs. The line is due to be delivered in the autumn. |

**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:**

| **April 2021** | **May 2021** |
|---|---|
| Film winders | Waterproof membranes |
| Photovoltaics | Materials handling |
| Agricultural film | Converting/bag making |
| Chinaplas preview | Screws & barrels |

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

**For information on advertising in these issues, please contact:**
**Claire Bishop: claire.bishop@ami.international Tel: +44 (0)1732 682948**
**Levent Tounjer: levent.tounjer@ami.international Tel: +44 (0)117 314 8183**

# Keep informed: read our latest editions

**AMI publishes five process-specific FREE plastics industry magazines. Simply click on the cover below to read each magazine. Or download the issue in the relevant Apple or Android app**


**Film and Sheet**
**January/February 2021**
The January/February 2021 edition of Film and Sheet Extrusion looks at how some polymer industry players have stepped up to take on the Covid pandemic. It also examines development in bioplastics, polyolefins and materials testing technology.

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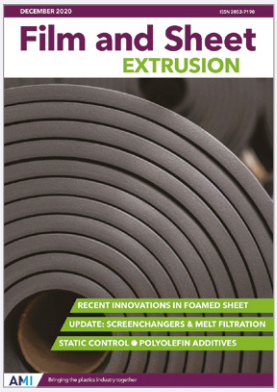


**Film and Sheet**
**December 2020**
The final 2020 edition of Film and Sheet Extrusion looked at the latest trends in foamed sheet materials. It also reviewed some of the newest developments in polymer melt filtration, static charge control, and additives for polyolefin films.

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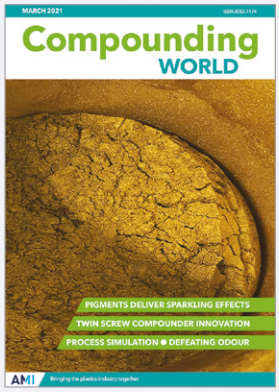


**Compounding World**
**March 2021**
The March issue of Compounding World reports on the latest twin-screw extruders and their ability to handle recycled materials and low bulk density natural additives. Other features cover special effect pigments, compounding simulation software and odour reduction.

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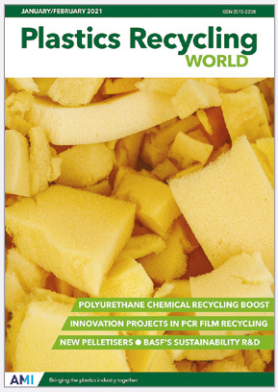


**Plastics Recycling World**
**January/February 2021**
The January/February edition of Plastics Recycling World looks at how chemical recycling technology could be utilised to recycle polyurethane foams. It also explores some of the latest developments in post-consumer film recycling and pelletising equipment.

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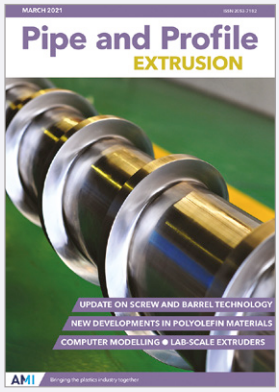


**Pipe and Profile**
**March 2021**
The March edition of Pipe and Profile Extrusion takes a look at new solutions for extending extrusion screw and barrel lifetimes. It also reviews some of the latest polyolefin pipe applications, laboratory extrusion systems and process modelling software.

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**Injection World**
**January/February 2021**
The January-February issue of Injection World investigates the increase in demand for medical plastics during the Covid-19 pandemic. Plus the latest in thermoplastic composites and new granulator technology for injection moulders.

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**Take out your own FREE subscriptions to any of the magazines. Click on the logos below to simply register on-line.**

Compounding WORLD
Film and Sheet EXTRUSION
Pipe and Profile EXTRUSION
Injection WORLD
Plastics Recycling WORLD

## GLOBAL EXHIBITION GUIDE

| | | | |
|---|---|---|---|
| 2021 | **13-16 April** | Chinaplas, Shenzhen, China | www.chinaplasonline.com |
| | **15-18 June** | FIP, Lyon, France **POSTPONED** | www.f-i-p.com |
| | **22-25 June** | Plast 2021, Milan, Italy **CANCELLED** | www.plastonline.org/en |
| | **21-25 June** | Colombiaplast, Bogota, Colombia | www.colombiaplast.org |
| | **14-18 September** | Equiplast, Barcelona, Spain | www.equiplast.com |
| | **21-23 September** | Plastics, Printing & Packaging, Dar-es-Salaam, Tanzania | www.expogr.com/tanzania/pppexpo |
| | **29-30 September** | Plastics Extrusion World Expo Europe, Essen, Germany **NEW DATE** | https://eu.extrusion-expo.com |
| | **3-7 October** | Plastex, Brno, Czech Republic | www.bvv.cz/en/plastex/ |
| | **12-16 October** | Fakuma, Friedrichshafen, Germany | www.fakuma-messe.de |
| | **3-4 November** | Plastics Extrusion World Expo North America, Cleveland, USA | https://na.extrusion-expo.com |
| | **8-12 November** | Plastico Brasil, Sao Paolo, Brazil | 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 **NEW DATE** | www.plastindia.org |
| | **8-11 March** | Plastimagen, Mexico City | www.plastimagen.com.mx |

## AMI CONFERENCES

| | |
|---|---|
| **16-18 March 2021** | Functional Fillers **VIRTUAL SUMMIT** |
| **23-25 March 2021** | Specialty Packaging Films **VIRTUAL SUMMIT** |
| **20-22 April 2021** | PVC Formulation North America **VIRTUAL SUMMIT** |
| **4-6 May 2021** | Polyethylene Films **VIRTUAL SUMMIT** |
| **1-3 June 2021** | Plastic Pouches **VIRTUAL SUMMIT** |
| **8-10 June 2021** | Stretch & Shrink Film **VIRTUAL SUMMIT** |

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

**www.ami.international**

PLASTICS RECYCLING WORLD EXPO

POLYMER TESTING WORLD EXPO

**29 - 30 September, 2021**

**ESSEN, GERMANY**

PLASTICS EXTRUSION WORLD EXPO

COMPOUNDING WORLD EXPO

**3 - 4 November, 2021**

**CLEVELAND, OHIO**

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