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Environmental study extols the virtues of flexible packaging

An updated study, commissioned by Flexible Packaging Europe (FPE), says that flexpack is a more effective way of reducing carbon footprint than either rigid packaging or focusing entirely on recycling.

The study uses a scenario in which all non-flexible packaging for Fast Moving Consumer Goods (FMCG) is substituted by flexible packaging where possible – so it excludes all beverages, as carbonated drinks cannot be packed in this way.

It showed that, at the EU level, the amount of primary packaging waste could be reduced by 21m tonnes/year. This equates to a 70% reduction of the total amount of non-beverage FMCG primary packaging, said FPE.

Using a life cycle assessment (LCA) approach, the study shows that this theoretical substitution would decrease total Global Warming Potential (GWP) by 33%, even if it is assumed that no material recycling of flexible packaging would take place.

The opposite scenario – replacing flexible with rigid packaging formats – would increase total GWP by about 30%. This is despite higher actual recycling rates of rigid packaging. Even if the recycling rate of rigid packaging was raised to 100%, the theoretical substitution would still lead to 14% higher GWP, says FPE.

The authors conclude that, for packaging, the focus should not be on recyclability only but on prevention. This can be achieved by a higher use of flexible packaging, which would lead to less primary packaging waste, lower carbon footprint and less use of resources, they said.

Jean-Paul Duquet, director of sustainability at FPE, said: "Prevention is on top of the waste hierarchy – defined by the European Commission's Waste Framework Directive – before other approaches like reuse, recycling and energy recovery. Flexible packaging fulfils this prevention requirement and proves to be a major part of the solution to today's challenges."

› **www.flexpack-europe.org**

New polymer head in Europe

PlasticsEurope, the pan-European trade association representing polymer manufacturers, has appointed Virginia Janssens (pictured) as its new managing director.

Janssens, who takes up her new role in March, was previously managing director of the European Organization for Packaging and the Environment (Europen).

"Virginia brings a proven track record in advocacy on sustainability related challenges and value chain collaboration which is invaluable to deliver on our sustainability goals," said Javier Constante, president of PlasticsEurope.

› **www.plasticseurope.org**

CCL expands with Poland buy

CCL Industries, a Canadian specialist in packaging and labels, is to acquire Polish BOPP film producer Flexpol.

Flexpol's sales in 2019 were around US$70 million, which was entirely focused on flexible packaging customers.

The deal, worth around US$22m, is expected to close during the first quarter of 2020 following regulatory approvals.

The new business will trade as 'Innovia Poland'.

"This brings us new capability to deliver label films in Europe using the same technology we have at Innovia Mexico for the Americas – complementing existing product offerings from Innovia's UK operations," said Geoffrey Martin president and CEO of CCL.

› **www.cclind.com**

Berry gets into PCR polyolefins

Major plastics processor Berry Group has entered an agreement with Georgia-Pacific Recycling to create a closed-loop system for post-consumer recyclate in the US.

Georgia-Pacific will use its national network of recycled material suppliers to source the PCR waste to be recycled. Berry will reprocess the material to incorporate into its portfolio of polyethylene film and polypropylene products.

The companies plan to begin material collection in Q1 of 2020, and start reprocessing in Q2.

› **www.berryglobal.com**

› **www.gapacrecycling.com**

KP agrees five-year deal for recycled PET

Klöckner Pentaplast (KP), a specialist in fresh food packaging, has agreed a five-year deal with recycler Viridor – to supply KP with 8,000 tonnes/year of post-consumer recycled PET

The agreement will be fulfilled by Viridor's £65m (US$84m) Avonmouth Resource Recovery Centre, which will make KP its largest rPET flake customer – and its largest buyer of rPET flake in the UK.

In the first two years, Viridor's multi-polymer processing plant will produce 60,000 tonnes of recycled plastics from 81,000 tonnes/year feed-stock – comprising 1.6 billion bottles, pots, tubs and trays. It plans to raise volume to 63,000 tonnes – from 1.7 billion items – in year three. From this, 8,000 tonnes/year of the PET will be supplied to KP.

Adam Barnett, president of the food packaging division at KP, said: "We want to take our partnership with Viridor to the next level of circularity as we continue to meet our common goals in true closed loop tray to tray recycling."

› **www.kpfilms.com**

Schur Flexibles of Germany says it aims to make the majority of its products recyclable before 2025 – and that it already has many within its portfolio.

"Sustainability is a clear management target and the company provides the resources to follow up," said Martin Berlekamp, head of sustainability at the company. "In addition to our 2025 target, we have one for 2020 – we want to provide a recyclable solution to all markets."

An example of this is the company's Vacuflex EX-T range, a recyclable thermoforming film made of polyolefins with an EVOH barrier.

› **www.schurflexibles.com**

Bubble Wrap's 90% recyclate

US-based Sealed Air has launched a new version of Bubble Wrap – which is made from at least 90% recycled content.

The recycled content used to make this version of Bubble Wrap is sourced from post-industrial materials that would otherwise end up in landfills. Sealed Air's future product developments will also incorporate post-consumer recycled content.

"We're proud to offer a reinvented Bubble Wrap that can be recycled at store drop-off locations – fostering a circular economy and delivering on our sustainability pledge to eliminate plastic waste," said Ted Doheny, president and CEO of Sealed Air.

› **www.sealedair.com**

US bag makers set targets

US plastic film producers and recyclers have set a target for 95% of plastic retail bags to be reused or recycled by 2025.

The American Recyclable Plastic Bag Alliance (ARPBA) said its members have also committed to targets for recycled content in plastic retail bags: 10% by 2021, 15% by 2023 and 20% by 2025.

› **https://bagalliance.org**

Persico acquires automotive know-how from Kiefel

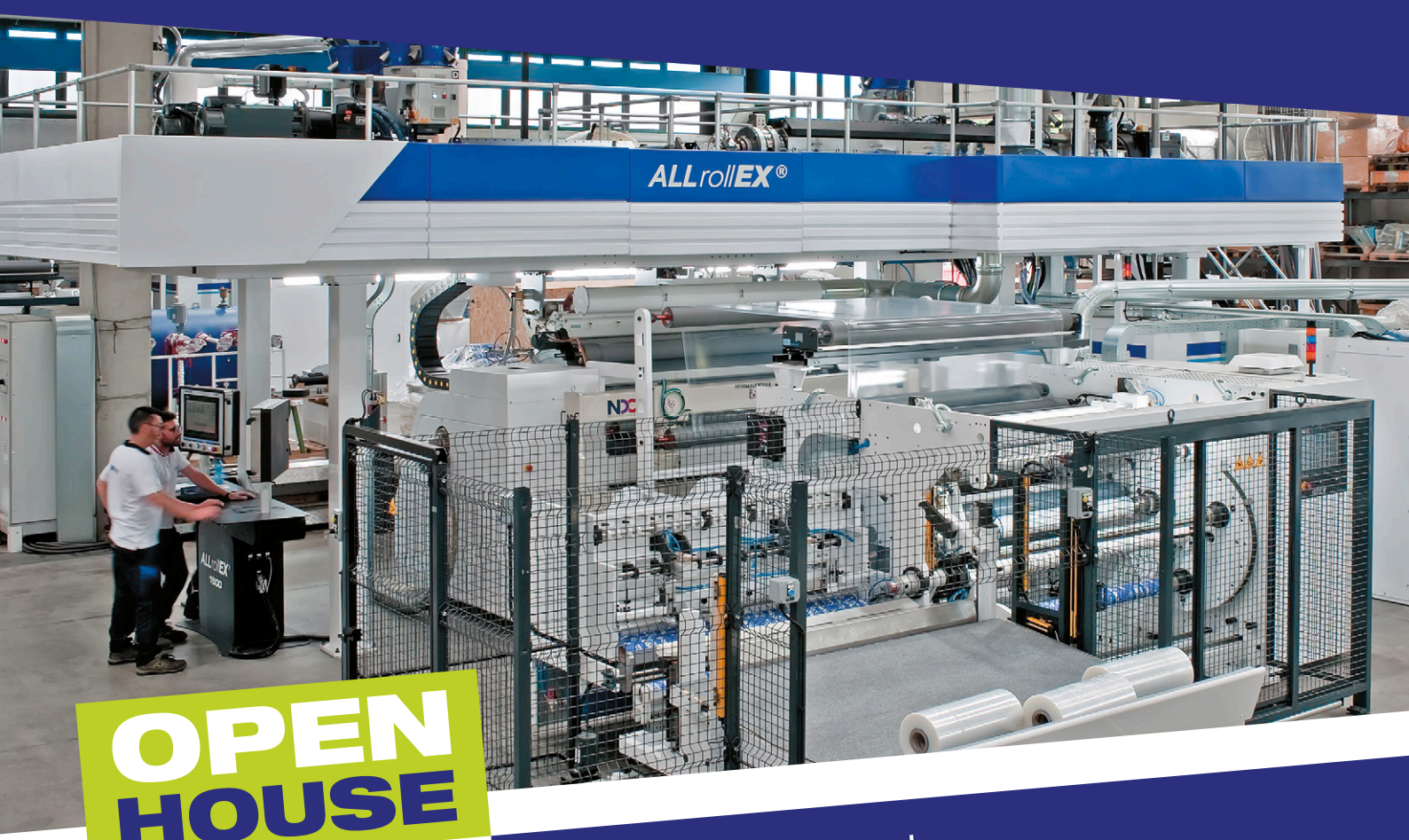
Persico has acquired Kiefel Automotive's technological know-how in the manufacture of automotive trim parts.

The deal has enabled the new owner to found Persico Automotive, a new German subsidiary with extensive expertise in vacuum laminating. The new company is based in Freilassing, near many major automotive players.

Persico now owns Kiefel's patents, know-how, employees and set-up and testing machinery – which will also be placed in Persico's American plants. In Freilassing.

› **www.persico.com**

Tesla is one user of Kiefel's automotive technology'



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Poor year for Italian machinery for first three quarters of 2019

Trade data for the first three quarters of 2019, generated by the Italian National Statistical Institute and analysed by the sector trade association Amaplast, indicates a negative year-end result for the Italian plastics and rubber processing machinery industry.

Amaplast attributes the poor result to "many issues and unknowns characterising the current world economic climate, compounded by the announced, but as yet poorly defined, legislative and fiscal measures aiming at reducing the use of plastics".

Both exports and imports were down on the same period in 2018. The former fell by 8.5% to €2.16bn; the latter 13.1% down to €645m.

Italian market for plastics and rubber machinery, equipment and moulds (Forecast Δ% 2019/2018)

Production	-9
Exports	-8
Imports	-15
Domestic market	-12
Trade balance	-5

Source: Amaplast

The trade balance fell by 6% but remains positive at €1.5bn, according to the association.

"I note a certain amount of concern deriving from the less than encouraging prospects for both the domestic and foreign markets," according to Amaplast president Dario Previero.

"However, we must not overlook the fact that this slump – whose first signs were seen in the year-end results for 2018 – comes after a long period of growth."

Germany remains the top export market, though sales there were 19.9% down at €270m and its share of the total fell from 14.3% to 12.5%. Most other European export markets were also weak.

However, Italy's second biggest market, the US, bucked the trend with sales 15.0% up to €224m, taking its share of the total to 10.4%.

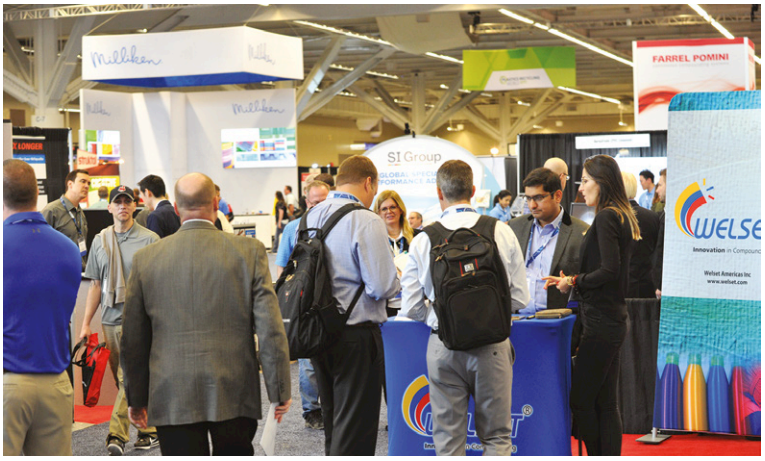
Some of the sharpest declines were in Turkey (-30%), Austria (-28%) and Switzerland (-24%). South Korea also saw a decline (-31%).

However, positive growth was seen in other Asian markets, notably Thailand (+24%), Indonesia (+39%), China (+14%) and Japan (+33%).

› **www.amaplast.org**

Reifenhäuser, Macchi and Piovan join Plastics Extrusion World Expo 2020

Reifenhäuser, Macchi and Piovan are among the latest companies to book stands at the *Plastics Extrusion World Expo 2020*, which takes place at Messe Essen in Germany on 3-4 June.



The exhibition made its successful debut in Cleveland, USA last year (pictured), and features a free-to-attend conference theatre covering the latest developments in film, sheet, pipe, profile and tubing extrusion. Speakers already confirmed for the Essen event include senior representatives from Barbier, Berry BPI, Bischof + Klein, Cofresco, Grupo Armando Alvarez, Klöckner Pentaplast, Pipelife, Polyplastic Group, Profine and Sealed Air.

The *Plastics Extrusion World Expo* will run alongside exhibitions focused on plastics recycling, compounding and testing, benefitting from the considerable crossover between these markets. In total, there will be more than 300 exhibitors.

Other companies that have already booked stands at Essen include Amut, Borealis, Clariant, Dynisco, Erema, ExxonMobil, Gabriel Chemie, Gneuss, Inoex, Jwell Machinery, Krauss Maffei Extrusion, Labtech Engineering, Maag, Motan Colortronic, Nordson, Plastic Systems, Starlinger, Theysohn Extrusion, Clariant, and Westlake Compounds.

For information on booking a stand at the show, please contact Levent Tounjer at **levent.tounjer@ami.international** or +44 117 314 8183.

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Above: Last year's debut event was well attended, with a wide variety of exhibitors and attendees

Expanded plastics exhibitions return to Cleveland in 2020

Three free-to-attend exhibitions – on extrusion, compounding and plastics recycling – will return to the Huntington Convention Center in Cleveland, Ohio, USA on 4-5 November 2020. They will be joined by a new event on polymer testing and analysis.

The Plastics Extrusion World Expo, Compounding World Expo and Plastics Recycling World Expo made their USA debuts in Cleveland in May 2019, attracting 261 exhibitors and 4,375 visitors.

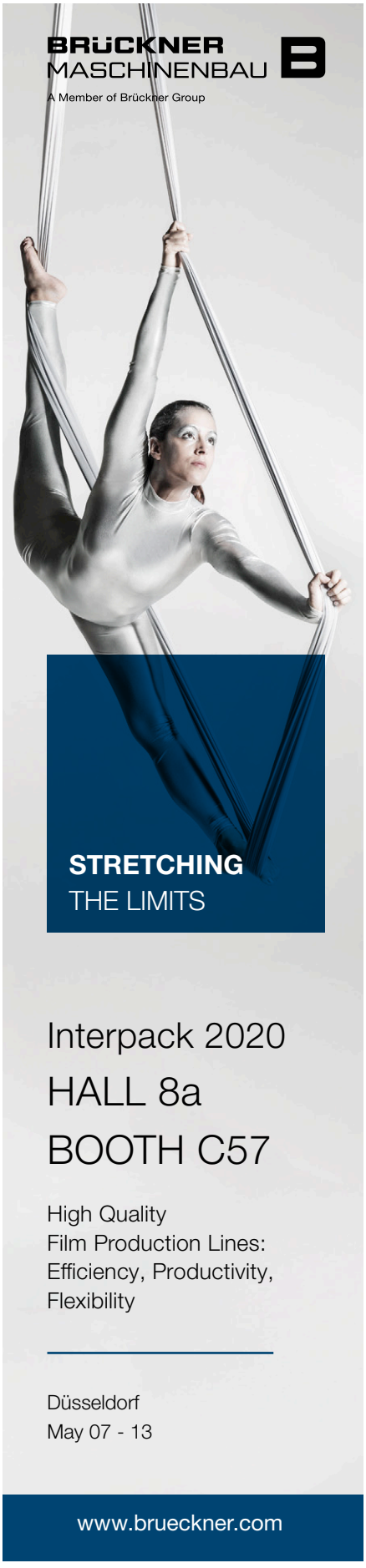
This year they will be joined by the Polymer Testing World Expo, a new focused exhibition and conference for scientists, laboratory staff and researchers who develop, test and analyse new polymer materials, formulations and products. It will benefit from the considerable crossover with the other exhibitions: last year, 1,091 of the visitors to the other three expos said they were involved in R&D and materials testing.

The exhibitions will see the return of five free conference theatres. These proved popular in 2019, with a series of technical papers, training seminars, market forecasts and business debates.

"We were delighted with the response to our first US exhibitions, which were very well supported by the North American plastics extrusion, recycling and compounding industries," said AMI's head of exhibitions, Rita Andrews. "We've had extremely positive feedback about the Cleveland shows from exhibitors and visitors alike."

More than 200 companies have already booked their booths for the four focused expos in Cleveland in 2020. They include Amut, Atlas, BYK, Clariant, Coperion, Cumberland, Davis Standard, Dover Chemical, Entek, Erema, Farrel Pomini, Gneuss, Heritage Plastics, Konica Minolta, KraussMaffei Extrusion, Leistritz, Maag, Maguire, Matsui, Milliken, Netzsch, NFM, NGR, Nordson, Omya, Piovan, PolyOne, PTi, Q-Lab, Reifenhauser, Struktol, Thermo Fisher, Vecoplan, Wacker, Windmöller & Hölscher and Zoltek.

Booths at the exhibitions start at less than $4,000. For more information, download the brochure **here**, or contact AMI's exhibition team at **exhibition_sales@ami.international**.



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Film and Sheet EXTRUSION

New compostable and bio-based plastics continue to hit the market – with applications ranging from mulch film to coffee packaging. Lou Reade reports

Natural selection: latest advances in bioplastics

Applications in bio-based plastics continues to grow rapidly, as users demand sustainable materials with properties that compete with those of traditional polymers.

Fabbri has used compostable Ecovio polymer from **BASF** to produce its transparent Nature Fresh stretch film.

It can be used to wrap meat, seafood and fruit and vegetables – either manually or with automatic packaging equipment. Industrial stretch packaging is also possible.

"By combining Nature Fresh with our Automac NF wrappers, the food packaging industry can benefit twice: from an innovative cling film; and from easy film processing," said Stefano Mele, CEO at Fabbri.

"In this way, our compostable cling film can be used with trays and labels of the same kind in order to have a complete compostable packaging."

BASF says this is the first certified compostable cling film that combines optimal breathability for an extended shelf life of fresh food with high transparency and good mechanical properties for automatic packaging.

As well as offering an alternative to PVC or PE wrap, Ecovio has better water vapour transmission than PE, says BASF.

Nature Fresh is food-contact approved according to US and European standards. After use, it can be composted with food waste either at home or in industrial facilities.

Carsten Sinkel, from global business development of biopolymers at BASF, added: "The market is looking for alternatives to PVC – which is today's performance standard for most cling film packaging of fresh produce. PE films are lacking in performance, often leading to a reduced shelf life of packed fresh food. This results in considerable greenhouse gas emissions from food waste."

Nature Fresh is available in four formats: as rolls for manual or automatic packaging machines; for cutter boxes in hotels and catering; as jumbo rolls for converters; and as rolls for end consumer hand-wrapping applications. ›

Main image: BASF's Ecovio has been used to make biodegradable mulch film

Above: Aimplas will create thermoformable sheet from PHA, derived from coffee and oil waste

Mulch benefit

Ecovio is also used to make mulch films that rot in the soil after use, rather than having to be collected.

One grade of the material, M2351, has been used as a component in mulch films that has also helped to increase the yield of tomatoes – by up to 50%. Farmers noticed higher resistance to fungal diseases, earlier harvests and better quality crops.

"We support farmers in many countries in using mulch films made of Ecovio", said Dirk Staerke, from marketing biopolymers for agriculture at BASF.

Ecovio M 2351 is a ready-made compound for extruding thin films. It can be processed on conventional blown-film lines for PE. Because of its mechanical properties regarding strength and tear resistance, the films can be manufactured in thicknesses of 12, 10 and 8 microns. The compound already contains slip and anti-block agents.

Cucumber wrap

An Australian converter has developed compostable shrink-wrap packaging for cucumbers – which has been taken up more widely.

BioBag World Australia, based in Adelaide in South Australia, originally developed the wrap for cucumbers after a request from a supermarket. It is made from the starch-based Mater-Bi resin from **Novamont**.

The company recently doubled production of the film and will boost output further when a second extruder and conversion machine arrive from China.

Qatar Airways now used the compostable packaging to reduce waste and collect food scraps.

The material has also been used to replace traditional mailing films covering magazines and newspapers, and as a wrap for meat.

"Lots of butchers have decided to go plastic-free," said Scott Morton, managing director of BioBag World Australia – a subsidiary of its Norway-based parent company. "They're using the film to wrap meat before they freeze it."

PHA from coffee

Spanish plastics research organisation **Aimplas** is taking part in Waystup, a pan-European research project that aims to make products such as bioplastics from urban biowaste.

Overall, it intends to improve the perception of urban biowaste as a resource and promote active citizen participation to separate and collect it.

New manufacturing business models will be developed to prepare the necessary technological solutions and end products for market entry. The project will also advise city managers on how to adopt new organisational models that support the use of urban biowaste, as well as evidence-based EU-level policy recommendations for decision-makers.

Aimplas' role in the project will be to make packaging from PHA – derived from coffee and oil waste. PHA will first be formulated so it can be extruded, sheet will be manufactured, then the packaging will be thermoformed.

The 42-month project will involve 26 research partners, local authorities, businesses and city networks.

Compostable barrier

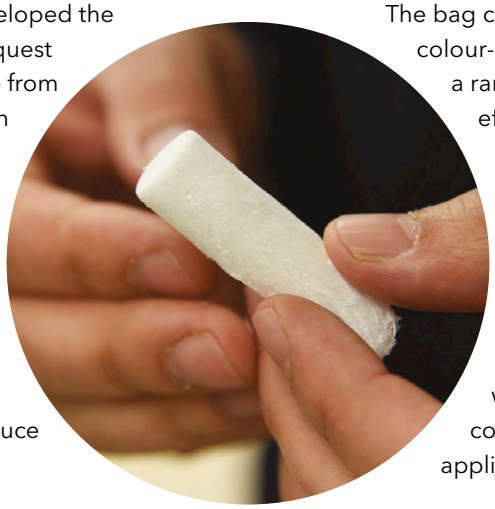
Emsur of Spain has developed a compostable bag with a high-performance triplex structure – using adhesives and special inks that are also compostable.

It was created in response to customer demands for a two- or three-layer barrier bag of sustainable origin, with compostable characteristics.

The bag can be transparent, opaque or colour-printed, in gloss or matt, with a range of visual and sensory effects to enhance product differentiation.

As well as its sustainability, the main advantage is the high barrier performance compared to other compostable plastics.

The laminated structure was specially designed for the coffee market but can be applied to other products such as



Right: Washington State University researchers have developed a cellulose-based foam that has better insulating properties than polystyrene

dry food, snacks, confectionery and pet food. It is suitable for both rotogravure and flexographic printing and can be made at Emsur facilities worldwide.

Emsur says that the concept could be adapted for other applications or structures – including both flexible and rigid formats.

Left: Emsur's three-layer compostable bag has a high barrier performance

Alternative foam

Researchers at **Washington State University** in the USA have developed a bio-based alternative to polystyrene foam, which they claim offers superior insulating performance.

The foam is made mostly from nanocrystals of cellulose – the most abundant plant material. The researchers have also developed a manufacturing process to make the foam, which uses water as a solvent.

The researchers say that other cellulose-based foams cannot compete with polystyrene foam – in terms of strength, insulation, and their resistance to temperature and humidity.

The WSU team created a material that is made of about 75% cellulose nanocrystals from wood pulp. They added polyvinyl alcohol – which bonds with the nanocellulose crystals and makes the resultant foam more elastic. The material has a uniform cellular structure, which makes it a good insulator.

This is the first time that a plant-based foam has surpassed the insulation capabilities of polystyrene foam, said the researchers. It is also lightweight and can support up to 200 times its weight without changing shape.

"We have used an easy method to make high-performance, composite foams based on nanocrystalline cellulose with an excellent combination of thermal insulation capability and mechanical properties," said Amir Ameli, assistant professor in the school of mechanical and materials engineering, who co-led the research.

Details of the work are published in the journal *Carbohydrate Polymers*. ›

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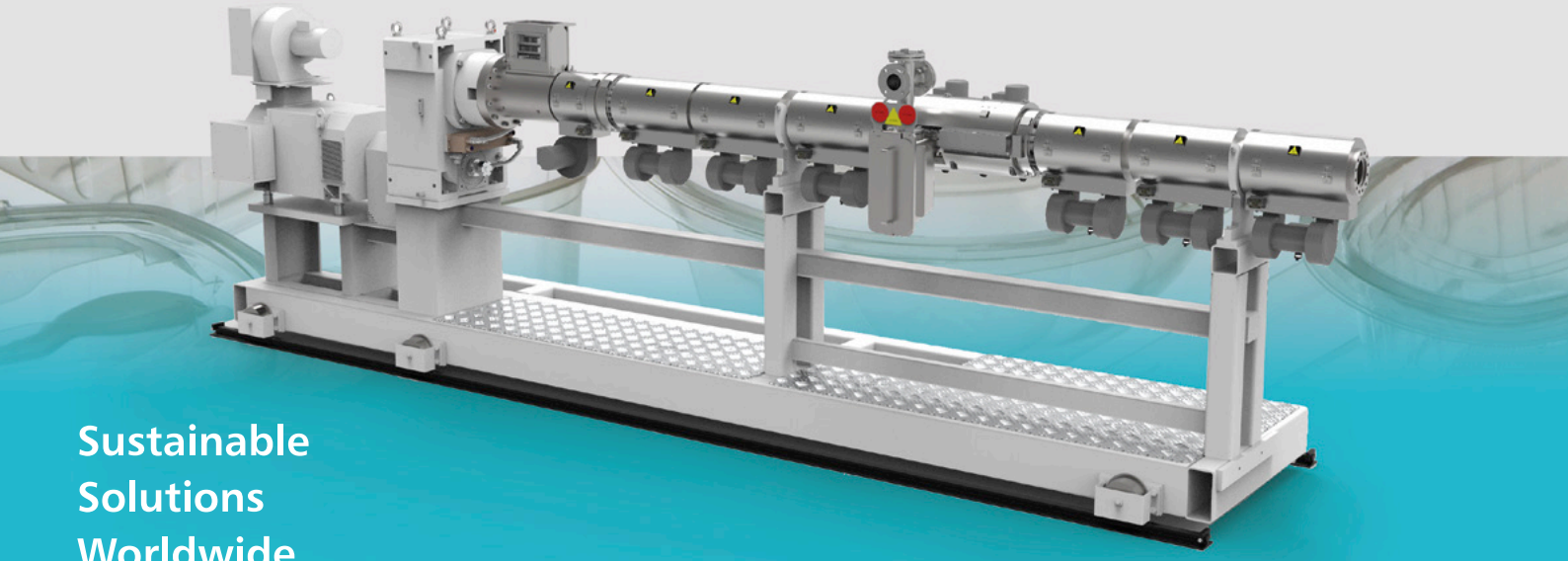

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Derived from potato

Kompuestos has developed a bioplastic made from potato starch that degrades in four weeks.

The company says that the material, part of its Biokomp range, aims to replace traditional supermarket plastic bags for fruit or vegetables. This bioplastic, and three others in the range, have obtained the OK Compost label from TÜV Austria, to certify they are 100% biodegradable in a specific period.

The four certificates obtained by the company are divided into: two 'OK Compost Home' labels for bioplastics suitable for household composting; and two 'OK Compost Industrial' labels for those that are only degraded in industrial composting facilities.

In order to be able to sell the products as biodegradable or compostable, it is mandatory to obtain certificates accrediting the properties that are advertised, which may require between four and fourteen months depending on the level of compostability, said the company.

Biokomp products are made from biodegradable resins derived from different starches – from corn, potato and various cereals. The resins can be processed in standard processing equipment, as a drop-in for traditional petroleum-derived plastics.

"Biokomp is a completely biodegradable and compostable alternative to traditional plastic," said the company.

Adding value at K2019

At K2019, **Total Corbion** showed applications of its Luminy series of PLA bioplastics. A key focus of the display was its high heat resistant grades, which were demonstrated by serving hot drinks in thermoformed Naturesse cups produced by Pacovis. Other exhibits included PLA-based Nespresso coffee capsules from ATI, thermoformed packaging items from Pack & Proper, Danone and Cuki Professional, and PLA-coated paper cups and drinking straws from EcNow Tech and Shanghai Xinxin.

Palsgaard says that all the polymer additives in its Einar range are food-grade and food-approved – as they are sourced from sustainably produced vegetable oils.

Solutions on show at K2019 included anti-fogs and anti-statics. Its anti-fogs include Einar 1122, a water-based, solvent-free dispersion of food-grade additives. Ideal for stretched polyolefin and polyester films, it delivers anti-fogging performance at low coating concentrations and compares well with competing products, says the company.

At the same time, its anti-statics include Einar 601, an amine-free solution for anti-static protection in polyethylene (PE) applications.

The company also showed Einar 201 – a general-purpose mould release and de-nesting additive for PP applications – and dispersing aids including Einar 101, which disperses pigments more effectively than industry-standard waxes.

"Anti-fogs, anti-statics and dispersing aids can be safe enough to eat," said Christina Normann Christensen, product and application manager for non-food at Palsgaard. "Furthermore, using food-grade solutions doesn't mean sacrificing on quality – in fact they commonly outperform fossil-based alternatives."

Left: Palsgaard's Einar range, including anti-fogs, is sourced from vegetable oils

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Below: Kompuestos has developed a bioplastic from potato starch that degrades in four weeks

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IMAGE: SPECTRO

Polymer analysis adapts to a changing world

*New certification requirements, tougher environmental and regulatory regimes, and the growth of Cloud-based data are just some factors playing out in the area of polymer analysis, writes **Jennifer Markarian***

The plastics industry is changing and so is the world of polymer analysis. The use of more recycled polymers, the growing application of in-line measurement, the emergence of artificial intelligence and predictive analytics, ever increasing levels of testing to assure regulatory compliance and the expanding use of laboratory automation along with digitalisation and the shift to paperless and Cloud-based systems are just a few of the trends to watch. With an eye on these changes, analytical equipment suppliers are harnessing the availability of increased data analysis computing power, connectivity and user-friendly "apps" to introduce new and more effective solutions for polymer analysis.

With compounding and use of recycled materials growing, and these re-engineered materials being applied in ever more demanding applications, producers in this segment of the market increasingly need to measure properties and provide certificates of analysis (CoAs). "Consumer product companies using more recyclate want better quality and more data ensuring quality," according to Bill Desrosiers, Vice-President of Business Development at sensor and polymer testing group **Dynisco**. "Recyclers should measure the melt flow rate or intrinsic viscosity (IV) of their polymers."

In part a consequence of this trend, Desrosiers says the company is seeing "a demographic shift in the industry, with an influx of processors who are not familiar with polymer testing." In response, it has aimed to make its advanced melt testing equipment more accessible, with calculations performed in the background and simple interfaces that look

Main image: Analysis technology companies such as Spectro are placing a lot of emphasis on development of software to simplify operation and streamline workflows

IMAGE: AGILENT TECHNOLOGIES

Right: The new Agilent 5800 and 5900 systems provide a range of smart capabilities to simplify analysis of samples, processes, and operational status

similar to traditional, basic lab equipment. Familiar features enhance the comfort level for new users, Desrosiers explains.

In-line measurement systems also benefit compounders using regrind or post-consumer recyclate, which can vary significantly. Dynisco offers several instruments for in-line and on-line melt-flow measurement, for example. "On-line measurement data gives a full picture and allows you to make process decisions in real-time," says Desrosiers.

Intelligent instruments

"Intelligent" instruments can guide users through an analysis, reducing the level of expertise needed. For example, **Agilent Technologies**' latest generation ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometer) systems for elemental analysis incorporate sensors linked to software tools, such as the IntelliQuant feature that collects data from the entire wavelength range, identifies spectral interferences and provides recommendations to the analyst.

Other smart algorithms available in the 5800 and 5900 ICP-OES systems include tools for background correction and curve-fitting and that use data analytics to automate troubleshooting and to assist with method development. In addition, the instruments incorporate sensors and software that track instrument health and alert users when maintenance is required. For example, a Neb Alert feature continuously monitors the nebulizer and alerts the operator when it needs cleaning or is leaking. In the polymers industry, ICP-OES can be used for effectively quantifying and identifying trace elements (for example metals such as zinc that may be components of additives in compounds).

Together with molecular weight (MW), molecular weight distribution is a critical polymer property that can affect processability and end-use properties. MWD can be measured using gel-permeation chromatography (GPC) and size exclusion chromatography (SEC). Agilent's High Temperature Evaporative Light-scattering Detector (HT-ELSD) for high-temperature GPC does not depend on MW and is now linear as a function of concentration; its signal is not dependent on MWD or the type of polymer, so the benefits of increased sensitivity can be used to generate reliable molecular weight characterisations for a range of high temperature soluble polymers, the company says.

The system provides a fast set-up time of one hour, compared to several hours for a typical conventional differential refractive index detector (DRI). Initial tests of the ELSD show a higher signal to noise compared to DRI, which allows for better reproducibility of MWD. This is especially useful for analysis of ultra-high density polyethylene (UHDPE), where sensitivity is problematic using conventional detectors. In addition, the system offers greater flexibility in solvent selection. And solvent gradients can be run at elevated temperatures, enabling the detector to be used for more advanced techniques.

Familiar looks

Spectro's ICP Analyzer Pro software, introduced in 2018 for the company's latest ICP-OES models, features a familiar interface that is claimed to simplify use for inexperienced operators. Features include displays that show only essential information and require minimal mouse movements. Workflows are streamlined, but data processing is even faster than in previous versions, the company claims.

An X-ray fluorescence (XRF) spectrometer is a suitable instrument for identification of materials and detection of additives ranging from large quantities down to trace levels. Instruments are available as handheld, portable, and benchtop units and are suitable for both screening and process control. In polymer compounding processes, a typical application for XRF could be to measure fillers, pigments, flame retardants, and stabilisers, according to Dirk Wissmann, Senior Product Manager at Spectro Analytical Instruments, which is part of Ametek's Materials Analysis Division. XRF can also be used to test

Below: Agilent's HT-ELSD detector for high-temperature GPC is said to provide reliable polymer molecular weight characterisation

IMAGE: AGILENT TECHNOLOGIES

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IMAGE: THERMO FISHER

Right: The Nicolet Summit iS50 FTIR from Thermo Fisher, shown with optional touchscreen, offers enhanced software tools and improved connectivity

materials for compliance with regulatory requirements—it can be used to identify and quantify heavy metals, such as lead, chromium, and cadmium, for example. Wissmann says the technique can also be used to identify and analyse particles on a polymer surface for troubleshooting investigations.

Material identification

Identifying materials and components in materials is important for quality control, product development, and troubleshooting or failure analysis. Fourier transform infrared (FTIR) spectroscopy is commonly used for material identification and analysing materials in blends. "FTIR is useful partly because it is fast—no sample preparation is needed, just put a piece of material on an ATR crystal of the analyser and you can have an analysis in less than a minute," says Michael Bradley, **Thermo Fisher** Product Manager for Nicolet iS50 and FT-IR Microscopes. He says that for polymer compounds and blends, FTIR can provide both qualitative results (identifying polymers and additives) and, once calibrated, quantitative results.

The latest Fisher Scientific Nicolet Summit iS50 FTIR spectrometer provides tools not available on the previous iS5 version, the company claims. The new instrument includes an integrated computer with Thermo Scientific OMNIC Paradigm software that provides connectivity to lab data management systems via Wi-Fi or Ethernet. It also includes access to the Thermo Scientific OMNIC Anywhere application for Cloud-based spectroscopy. This allows data to be accessed and analysed securely on any device.

"Users are looking for the ability to analyse data in the Cloud and even, in some cases, operate the instrument from the Cloud," says Bradley. As an example, he says a central lab may perform method development for global sites and use Cloud access to allow them to manage instruments more efficiently. In addition, service providers can access instruments remotely to undertake troubleshooting or software updates.

The OMNIC software allows users to build workflows easily by dragging and dropping workflow tiles, while an optional touchscreen simplifies the execution of workflows. A dashboard on the interface allows users to create libraries, automate background collection and perform multi-component searching. "Because labs are running increasingly lean, instruments need to be able to be quickly embedded into a workflow and be operated by scientists who are not spectroscopists. There is still a need for expertise in spectroscopy, but the trend is to move to automated pattern recognition for common analyses," says Bradley. Pre-programmed workflows can be designed, for example, to run a method to identify and quantify plasticiser concentration.

Another new feature is a built-in, multi-coloured LED LightBar that gives users immediate visual feedback on instrument status and sample pass/fail results. Having multiple signals, such as this visual indicator in addition to the data on the screen, is a best practice in graphical user interfaces, says Bradley.

Raman spectroscopy offers a complementary technique to FTIR for polymer compound analysis, according to Bradley. Because it is more complex, it is more typically used for qualitative analysis for research and development purposes, rather than quality control. Thermo Fisher has introduced a next-generation family of Raman analysis instruments that includes the Thermo Scientific DXR3xi Raman Imaging Microscope, the Thermo Scientific DXR3 Raman Microscope and the Thermo Scientific DXR3 SmartRaman Spectrometer.

While FTIR looks only at the surface, Raman can see deeper inside a polymer material if the material is transparent to the laser. "Using confocal depth profiling, you can take a series of Raman spectra through the material and then visualiae the

Below: Thermo Fisher's latest generation DXR3xi Raman Imaging Microscope in a lab setting

IMAGE: THERMO FISHER

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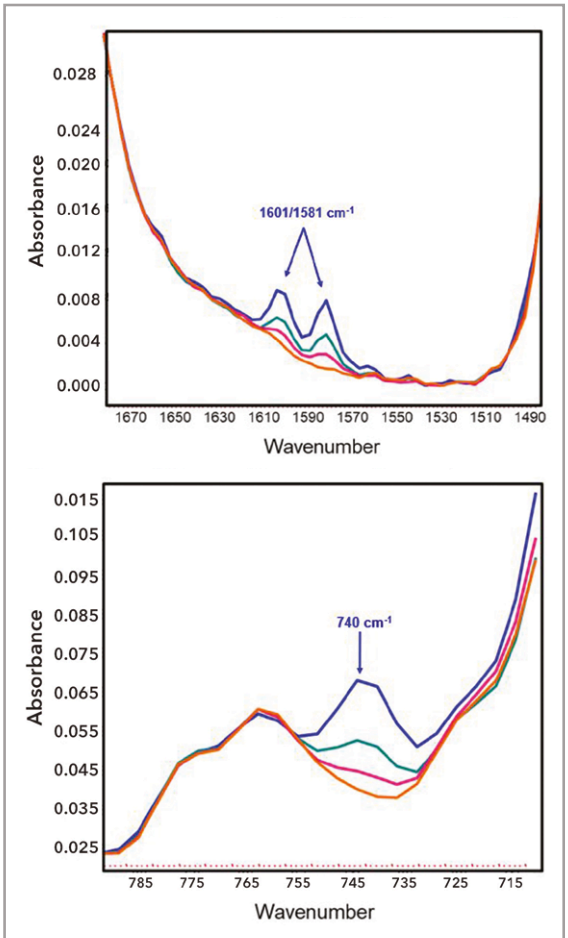
image in three dimensions," explains Bradley. This technique can be used, for example, to examine fiber or filler dispersion through the bulk polymer.

Phthalate analysis

It is becoming increasingly important today to be able to measure and document the absence of chemicals of concern. Phthalate-based plasticicers, for instance, have been commonly used in flexible PVC but concerns about orthophthalates have led to regulatory restrictions, leading to the need to be able to identify their presence. **Actus Analytical** has developed an FTIR method to screen polymer samples and detect orthophthalate plasticiser down to levels of 0.1% (1000 ppm), according to Michael Gray, CEO of Actus Analytical.

The method is positioned as a quality control tool to allow processors to quickly determine whether or not a sample contains an orthophthalate. FTIR is well suited for such quality control tasks, Gray says, because it is a non-destructive, simple, and inexpensive test that gives immediate results. In addition, the chemometric model allows its use by non-technical personnel. The technique was developed for the Agilent 4500 FTIR, which he says is very well suited to the task due to its power and patented permanent calibration.



Chemometric analysis of the presence of different plasticisers in PVC using the Agilent 4500 FTIR and method developed by Actus Analytical
Source: Actus Analytical

"There are approximately 21 orthophthalates, but only 10 of these have ever been made in significant volumes, five to eight of which are banned by various regulations," says Gray. The Actus method takes an FTIR spectrum and looks for characteristic vibrational responses of an orthophthalate within the sample, using chemometric modeling with algorithms that compare the spectra to reference libraries. "Because we can detect below 1000ppm, which is the legal limit in restricted cases, we don't have any 'false negatives'—if no orthophthalate is detected then it contains no orthophthalate," says Gray.

The method can distinguish between orthophthalates and other phthalates (terephthalates or isophthalates, for example) as well as other classes of plasticisers (including adipates and citrates). While FTIR can quantify the level of orthophthalate, it cannot distinguish between different types of orthophthalates (the speciation). However, screening with FTIR allows analysts to determine what samples may need further testing by gas chromatography (GC)-mass spectrometry (MS), if desired, to determine which of the orthophthalates is present and to affirm their concentration.

Paperless laboratories

Digitisation—the move from paper to digital data—takes effort but offers the potential for reduced error, improved data security, automation, and higher efficiency.

Anton Paar has introduced AP Connect, which connects all laboratory devices to one software system that serves as the main data link for transferring lab data to a central database and data management system. The software supports all the company's devices, including viscometers and dynamic-mechanical analysis (DMA) devices, as well as selected third-party devices.

Automated testing equipment is more accurate and efficient than manual methods. For example, robotic testing equipment and software program from **LabsCubed** automatically collects and analyses physical property data from sets of samples. The automated program can be used to speed material development by making testing, data collection, and data analysis more efficient, according to Khaled Boqaileh, CEO of LabsCubed, in a presentation given at AMI's 2019 Polymer Testing & Analysis conference.

The company's CubeOne tensile tester uses a

robotic arm to automatically load and unload samples, while "smart grips" ensure consistent testing. It claims that testing is four times more accurate and twenty times faster than manual tensile testing methods.

Molecular fingerprints

Raman spectroscopy is a light-based technique that can be used to "fingerprint" materials and to understand chemical bonds and molecular structure. **TA Instruments**, a subsidiary of Waters Corporation, has introduced the Rheo-Raman Accessory for its Discovery Hybrid Rheometer (DHR) product line to enable simultaneous collection of rheology (flow properties) and Raman spectroscopy data. This combination helps to develop "a deeper understanding of how chemical structure drives material properties, and how macroscopic deformations can have implications at the molecular level," says the company.

The Discovery TMA 450 Thermomechanical Analyzer from TA Instruments measures dimensional changes of materials from -150 to 1000°C. Sample configurations allow testing in expansion, compression, flexure and tension modes. The instrument can measure a material's coefficient of linear thermal expansion (CTE), shrinkage, softening, and glass transition temperatures. Test options also include stiffness (modulus), damping properties, and creep and stress relaxation over extended experimental time.

IMAGE: MALVERN PANALYTICAL

Above: University of Bristol Pro-Vice Chancellor John Iredale (left) and Malvern Panalytical President Paolo Carmassi seal a partnership to explore advanced digital technologies and AI tools

For applications where fatigue resistance is important, TA Instruments has launched two new

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The MetaStation 4E can optionally be placed on a standard laboratory table or mobile support frame

fatigue-testing instruments that both use a patented, frictionless motor to provide the durability needed for high-cycle testing. Fatigue testing of material specimens or final assemblies uses repetitive stress and strain to determine point of failure. The ElectroForce 3300 Series III offers controlled stress and strain up to 100Hz loading frequency and can be configured with either 1000N or 3000N force capacity. The MSF16 Multi-Specimen Fatigue Instrument can measure 16 samples at a time, which helps to accelerate time-consuming testing.

Atomic force microscopy (AFM) is useful for analysing the structure and properties of polymers. A new instrument from Oxford Instruments' **Asylum Research**, the Jupiter XR AFM, is a large-sample AFM with 200mm sample access and simple software control for R&D duties. The company has also launched the new Ergo software platform for its AFMs. This uses a simplified user interface that is said to make analysis more accessible and uses algorithms to automatically calculate optimal image settings.

Artificial intelligence

The ability to use advanced data analytics and artificial intelligence (AI) to solve problems is advancing rapidly and the polymer analysis equipment of the near future is likely to take advantage of these tools. Uses of predictive analytics could range from predicting analysis equipment health to using large data sets to build models to model behavior of polymer compounds. Last year, **Malvern Panalytical** and the University of Bristol announced a partnership that will focus on areas such as data analytics, machine learning, and AI. Malvern Panalytical also opened its Data Science Hub at Engine Shed, which is an innovation space run by the University. The two partners expect their collaboration to both enhance the future workforce and expand the company's capabilities.

Lab-scale rheometry

Brabender has developed a compact torque rheometer on a laboratory scale.

The new drive unit for rheological measurements can be used very flexibly and provides information on the plasticising behaviour of different materials, including polymers.

The MetaStation 4E is part of a new generation of flexible and versatile drive units. It was specially designed for laboratory use and allows fast measurement of rheological properties. In conjunction with an extruder or mixer measuring attachment, it determines processing and plasticising behaviour.

Using MetaStation 4E for trials has economic advantages over machines that are typically used in ongoing production. Compared to large-volume machines, only a fraction of the raw material quantity is consumed, says Brabender.

The unit is used in research and development as well as in industry. Many applications exist in fields such as materials testing, incoming and outgoing goods inspection and quality assurance.

The modular design of the torque rheometer makes it possible to adapt the test setup to the needs of the application. A wide range of extruders and mixer attachments are compatible with the unit. An optional docking station also allows the combination with larger mixers and extruders, which expands the range of applications.

Compared to older models, the latest product is both smaller and lighter. This means it can be set up directly on the laboratory table. The device is also compatible with MetaBridge software, which offers user-friendly control of several devices and fast transmission, evaluation and export of measurement data.

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Latest applications of polyolefins in film

Polyolefin film may be a commodity product, but there are constant efforts to improve the performance of its many forms.

Speakers at the recent *Polyethylene Films* conference, organised by **AMI**, had plenty to say on the use of PE in film applications.

Emily Silber, applications development and technical service engineer in film and extrusion coating applications at **Lyondell Basell** in the USA, explained how nucleated HDPE might be used to improve the performance of multi-layer barrier film.

The company designed two studies to assess the use of LLDPE and/or HDPE in the core layer of a co-extruded film. (The core layer was LLDPE, HDPE or a blend of the two.) Nucleated HDPE was proposed as the barrier skin layer.

In the first study, using LLDPE rather than HDPE in the core layer changed a number of properties of the finished film. Overall, adding LLDPE to the core layer – with a nucleated HDPE barrier skin layer – improved MD tear, reduced haze and lowered MD modulus.

The slight increase in WVTR was offset by the outer barrier layer.

The second study assessed the effect of M6020SB – a nucleated HDPE – as a barrier skin layer. Using LLDPE in the core increases WVTR, but also boosts MD tear strength.

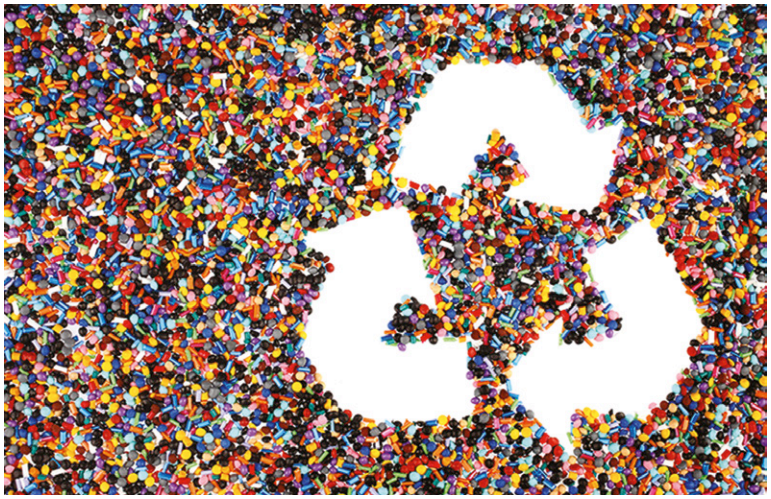
"The improved barrier grade [M6020SB] allows for optimisation of WVTR and MD tear strength," said Silber.

Sealed tight

Several speakers addressed the importance of sealing layers in the creation of multi-layer film.

Vinod Kumar Konaganti, a product development research scientist at **Nova Chemicals** in Canada, stressed the importance of selecting the correct sealant for different applications. This was informed by the fundamentals of the process – in which heat,

Main image: AddWorks PKG 906 Circle from Clariant helps producers re-use their polyolefin manufacturing waste



Above: KNF Flexpack used Baerlocher's T-Blend stabiliser to recycle more post-industrial film into its products

pressure and time cause two polymer surfaces to bond together.

Some important properties for sealants include: versatility – including good seal performance and easy processability; performance – including high hot tack and seal strength; caulkability; and high speed – including quick melting and setting.

He said that Nova offers a number of sealants that perform well in certain of these areas. For instance, its FP120 is a versatile sealant, while its VPSK914 performance sealant offers better hot tack and cold seal performance.

In a 'real' nine-layer co-extruded film, a package for cheese – requiring a nylon barrier – will need different sealants to an all-PE film for packaging fruit.

Nova tested these sealants in a number of scenarios. The performance sealant generally outperformed the versatility sealant – in areas including leak performance and lower seal onset temperature.

"The selection of a sealant depends on the demands of the package," he said.

He said that Nova had developed novel test methods to evaluate and select appropriate sealant resins for real-world packaging applications.

In similar fashion, Greg Griffin of Mitsui Chemicals told delegates how its Tafmer sealants can improve the performance of different types of packaging.

One example is to improve sustainability, by allowing packaging to be made from PE only – which improves recyclability. Its Tafmer A, an ethylene-based copolymer, offers low seal initiation temperature (SIT), high impact resistance and high pin-hole resistance. A mix of 70% LLDPE with 30% Tafmer A showed a good balance of high seal strength and low SIT.

Light work

Additives play an important role in improving the performance of polyolefin products, and several speakers explained how this has worked in practice.

Michael McLaren of **Ingenia Polymers** in Canada explained how the company developed a range of HALS-based masterbatch formulations for greenhouse film.

Hindered amine light stabilisers (HALS) are used to prevent UV damage in applications such as greenhouse film – in order to extend its lifetime.

Ingenia's objectives were to evaluate and benchmark HALS packages on the market, and develop mid-range and high performance HALS packages that also had pesticide resistance.

Its IP1368 package offers optimised, mid-range performance, while its IP1369 offers higher performance – and is recommended for service lives of longer than four years. Both grades offer pesticide resistance – and can be used in typical applications where combinations of LDPE-EVA and LLDPE are used.

"By thoroughly comparing the performance of different types of HALS and synergistic additives, we have developed two packages for greenhouse films," he said.

Evaluation is continuing, with the packages undergoing Xenon arc exposure to gather extra performance data, he said.

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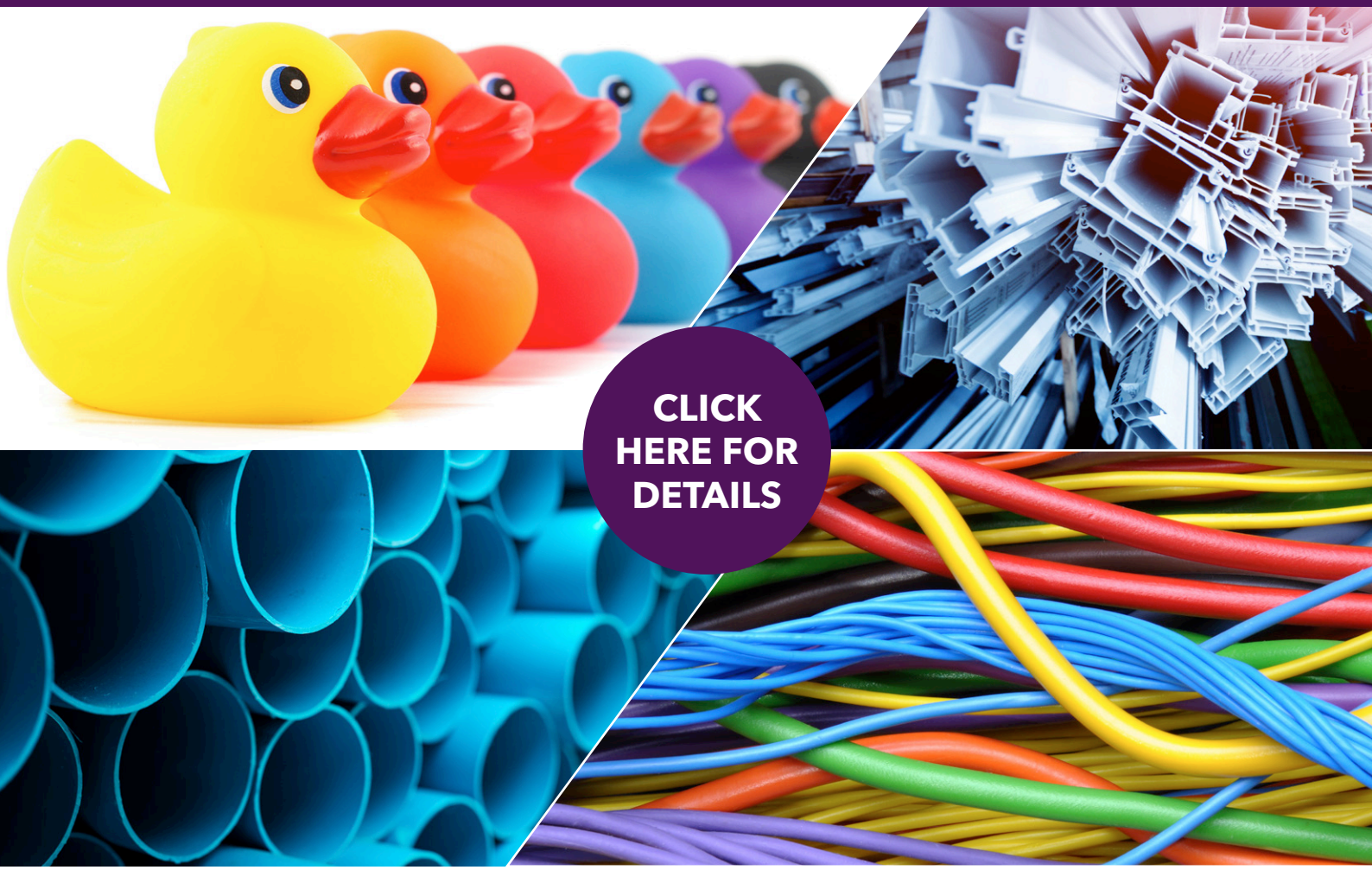

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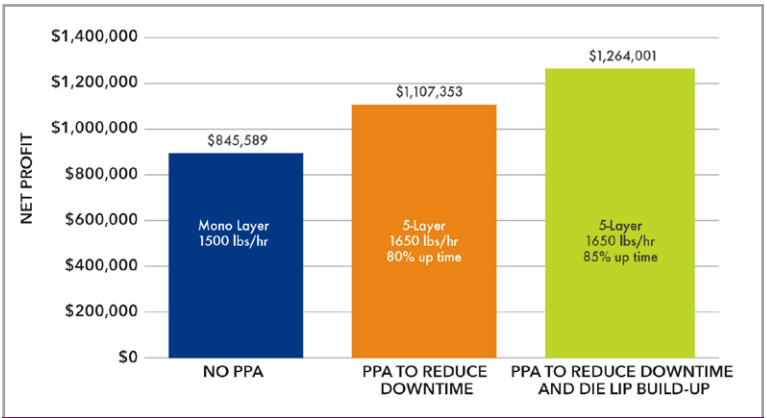

How reduced downtime and die lip cleaning increase net profit
Source: Shell Polymers

Processing aids

Dan Falla, senior technical service for films at **Shell Polymers** in the USA, highlighted how polymer processing aids (PPAs) can boost extrusion performance.

He said that the company's PPAs – which typically use a combination of fluoropolymers – can help to raise film extrusion output by coating internal extruder components such as die lips and walls. This can help to reduce drag and back pressure – and increase output.

In one case study, he said it was important to determine the economic cost-advantage of PPA addition. Factors such as a reduction in back pressure, as well as a drop in motorload, can contribute to cost savings.

He summarised the effect of adding the company's PPA – at 500ppm and 800ppm – to the extrusion of hexene LLDPE film at 1500 lbs/hour. At the upper end, over a whole year, output had risen by more than 1m lbs. This equated to a net profit of around US$1m – an increase of about 20%.

For multi-layer film, adding the PPA helped to reduce the thickness of the layers – which further reduced cost – boosting net profit by around 30%.

In a second example, PPA was used to reduce die lip build-up by creating a coating at the die exit. This reduced downtime because there was less need to clean the die, less scrap and less variation in film thickness. It resulted in 85% uptime, compared to 80% without the PPA. This helped to raise net profit by nearly 50%.

"Using PPA reduces downtime and can increase output – improving productivity and bottom line profits," he said.

Optical improvement

Kysle King, technical sales manager at **Sibelco**, said that different anti-block formulations could help to improve the optical properties of LLDPE films.

He said that the company's nepheline syenite is a high clarity anti-blocking agent that is typically used in agricultural film and other applications.

The company tested its Minibloc HC1400 against other anti-blocks – diatomaceous earth (DE), talc and synthetic silica – by extruding Dowlex LLDPE resin on a blown film line. The film was tested for haze/clarity, transparency and blocking.

For haze, a loading of 0.5 wt% showed the best result. For clarity, 0.5 wt% was most effective – with 0.75 wt% in second place, ahead of other formulations.

Transparency was tested by shining an LED light source through the film. Software interpreted the data, reporting faults such as gels, holes and die lines. Results were calibrated against DE at 0.5 wt%. Taking this as 100% transparency, HC1400 came out at around 104% – the best result. The same was true for the higher loading. Both loadings showed a transparency of more than 90% – better than any other anti-block.

The blocking force at 0.75 wt% was around 3g – the best result.

In direct comparison with DE, King said that Minibloc allowed higher loadings (of up to 70%), better top size control and better clarity/lower haze.

He said there are three specific grades: HC500 for thin films; HC1400; and HC2000, for thicker films such as agricultural film.

■ Papers from the recent *Polyethylene Films* conference, organised by **AMI**, are now available. Contact Alexandra Fish on +44 (0) 117 314 8111 (**alexandra.fish@ami.international**) for more details.

Stable performance

At K2019 last year, there were several additive innovations to boost recycled polyolefins.

Clariant showed its AddWorks PKG 906 Circle stabiliser. It allows producers of polyolefin films to increase the reuse of recyclate in their products – such as their own reground scrap – without any loss of performance or processing efficiency.

It is particularly well-suited for BOPP film, says Clariant, but is also applicable to cast and blown film processes. With Clariant's additive, the reuse content of the post-production waste in the final film can be increased by up to 30%, the company says.

At the same time, the additive protects the resin so that film quality is maintained – with significant reduction of gel formation and prevention of additional yellowing at high line speeds.

AddWorks PKG 906 Circle helps to make plastic waste reusable, without compromising packaging film quality – and increases the efficiency of the manufacturing process, says Clariant.

Post-industrial re-use

KNF Flexpack, a US-based film converter has improved the quality and consistency of its polyethylene film – which is made completely from post-industrial PE film – thanks to Baeropol T-Blend resin stabiliser from **Baerlocher**.

The technology resolved issues of variable film quality by preventing gels, bubble instability and haze that previously prevented KNF from using post-industrial film in certain applications.

In a separate trial, KNF and Baerlocher joined up with recycling specialist Erema – which reprocessed film scrap stabilised with the Baeropol T-Blend during testing at its facility in Ipswich, USA.

"Thanks to the high quality of the post-industrial film incorporating Baeropol T-Blend, we can now run 100% recycled material with confidence in its quality and consistency," said Ray Glenn, sales director at KNF.

Before, it would have had to blend the recyclate with expensive virgin material. Now, the production rate for recycled material is almost equal to that of prime material, he said.

"Further, since film lines can now run more efficiently – and recycled materials can be used in higher-end products – our business has become more sustainable and cost-effective," he said.

KNF wanted to increase the use of scrap from its film production processes in other applications but encountered quality problems. The blown film process subjects resin to high-shear and temperature conditions that can cause degradation. Recycling this film without adding stabilisers can cause crosslinking – creating gels and variable melt flow that affect quality and processing.

During trials, Baerlocher identified its T-1111 TX resin stabiliser as a best candidate to help resolve these quality issues.

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Health kick: new medical materials and applications

Recent examples of extruded medical products – including a thermoformed package for implant screws – show that innovation is thriving

Main image: Placon's custom thermoformed tray keeps medical screws suspended to prevent damage to the specialist coating

While many applications of plastics in the medical industry are related to injection moulding – especially for medical devices – there is also a huge amount of film extrusion, particularly in packaging.

There is also a huge demand for thermoforming. The thermoforming division of the US-based **Society of Plastics Engineers** (SPE) announced several medical industry winners in its annual parts competition. These included a tray to keep bone screws in place, a part for a neonatal unit and an enclosure for medical equipment.

In the roll-fed thin gauge industrial category, US thermoformer **Placon** won for a custom tray that keeps medical screws suspended to prevent hydroxyapatite (HA) coating damage.

The product, made for medical device manufacturer Orthofix, is a tray package designed to hold two medical screws – coated with HA – in place until they were used in the operating room. The HA coating on each screw helps reduce the screw from backing out of the bone after being implanted into the patient. Once screws are fastened into the retainer base, a retainer cover snaps into place to create a second secure barrier for the HA-coated screws.

The tray and all packaging components are made from PETG. The tray comprises two designed parts – a retainer tray and tray cover – and two pre-validated, double sterile barrier trays. These go inside each other and hold the newly designed tray and tray cover.

The customer is using the double sterile barrier trays to package around 2,000 different products from its portfolio. Placon was able to save over US$50,000, as this is the average cost of validating a new medical package.

The customer had to find a solution that would hold the product without causing the HA coating to rub off while in the package – which would make the product defective.

This was done by creating a locking retainer for the head of the screw, while keeping the body of the screw suspended.

Clear winner

Profile Plastics was also a winner, in the cut sheet heavy gauge vacuum forming category. It won a gold award for a clear part – made from cast acrylic sheet. The part requires total clarity on all flat surfaces to give nursing staff an unimpeded visibility of premature new born babies.

At the same time, a precisely 'shaded' section was required, to hide the unit's electronics and wiring. This was done via distortion printing of each sheet of cast acrylic prior to forming. Ridge forming was chosen for the moulding process. To achieve the customer's target price point, the part was produced in a rotary forming machine equipped with a quartz oven.

›

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Portland / 2020

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April 7-8, 2020
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Robotic assembly

Wilbert Plastics was also a winner, for a medical equipment enclosure that is thermoformed, robotically trimmed then assembled using vision systems and augmented work instructions to ensure a complete and correct assembly.

The main equipment component is thermoformed and robotically trimmed to the customer's specifications. It is then moved into an assembly area for completion. The assembly has 88 components and 28 steps, so it is critical that all components are correct, and all steps are completed correctly prior to shipment.

Assembly operators are guided by augmented work instructions which are projected on the main component part surface showing/describing assembly steps, component part numbers and locations. Multiple vision systems are used to ensure the correct component(s) are used at each step in the assembly process and that each is in the proper location. Overall assembly process is completed ensuring all components are installed and in their correct locations, so the customer is confident the assemblies that are shipped directly to their end customer are complete.

Medical PP

Braskem of Brazil has launched a new portfolio of polypropylene (PP) grades for the medical industry, which are available in Europe.

The range, called Medcol, are aimed at medical devices and pharmaceutical packaging. They were created in collaboration with Braskem's customers, to ensure that they met their specific needs.

The grades are made with phthalate-free catalyst technology and have been tested to European and US Pharmacopeia standards. Braskem says there will be no formulation change to the grades without a two-year notification period.

"We aim for the high quality standards that are requird in this industry, but also want to be the cost leader in the segment," said Tim Wagler, commercial director of renewable chemicals for Europe and Asia at Braskem.

The grades were launched at K2019 last year. The company says that it is planning to add more materials to the portfolio.

Isabelle Rothe, segment leader for healthcare at Braskem, added: "Healthcare is a key segment for us. We plan to expand our portfolio and become a partner of choice in the healthcare industry."

REPORT

Single-use Plastics Products in Europe

Market magnitude in the convenience & retail channels and the regulatory context

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MD&M highlights

Clariant will use the forthcoming MD&M West exhibition in the USA to celebrate the tenth anniversary of the launch of its Mevopur medical-grade materials.

A new branding scheme, called 'Color of Innovation', which is launched globally in conjunction with the anniversary, aims to capture the nature of the Mevopur family – which includes compounds, concentrates, regulatory support and more.

All Mevopur materials – including colour and additive concentrates and 'ready-to-use' polymer compounds – are made at three dedicated EN:ISO13485-2016 registered facilities. These have been pre-tested to support compliance needs of customers in US and Europe.

In just the last few years, Clariant has boosted compounding capacity at its plant in Lewiston, Maine (USA) – and will soon announce expansions in Asia.

"We apply multi-industry problem-solving expertise grounded in deep technical and regulatory knowledge to help ensure the safety, compliance and performance of our customers' products," said Steve Duckworth, global head of marketing and business development at Clariant.

Meanwhile, **Polyplastics** is to show its latest material offering for the medical and healthcare market at the show. As well as a new series of acetal materials – for injection moulding – it will show its Topas cyclic olefin copolymer (COC). COC is a clear material that offers a range of properties – including stiffness and barrier resistance. It is used for a variety of applications, including pharmaceutical blisters and trays.

Packaging range

Tekni-Plex will show a range of medical device films, as well as adhesive and extrusion laminations at MD&M West.

For thermoformable rigid medical device tray applications, the company will show its TekniMD

Left: Clariant is launching a new branding initiative on the tenth anniversary of launching its Mevopur range

PXA structure – a lamination of its proprietary PX film and Aclar. It is aimed at products that require an enhanced moisture barrier.

Also suitable for thermoformable medical device applications is TekniMD COC.PG, a PETG/COC/PETG coextrusion. Both TekniMD films structures can be sterilised using gamma, EtO or e-beam and are available in clear, white or blue tint.

The company's healthcare packaging businesses (Tekni-Plex Flexibles, Tekni-Films, Lameplast, LF of America and Beyers Plastics) make flexible packaging for the medical device and pharmaceutical markets at nine manufacturing plants in North America and Europe.

Separate to this, Tekni-Plex announced it was bringing all its medical brands – Colorite, Natvar and Dunn – into a single division called Tekni-Plex Medical. The business will supply medical products, including specialist compounds and tubing, to medical device manufacturers from a single source. Its sales team will represent all product lines.

Manufacturing will be done at the same locations, and the Colorite, Natvar and Dunn will continue be used as product brands. Colorite includes PVC and TPE medical-grade compounds; Natvar is known for multi-layer and multi-lumen tubing, and other extruded products; and Dunn makes precision tubing for catheters and minimally invasive devices.

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Left: Tekni-Plex offers a range of thermoformed medical products

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AMI's Plastics Regulations conference takes place in Cologne in March, covering everything from food contact and chemical regulation through to the single-use plastics directive. We preview the event

IMAGE: SHUTTERSTOCK

Keep in touch with regulation

AMI's fourth Plastics Regulations EU conference takes place on 11-12 March in Cologne, Germany, providing a valuable opportunity to gain focused advice on a range of legal and compliance issues impacting on polymer producers, compounders, processors and end users. Bringing together a wide variety of leading legal experts, the conference presents a cost and time efficient way to future-proof your business by making sure you are aware of changing and developing regulations.

This year's event will be preceded by a standalone pre-conference Brexit workshop that will explain the potential regulatory and trading implications of the UK's departure for UK, EU and non-EU companies. See the box on the following page for more information on the expert speakers and content or click **here**.

Plastics Regulations 2020 will open with a global regulatory update on the plastics economy, which will be presented by **Peter Sellar**, Partner at **FieldFisher** in Belgium. This will be followed by an overview of international economic sanctions presented by **Siegfried Richter**, Policy Officer at the **European Commission**. Then **Bonita Reynolds**, Senior Director Authoring Services at **Verisk 3E** in the US, will speak about the US Toxic Substances Control Act (TSCA) and achieving compliance for plastics.

Recycling issues

It would be difficult to underplay the importance of recycling and waste regulations in today's business environment. **Joachim Quoden**, Lawyer at **Law Firm Joachim Quoden** in Germany, will provide a perspective on the impact of the initiatives and tools being used to build the circular economy. Then **Luke Douglas-Home**, Managing Director of **Clear Public Space** in the UK, will share details of a study highlighting differences in plastic packaging regulations across EU member states (and the UK).

The next session will turn to the topic of REACH. **Marcus Navin-Jones**, a Partner at **Keller and Heckman** in Belgium, will ask whether REACH authorisation is becoming a barrier to recycling and re-use of plastics. **Dr Frank Friedel**, Senior Chemicals and REACH Consultant at **TSG Consulting** in the UK, will give an overview of the Single-Use Plastics Directive and the REACH regulation. And **Filippo Mattioli**, an Associate at **Steptoe & Johnson** in Belgium, will cover

Main image: AMI's fourth European Plastics Regulations conference will update on food contact, packaging and recycling regulations

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EUROPE
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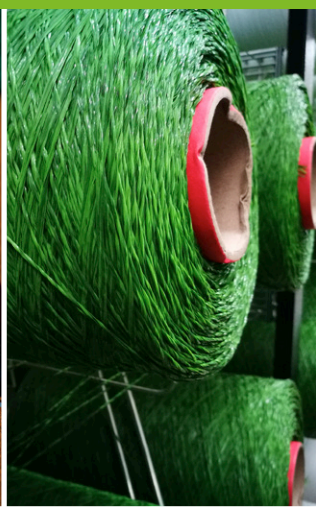
23–25 March 2020, Hilton Barcelona, Barcelona, Spain



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microplastics and the moves towards REACH restriction.

The final session of the first day looks at sustainability issues. It will be opened by **Dr Gary Ogden**, Technical Manager at **Wells Plastics** in the UK, who will discuss regulations and standards covering oxo-degradable plastics. Regulations applicable to plant-based additives for plastic food contact materials will be explored by **Job Ridderbecks**, Food Contact Technical Specialist at **Intertek** in Germany. Then **Ines Zitterbart**, Senior Regulatory Consultant at **Yordas Group** in Germany will bring the day to a close with an explanation of the challenges and misconceptions relating to biodegradable plastics.

Expert discussions

The second day of Plastics Regulations will open with a panel discussion exploring the outcome of the EU framework review and the implications it holds for the plastics industry. Expert participants will include: **Marcel Bosma**, Regulatory Expert at **SABIC** in the Netherlands; **Dr Peter Oldring**, Manager Regulatory Affairs – Europe at **Sherwin Williams** in the UK; and **Dr Anna Gergely**, Director EHS Regulatory at **Steptoe & Johnson** in Belgium.

The conference then turns to discuss the challenging topic of non-intentionally added substances (NIAS). **Dr Stamatios Stamenitis**, Senior Principal Scientist SRA at **Mars** in Germany, will open the session with an overview of what is happening in Europe in this area. NIAS testing, database implementation and post-run evaluations will be detailed by **Dr Marinella Vitulli**, Technical and General Manager at the **Food Contact Center** in Italy. And **Dr Christian Kirchnawy**, Team Leader at the **OFI Austrian Research Institute** will talk through safety assessment of food contact materials, including the value and limitations of in-vitro bioassays.

Registration of food contact resins and additives in China will be covered by **Ran Liu**, Regulatory Consultant at **CIRS Group** in Ireland. Then **Dr Ralph Derra**, Managing Director of **ISEGA** in Germany, will share some new developments in test methods for plastics in contact with food.

The final session of Plastics Regulations 2020 looks at regulation of specific additives. **Alfred Voskian** and **Jytte Syska**, both Consultants at **Syska Voskian Consulting** and based in the US and Denmark respectively, will outline the current state of play on pigments used in plastics. And **Mark Carpels**, Environment Product safety and CSR at **Campine** in Belgium, will discuss the impact of REACH on antimony and other metals.

Brexit – find out what it will mean for you

The UK's departure from the EU will have far-reaching consequences for many companies. And those consequences are not restricted to EU and UK firms; they will also affect companies from outside the EU that have, until now, used a UK subsidiary or representative to access the European market.

With this in mind, AMI has assembled a special one-day Brexit Workshop that will highlight the legal implications of Brexit and their potential impact on businesses trading from or to the EU, UK and other global locations. Taking place one day before Plastics Regulations 2020 on 10 March 2020, the event will be run by three experts on international trade and regulation: **Paul Ashford**, Managing Director of **Anthesis-Caleb** in the UK; **Simon Tilling**, Partner at **Burges Salmon** in the UK; **Dr Anna Gergely**, Director EHS Regulatory at Steptoe & Johnson in Belgium.

Each host will run a session looking at the impact of Brexit from different perspectives, allowing attendees to build a picture of the potential risks it entails and to formulate a readiness strategy. The workshop will be broken up with round table discussion periods moderated by the workshop hosts.

Find out more and book your place **here**.

Learn about Plastics Regulations 2020

AMI's fourth Plastics Regulations Europe takes place on 11-12 March 2020 at the Pullman Cologne Hotel in Cologne, Germany. It will be preceded by a special one-day Brexit Workshop on 10 March 2020 (see the box above or click **here**).

The conference will bring together a selection of expert speakers to detail the latest regulatory developments impacting on the plastics industry, from chemicals and food contact through to recycling and single-use packaging. Aside from the formal presentations, it will provide extensive networking opportunities during the break-out sessions and complimentary cocktail reception.

To find out more, contact the conference organiser, Emily Nicholson. Email: **emily.nicholson@ami.international** *Tel: +44 (0) 117 314 8111*. Or visit the **conference website**

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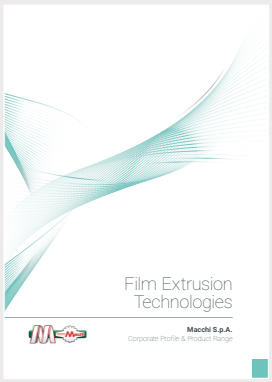

This 28-page brochure from Macchi covers the company's wide range of film extrusion technologies including coextrusion lines, wide webs, die heads, take offs, winders, trim recovery and control systems.

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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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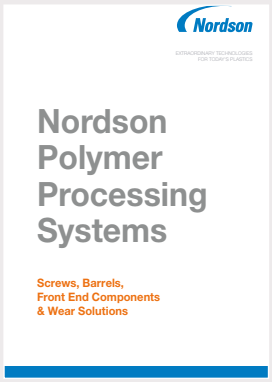

In this Nordson Polymer Processing Systems brochure, find out about Xaloy bimetallic extrusion screws and barrels, designed to meet process requirements, help optimisation, combat wear, boost output, and improve and maintain quality.

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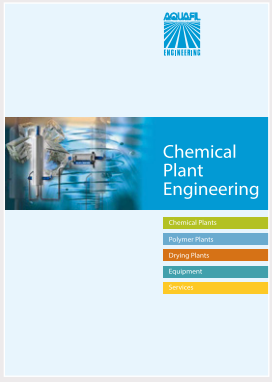

This 12-page brochure from Aquafil Engineering details its comprehensive range of chemical plant engineering capabilities, which include polyamide polymerisation, polyester condensation and polymer drying installations.

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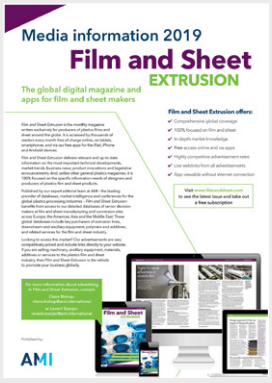

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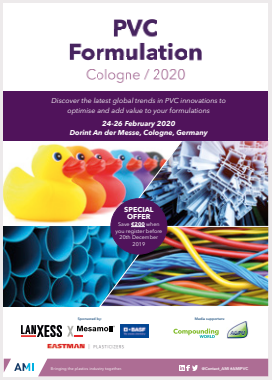
PVC FORMULATION



Taking place in Cologne, Germany, on 24-26 February 2020, AMI's 12th PVC Formulation conference will expose the global trends influencing the flexible and rigid PVC industry and explore regulation, additives, materials and processing.

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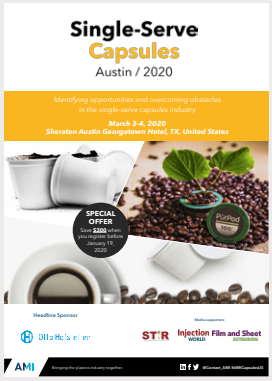
SINGLE-SERVE CAPSULES



The 3rd edition of AMI's international Single-Serve Capsules conference in North America, on March 3-4, 2020 in Austin, Texas, brings together industry-elite speakers from the entire supply chain to evaluate and discuss the trends, challenges and opportunities facing the sector.

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PLASTICS REGULATIONS

The 4th edition of Plastics Regulations provides advice on a range of compliance issues at one event, taking place on 11-12 March 2020 in Cologne, Germany. The conference provides an ideal environment for regulatory updates.

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POLYMERS IN FOOTWEAR USA

The second edition of AMI's North American Polymers in Footwear conference takes place in Portland, OR, USA, on 7-8 April 2020, presenting a comprehensive analysis of the latest advances in footwear materials and processing technologies.

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POLYMER SOURCING & DISTRIBUTION

The AMI event specifically created for companies involved at every stage of the European polymer supply, Polymer Sourcing & Distribution, takes place in Hamburg on 12-14 May 2020, reviewing recent trends in sourcing options for both commodity and engineering resin grades.

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MULTILAYER FLEXIBLE PACKAGING

The 11th edition of the Multilayer Flexible Packaging conference takes place on June 30 and July 1 2020 in Chicago. Expert speakers share the latest market insights and developments in high-value films.

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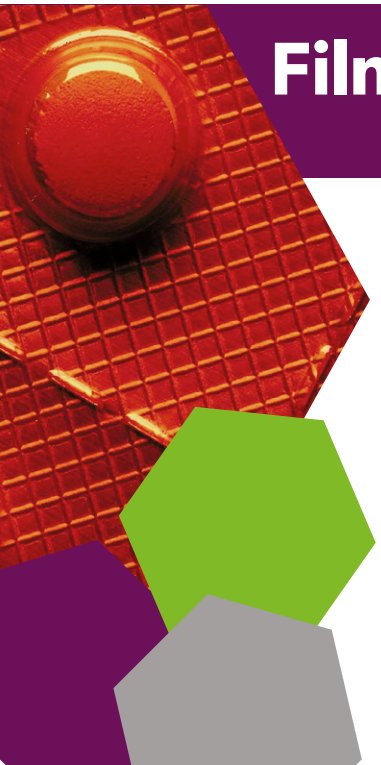
Vishakha Polyfab

Head office:	Ahmedabad, Gujarat, India
Managing director:	Jigish Doshi
Founded:	2001
Ownership:	Private
Profile:	Vishakha was founded in 2001 and is a specialist in multi-layer packaging. The company produces five-, seven- and nine-layer co-extruded film at its plant in Vadsar, Gujarat. It supplies its products to a number of markets including food packaging (for products such as milk, edible oil and sauces) and non-food (including electronic components and personal care products).
Product lines:	The company's films are used in a variety of products. One example is its VishVacu range of barrier pouches for vacuum packaging. Others include: VishForm (clear formable film); VishLami (a range of printed, laminated film); VishBarr (barrier films for VFFS applications); VishTop (for tray lidding); and VishPE (PE shrink wrap films). It also has a range of ziplock pouches sold under the Zipfresh brand. Products from its sister companies include drip irrigation hoses and EVA backsheets for solar modules.
Factory location:	The company's facility in Vadsar is equipped with a wide range of production equipment – including co-extrusion, printing, lamination and pouch making. Here, it produces a variety of PA- and EVOH-based barrier films. Vishakha recently installed an AquaFrost water-quenched blown film line from Brampton Engineering – the first in India to do so. The company says the new line – which adds to several previous Brampton installations – will help it to improve film clarity and thermoformability, balance orientation and increase processing versatility with fewer resins. In addition, the company uses ERP software from SAP.

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:

March 2020
Thermoforming applications
Additives for film
Control & instrumentation

April 2020
Flat die developments
Agricultural film
Film winders
Chinaplas 2020 preview

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

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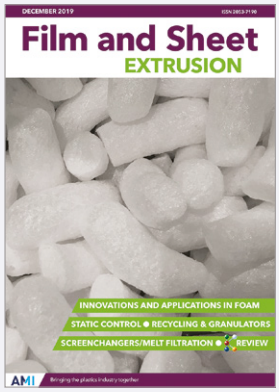

Film and Sheet December 2019
The December 2019 edition of Film and Sheet Extrusion looks at the latest developments in foamed sheet. It also reviews new introductions in melt filtration, static charge control and granulation equipment, plus some of the best from K2019.

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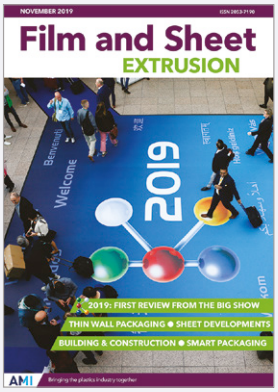

Film and Sheet November 2019
The November edition of Film and Sheet Extrusion magazine looks at intelligent and thin wall packaging developments. It also explores the latest sheet and construction innovations and reviews the K2019 show.

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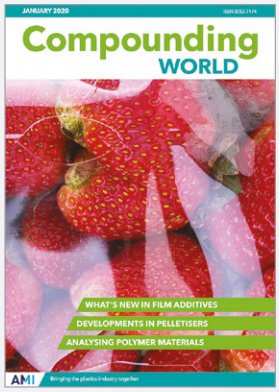

Compounding World January 2020
The first edition of Compounding World in 2020 explored the latest developments in additives for film materials. It also looked at some of the most recent innovations in pelletisers and polymer analysis equipment.

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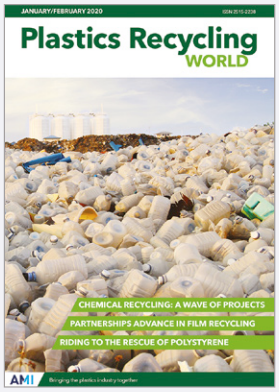

Plastics Recycling World January/February 2020
The January-February of Plastics Recycling World takes a deep dive into chemical recycling, with features on the many technologies being developed for polyolefins and polystyrene. Plus the latest on film recycling technology and projects.

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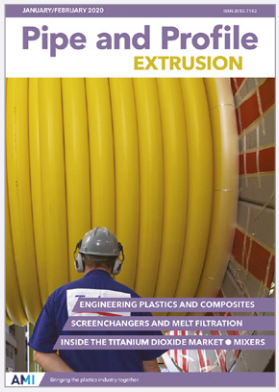

Pipe and Profile January/February 2020
The January-February issue of Pipe and Profile Extrusion looks at applications using engineering plastics and composites, provides updates on mixing technology and melt filtration and delves into the titanium dioxide market.

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Injection World November/December 2019
The November/December edition of Injection World takes explores new developments in hot runners and engineering thermoplastics. It also examines some of the latest automotive applications and details innovations on show at K2019.

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Compounding WORLD

Film and Sheet EXTRUSION

Pipe and Profile EXTRUSION

Injection WORLD

Plastics Recycling WORLD

GLOBAL EXHIBITION GUIDE

2020

24-26 February	Plastics, Printing & Packaging, Addis Ababa, Ethiopia	www.expogr.com/ethiopia/pppexpo
9-11 March	Plast Alger, Algiers, Algeria	www.plastalger.com
11-12 March	Plast Expo Nordic, Helsinki, Finland	www.plastexpo.fi
11-13 March	Expo Plasticos, Guadalajara, Mexico	www.expoplasticos.com.mx
26-28 March	MECCSPE, Parma, Italy	www.mecspe.com
21-24 April	Chinaplas, Shanghai, China	http://www.chinaplasonline.com
7-13 May	Interpack, Dusseldorf, Germany	www.interpack.com
12-15 May	Elmia Polymer, Jönköping, Sweden	www.elmia.se
13-15 May	Plastic Expo, Osaka, Japan	www.plas.jp/en-gb.html
3-4 June	Plastics Extrusion World Expo Europe, Essen, Germany	https://eu.extrusion-expo.com
29 Sep-1 Oct	Interplas, Birmingham, UK	www.interplasuk.com
13-17 October	Fakuma, Friedrichshafen, Germany	www.fakuma-messe.de
4-5 November	Plastics Extrusion World Expo USA, Cleveland, USA	www.extrusion-expo.com/na/
8-11 November	Pack Expo, Chicago, USA	www.packexpointernational.com
23-26 November	All4Pack, Paris, France	www.all4pack.com

AMI CONFERENCES

17-18 March 2020	Plastic Pouches, Vienna, Austria
20-22 April 2020	Stretch & Shrink Film, Barcelona, Spain
23-24 June 2020	Thin Wall Packaging, Chicago, USA
30 June – 1 July 2020	Chemical Recycling, Hamburg, Germany
30 June – 1 July 2020	Multilayer Flexible Packaging, Chicago, USA
28-30 September 2020	Biax Film, Madrid, Spain
16-18 November 2020	Waterproof Membranes, Bonn, Germany
17-19 November 2020	Multilayer Flexible Packaging, Vienna, Austria

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

3 – 4 June, 2020

ESSEN, GERMANY

PLASTICS EXTRUSION WORLD EXPO

COMPOUNDING WORLD EXPO

4 – 5 November, 2020

CLEVELAND, OHIO

www.ami.international/exhibitions