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Film and Sheet EXTRUSION

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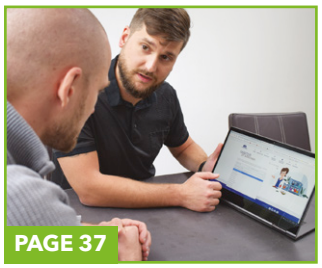

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Mondi adds extrusion and printing in Russia

Packaging specialist Mondi has added new capacity at two of its plants in Russia.

The company is to install a new machine at its Pereslavl facility in early 2021, which will help it to expand printing capacity. This will allow it to offer both flexographic and rotogravure printing to customers.

At the same time, Mondi will install a nine-layer co-extrusion line at its plant in Aramil, to produce high-barrier films by the end of this year. The company will now offer a range from mono-materials to multi-layer high-barrier laminates.

This will help it to meet rising demand for sustainable packaging for the confectionery, food and dry and wet pet food markets.

"Russia is an important region for Mondi, which is why we have integrated the supply between both Aramil and Pereslavl, now called Consumer Flexibles Russia," said Peter Orisich, CEO of Mondi Flexible Packaging.

Above: Mondi is boosting production capacity in Russia

The new capabilities and portfolio will be available for customers during the first quarter of 2021.

■ Mondi recently teamed up with Austrian meat producer Hütthaler to produce a recyclable thermoforming film – made from a mono-material – for its meat and sausages. The film is fully recyclable and provides a barrier to protect the food and extend its shelf life. The Cyclos-HTP Institute for Recyclability and Product Responsibility has awarded the film its 'AAA' classification for recyclability.

Hütthaler's requirement was to replace its previously used film with a recyclable solution.

› **www.mondigroup.com**

NEWS IN BRIEF...

Pontacol, a Swiss manufacturer of adhesive film, has merged operations with Emerall – which has film extrusion plants in Buxtehude, Germany and Schmitten, Switzerland. It says that the new company will merge the development and sale of Pontacol with the production capacities of Emerell – to create a competence centre for thermoplastic functional and adhesive films Pontacol. Ralf Hoppe will continue in his role as general manager of Pontacol.
www.pontacol.com

Scanfill has acquired the assets of Jiha Plast – a foil manufacturing company based in central Sweden. The deal is expected to increase sales by €2 million, create new jobs and open up a whole new market, says Scanfill.
www.scanfill.se

Domo stops BOPA production in Germany

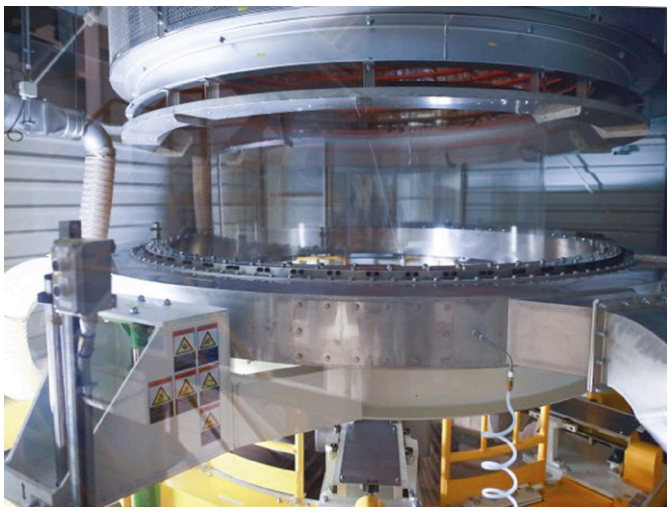
Domo Chemicals is to stop production of biaxally oriented polyamide (BOPA) films at its facility in Leuna, Germany.

The decision to end production – which will take place over the summer, was made as a result of global overcapacity for nylon films, said the company. Affected employees have been informed. Other operations at the Leuna plant, such as Domo's polyamide 6 core operations, will not be affected by the move.

"In these extraordinary circumstances of high business volatility, we have continued to focus on quality and flexibility through cautious and smart asset management, rather than reacting with short-term volume strategies," said Attilio Annoni, Managing Director at Domo Film Solutions (DFS).

DFS will continue to run its BOPA and cast PA lines in Cesano Maderno, Italy.

› **www.domochemicals.com**



Above: Domo is closing the BOPA line at its Leuna plant

Colines appoints new CEO

Anthony Michael Caprioli is the new CEO of Italian machinery manufacturer Colines.

He joined the company around a year ago, as a board member and commercial director. Caprioli earlier spent eight years as managing director of Macchi, and also sat on the board of Amaplast – the trade association for Italian plastics machinery manufacturers.

Caprioli said: "My goal is to further develop our activities by widening our range of extrusion lines, as well as reconsidering our strategies related to activities that currently are not part of our core business."

Eraldo Peccetti, who remains president of Colines, added: "We are confident that Anthony is the right person to lead the company over the next years."

› **www.colines.it**

Prototype plastic 'tent' protects medical staff

Researchers in Singapore have developed a prototype plastic 'tent' that can be placed over a patient's head during treatment for Coronavirus – reducing the risk of exposure to medical staff.

The Droplet and Aerosol Reducing Tent (Dart) was designed by researchers at the National University of Singapore (NUS) and doctors at the National University Hospital (NUH). The device can reduce the risks of infection associated with procedures such as suctioning, intubation and extubation by providing an extra layer of protection. It also helps to limit environmental contamination, which can be a source of transmission.

It is made from transparent polycarbonate panels, 3D printed nylon joints and Delrin inserts. The materials were chosen so that the device could be sterilised using all standard methods, such as high temperature autoclaving, or using 70% alcohol. This allows the device to be re-used and cuts the risk of cross-contamination.

Above; NUS and NUH researchers with the Dart device

Dart weighs 3kg and can be folded flat into a structure around 50cm square (and 3cm thick), making it easy to transport, store and sterilise.

"The quick invention and deployment of Dart was made possible by close collaboration between the NUS and NUH teams, which allowed multiple refinements to be made to the prototypes within a very short time," said Freddy Boey, who led the NUS research team.

There are arm access ports on the back and side panels. Snap-on flanges allow disposable sleeves or diaphragms to be attached. This addresses the concern of arm ports being high-risk areas of contamination, and allows health workers to use either sleeved or diaphragm seals – which are commonly available in hospitals. The elliptical shape of the access ports gives the user more flexible arm movements.

The team has produced 25 prototypes, which are being tested in hospitals.

› **www.nus.edu.sg**

Face shields benefit from clear PP

Left: Milliken's NX Ultraclear PP is being used to make face shields

Milliken has collaborated with a number of plastic manufacturers to make medical facemasks from polypropylene (PP) – which is naturally hazy.

The company has supplied its NX Ultraclear PP to help companies produce masks that are highly transparent. The material contains Miliken's Millad NX 8000 clarifier.

"In this global pandemic, the need for medical PPE continues to rise," said Halsey Cook, president and CEO of Milliken. "We are committed to finding solutions that assist our customers."

US-based Impact Plastics is using NX UltraClear concentrates to make clear PP face shields, while Germany-based Mezger is using it to produce PP sheet, for the same purpose. Medical face shields made with the material are now being used by front-line workers.

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Italy plastics machinery exports and production fell 6% in 2019

Italy's machinery sector declined in 2019 for the first time in eight years.

Figures from trade association Amaplast show a 6% decline in both production and exports. At the same time, machinery imports fell by nearly 9% and the domestic market shrank by almost 8%.

Amaplast said a number of factors were behind the decline. These included low domestic industrial production and consumption, and international factors – such as Brexit and rising tensions between the USA and China.

"This economic instability caused a contraction in investments – as Industry 4.0 incentives dried up – translating into a reduction in imports and alterations in export dynamics," said Amaplast.

Machine production fell more than 6% to a value of €4.4billion. As well a reduced demand for machinery, the Italian plastics industry also consumed marginally less material in 2019 – seeing a 1% decline to around 5.7m tonnes. Amaplast said this could be down to 'plastic-free' campaigns "and the directive against disposables".

Total exports fell more than 6% to a value of just over €3bn. Exports to Europe were generally reduced, while those to Asia increased. Examples of this include a 22% decline in sales to Germany (to around €362m) and falls of 7% and 14% to Poland and France, respectively. However, sales to China rose by 31% (to exceed €150m) and to India by 14% (to exceed €93m). Sales to the USA rose by almost 8%, to reach €315m. Overall, exports of extruders fell 4%.

Amaplast pointed out that German plastics machinery companies had similar results in 2019 – with a 6% decline in production, a 5% reduction in imports, and a 7% fall in exports.

It added that the 2019 decline came before the current Coronavirus pandemic. Italy was the first European country to be affected by the pandemic.

Although the plastics industry continued to operate, orders were reduced – and output was affected, said Amaplast.

› **www.amaplast.org**

Italian Market for Plastics & Rubber Machinery (million Euros), 2019

	2018	2019	Change 2019/2018 (%)
PRODUCTION	4,700	4,400	-6.4
EXPORTS	3,260	3,060	-6.1
IMPORTS	1,010	920	-8.9
DOMESTIC	2450	2,260	-7.8

Source: AMAPLAST

Exports of Italian machinery by region ('000 Euros), 2019

	2019 Sales	% of total	Change 2019/2018 (%)
EUROPEAN UNION	1,490,020	48.7	-9.9
OTHER EUROPE	238,935	7.8	-23.8
NAFTA	469,200	15.3	-4.2
SOUTH AMERICA	141,244	4.6	+0.8
CENTRAL AMERICA	20,669	0.7	+1.0
FAR EAST	431,676	14.1	+12.6
MIDDLE EAST	91,868	3.0	+27.6
NORTH AFRICA	78,619	2.6	-27.1
OTHER AFRICA	78,458	2.6	+20.2
OCEANIA	16,134	0.5	+13.8
WORLD TOTAL	3,056,823	100	-6.2

Source: AMAPLAST

VinylPlus may not reach 2020 recycling target

The European PVC industry says it may not meet its 10-year recycling target at the end of this year.

In 2019, the sector was just short of its 2020 goal of recycling 800,000 tonnes/year. However, the Coronavirus pandemic has caused a shutdown in the European plastics recycling industry.

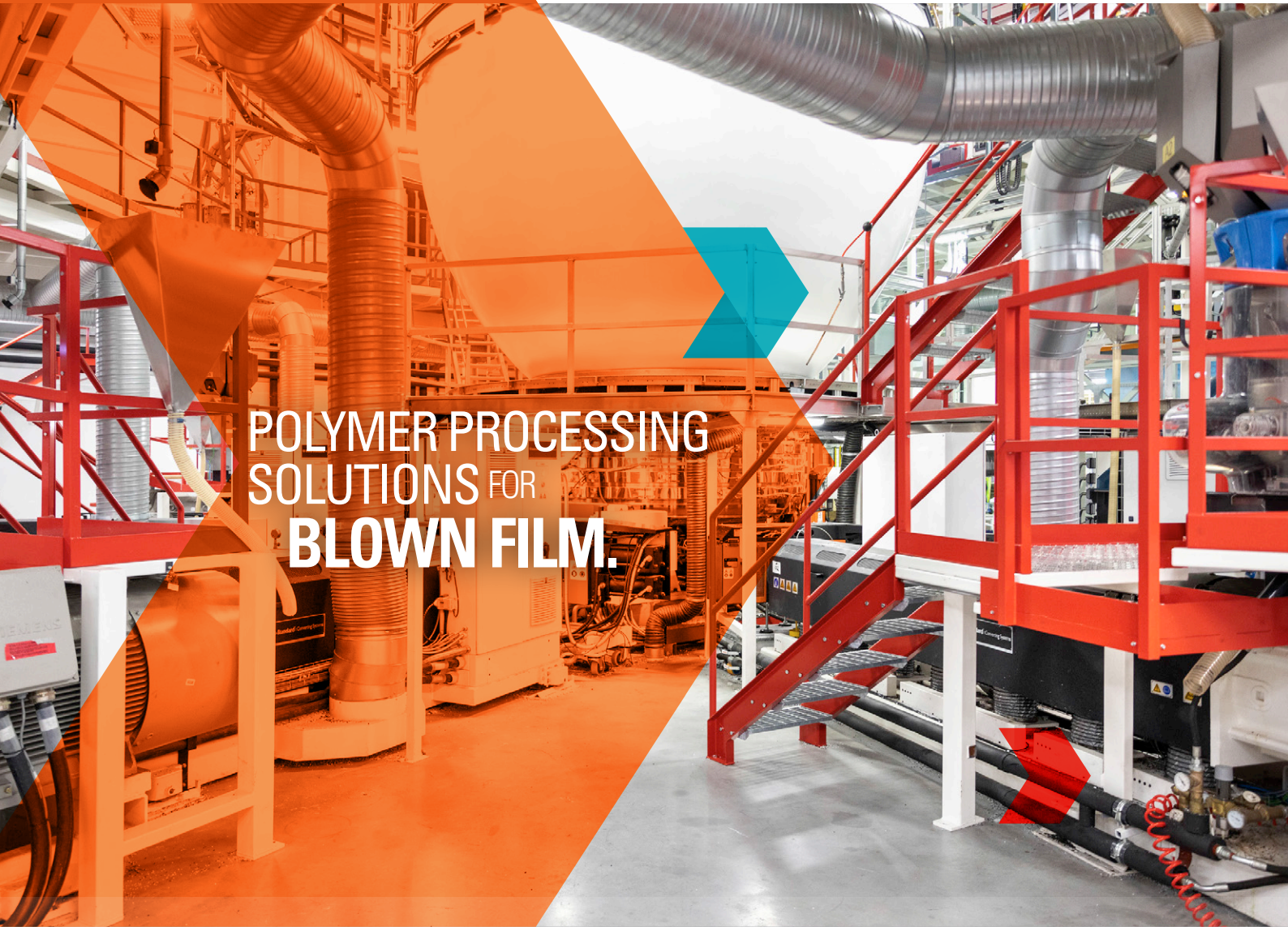
Brigitte Dero, managing director of VinylPlus, said that recycling operations were almost normal in Europe until mid-March.

"Then the situation deteriorated rapidly," she said. "This was due to lack of demand, lack of supply, reduced workforce availability, and government lock-down decisions."

Regarding the 2020 recycling target, she said: "It will be very difficult to compensate the volumes lost since mid-March – but we will do what we can."

■ Our PVC recycling article starts on **page 47**.

› **www.vinylplus.eu**



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Global demand for BOPP film 'will continue to rise'

Annual demand for BOPP film is expected to keep growing at around 4%, despite the effects of the Coronavirus.

In its latest assessment of the BOPP films market, AMI estimates that global demand will exceed 11 million tonnes by 2024.

This comes on the back of a growth rate of 4.6% between 2014 and 2019 – which added around 1.5 million tonnes to the global market, taking it to 9 million tonnes.

"Demand for BOPP film continues on a growth trajectory – despite Covid-19 slowdown experienced in other plastics markets – given its important role in primary food packaging and its core functional characteristic as a cost-effective barrier protection," said the report.

Growth in packaged foods markets around the world will continue to be a key driver for future demand, it added. "This is particularly so in emerging markets experiencing population growth, urbanisation and rising incomes."

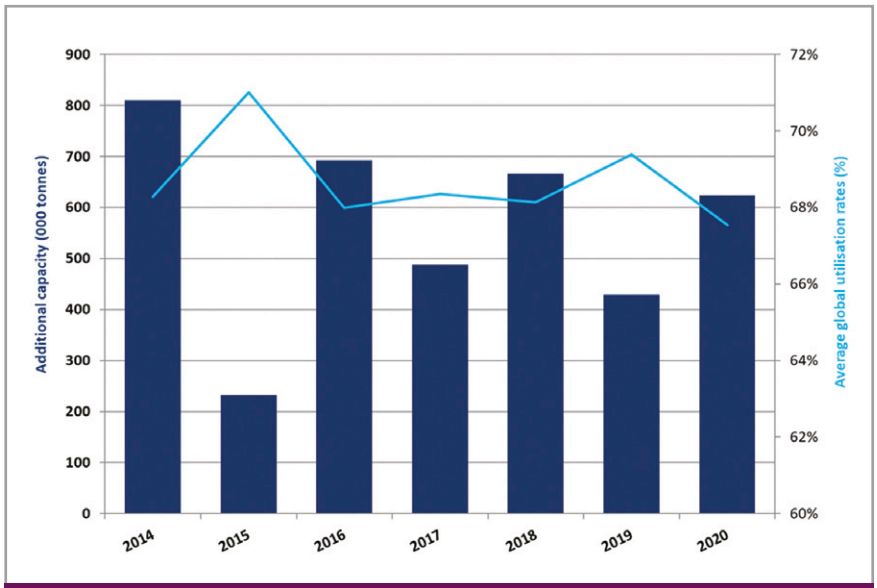
Despite factors such as disrupted raw materials supply and trade tariffs, BOPP film producers have seen improved overall margins over the last two years – thanks to a reduction in overcapacity and more favourable raw materials prices.

Capacity investment continues – but the fastest growth is now seen in India, rather than China.

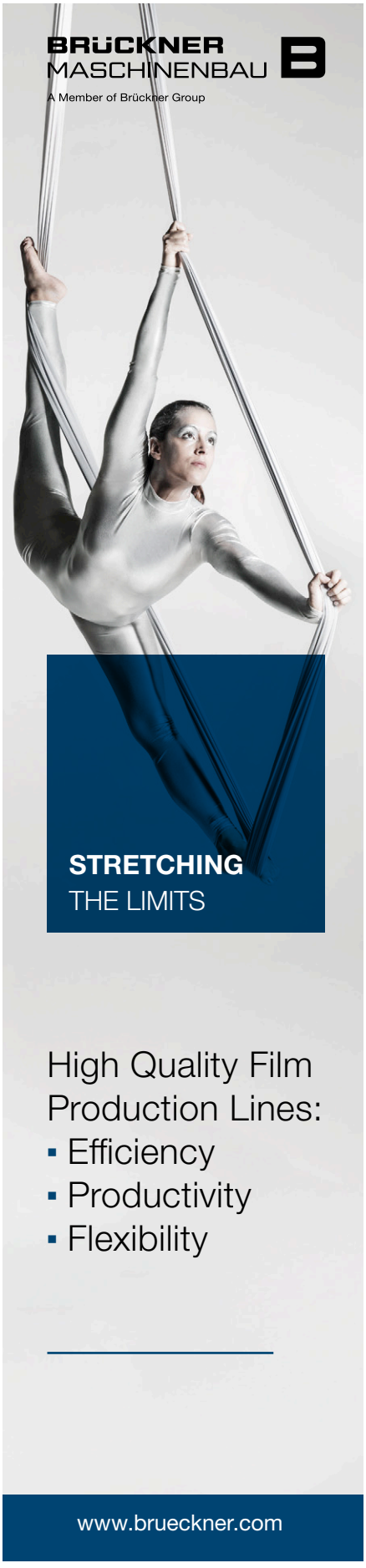
"India has seen capacity nearly double over the past five years, driven by the opening up of its retail sector, growth in middle classes and associated consumer spending on packaged food and other goods," said the report.

■ For more information on BOPP films – the global market 2020, contact Andrea Jenn (**andrea.jenn@ami.international**) on +44 (0)117 924 9442.

› **www.ami.international**



Average global utilisation rates for BOPP film fell slightly this year, as additional capacity rose ***Source: AMI Consulting 2020***



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Drivers of change in global thin wall packaging sector

The reasons behind the continuing growth of the global thin wall packaging market are examined by Martyna Fong in a new AMI Consulting report

Fuelled by consumer demand for convenient and attractive packaging solutions, thin wall packaging is increasing its penetration versus traditional media and flexible plastics. The growth is facilitated by the expansion of centralised retail distribution, on-the-go convenience formats, and technological advancement in plastics engineering, food processing and packing.

Thin wall packaging accounts for 12% of global packaging production, equivalent to 18 million tonnes. It is a market with a clear definition in Europe, but not globally. AMI Consulting has been instrumental in aiding the process of industry segmentation, quantification and strategy development.

Each region shows different levels of market maturity, influenced by socio-economic factors. Asia is the biggest thin wall packaging region globally, equivalent to 37% of demand for all polymers. Local culture-driven applications and market idiosyncrasies have shaped formats in different regions, for example water cups in Indonesia, labneh (thick yoghurt) in Turkey or dates in Saudi Arabia. Nevertheless, there is a high level of standardisation as far as process technology and materials are concerned.

Consumer convenience has been one of the main drivers for thin wall packaging developments. Both retailers and brand owners have driven innovation to offer convenience solutions, both with regards to new product launches and their packaging functionality. Functional packaging solutions include these offering longer shelf-life, ease of use, re-sealability and microwaveability.

Consequently, functionality to deliver convenience and superior product image have dictated the choice of material, and hence increased demand for individual polymers used for thin wall packaging production. Packaging design is being adjusted to optimise the logistics (transport, storage, stackability, waste, etc.), which brings financial benefits to both the manufacturer/brand owner and the customer/retailer.

Technology is a key driver of change, growth and reconfiguration of the global thin wall packaging industry. A drive towards sustainable formats, technologies and materials, triggered by changing regulations in Europe as well as environmental consumer initiatives in developed markets, has been a defining factor in shaping the global plastics processing landscape.

Concomitant with these changes have been changes in the supply chain. The industry is actively consolidating and the leaders have attempted to redefine and restructure their businesses to maximise technical competence and to create a stronger negotiation platform.

Global thin wall packaging supply is very fragmented, with the top 25 producers globally accounting for just 25% of supply. Market fragmentation varies by region. North America (including Mexico) is the most consolidated region with the top 10 players accounting for 56%, while in Asia the top 10 players account for just 3%. The industry is actively consolidating, and the leaders have been restructuring their businesses to maximise technical competence and to create a stronger negotiation platform. Global giants like Berry Global (now incorporating RPC Group), Paccor and Klöckner Pentaplast have changed industry dynamics.

Only by probing into the activity of both larger and smaller producers can the size and structure of demand be properly demonstrated, and the variations by end-use application highlighted. This depth of

Unit: 000 T	2011	2015	2019	2011/2015	2015/2019
Global Thin Wall Packaging	13,216	15,421	17,906	3.9%	3.8%
Injection Moulding	1,947	2,353	2,767	4.9%	4.1%
Extrusion - thermoforming	11,269	13,068	15,139	3.8%	3.7%

analysis serves to highlight opportunities and threats by end-use application and provides insight into winning supplier strategies. A clear business definition and portfolio strategy are fundamental in exploiting the forward opportunities, based on assessing the scale of demand, understanding the growth potential, exploiting internal competences, and appreciating the competitive dynamics and degree of threat.

The search for higher margins and market positioning causes the industry to focus on improvements in material and process engineering. Advances in process technology synergistic with polymer science have enabled changes which have facilitated the emergence of new applications. Technology is a key driver of change, growth and reconfiguration of the global thin wall packaging industry.

Thermoformed packaging accounted for 85% of thin wall packaging in 2019 and injection moulding 15%. Driven by new product development, injection moulded packaging growth is faster than thermoformed packaging growth, and hence this technology has been increasing its market penetration in the past decade.

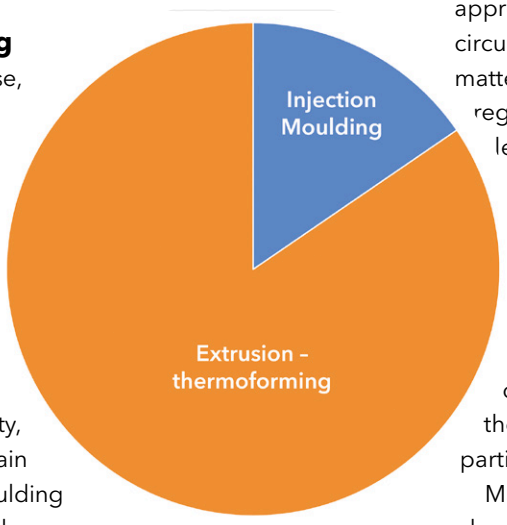
The share held by thermoforming is sustained by growth in fresh produce and pre-packaged convenience food applications, where pack selection is fit-for-purpose and cost driven. Thermoforming has highest penetration in meat/fish/poultry, fruit/vegetables and disposables, where it is close to 100%. Thermoformed chilled dairy packaging volumes are high thanks to a well-established form-fill-seal model (in Europe in particular). The FFS technology is well developed in Europe, accounting for a quarter of the total market (but over three-quarters of chilled dairy). In North America FFS is an area of growth, coinciding with the organic growth of chilled dairy. In other regions the FFS technology remains underdeveloped.

Injection moulding

Albeit from a lower base, injection moulding is putting the market position of thermoforming under pressure as production economics can be comparable. In-mould label technology, allowing for superior label quality, has been one of the main drivers of injection moulding development. This has been particularly important for such applications as yellow fats, chilled dairy, and frozen food (ice cream). An important breakthrough in IML technology is integrating a functional gas barrier through the application of EVOH multilayer film. This technology presents an alternative solution for barrier packaging without significant investment in new technology.

IML technology has now been commercialised for thermoforming as well in Europe and America. Utilisation of the IML process goes beyond product presentation and preservation. Verstraete IML leads on developments in interactive IML labels, which can be used to engage consumers with the brand even more or contain coded information for packaging sorting and recycling.

High barrier rigid thin wall containers is an attractive segment for all value chain participants. It is attractive for investors wanting exposure to technologically driven manufacturing with stable but growing demand and blue-chip customers. Highest commercial returns



can be achieved with systematic development of specialism in the segment, encompassing know-how of oxygen transmission parameters and shelf-life management. Vertical integration of extrusion and thermoforming, preferably in-line, offers higher margin capture. Specialism and high barriers-to-entry in this segment results in relative market consolidation.

Single serve capsules have become the key contributor to growth of high barrier thin wall solutions, fuelling not only demand for barrier thermoforming, but also enabling barrier co-injection projects and barrier IML. The application is more forgiving for novel barrier technologies, as the filled product is in dry form and does not require retorting. Oxygen management is not encumbered by retort shock in this case and any potential barrier failures will not compromise consumers' health and safety.

Sustainability needs

The European Commission's sustainability agenda is spearheading the global approach to plastics in a circular economy. It is only a matter of time before other regions adopt similar legislation. As part of the European Commission's Plastics Strategy, the Single-use Plastic Directive has been produced to reduce accumulation of plastic products in the natural environment, particularly marine.

Many of the leading players in the plastic packaging industry operate on a pan-European as well as a global scale. The changing market conditions in Europe will place the global players in a strong position to quickly respond to changes in other regions of the world wanting to transition towards more sustainable packaging.

There is considerable push and pull at play within thin wall packaging; retailers and brand owners move away from established practices when there appears to be no available solution for them to meet recycling and recyclability targets outlined in the

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- The magnitude of opportunity for thin wall packaging and polymer demand
- How to manage your product portfolio and market segment focus to fully exploit market potential
- Where to invest your R&D resources to maintain positioning
- How changes in a regulatory context will affect your business

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Packaging and Packaging Waste Directive (2018). This is particularly apparent in regard to black plastic and PS packaging. Consequently industry is stimulated to innovate to find solutions or otherwise risk their products being phased out. The upshot of this has been numerous innovations and developments for the thin wall packaging market such as alternative black pigments (carbon-black-free or sorting technology that can identify carbon black), technological developments in chemical recycling of PS, commercial scalability of fibre based packaging formats trialled and adopted by retailers and increasing demand for compostable bio-resin in certain applications such as coffee capsules as well as meat, fruit and vegetable trays.

While "every little helps", a full environmental analysis should be well thought-through before a major technological change is introduced in order to meet the targets of 100% of packaging placed on the market to be reusable, recyclable or compostable.

The industry is definitely acting to increase its eco credentials, though some activities are still based on trial and error principles. Consumers, on the other hand, form their views based on green marketing and media campaigns designed to create an emotional response, which may not always be accurate.

About the report and author

The **Global Thin Wall Packaging 2020** report published by AMI aims to support the development of robust participation strategies to meet the challenges of all sectors of the thin wall packaging market in Europe, by equipping industry players with a full understanding of the source and scale of potential for future development, growth dynamics over the next five years, market drivers and competitive pressures.

The report's author Martyna Fong is Consulting Manager – Packaging and Recycling at AMI. With extensive experience in research and consultancy in FMCG and downstream plastics markets, Martyna has a comprehensive understanding of the value chain and commercial factors that influence market dynamics, all in the context of sustainability driven initiatives.

Having joined AMI in 2011, Martyna has led the development of AMI's market leading expertise in rigid packaging markets. Martyna is now actively driving the expansion of AMI's Packaging & Recycling portfolio. She can be contacted at **martyna.fong@ami.international**

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Bio-based and compostable plastics are finding greater use across industry – including labels and durable applications – and are derived from an increasingly diverse range of starting materials

Green revolution: widening the scope of bioplastics

Bioplastics are being made from a diversifying spread of precursors – including olive stones, various types of cellulose and hemp. At the same time, they are finding their way into places where they had traditionally not been used – such as labelling.

Avery Dennison has achieved OK Compost certification for a new thermal label material, which it says offers brands new options in sustainable packaging.

The material, which is BPA-free and FSC-certified, also incorporates a new adhesive.

Jennifer Bijkerk, development engineer, said that the new material addresses a shortfall in the supply of compostable thermal materials.

"Demand for sustainable thermal labels – including compostable labels – is huge, and the European EN13432 standard imposes extremely strict requirements before 'OK Compost' certification can be awarded by TUV Austria," she said.

This new material – which uses a new combination of facestock and adhesive – needs no special storage conditions and has a normal shelf life. As composting standards are limited, the EN13432 is also accepted as a compostability standard in many countries outside Europe.

The main application for the material, called BW099, will be labelling compostable food packaging and compostable plastic bags – especially direct-printed labels for fruit and vegetables that are weighed and packed by consumers in the supermarket. Bans on single-use plastics also means there is a drive towards using compostable carrier bags and other packaging – all of which will require a compostable label.

The material is available in 2m widths and with optimised production efficiency.

Luuk Zonneveld, product manager of select solutions at the company, added: "We have used conventional technology to produce this innovation, by creating a unique facestock/adhesive combination, and work is underway towards expanding our compostable range with more certified products."

Main image: Compostability has become an increasingly important attribute for plastic film

Right: UPM Raflatac's Forest Film labels are made from a Dow polymer that is derived from wood residue

Wood-based label

UPM Raflatac has expanded its Forest Film product range with what it says is the industry's first wood-based polyethylene (PE) label film. The label material is produced in collaboration with UPM Biofuels and **Dow**. UPM Biofuels provides the wood residue-based raw material -- called BioVerno naphtha – which is then processed by Dow into bio-based plastic granules to be extruded into label film.

"This new product shows the versatility of UPM BioVerno as a raw material," said Panu Routasalo, vice president of UPM Biofuels. "Crude tall oil, a residue of paper pulp production, is transformed into UPM BioVerno naphtha, which can be used as raw material for different kinds of plastics that helps brand owners meet their sustainability goals in packaging."

Last year Dow announced the commercialisation of bioplastics for the packaging and labelling industry made from a bio-based renewable feedstock. Dow integrated BioVerno naphtha – a key raw material used to develop plastics – into its slate of raw materials, creating an alternative source for plastics production. It uses this feedstock to produce different types of bio-based PE.

Carolina Gregorio, biobased project leader at Dow, added: "Forest Film PE is another step in the right direction for sustainability in packaging. This new film label material helps customers and consumers reduce the reliance on fossil fuels."

Below: Innovia's Encore family of recyclable BOPP films are made from renewable, non-food based raw materials

Bio-based BOPP

Innovia has developed a new family of recyclable BOPP films, called Encore. The films are made from renewable, non-food based raw materials.

Encore packaging and labelling film will have the same properties as equivalent fossil-based BOPP film – including clarity and gloss, stiffness, water vapour barrier and printability. The material has been assessed by Interseroh – an independent German recycling and consulting company – and received its highest rating, confirming they are fully recyclable.

"Using our in-house Life Cycle Analysis (LCA) programme we have calculated that, by using renewable polymer, Encore films offer reductions in [cradle to gate] carbon footprint," said Steve Langstaff, business manager for packaging at Innovia.

The first two grades of Encore film are a low temperature heat seal film for packaging and one for pressure sensitive labelling applications.

"This represents the first step in our journey to produce more sustainable films, with the next step being products that contain recycled post-consumer content," said Langstaff. "We have agreements in place and hope to be able to launch the first of these in 2022."

Bio-based polycarbonate

Covestro has developed a polycarbonate film with more than 50% of its carbon content sourced from plant-based biomass.

Makrofol EC is the first partially bio-based film in the company's product portfolio. It replaces some of the oil-based products used in the film's production with plant-based raw materials. As a result, the film's carbon footprint is much lower, says the company.

"More and more customers are supporting sustainable products," said Wieland Hovestadt, head of research and development in the speciality films division at Covestro. "This is why research on bio-based products is an important priority for us."

The properties of Makrofol EC are comparable in quality to standard polycarbonate films in the Makrofol range, says Covestro. It also features improved chemical, weather and abrasion resistance. The film is suitable for further processing in standard processes. For instance, it can be easily printed on, laminated, coated and can be formed by thermoforming or high pressure forming (HPF) processes. It can be used in applications in the electrical, consumer and automotive industries, as is typical for conventional polycarbonate films, said the company.

Water-soluble funding

Lactips, a French company that claims to have developed a fully bio-based and biodegradable water-soluble polymer, has raised €13m in a new financing round.

The company will use the new funding to ramp

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Above: Floreon and Clariant have teamed up to develop biopolymers for single-use and durable applications

up its product development and specifically "to accelerate the industrialisation of its plastic pellets and films to offer a wider selection of fully biodegradable and recyclable biosourced packaging".

It also plans a new production plant on a 2,500m² site in the Gier Valley, south west of Lyon.

The company recently developed a water-soluble strip, which will hospital laundries to isolate contaminated linen – so that staff in hospitals and care homes can limit their handling of these items.

Early in lockdown, the company was contacted by a number of hospitals that had reported a shortage of water-soluble strips. The new product, developed with a manufacturing partner, seals laundry bags closed until they dissolve during a wash – at 40-60°C – which then releases the linen inside.

The strip is fully bio-sourced, says Lactips, and dissolves without leaving a sticky residue.

"Initially, we responded quickly to provide a temporary solution for healthcare stakeholders who were on the front line during the epidemic," said Pascal Chabance, head of sales at Lactips. "Faced with growing demand, we developed an effective and approved solution that continues to be used by hospitals today."

Right: Lactips' bio-based, water-soluble strip helps hospital laundries to isolate contaminated linen

Compostable licence

BASF has granted China-based Red Avenue New Materials a licence to produce compostable aliphatic-aromatic co-polyester (PBAT) to BASF quality standards.

Under the agreement, Red Avenue will build a 60,000 tonnes/year plant in Shanghai that will use BASF's process technology. BASF will have access to raw material from the plant, which it will sell under its Ecoflex brand. Production is due to start in 2022.

BASF currently produces Ecoflex at its plant at Ludwigshafen in Germany. The certified-compostable polymer can be produced from bio-based sources but is currently made from fossil-based feedstock. Together with PLA and thermoplastic starch, Ecoflex forms the base for BASF's Ecovio blends.

The global market for certified compostable and bio-based plastics is expected to grow by around 15%/year, according to BASF, driven largely by new laws enforcing the use of compostable materials in packaging, agricultural mulch films and bag applications in certain countries.

Teaming up on PLA

UK-based **Floreon** – which specialises in PLA-based compounds – has teamed up with **Clariant** to develop a range of biopolymers for single-use and durable applications.

Clariant will contribute its Exolit OP Terra, Licocene Terra and Licocare RBW bio-based additive knowhow to help Floreon improve the performance and processing characteristics of its materials – which typically contain 70-90% renewable plant-based raw materials.

"The scope of benefits is vast. Examples include achieving less energy use and faster cycle times by increasing the processing efficiency or adding completely new properties to the material," said Clariant.

Key target markets will include rigid and flexible packaging, hygiene products and consumer goods.

Floreon says that its products are typically mechanically tougher than traditional PLA and can deliver significant energy savings in processing. Its compounds are recyclable and they can be composted via industrial composting.

"Brand owners and plastic converters are seeking more sustainable material solutions to offer their customers, driven by goals ranging from recyclable solutions and improving waste management to lowering carbon footprint and reducing resource use," said Shaun Chatterton, CEO of Floreon.

IMAGE: HUBERT GENOUILHAC BY PHOTUPDESIGN

FDCA plant planned

Avantium is to build a 5,000 tonnes/year plant in Delfzijl, Netherlands – scheduled to be ready in 2023 – to make FDCA, the bio-based feedstock for


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production of high performance polyesters such as PEF (polyethylene furanoate).

Avantium is already producing FDCA and PEF on a pilot plant scale in Geleen, Netherlands. PEF can be used in applications where PET is currently specified, but PEF's barrier to oxygen and CO_2 is 10 times higher.

"PEF will be therefore a performance material side-by-side to PET, enabling plastics to reach those applications where the performance and sustainability of incumbent solutions are not high enough, maintaining recyclability," said Avantium.

The company currently offers a 100% bio-based high IV PEF grade for development and market introductions in rigid and flexible packaging, films and fibre applications. Food contact approved grades will also be soon available.

Avantium says PEF is compatible with PET recycling assets, can be sorted using near infrared technology and recycled in a separate stream.

"Should it end up in the PET recycle stream, it has no negative impact on haze, colour and other properties of the resulting rPET products for content levels of at least up to 2% of PEF," the company said.

Above: VTT has used cellulose and fatty acids to create a material that can be used to make thermo-formable food packaging

Cellulose for thermoforming

Finnish research organisation **VTT** has used two renewable substances – cellulose and fatty acids – to create a material that can be used to make thermoformable food packaging.

The development work is underway at VTT in cooperation with Arla Foods, Paulig and Wipak.

The final use of the Thermocell material will depend on how companies want to use it, says VTT. It is suitable for many purposes for which conven-

Above: Aimplas is developing a biodegradable plastic from olive stones – a waste product in the industry

tional fossil-based plastics are now used. Thermoplastic cellulose can be processed in conventional plastic treatment processes.

The next step is to produce hundreds of kilos of the material and process it into various packaging prototypes with companies. This will verify the functionality of the material in industrial processes and in real application conditions.

Cellulose is the most abundant natural polymer. Due to its hydrogen bonds, it has formed a resistant microfibril network, making it strong. In order to achieve thermoplasticit behaviour, it must be tailored without significantly affecting its natural properties. In the technology developed by VTT, the molar mass of cellulose is first adjusted in a controlled manner, followed by chemical treatment – which eventually produces a thermoplastic.

The project concludes in May 2021.

Olive stone plastic

Spanish plastics research organisation **Aimplas** has teamed up with olive oil producer Olipe to find a use for olive stones – a key waste product in the industry.

In the Go-Oliva project, Aimplas has developed a biodegradable plastic from olive stones. These are usually incinerated for their energy content. Now, the researchers have developed Oliplast, which will be used to make products for the olive oil industry, such as trays, plates and bottle caps. The material can be processed by extrusion and injection moulding.

Research to date has involved selecting raw materials and developing an olive stone that can be used to obtain the new material. The next step will be to perform a behavioural study so that the material can be validated for transformation processes. Finally, an environmental study will be carried out to determine the material's compostability.

UV shielding

Researchers in Australia and the USA have developed a way to make transparent, flexible composite films – with high UV shielding – using waste hemp and polyvinyl alcohol (PVA).

UV shielding is important in food packaging, as it helps to ensure a longer shelf life for foods. Inorganic metal oxides, such as titanium dioxide, are highly effective UV shields, but "their synthesis and disposal methods may have some environmental and health concerns", according to the researchers.

A more benign alternative – derived from wood – is lignin, which has innate UV-shielding properties. However, when added to plastic, it can reduce the transparency of the film.

The researchers, from **Deakin University** in Australia and **Cornell University** in the USA, made a composite material by mixing PVA with lignocellulose particles obtained from ball-milled waste hemp hurd – without chemical treatments.

The UV-shielding properties of the resulting composite film, as a function of hemp/PVA weight ratios, were investigated. The intermolecular interactions between the hemp particles and PVA were characterised using infrared spectroscopy. The presence of a –C=O group at 1655 cm−1 proved that the chemical structure of lignin had been preserved.

"The fabricated films exhibit stronger UV-shielding, in the UVA-I range (340–400 nm) than TiO_2/PVA films," said the researchers.

The films maintiained their transparency, and also showed comparable water vapor permeability (WVP) with commercial packaging plastic film made of HDPE.

"This work adds value to agriculture hemp waste, enabling its use as a UV-shielding additive," said the researchers.

The work was published in the journal *Polymers*.

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Sustainable transit: the role of stretch and shrink film

Stretch and shrink film is playing an increasing role in sustainability – whether through being made from recycled or bio-based materials, or by reducing the carbon footprint of logistics

Stretch and shrink films are typically only microns thick – yet they are helping to improve environmental performance. High-performing stretch film ensures that pallets are held securely in place – which reduces the chance of product damage. Similarly, both stretch and shrink films are increasingly being made from bio-derived materials.

Renewable pallet film

Doxa Plast of Sweden has developed a range of stretch films from renewable resources, using materials supplied by **Dow Chemical**.

Reborn, the new range of stretch films from Doxa, uses Dow's bio-based LLDPE, Elite 5230GC R, which is made from renewable feedstock. The feedstock comes from residues of paper production from sustainably managed forests in Finland. It does not compete with the human food chain, and no extra land is required for its production. The films are made in Doxa's factory in Sweden.

The new film range is optimised for downgauging without affecting functionality. Using a patented technology, Doxa offers thin stretch films down to four microns of thickness, while maintaining high level performance for improved load pallet stability and reducing overall packaging material.

"Our vision for 2020 is to offer our customers the option to choose carbon neutral versions of all our products," said Sandra-Stina Vesterlund, managing director at Doxa Plast.

"Dow's bio-based resins help us achieve this because they enable us to move towards a carbon neutral stretch film."

Dow's bio-based polyethylene portfolio is made using bio-naphtha from tall oil, a by-product of paper pulp production. This helps to produce stretch films with renewable resources that have a lower carbon footprint than standard fossil-derived PE resins. ›

Main image: Doxa Plast's Reborn range of stretch films are made from a bio-based LLDPE from Dow Chemical

Right: At last year's K show, ExxonMobil and Windmöller & Hölscher showed a collation shrink film made with 30% recycled polyethylene

Shrink film with PCR

At the same time, Dow is developing a new family of resins made from post-consumer recycled (PCR) material – which can be used in applications including collation shrink film.

Packaging made from the resins – which are available in Asia and Europe – have comparable performance to those made with virgin material but have a 20-30% lower carbon and energy footprint.

When used in collation shrink film, the resin will help ensure product safety while reducing the amount of plastic waste ending up in the environment.

"This new recycled plastic resin represents our commitment to work with our customers to stop plastic waste from entering the environment and to drive circular economy solutions," said Diego Donoso, president of Dow Packaging & Specialty Plastics.

Compostable clingfilm

BASF and **Fabbri** have developed certified compostable cling film for fresh-food packaging.

The film, called NatureFresh, is based on BASF's compostable Ecovio material and combines breathability, mechanical performance and transparency.

It can be used to wrap meat, seafood or fruit and vegetables – either manually or with automatic packaging equipment. Industrial stretch packaging is also possible. The companies say it is the first certified compostable cling film that combines optimal breathability for an extended shelf life of fresh food with high transparency and the mechanical properties needed for automatic packaging. The film is food- contact approved according to US and European standards.

With its property profile, the film helps to keep food fresh for a longer period of time compared to PVC-alternatives such as polyethylene (PE). By cutting food waste, this helps to reduce greenhouse gas emissions.

"The market is looking for alternatives to PVC – which is today's performance standard for most cling film packaging of fresh produce," said Carsten Sinkel, of global business development for biopolymers at BASF. "PE films are lacking in performance, often leading to a reduced shelf life of packed fresh food. Ecovio enables the production of a cling film that prolongs shelf life of fresh food."

After use, Nature Fresh can be composted with food waste in home or industrial composting systems. The partners said it was also important to develop a cling film that can be used on stretch wrapping machines.

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

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

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Recycled content

Also at K last year, **ExxonMobil** and **Windmöller & Hölscher** (W&H) demonstrated a 40-micron, five-layer polyolefin dedicated (POD) collation shrink film, which was made with 30% recycled polyethylene (PE) at K2019.

Processed on a Varex II blown film line, the collation shrink film maintains performance due to the inclusion of Exceed XP and Enable PE polymers and ExxonMobil LDPE in the formulation.

"Including recycled PE in this collation shrink film enables valuable material to be re- used in new applications and helps customers create sustainable solutions," said David Hergenrether. vice president of polyethylene at ExxonMobil Chemical. "As a mono-material solution, it is easily recycled where programmes and facilities to collect and recycle plastic films exist."

The ExxonMobil materials help to maintain the necessary toughness, holding force and shrink performance for high integrity packaging and storage stability at thinner gauge. The film is easy to process with fast start/stop technology and high output. Recycled PE can be used in W&H film extrusion equipment like Varex II with consistent processability.

"The combination of Varex II technology and ExxonMobil's performance PE polymers allows a broad range of recycled PE streams to be used," according to Martin Backmann, R&D division manager at W&H.

The shrink film has been validated by plastic film and packaging producer Grupo Armando Alvarez, which has used it to package six-packs to 1.5L bottles.

Above: SML's PowerCast XL stretch film line was used to make 12-micron stretch film at K2019

Touchless performance

SML of Austria says that its display at K2019 was the largest cast film line ever seen at the show – and was used to produce stretch film in a live demonstration.

Its PowerCast XL stretch film line had a start-up time of less than five minutes, hands-free production changes and very high output. At the show, it was seen producing ready-to-use 12 micron high-elongation film for the European market.

The line reached a production speed of 525 m/min within five minutes. In this time, the thickness cross-profile variation of the film was lower than 0.24 micron 2-Sigma, making it ready for sale.

During production changes, no operator intervention is needed – as it is done hands free. To demonstrate this, SML increased the production speed of the PowerCast XL twice a day during the show.

By pushing a single button, line speed went from 525 to 710 m/min fully automatically. The 9-up line

Scientex plans second US stretch film plant

Scientex Packaging Film, a Malaysia-based producer of stretch film, is to invest US$43 million to build a second manufacturing facility in the USA.

The new plant, in Lancaster, South Carolina, is expected to open by the start of 2021, and create 69 jobs. Its existing USA plant, in Phoenix, Arizona, opened in 2018.

"This is an ideal location for us to manufacture products for our customers in the eastern half of the United States," said Goh Tian Chin, senior general manager at Scientex. "We look forward to being operational early next year and active in the community."

Scientex makes a variety of custom films including shrink films, polyethylene (PE) films, tubes and bags and lamination films.

› **www.scientex.com.my**

reached a net production output of over 2,150 kg/h.

"The technology integrated in the new PowerCast XL has significant effects on overall line performance and effectiveness, reducing downtimes and waste to a minimum," said SML.

Using the force

At last year's *Stretch & Shrink Film* conference, organised by **AMI**, there were several presentations on how shrink film can help to boost delivery performance. US-based **Highlight Industries** told delegates that correct use of stretch film can help to reduce carbon footprint.

"When used properly, it provides the best load containment, lowest carbon footprint, and best value," said the company.

In one example, a brand owner for bottled water launched a new pack design – which then saw 5% product damage in the first 90 days of release. The company contacted Highlight for help.

The first step was to evaluate the company's existing packaging methods – and its stretch film. Packing methods were successful for past products, but not for the new design.

In addition, the customer supplied samples of its film to Highlight for testing. Highlight analysed it to determine the 'sweet spot' – which is around 70% of the ultimate stretch level.

Loads were evaluated on Highlight's transportation simulation system. Then, loads were created and tested. Increasing the containment force from 15 to 19lbs across the product – and to 24lbs across the pallet – increased load stability by 78%.

Stacking patterns were also an important factor in stability, said Highlight.

Overall, equipment was configured to stretch the film to 270%. Portable load cells ensured that the correct containment force was maintained.

The carbon footprint of the film was tiny in comparison to that resulting from a damaged load, said the company. It also helps to save costs: to deliver a truckload of product, around 90% if the cost of the product and 10% is transportation – with stretch film accounting for less than 0.1%.

Better beer delivery

At the same event, **Duo Plast** and **Safe Load** presented details of how they had helped to optimise stretch film performance to help a beer producer transport its loads more safely.

Research by KU Leuven in Belgium – based on analysis from Belgian police – showed that 25% of all accidents are caused by cargo securing failures.

The customer, which has a €1.3bn turnover business, wanted to increase sales, minimise environmental impact and optimise packaging costs – as well as analysing the existing stability of its unit loads.

Factors such as the number of turns, film consumption per pallet and film thickness were analysed. The companies came up with an alternative scheme for wrapping – which relied on a new film and a new wrapping strategy.

The new film was 6-7 microns thick and took 15 turns to secure the load. This compared with the original 7-8 micron film, which was wrapped with 23 turns. Overall, this improved productivity by just over one-third, while the weight of the film was about 60% of the original.

Overall, this led to a 25% reduction in film costs per pallet for the year (around €60,000).

■ The next *Stretch & Shrink Film* conference takes place in New Orleans, USA, on 30 November-2 December 2020. For more details, contact Alexandra Fish (**alexandra.fish@ami.international**) on +1 610 478 0800.

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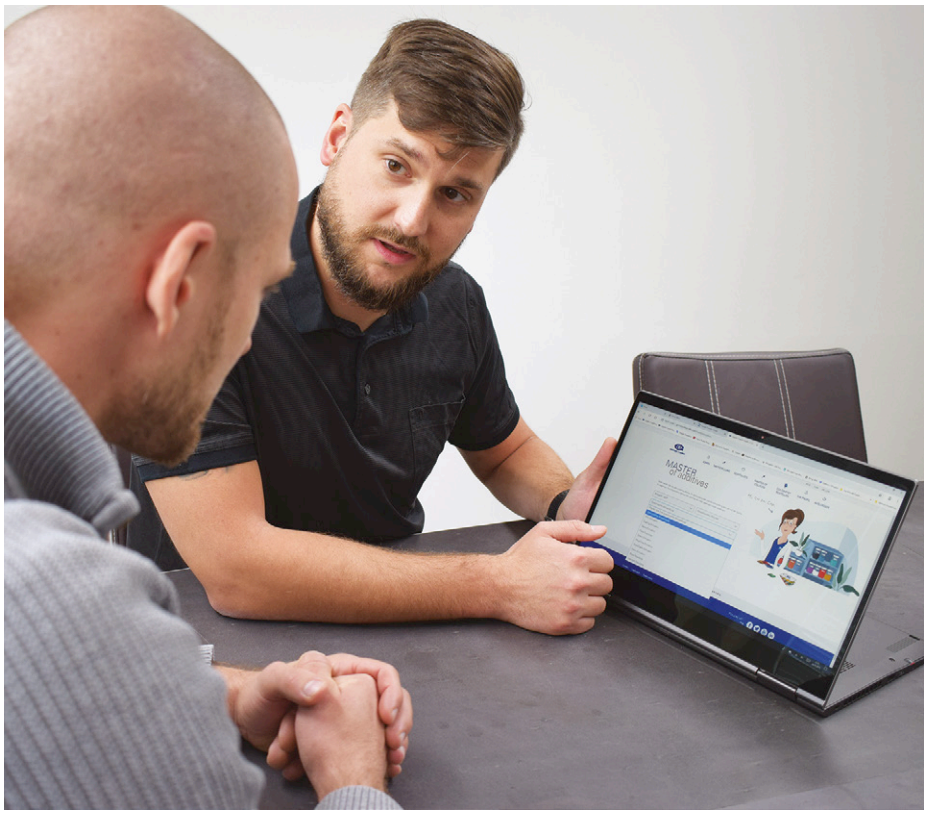


Recent masterbatch developments have helped to solve colouring accuracy in film production, raise impact performance and improve the performance on BOPE film

Masterbatch adds value to polymer formulations

Masterbatches are a convenient way of adding effects – whether it is colour, or a specific physical characteristic – to an extruded plastic product.

However, the choice of grades – and what they can achieve – is sometimes slightly bewildering. **Gabriel-Chemie** says that its Master of Additives digital search tool makes it easier for customers to select the correct additive masterbatch.

A beta version was unveiled at last year's K2019 exhibition, and now the full version has been launched (at **www.masterofbatch.com**).

"We used feedback from K to get the platform ready for the official launch. This allowed us to incorporate suggestions from the target group in the production process," said Lukas Houska, digital sales product manager, who runs the project.

The tool it – which joins the earlier 'Master of Colours' platform – helps customers and prospective customers find the right masterbatch for their application by choosing specific parameters and polymer types online. Intelligent filters adapt dynamically to the application. If plastic article needs to be equipped with flame retardants, for instance, the user can decide between the possible flame retardant classes in the extended filter function. In a search for products with UV protection, the filter options change accordingly, and they can select between UV absorber and Hals systems.

Users can request an offer for an individual product adjustment online, if they cannot find what they are looking for. The collected information is transmitted to the technical service department, who can supply a tailored solution.

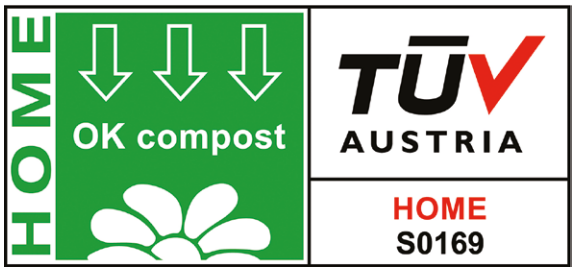
Smooth colouring

UK-based **Silvergate** has developed a new range of pigment masterbatches for film, following a number of approaches from film manufacturers who had experienced problems.

The enquiries related to the quality and performance of pigments within film manufacture. Silvergate found that, in many cases, a build-up of pigments was clogging machines – which was slowing cycle times and disrupting production. Despite regular and time-consuming cleaning, the problem was still occurring regularly. ›

Main image: Gabriel Chemie's Houska: "We used feedback on the beta version of Master of Additives to get the platform ready for the official launch"

Right: Five Clariant plants are now accredited with OK compost Home certification, meaning compostability is guaranteed for home garden compost heaps



The company was invited to trial a new range of masterbatches made specifically to overcome the problem. The new formulation incorporates ingredients that work together to improve dispersion during manufacture. Manufacturers have now been able to improve the colouring accuracy of plastic film while increasing productivity.

"When we realised processors were facing similar challenges within their production processes, we set about finding an appropriate solution," said Emma Cank, sales executive at Silvergate. "This new range focuses on the quality of ingredients within the formulation whilst achieving the right price points for our customers."

The range has been developed specifically for the film market and is available in any colour.

PET modification

Sukano has developed an impact modifier masterbatch for use with PET packaging including films and thermoformed sheet.

The product can be used with cold, flash frozen and room temperature applications. It allows the creation of mono-material PET structures for products such as frozen food trays. It can be used with both virgin and recycled PET.

"With our impact modifier portfolio, customers have a recyclable alternative to replace products made of, for instance, amorphous co-polyester or GAG film structures – while enjoying the benefits that go beyond mechanical properties modification," said Alessandra Funcia, head of marketing at Sukano.

The product improves durability and toughness, impact resistance and shatter resistance – and allows the use of a greater proportion of RPET in a formulation.

At the same time, there is no loss in transparency, says the company.

Michaal Kirch, global head of R&D, added: "It allows cold, flash frozen and room temperature trays to be fully recyclable."

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BOPE boost

Ampacet has developed a new masterbatch portfolio for bioriented polyethylene (BOPE) film.

The product, Biax4CE, helps film manufacturers create mono-material film – helping them and their customers to meet tough recycling targets for their products.

The company says that, because PE recycling is more prevalent that PP recycling, it makes sense to develop more BOPE film applications.

"BOPE film production also benefits from idle capacity on existing BOPP film manufacturing equipment, requiring only an adjustment in processing conditions – with no major machinery changes," it said.

In laminated packaging, BOPE film allows substitution of some non-PE substrates such as BOPP, BOPA and BOPET – allowing the manufacture of a mono-material PE structure. It also offers some benefits over BOPP – such as greater seal strength and seal integrity, said the company.

Biax4CE masterbatches include additive and white masterbatches – including anti-block, anti-static, migrating and non-migrating slip and anti-fog products.

OK for composting

Colour and additive masterbatches from **Clariant** – which are made in five plants in Europe and Asia – have been awarded OK compost Home and Industrial labels by TÜV Austria Belgium NV testing company.

The certification means that the masterbatch ingredients, including the polymer carrier, will not compromise the biodegradability of the plastic products and packaging in which they are used.

The masterbatches are formulated and tested for compliance with EN 13432:2000 – the widely recognised European standard for heavy-metal content and plant toxicity, as well as the EU Packaging Directive (94/62/EEC), says the company.

Clariant plants in Poliagno, Italy, and Sant Andreu de la Barca, Spain, initially received OK compost Industrial certification in 2012. The latest testing adds the more challenging OK compost Home label to their products. This means compostability is now guaranteed for home garden compost heaps – where conditions are less controlled and breakdown is achieved more slowly.

In addition, plants in Ahrensburg and Lahnstein, Germany also comply with both standards. Clariant's plant in Phanthong, Thailand, is certified to supply OK-compost-labelled masterbatches to Asian customers.

■ On 1 July this year, Clariant completed the sale of its masterbatches division to US-based PolyOne. PolyOne has also been renamed **Avient**.

Above: Colloids offers a number of formulations to protect geomembranes from UV exposure

UV protection

As with many types of plastic product, longevity is a key issue. Derek Hepburn, technical director at **Colloids**, told delegates at the recent *Waterproof Membranes* conference, organised by AMI, of some of the factors behind extending the life of waterproof membranes using carbon black masterbatch within the formulation.

Some particular failures include: ductile yielding – in which the geomembrane is overstrained; slow crack growth, caused by material creep; and brittle failure, where stress concentrations lead to failure.

One of the main ways to prevent these mechanisms is to restrict UV light – and this can be done by adding carbon black to formulations, he said.

"It acts as a light screen, absorbing harmful UV radiation before it reaches the photo chromophic species in the polymer molecule," he said. "As well as being a UV absorber, carbon black acts as a radical scavenger."

However, carbon black can be designed to give maximum effect by ensuring that molecules are of the correct size and morphology. It can also be combined with other additives to lengthen product life.

"Mie scattering highlights that surface area – particle size – is the most important property for UV protection," he said.

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- **www.gabriel-chemie.com**
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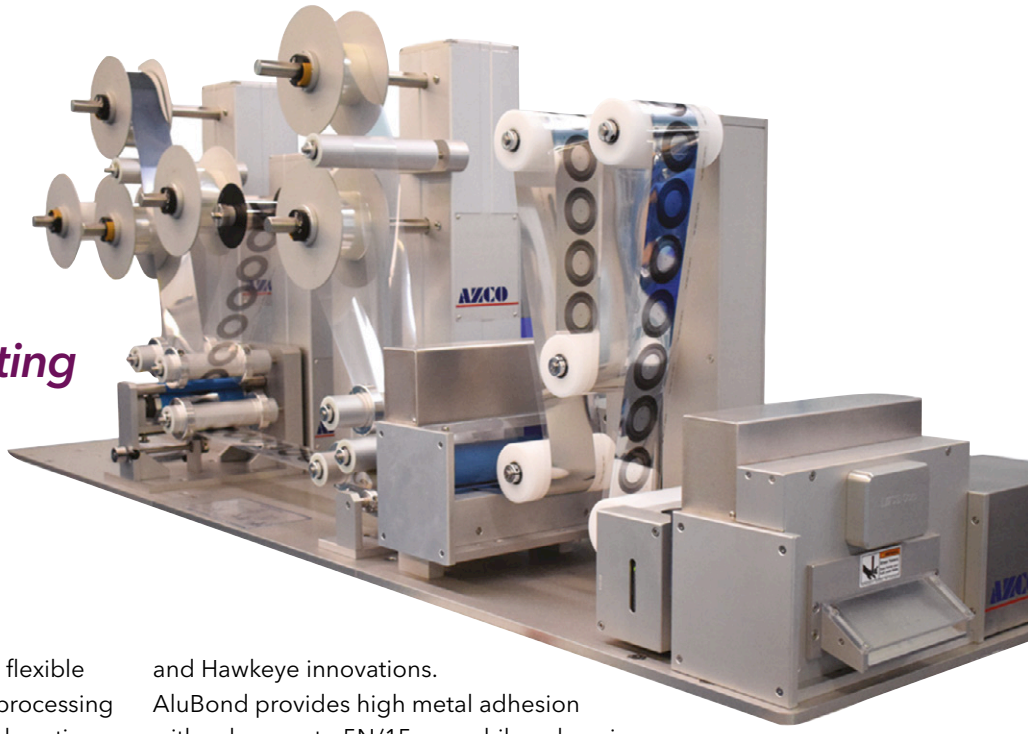
Conversion factor

Boosting the performance and throughput of converting processes – such as metallisation – helps to ensure more efficient production



Main image: Azco's new system can laminate four materials together and cut them to length

Turning film into a plastic product such as flexible packaging can involve a number of post-processing steps – such as laminating, embossing and coating.

Parikh Flexibles – part of Constantia Flexibles – has bought an Expert K5 1350mm metalliser from **Bobst**, which will be installed at a new greenfield facility in Ahmedabad in India in 2021.

The specially designed, narrow-width Expert K5 will make ultra-high barrier MDO PE film, as a fully recyclable replacement for aluminium foil. It is the first Expert K5 to be produced at 1350mm width, said Bobst.

The company says that Expert machines have a 700mm coating drum – and claims this gives an increased collection efficiency of 16% and better coating uniformity. The 1350mm model has optimised web handling, tension control and thermal management – and barrier enhancing features that enable production of PE-based film for foil replacement.

The machine incorporates the Bobst AluBond and Hawkeye innovations.

AluBond provides high metal adhesion with values up to 5N/15mm, while enhancing oxygen and water vapour barrier levels on films including MDO PE, BOPP and CPP. Hawkeye is an in-line optical density deposition control system that detects, counts and categorises pinholes and other defects at full metalliser speed.

"We have worked with Bobst for some time in the quest for fully recyclable metallised film suitable for foil replacement," said Pragnesh Shah, head of plant at Parikh Flexibles. "We needed a machine to enable us to produce our EcoLam HighPlus laminates. The Expert K5 is perfect for our requirements. We look forward to having the machine installed in our new plant in India next year."

At its new site in Ahmedabad, Parikh Flexibles mainly produces snack packaging, stand up pouches and single-unit shampoo sachets.

Left: Constantia Flexibles subsidiary Parikh is using a Bobst metalliser to make its EcoLam HighPlus laminates

Embossed bags

At K2019 last year, US-based **CMD** demonstrated its 1270GDSE global drawtape system for embossed bags.

Embossing presses a pattern into the PE material of the bag. CMD says that its special technology adds a distinctive embossed pattern during the bagmaking process at speeds up to 183 m/min. It produces bags that are 18-147in (457-3734mm) wide, and up to 48in (1219mm) long.

"The embossed bag stretches, to accommodate more trash," said the company. "The result is a value-added product that consumers ask for."

Above: Amotek showcased its R168 machine at K2019, making trash bags from bioplastic

The embosser can be by-passed – so that non-embossed bags can be made on the same system.

Parent rolls of tube or pre-slit material are used to make side-sealed drawtape bags with embossed film. Drawtape material is sealed into top of bag. The film web is guided through the embossing unit, which applies the specialised pattern.

Side seals and tape seals are applied in the blanket and drum section. The film web is folded over onto itself two to three times to reduce web width. A series of perforations are placed between the side seals to allow for separation of the bags.

Also at the show, CMD demonstrated its 1270GBM global bag machine, which convertes bags at 600 feet/min (183 m/min). The rotary bag system can be configured to run in-line with an extruder, or use parent rolls. It can be used to make star-sealed, gusseted and bottom-seal bags.

Bag forming

Packaging machinery producer **Amotek** – part of the **Optima Group** of Germany – showcased an automatic bag forming and filling machine at K2019 last year.

The R168 can process conventional, recycled and bio-based plastics – and during the show was seen producing trash bags made of Novamont's starch-based Mater-Bi material.

Amotek says that the machine's frame design is also more compact than before. In addition, the machine features smart control – which can be done in parallel via external devices such as tablets or smart phones – and simplified human/machine interfaces.

During the show, the company discussed a number of applications for the R168, including freezer bags and disposable gloves.

Cutting to length

US-based **Azco** has developed a complete system to unwind four different materials from rolls, laminate them then cut the finished product to a specified length.

The rolls of material – which include PET film, aluminium-coated PET with adhesive, and release liners – are loaded onto four separate cantilever design brake unwinds. A roll feeder pulls the materials off the unwinds and laminates them together. The product travels through a dancer accumulator using urethane drive rollers. An internal guide directs it from the drive rollers into the knife assembly.

A registration eye recognised a mark which signals where to cut the product. The modular designed knife assembly is pneumatically operated, requiring 2.75-3 bar (40-60psi) of regulated air pressure. An operator control panel is provided which includes an HMI colour touch screen for easy setup and operation of the unit.

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- **www.bobst.com**
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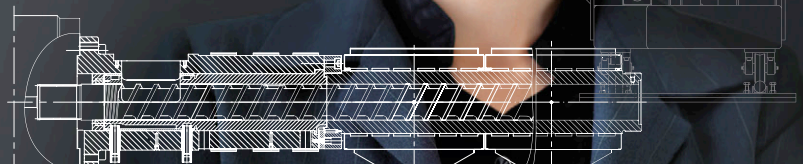

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The European PVC industry is still marginally short of meeting its 2020 recycling target – at a time when the Coronavirus slowdown may cause recycling to actually fall this year

VinylPlus still short of its 2020 PVC recycling target

Despite another increase in recycling last year, VinylPlus – the voluntary recycling commitment of the European PVC industry – is still marginally short of its stated target.

According to the latest VinylPlus progress report – which covers activities in 2019 – recycling of PVC in Europe now exceeds 770,000 tonnes. This puts it more than 96% of the way to its goal of recycling 800,000 tonnes/year – which it needs to meet by the end of this year.

Being so close to its 2020 target, VinylPlus has since set a new goal: to recycle 900,000 tonnes/year by 2025 – and at least 1 million tonnes/year by 2030. It is also in the process of setting further targets for the future.

Brigitte Dero, managing director of VinylPlus, said: "Each progress report is an opportunity for the industry to reflect on its achievements and on future challenges and opportunities. With the culmination of VinylPlus in sight, we are building a new programme towards 2030 – which will be launched in May 2021."

However, the economic slowdown caused by the Coronavirus pandemic may even see PVC recycling fall this year, said VinylPlus.

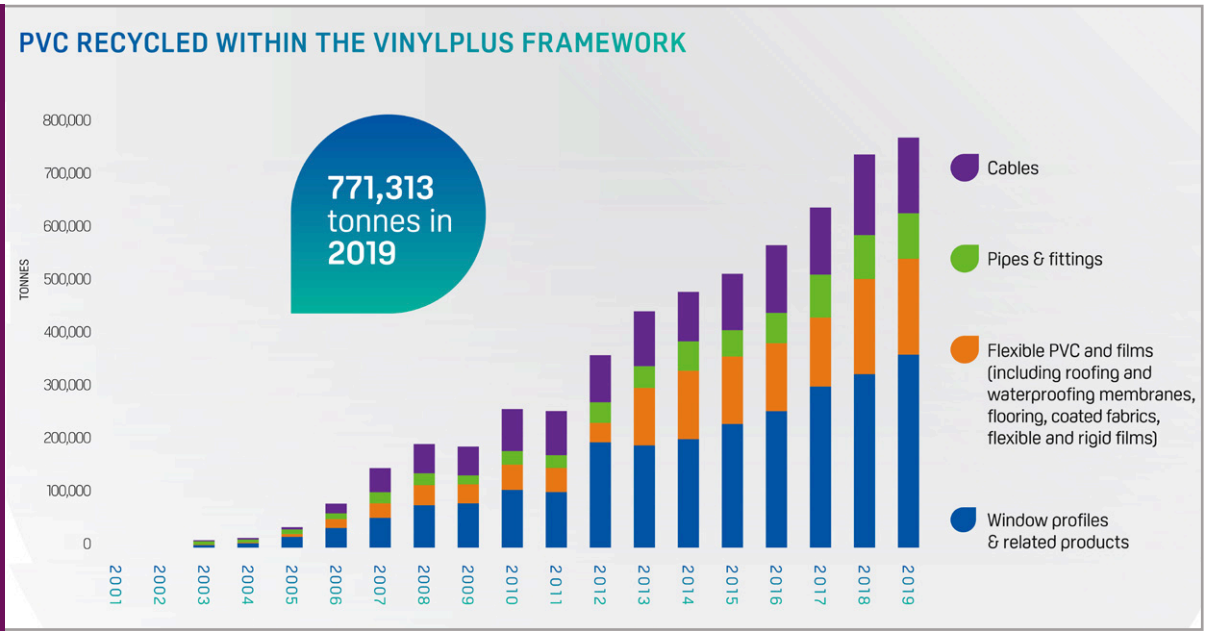
The latest progress report reveals that the European PVC industry recycled 771,313 tonnes of PVC last year, a total rise of around 4%. This is far lower than the 16% rise in recycling seen between 2017 and 2018.

"Market conditions for recycling were difficult in 2019," said Dero. "Converters appeared to choose virgin materials over recyclate, due to the comparatively low price of virgin PVC. Brexit also created uncertainty in the UK – which so far has been one of the most active recycling countries."

Another reason for the small rise in recycling is a dip of around 5% in the recycling of PVC cables. The total volume reclaimed in 2019 was around 142,000 tonnes (down from around 151,000

Main image: Flexible PVC, including roof membranes, accounted for around a fifth of recycled material in 2019

Europe recycled more than 770,000 tonnes of PVC in 2019



Source: VinylPlus

tonnes in 2018). According to the report: "More PVC waste was available from cables – particularly in the Czech Republic, France, Germany, Poland and the UK – due to reduced exports to China."

Flexible PVC and films accounted for just over 170,000 tonnes of recyclate in 2019. This is around 22% of the total – and a rise of almost 2% compared to 2018. Rigid PVC – in the form of profiles, pipes and fittings – accounts for around 58% of the total, while cables account for about 18%.

Alternative methods

VinylPlus is looking beyond pure mechanical methods of recycling PVC. For instance, the Thermovinyl project assesses the environmental characteristics of the PVC waste treatment processes in Swiss waste-to-energy plants. Some plants use the SolVair process to neutralise hydrochloric acid (HCl) gas by sodium bicarbonate, and recover residual sodium chemicals (mainly NaCl). These are then recycled in a separate dedicated plant.

Chemical recycling – in which a plastic such as PVC is broken down into its constituent chemical components – is also under consideration. The Oreade chemical plant in France began a pilot project in 2019, using chemical recycling on roofing membranes. However, a fire at the plant has delayed this project.

"We treated in total 300 tonnes of PVC waste – either flooring or tarpaulins – in 2019," said Dero. "For now the trials at the Oreade chemical plant have been stopped. We are looking at alternative solutions."

Despite this setback, this type of technique is being actively considered as a way of recycling certain types of PVC.

"Chemical recycling could contribute by allowing the recycling of PVC waste that is difficult to recycle mechanically – such as because it is part of a composite material or is too contaminated. But no fully technology-ready solution is available yet," she said.

Recycling slump

The figures in the VinylPlus progress report predate the Coronavirus pandemic, so were unaffected by it. However, the subsequent economic slowdown has had a serious effect on recycling in Europe.

"Recycling operations were nearly normal across Europe until mid-March, but then the situation deteriorated rapidly," she said. "This was due to lack of demand, lack of supply, reduced workforce availability, and government lock-down decisions."

Another factor was that the cost of virgin PVC collapsed – in line with global oil prices – making it cheaper than recycled PVC. The situation was felt across the whole plastics recycling industry – which has now effectively closed down.

Trade body Plastics Recyclers Europe has said that, if the situation continues – and no action is taken – plastics recycling will no longer be profitable in Europe.

Dero says it is hard to assess the impact of the current situation on this year's recycling volume – but accepts that VinylPlus may even miss its target.

"It will be very difficult to compensate the volumes that have been lost since mid-March – but we will do what we can," she said.

CLICK ON THE LINKS FOR MORE INFORMATION:

› **www.vinylplus.eu**

› **www.plasticsrecyclers.eu**

Chemical Recycling

3-4 November 2020
Marriott Hotel
Hamburg, Germany

Explore the potential of chemical recycling to turn waste plastics into new materials.

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- Discover how chemical recycling will aid in meeting plastics recycling targets
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Outi Teras
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New dates

Stretch & Shrink Film

8-10 June 2021
Hilton Barcelona, Barcelona, Spain

Optimising brand owners' marketing and transit operations

Join us at the 17th edition of AMI's Stretch & Shrink Film conference.

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CONTACT US

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Film and Sheet EXTRUSION

PROCESSING

Thermal blanket keeps in the heat

Shannon Global Energy Solutions has developed a thermal removable and reusable insulation blanket, LT550SG, to improve safety for owners and operators of plastics machinery.

Shannon's representative, Associated Steam Specialty, led a project to install a blanket at the Pennsylvania facility of Airlite Plastics, a producer of thermoplastic sheet – in order to improve safety and reduce ambient heat.

The reusable blankets cover a Davis-Standard extruder, extrusion die and related piping. Airlite makes, among other things, containers and lids from FDA-approved plastic resins and custom, proprietary package designs.

"Associated Steam intrigued me with the idea of blanketing our boiler and steam system," said Tony Alfieri, vice president and general manager for the Airlite plant.

He said that the blanket has openings allowing the extrusion line to be adjusted without removing the blanket. The blankets eliminate temperature swings in the area around the equipment. Operators no longer need forearm protection for safety because the blankets serve that role.

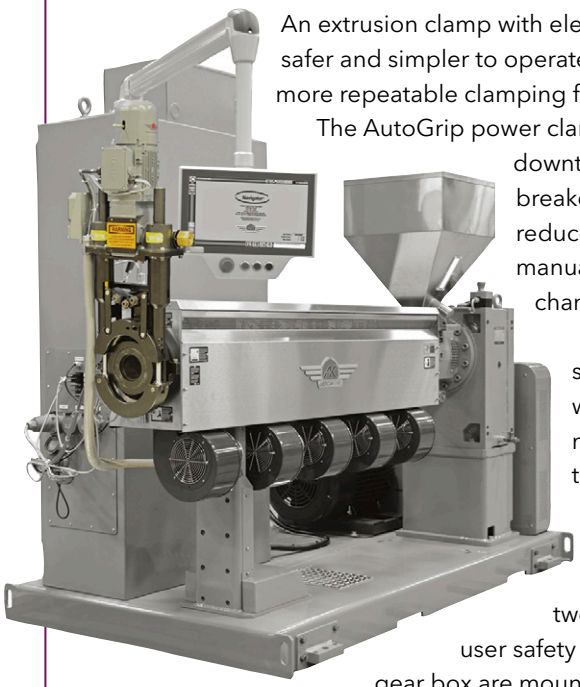
"The best compliment comes from our machine operators, who continue to remove and replace these blankets once a month to make routine adjustments and perform maintenance," he added Alfieri. "The blankets aren't required for the plastics-making process – but my guys would have put them in a box if they weren't beneficial, and easy to take off and put back on."

Airlite is now planning to install insulation blankets on the Pennsylvania plant's remaining lines.

› **www.shannonglobalenergy.com**

ANCILLARIES

Extrusion clamp adds safety, repeatability and simplicity



An extrusion clamp with electro-mechanical actuation claims to be safer and simpler to operate than manual devices, while providing more repeatable clamping forces.

The AutoGrip power clamp, from Graham Engineering, reduces downtime in installations with frequent screw, breaker plate, or tooling changes. It can also reduce the risk of injury or burns involved in manually releasing and tightening clamps during changeovers.

The torque required in manual systems to seal the clamp assembly can be dangerous with large extruder sizes. In addition, the manual clamps are typically heated to temperatures above 400F (200°C), which increases the risk of injury with traditional manual systems.

AutoGrip is remotely controlled by a two-hand pushbutton controller, to enhance user safety and convenience. The drive motor and gear box are mounted above the clamp, protecting them from melt residue and making them easy to access for maintenance.

"We have engineered AutoGrip with simplicity and safety in mind," said Michael Duff, vice president of sales and service for Graham Engineering. "While manual clamps are difficult to operate and inherently dangerous, this automatic system speeds up changeovers and is easy to maintain."

The power clamp is available for extruder sizes of 3.5in (90mm) to 6in (150mm). As well as applications involving new extruders, it can be retrofitted to many existing installations.

› **www.grahamengineering.com**

BOPA

Chinese invests in BOPA line

Chinese bioriented polyamide (BOPA) film producer Xiamen Changsu has ordered two new sequential film stretching lines from Brückner.

The lines have a working width of more than 7m, a production speed of 340 m/min and an output of more than 2.5 tonnes/hour.

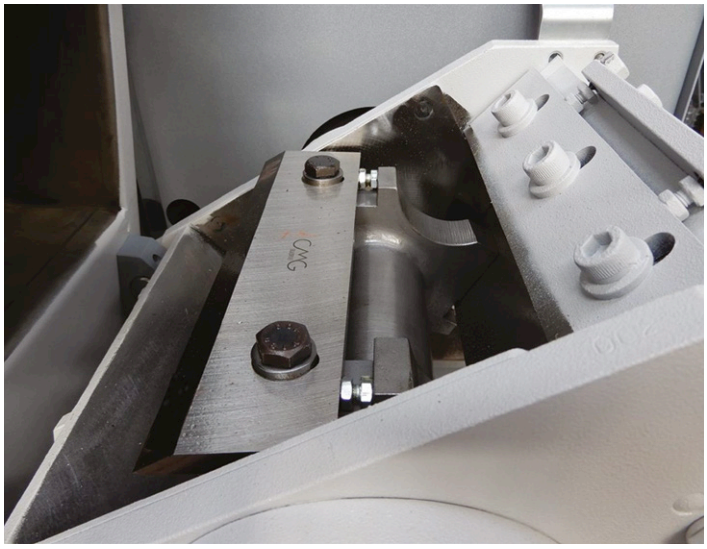
Xiamen Changsu is one of Brueckner's longest-standing customers in BOPA – both in China and worldwide. Since 2003, the companies have carried out 10 joint BOPA projects.

The new lines also mark the latest development stage in sequential PA film stretching, says Bruekner – going beyond 7m in width. The lines are due to start at the end of 2021.

› **www.brueckner.com**

GRANULATORS

Blade discount helps cut costs



CMG Granulators of Italy, which supplies a wide range of size reduction equipment, is offering discounts on its range of replacement blades and screens.

The company says that, as companies look to cut costs in difficult times, many will be looking to replace these common 'wear and tear' items – rather than invest in new machinery – but all within lower budgets.

"The involvement of every party, internal or external, in the production of blades and screens – from fabrication all the way to packaging – allows us to offer a discount of 40%," said Giorgio Santella, general manager of CMG. "These spare parts help our customers to keep operating efficiently and safely."

The promotional sale of blades and screens has will be kept in place until September 2020, he said.

› **www.cmg.it**

PROTOTYPING

Vacuum-forming on a desk top

UK-based Mayku says that its FormBox is an industrial-grade vacuum forming press that is small enough to fit onto a desk top.

The company says that this "enables the user to make moulds or replicate intricate shapes in a matter of seconds".

This can help companies of all sizes to speed up product development and bring their ideas to market quickly.

One company, UTR of Canada, used it to produce prototype blister packaging designs at its in-house workshop. Using this method, UTR reduced its lead time on packaging development from around three months to just two days.

› **www.mayku.me**

ANCILLARIES

Tracking materials through polymer processing plants

The TrueRate intelligent inventory tracking system from Conair tracks changes in the inventories of up to 500 different resins or flowable powders in a processing plant.

Developed as an alternative to the use of single-component batch blenders for resin inventory measurement, it uses highly accurate gravimetric measurement.

It is available in two sizes, consisting of an 8in weighing ring equipped with two load cells, or a 12in ring equipped with three. Both configurations connect to a separate electrical control panel containing a PLC. The weighing ring is mounted below a material loader or receiver but above a container or bin. It uses resin information from the user to calculate the change in weight of the loader/receiver before discharging the material through the ring and into the container.

The system can operate in two modes: in default (or 'totaliser') mode, in which it continuously and automatically measures the total resin flow through the receiver to a bin or container below; and, in job (or 'active') mode, which adds an optional discharge valve to the weighing ring.

"TrueRate is a new, elegant way to track and regulate the receipt, flow, and use of resins and flowable powders through a plastics processing facility," said Alan Landers, product manager for blending at Conair. "In totaliser mode, the system can accurately measure and validate the quantity of resin conveyed from a process bin that was loaded from a silo. In job mode, an operator can program the system to measure out a precise amount of material into a bin."

› **www.conairgroup.com**

Thin Wall Packaging

30 November - 2 December 2020
Le Méridien Grand Hotel
Nuremberg, Germany

Identifying opportunities and maximising returns in plastic tubs, pots and trays industry

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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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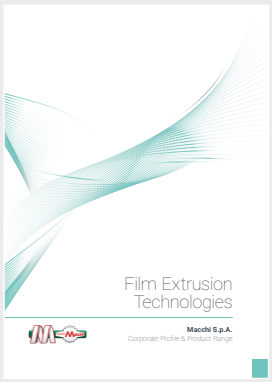
MACCHI: FILM EXTRUSION



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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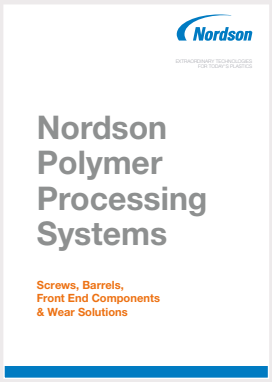
NORDSON: SCREWS & BARRELS



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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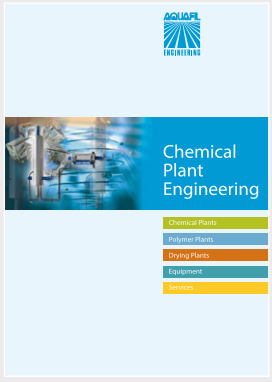
AQUAFIL: PLANT ENGINEERING



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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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

Learn more about AMI's upcoming conferences

Click on the relevant brochure cover or link to download a PDF of the full conference programme

PLASTICS REGULATIONS

The 4th edition of Plastics Regulations provides advice on a range of compliance issues at one event. The event takes place on 2-4 November 2020 in Cologne, Germany. The conference provides an ideal environment for regulatory updates.

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CHEMICAL RECYCLING

AMI's new Chemical Recycling conference on 3-4 November 2020in Hamburg, Germany, will explore the challenges and opportunities surrounding chemical recycling of plastics and its relevance for all companies in the supply chain.

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WATERPROOF MEMBRANES

Taking place on 16-18 November 2020 in Bonn, Germany, Waterproof Membranes provides a global forum for discussion of the latest solutions, technology and market trends within bitumen, polymeric and liquid membranes across all waterproofing applications.

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PLASTIC: DESIGN FOR SUSTAINABILITY

The third edition of this event, taking place on 17-18 November 2020 in Berlin, Germany, brings product and packaging designers and brand owners together with the plastics industry to discuss technical innovation and circularity solutions.

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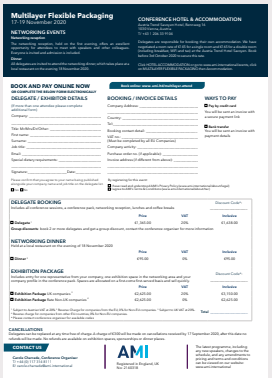
MULTILAYER FLEXIBLE PACKAGING



The 13th edition of Multilayer Flexible Packaging will take place on 17-19 November 2020 in Vienna, Austria. Not only delivering vital updates on technology and market trends, the event provides a forum to discuss solutions for recycling barrier packaging.

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THIN WALL PACKAGING

AMI's Thin Wall Packaging conference on 30 November-2 December 2020, in Nuremberg, Germany, offers a meeting point for the industry to debate business trends and improvements in packaging technology, as well as legislation driving change.

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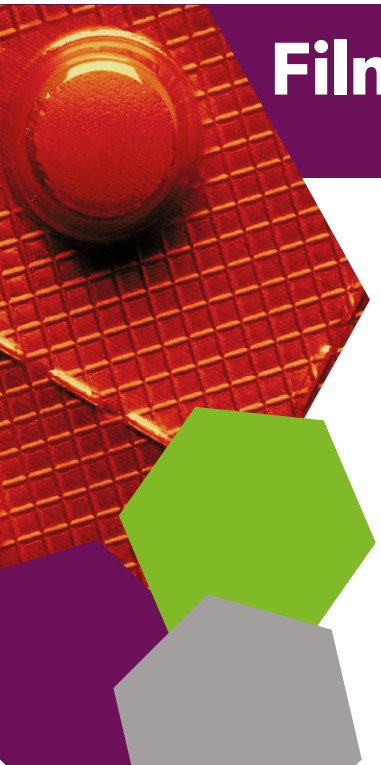
To see our full line-up of more than 50 plastics industry events over the next 12 months, please visit www.ami.international/events

Eurofilms Extrusion

Head office:	Telford, United Kingdom
CEO:	Will Humphreys
Founded:	1995
Ownership:	Private
Employees:	Around 95
Sales (2019):	Around £27 million (US$33m)
Profile:	Eurofilms, founded in 1995, says it is the UK's largest independent producer of pallet wrap, stretch film and collation shrink film. It also claims to be the leading manufacturer of pre-stretch films in the UK – and number two in Europe. The company celebrates its 25th anniversary this year.
Product lines:	The company offers a range of packaging products, including stretch film products, shrink film, covers, sheets, bags and sacks. Its standard stretch film, which is made using both cast and blown film technology, is for hand pallet wrapping. Its Euro-Lite pre-stretch film is available as both core and coreless products, in a number of different sizes. Its bag products include LDPE gusseted bags, while it also offers a number of pallet covers – and top/bottom sheets – to protect palletised loads.
Factory location:	Eurofilms' products are all produced at its 25,000 sq m facility in Telford. The company recently invested in a new Allrollex 1500 cast film line from Colines of Italy. The multi-layer extrusion line can produce thinner film while maintaining strength and durability. Eurofilms says the investment – which was helped by a £1.5m (US$1.9m) finance deal from HSBC – will help it grow its customer base by 10%. It also plans to add up to 15 jobs over the course of a year.

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:

September 2020
Biaxially oriented film
Thermoforming
PVC plasticisers
Laboratory extruders

October 2020
Extruder developments
Recycling ● Mineral fillers
Multi-layer packaging
PEWE USA preview

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
June 2020
The June edition of Film and Sheet Extrusion magazine takes a look at some of the latest developments in printing systems. It also explores new ideas in pouch packaging, blown film control technology and downstream equipment.

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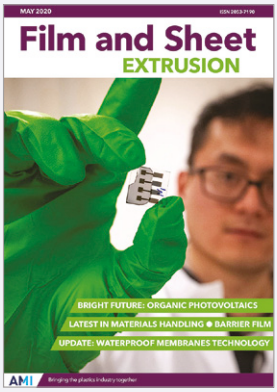

Film and Sheet
May 2020
The May issue of Film and Sheet Extrusion features new developments in materials handling and looks at innovations and opportunities in waterproof membranes, barrier film and organic solar cells.

› CLICK HERE TO VIEW

Compounding World
July 2020
The July edition of Compounding World magazine finds out what the Covid-19 pandemic has meant for the antimicrobials sector. It also looks at developments in colour measurement, liquid feeding and melt filtration.

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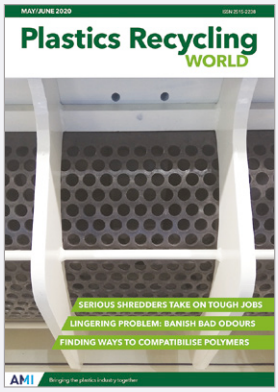

Plastics Recycling World
May/June 2020
The May/June edition of Plastics Recycling World looks at the industry's lingering problem of bad odours. It also reviews the latest developments in high performance shredders and explores the world of polymer compatibilisers.

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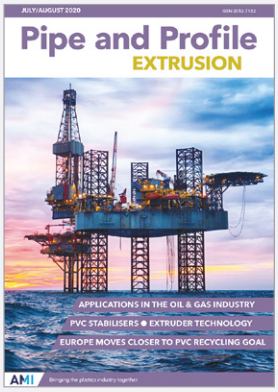

Pipe and Profile
July/August 2020
The July/August issue of Pipe and Profile Extrusion examines the technical advances in pipelines for the offshore oil and gas industry. Features also cover the PVC sector in its use of stabiliser additives and its achievements in recycling; plus the latest from extrusion technology suppliers.

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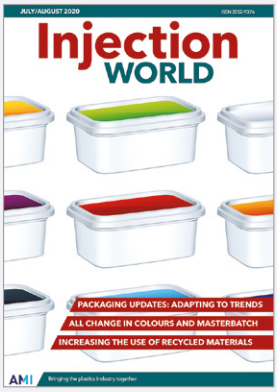

Injection World
July/August 2020
The July-August edition of Injection World has two articles on challenges and trends in rigid packaging. Plus there are features on increasing the use of recyclate in new injection moulded products and developments in colour masterbatch.

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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

2020	**7-8 October**	Plastics Extrusion World Expo Europe, Essen, Germany	https://eu.extrusion-expo.com
	13-17 October	Fakuma, Friedrichshafen, Germany	www.fakuma-messe.de
	29-31 October	MECSPE, Parma, Italy	www.mecspe.com
	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
	10-13 November	Plastimagen, Mexico City, Mexico **POSTPONED**	www.plastimagen.com.mx
	23-26 November	All4Pack, Paris, France	www.all4pack.com
	1-5 December	Equiplast, Barcelona, Spain **POSTPONED**	www.equiplast.com
	2-4 December	Plastic Expo, Tokyo, Japan	www.plas.jp/en-gb.html
2021	**25 February-3 March**	Interpack, Dusseldorf, Germany	www.interpack.com
	1-3 April	Plastics Printing Packaging, Dar-es-Salaam, Tanzania **NEW DATE**	www.expogr.com/tanzania/pppexpo
	13-16 April	Chinaplas, Shenzhen, China	www.chinaplasonline.com
	4-7 May	Plast 2021, Milan, Italy	www.plastonline.org/en
	17-21 May	NPE 2021	www.npe.org
	22-25 June	Colombiaplast **NEW DATE**	www.colombiaplast.org
	29 June-1 July	Interplas, Birmingham, UK	www.interplasuk.com

AMI CONFERENCES

3-4 November 2020	Chemical Recycling, Hamburg, Germany
9-11 November 2020	Agricultural Film, Barcelona, Spain
16-18 November 2020	Waterproof Membranes, Bonn, Germany
17-19 November 2020	Multilayer Flexible Packaging, Vienna, Austria
17-18 November 2020	Plastic: Design for Sustainability, Berlin, Germany
30 Nov-2 Dec 2020	Thin Wall Packaging, Nuremberg, Germany
30 Nov-2 Dec 2020	Stretch & Shrink Film N America, New Orleans, USA
28-29 January 2021	Stretch & Shrink Film Asia, Bangkok, Thailand
2-4 February 2021	Polyethylene Films N America, Coral Springs, USA

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

7 - 8 October, 2020

ESSEN, GERMANY

PLASTICS EXTRUSION WORLD EXPO

COMPOUNDING WORLD EXPO

4 - 5 November, 2020

CLEVELAND, OHIO

www.ami.international/exhibitions