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Simona profits grow faster than sales revenue

Simona of Germany saw a 10% leap in profitability in the first half of the year, despite a relatively modest growth in sales revenue.

The company reported an increase in turnover of just over 2%, to nearly €205 million (US$238m) in the first half of 2018. Sales grew significantly – after currency adjustments – in both the USA and Asia, but were slower in Europe "due to a slightly weaker economic performance".

At the same time, EBIT grew by 10% to almost €19 million (US$22m).

Sales in the company's semi-finished parts division rose by 2.5% to exceed €165m (US$192m) in the first half. PVC sheet products for the aviation sector and high-performance plastics expanded significantly in the first half. The market for foamed PVC sheets for applications in the printing and advertising industry remained highly competitive, said Simona.

Moyses: "We anticipate we can meet our revenue target for 2018"

"The quality of our bottom-line result is encouraging," said Wolfgang Moyses, CEO of Simona. "We improved at an operating level and lifted EBIT significantly. We anticipate we can meet our revenue target of €405-410m – and EBIT margin target of 7-9% – for 2018, despite the fact that the second half of the year tends to be weaker due to seasonal effects."

Simona also extended its presence in the US by acquiring Premier Material Concepts (PMC), which manufactures plastic sheet for use in caravan, agricultural, and industrial applications. Employing more than 60 people, the company generated around US$27m (€23m) in 2017.

"PMC allows us to extend our product offering and strengthens our position in the US plastics market," said Larry Schorr, CEO of Simona America. "In addition, it gives us access to materials for thermoforming applications and underpins our strategic ambitions when it comes to diversifying our sheet business."

› **www.simona.de**

Jindal buys stake in Treofan

Indian film and label manufacturer Jindal Films has bought German film company Treofan from M&C.

The transaction is expected to close in early 2019, subject to regulatory approval.

Jindal is a specialist in biaxially oriented polypropylene (BOPP) films. It has production plants in India, Europe and the USA and employees around 3,000 people. Treofan is also a BOPP specialist and employs around 800 people at three production sites in Germany and Italy.

"The takeover of Treofan by Jindal will open up new global strategic directions for the company and its employees," said Walter Bickel, CEO of Treofan.

› **www.jindalfilms.com**

› **www.treofan.com**

Graham builds up thermoforming

Graham Partners, a US-based private equity firm has made its third thermoforming investment in the shape of Nuconic Packaging. This investment comes less than a year after the acquisitions of Tray-Pak and EasyPak.

Graham's strategy is to build a nationwide, top tier, mid-sized packaging provider, by combining the three entities.

Located in Vernon, California, Nuconic supplies thermoformed PET packaging to the food market, and its products are complementary to those of EasyPak and Tray-Pak, said Graham. Nuconic brings "a unique approach to product and tool design, which will allow the combined platform to deliver an expanded offering to the market", said the company.

Adam Piatkowski, managing principal at Graham Partners, said: "Nuconic has experienced strong growth driven by a strategic market focus and strong customer relationships, and we have identified significant synergies due to the expanded geographic coverage and capabilities of the combined platform."

› **www.grahampartners.net**

Graham has added Nuconic to its portfolio

TI expands into Latin America

Film producer Taghleef Industries (TI) has expanded in Latin America with the acquisition of Colombian film manufacturer Biofilm.

The transaction is subject to regulatory approval and is expected to close this year.

Biofilm, which makes BOPP films for flexible packaging, labels and industrial applications, was founded in 1988 and has manufacturing plants in Colombia and Mexico. By adding these to its existing portfolio, TI will raise its annual production capacity to more than 500,000 tonnes.

"By joining Biofilm's experienced and trained workforce with ours, we will achieve synergies in product, production and technical service that will benefit both TI's existing customers and the new ones we welcome from Biofilm," said Detlef Schuhmann, CEO of TI Group. "We are looking forward to expanding our presence in Latin America and are especially excited to leverage Biofilm's strong portfolio in metallised film and vacuum deposited barrier solutions."

Vittoriano Di Luzio of Biofilm added: "We look forward to being part of this strong and growing organisation."

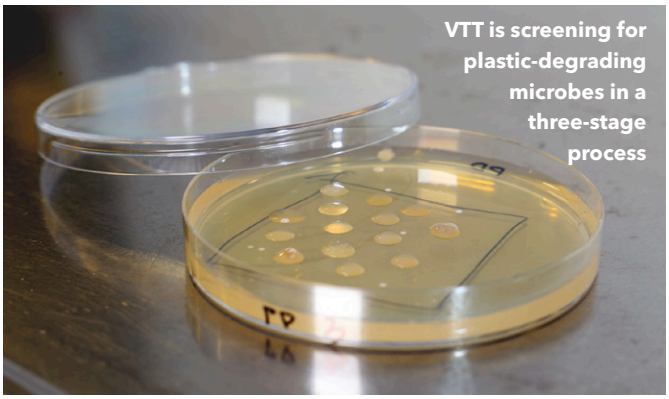
› **www.ti-films.com**

VTT will use bugs to clear plastic from sea

VTT of Finland has begun a project called PlastBug which aims to develop new strains of microbe that can degrade plastic pollution in the sea.

"Our idea is to design a mobile container where microbes degrade plastic waste into valuable products like fuels or chemicals," said Kari Koivuranta, principal scientist at VTT.

The aim is to develop a small, container-based factory that can be placed in an area where centralised plastic waste collecting or recycling is not possible or feasible. The container can be located on a beach or ship. The factory unit would get most its energy needed for the process from solar energy and wind power.



VTT is screening for plastic-degrading microbes in a three-stage process

This year, researchers in the project have been searching for microbes that can degrade different kind of plastics (PE, PP, PS or PET) and developed methods for the pre-treatment of plastics. They are currently using a three-stage screening method to screen microbes from different sources.

"Some microbes have already passed the first two stages of the screening," said Koivuranta. "In the third stage, we will confirm if are they capable to consume and digest plastic."

A complete process is being engineered around the fermenting unit containing microbes – a small plant in which plastic is modified from waste to products. The aim is that the pilot unit will operate on the Baltic Sea in 2021, but funding still needs to be secured for this.

› **www.vtt.fi**

Premium share in Clarus

Premium Equity Partners, based in Frankfurt, Germany, has acquired a majority share in Germany's Clarus Films, from Pinova Capital.

Clarus, founded more than 30 years ago, is a value-added reseller in the packaging and lamination film sector. It employs 60 people and has an annual turnover of nearly €60 million (US$70m). Its recyclable foils are currently distributed mainly in German-speaking countries, but it now plans to expand its reach across Europe with future acquisitions.

The company, based in Dietzenbach near Frankfurt, plans to open a new facility there by the end of this year. Its joint managing director, Norman Thom and Markus Mondani, will remain invested in the company, and the employee participation program will be enlarged, said Premium.

"With Pinova's support we were able to lay the ground for a long-term growth strategy," said Thom.

Fabian Walesch, partner at Premium, added: "Clarus Films has a strong position in the packaging industry's value chain. Together with the dynamic and experienced management team, we are looking forward to implementing the European growth plans and further expanding market leadership through selective add-on acquisitions."

Martin Olbort, partner at Pinova Capital, said: "Since our investment in 2012, Clarus has developed through organic and inorganic growth. We are convinced that Premium is the suitable new owner to support further growth."

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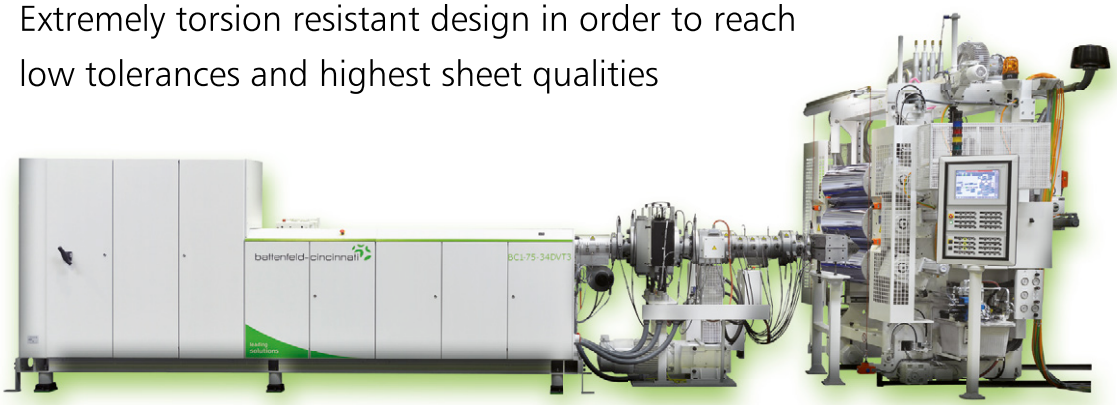

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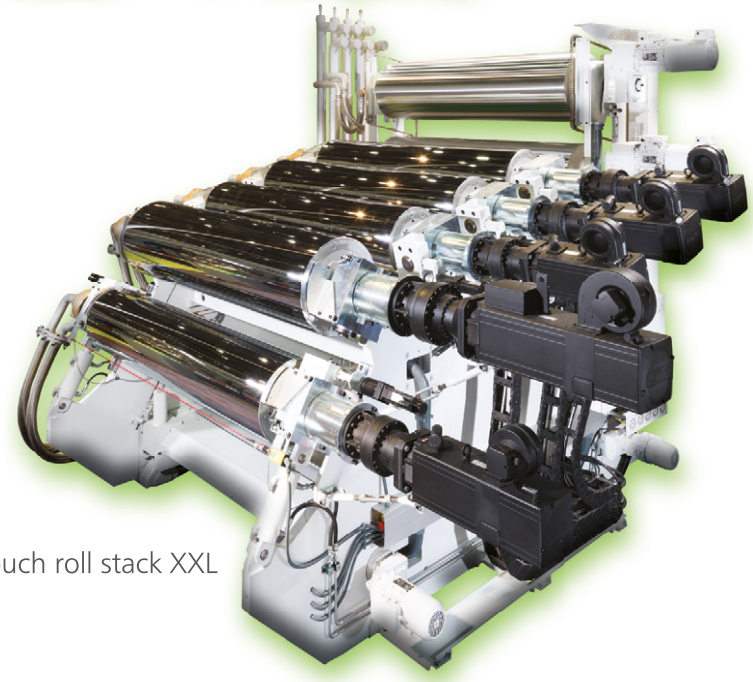

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Pregis spends $10m to expand flexpack plant

US-based Pregis has invested more than $10 million in its Sharp Packaging flexible packaging operationin Wisconsin – which includes adding a blown film line and enhancing printing capabilities there.

A new Hosokawa Alpine five-layer, coextruded blown film line – which produces polyethylene-based film for use in flexible packaging, including poly bags – has been installed in the vertically-integrated facility. Material is extruded, printed, then converted into pre-opened flexible bags.

The company has also invested in two 8-colour flexographic printing presses that have a broad range of printing capabilities and wider colour range, with higher quality graphics.

"With increased demand for Sharp bagging systems –particularly for e-commerce applications–this investment puts us in an ideal position to supply marketplace needs," said Mike Menz, president of Sharp Packaging Systems. "Our new five-layer blown film line allows us to push the envelope on engineered film solutions which address specific packaging objectives."

Sharp flexible bags and bagging systems are used in a variety of applications including e-commerce, medical/pharmaceutical, retail displays and OEM parts.

› **www.pregis.com**

Borealis to buy recycler Ecoplast

Borealis is to buy Austrian plastics recycler Ecoplast Kunststoffrecycling, subject to required regulatory approvals.

Based in Wildon, Ecoplast processes around 35,000 tonnes/yr of post-consumer plastic waste from households and industrial consumers into LDPE and HDPE recyclates. These go mainly into plastic film market.

Borealis CEO Alfred Stern described the move as "a logical next step for us to expand our mechanical recycling capabilities, which are key to our sustainability and circular economy efforts". The company already owns MTM in Germany, which focuses on rigid injection moulding recyclates. Ecoplast is seen as complementary.

› **www.borealisgroup.com**

Rajoo new innovation centre

Rajoo Engineers of India has opened an innovation centre at its facility in Gujarat.

The centre It has been conceived with four main aims: to provide access to newer technologies that have been developed there; to offer additional resources to those who may have gone beyond their existing capacities, cannot meet challenging delivery timelines or do not have the necessary equipment; to give customers the chance to conduct trials and develop newer products; and to develop into a skill development centre.

Khushboo Chandrakant Doshi, executive director of Rajoo Engineers Limited, said: "In our domain, we are the first company in Asia to have launched such an innovation centre. Already customers from India and overseas are benefitting from the facility."

› **www.rajoo.com**

Transcendia acquires Precision Poly

Materials science specialist Transcendia has acquired Precision Poly, a custom manufacturer of food grade and industrial co-extruded blown film bags and rolls for flexible packaging.

The acquisition broadens Transcendia's technology platform in active packaging and engineered films for the food and beverage market.

"This strategic acquisition enhances our growing food and beverage segment through the addition of complementary multi-layer blown film technologies," said Andy Brewer, president and CEO of Transcendia.

Founded in 1995, Precision Poly operates a manufacturing facility in Grand Rapids, Michigan, whose extrusion processes incorporate in-line/dedicated bag machines, as well as on-site converting for individually-cut products.

This is Transcendia's sixth strategic acquisition in the last five years, as it looks to become a leader in custom engineered films.

› **www.transcendia.com**

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The event builds on the success of earlier shows held in Essen

Exhibitors sign up for new US plastics shows

More than 100 companies have already booked booths at three free-to-attend plastics industry tradeshows that make their US debut next year.

Organised by AMI, the Extrusion Expo, Plastics Recycling World Expo and Compounding World Expo will be co-located in the two largest halls at the Huntington Convention Center in Cleveland, Ohio on 8-9 May 2019.

Building on the successful launch of AMI's compounding and recycling shows in Essen, Germany, in June of this year, the new Cleveland event is shaping up to be the largest plastics industry gathering in the US next year. It will include five free-to-attend conference theatres, plus a networking party for attendees and exhibitors at Cleveland's Rock and Roll Hall of Fame on the evening of 8 May.

"The first Compounding World and Plastics Recycling World Expos in Essen, Germany attracted 184 exhibitors plus 4,024 visitors, and received an extremely positive reaction from the industry," said Rita Andrews, Head of Exhibitions at AMI. "With the addition of the Extrusion Expo, we are confident that we will build on these numbers to make the Cleveland event even bigger and busier."

Companies already signed up for booths at the focused Cleveland expos include Azo, Bausano, Beier, Brabender, Buss, Cabot, Chemours, Coperion, CPM Extrusion, Cumberland, Davis-Standard, Dr Collin, Doteco, Dover Chemicals, Entek, Farrel Pomini, FB-Balzanelli, Ferro, JSW, Leistritz, Luigi Bandera, Macchi, Milliken, Modern Dispersions, NFM, Nordson, Oden Technologies, Omya, Orion, Piovan, Reifenhäuser, Schenck, Struktol, Vertellus, Wacker, Zeppelin.

"We've been delighted by the very positive industry response to our new tradeshows," said Andy Beevers, Director of Events at AMI. "We selected Cleveland as the ideal location for the US exhibitions because of its easy accessibility for huge numbers of extruders, recyclers and and compounders, as well as its excellent convention facilities."

For more information on the Extrusion Expo 2019, Plastics Recycling World Expo 2019 and Compounding World Expo 2019, please visit: **https://www.ami.international/exhibitions**

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Atlanta / 2018

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Plastics Recycling WORLD

Project aims to define 'recyclable'

Plastics Recycling Europe (PRE) and the Association of Plastic Recyclers (APR) in the US have teamed up to develop a global definition governing the use of the term 'recyclable' in the context of plastic packaging and products.

The associations lay out four conditions that should be met for a product to be considered recyclable: It must be made with a plastic that is collected for recycling and has market value and/or is supported by a legislatively mandated programme; It must be sorted and aggregated into defined streams for recycling processes; It can be processed and reclaimed or recycled with commercial recycling processes; The recycled plastic becomes a raw material that is used in the production of new products.

"The use of the term 'recyclable' is consistently used with packages and products without a defined reference point," said APR President Steve Alexander. "At the end of the day, recyclability goes beyond just being technically recyclable."

Ton Emans, PRE President, added that there have been many recent announcements about legislative measures on plastics products and pledges by industry actors to make their products recyclable. "We welcome these commitments and encourage others to follow. Nevertheless, clear and universally endorsed definitions and objectives are needed," he said.

The stated aim in doing this was to "provide a consistent metric to guide the efforts of sustainability for plastics in the circular economy". It is also seen as a step to harmonise the worldwide plastics recycling industry. Comments from industry and other stakeholders are invited.

› https://plastics-recyclers-europe.prezly.com

Organisations are looking for a global definition of 'recyclable'

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Stretching possibilities: advances in biaxial film

Bioriented film is a key product in the packaging arena, and advances in both machinery and materials are pushing performance further to improve performance in strength and barrier performance. Lou Reade reports

Biaxially oriented film is still dominated by polypropylene, and delegates at AMI's recent Biax Film conference in Vienna, Austria, heard about plenty of new machinery and materials developments in this area.

Florian Brehmer, technical director of **Softal** in Germany, highlighted two different possibilities to activate the surface of a BOPP film after extrusion: one combined in-line plasma and coating; the other used plasma and corona.

The film in this case was a transparent, three-layer PP film with a printable/coatable top layer. The company used its patented Aldyne system to carry out homogeneous plasma treatment at high speed, and application of a UV ink. The film was 2m wide, and travelling at 400m/min.

When combined with coating, the plasma treatment system was integrated between the MDO and TDO. The BOPP is coated after plasma treatment, but before the TDO process. This method is typically used in BOPET production, he said. Three coatings were tried, and the feasibility of coating each of them in-line depended largely on their individual chemistries, he said.

An alternative method looked to apply plasma and corona treatment at different stages of the extrusion process. Overall, applying plasma treatment between the MDO and TDO stages offered new possibilities, he said. Also, the surface tension of the film could be boosted from 52mN/m to 56mN/m by refreshing with corona treatment after around 10 days.

According to Louis Darlet, sales director of **Esopp**, there are several key requirements of modern stretching lines, including: higher output – with a focus on wide, fast lines; flexibility – such as the ability to run different types of film on the same line, and for fast changeover; and energy saving.

"We have already committed to 20% lower energy consumption than the existing alternative," he said.

Metal performance

Marilena Pezzuto, of the R&D team at BOPP film manufacturer **Manucor** in Italy, told delegates that her company is constantly trying to improve the quality of its metallised film.

Metallised BOPP film ensures a long shelf life for products, and can be presented with a clear barrier for good presentation, but manufacturers must be

Main image: Bobst says that its AluBond vacuum metallisation technique improves adhesion between the metal and base layer of a film

Above: Manufacturers are constantly trying to improve the production of metallised BOPP film

careful to make the film with consistent optical density and without faults such as pinholes and scratches, she said.

The surface of the BOPP – which is chemically inert – must first be treated before metallisation, and Pezzuto explained how Manucor uses a combination of flame and plasma treatment to ensure maximum metal adhesion.

SIMS analysis showed that this combination gave a higher level of oxidation on the surface and through the aluminium layer than when using corona/plasma treatment, she said.

However, there are a number of ways to measure metal adhesion – and she said: "The scientific community has to agree on one common method to evaluate it."

Chris Cheetham, regional sales director at **Bobst** in the UK, presented details of the company's AluBond technology – a vacuum metallisation technique used to create metallised film. He said that the hybrid coating technology leads to improved adhesion between the metal and base layer of the film.

"Conventional plasma-based systems have been unable to achieve this," he said.

He said that typical tests, including the EAA peel test, have been used to demonstrate its performance. For instance, for a 12 micron PET/Al film the peel force for a 'metal only' bond was around 0.38N/15mm, while it was more than 6N/15mm for a similar film made using AluBond. Similar performance was seen for BOPP/Al and CPP/Al films.

As well as having higher bond strength, Cheetham said the AluBond-based film delivered a

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superior barrier: a metallised 20 micron BOPP film for instance, had around one-fifth the oxygen transmission rate and around one-seventh the water vapour transmission rate.

Crystal clear

Marco Izzi, application development and technical service engineer at **Basell Polyolefine** in Italy, said that the company's new Adstif range of polypropylenes – made using its fifth generation of catalysts, and having a lower oligomeric content – can be used to make thinner film with higher barrier properties.

He said that a higher crystalline phase fraction in the materials helped to boost the barrier properties.

"Gas molecules are unable to permeate through the polymer crystallites," he said. "Gas permeation into semi-crystalline polymers is confined to the amorphous regions."

He added that a new set of catalysts is under development to make 'cleaner' PP products that will meet the more stringent regulatory requirements of European food packaging. The company is developing a set of homopolymers based on the catalysts, he added. Properties include high stiffness and better processability, he said.

On a pilot BOPP film line, the company has produced 25 micron ABA structures, using three new high crystallinity polymers in the core layer. Compared with a standard homopolymer, they had comparable optical properties, but a 20% improvement in barrier properties as well as a superior xylene soluble fraction (fewer extractables).

Experimental grades with low oligomeric content are also available for skin layers, he said.

Enhanced packaging

Ampacet says it has developed a number of compounds to extend packaging production capabilities – including phthalate-free masterbatches, a new generation of matte compounds (called Matif) and an ultraviolet barrier solution called UVBlock.

The Matif matte compounds manage to balance the challenge of achieving a homogeneous matte aspect with matte co-extruder dimensioning and optimum BOPP line output. In the first instance, the grades have a haze of around 75%, with high uniformity. At the same time, significant downgauging is possible, with matte skin thickness as low as

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1.5 microns. Also, the co-extruder can be run within a standard operating window, allowing the BOPP line to be run at optimum speed.

Overall, says the company, producers can improve output by up to 33% over a year by using the film.

Its UVBlock product balances the need to improve package transparency while protecting the contents – so that other properties such as oxygen and water barrier are not affected. Overall, it gives good UV light blocking even at low thickness, and is ideal for thin BOPP films used in food- and non-food transparent applications.

Bio-based barrier

Lucia Jimenéz García, technical application manager at **Synvina** – a joint venture between BASF and Avantium – explained how its new type of polyester called polyethylene furanoate (PEF) can be used as a high barrier, bio-based alternative to PET in many applications.

As well as being used to make bottles, it can also be used to make a high barrier BOPEF film. Extensive research, in collaboration with Toyobo, has led to a film with similar properties to BOPET, allowing its use in comparable structures.

"It has a suitable oxygen barrier for products such as cheese and meat," she said. "It can directly replace BOPET combined with barrier layers such as PVDC and EVOH."

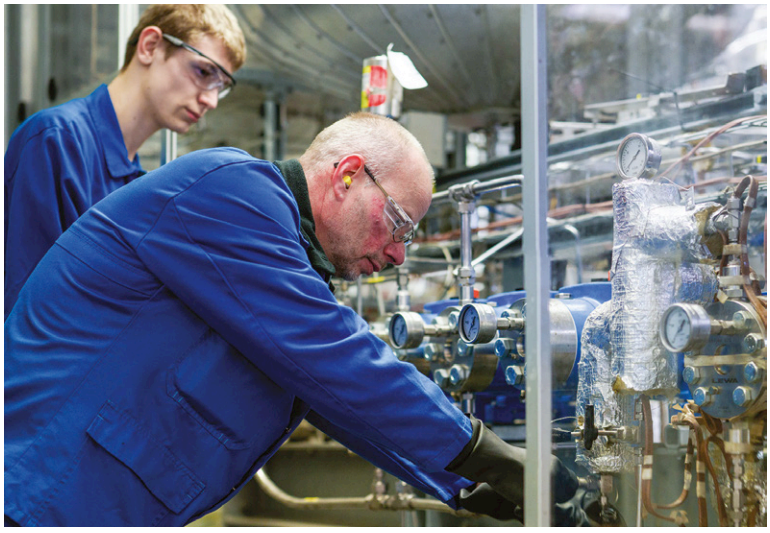
A comparison between the two films shows that BOPEF has 11 times the oxygen barrier and three times the water vapour barrier of BOPET – and this does not vary much with humidity. It is processable on the same equipment – meaning to replacement is needed – and is similarly recyclable.

However, until PEF is widely available, traditional methods – such as using an EVOH layer – will continue to dominate in barrier applications. Wout Luyten, technical service director at **Eval Europe**, said that its high barrier grades – including a new one for oriented film – can help to boost packaging shelf life.

The material is commonly used in many types of flexible packaging and blocks the passage of oxygen and water vapour, while also protecting against mineral oil contamination.

The company has now developed a new grade for oriented film applications. Its new Eval DBS (38) grade is designed to be oriented (while standard Eval grades cannot). At 20°C, the new grade's oxygen transmission rate is about four times higher than that of PVdC. However, at 10°C, the performance is comparable, said Luyten.

The grade has been tested in sequential tenter film, including a seven-layer design – in which it made up 1.4 microns in a 26 micron thick film.



Below: Synvina makes FDCA – a precursor of PEF – at its pilot plant in the Netherlands

Slipping away

Jean-Pierre Patte, senior sales developer at **Multibase**, told delegates that the company's new non-migrating slip additive – a silicone-based masterbatch in pellet form – can be used in skin layers of either transparent of opaque BOPP film.

"It reduces the coefficient of friction with long-term stability over a wide temperature range," he said.

HMB-6301 masterbatch – from Dow Corning – can be dosed with any conventional method, and does not affect extrusion parameters such as temperature profile and stretching rates, he added. As well as having little effect on the haze of clear films, it also has limited effect on corona treatment on the reverse side of the film.

The product was trialled on a three-layer **Brückner** BOPP extrusion line running at 300kg/h. The masterbatch was added at different dilution rates. Overall, the masterbatch gave a consistent coefficient of friction after six months, was suitable for vacuum metallisation or printing, and maintained the transparency of clear films.

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Pulling it off: latest in downstream equipment

The correct downstream equipment is vital in controlling the quality of the end product in film and sheet extrusion

While upstream processes such as polymer testing ensure the quality of input resin, downstream machinery – ranging from haul-off equipment and winders to web guidance and air rings – helps to ensure that the final product meets customer expectations.

For instance, a stretch film line from **Davis-Standard** – installed at a North American film producer last year – relies heavily on an overlapping winder for its performance.

The system is engineered for producing thin films from 31- to 51-gauge (7.8 to 13 microns) at high speed. The side-by-side DS S3 overlapping winder is essential to its capability: it enables maximum slit widths for hand-wrap, machine-wrap and jumbo rolls, supporting multiple market segments on one winder, says the company.

Films discharge from the front of the line to a common side to simplify roll packing and future automation. Cores are also same-side loaded from the back to prevent disruption of packing activities. There is an auxiliary lay-on roll to eliminate top-wind waste during transfer, optimizing roll quality and eliminating outer wrap transfer waste.

High volume

High-volume core bins minimise refilling frequency and feature a simultaneous core set discharge of multiple core lengths while decreasing cycle time, and improving both slit-width flexibility and net film utilisation. Core widths can be changed on the fly to maximise uptime.

There is a 30-second cycle time regardless of the number of slit widths, which is ideal for hand-wrap products. A pull-through trim system eradicates trim jams into the granulator regardless of line speed or film thickness.

Motor-driven web support rollers with an air-venting finish improve film transport at high line speeds, providing quality winding and wound roll

Main image: The Digital Inspection Table from Bobst is designed to boost productivity and cut print production errors

Above: An S3 winder enables maximum slit widths for hand-wrap, machine-wrap and jumbo rolls on a Davis-Standard stretch film line

formation. The air-venting idler roll finish locks film on the rolls at low tension for excellent tracking and roll edge straightness.

The customer reports very few medium gels and no large gels in films. The combined IR web measurement system, profile control, melt delivery and gravimetric rate control has resulted in a deviation of less than 1%, regardless of film thickness, resulting in superior roll quality says the company.

On the table

Bobst has unveiled its Digital Inspection Table – a novel technology that is designed to boost productivity and cut print production errors.

It incorporates digital projection for the proofing of printed sheets and die-cut blanks, while providing real-time visual representations to match product with digital proofs. It uses HD projectors to illuminate the product sample with quality control imaging, enabling the operator to easily see if quality standards are matched or compromised. The layout file can also be projected onto the sheet so that print registration can be checked and adjusted, removing the need for overlays and print minis and moving the process from paper to digital.

"The table has been designed to help drive efficiency along customers' entire production lines," said Raphael Indermühle, head of sales and marketing for the services business unit at Bobst.

The Digital Inspection Table offers a range of features, including warp analysis, automated quality tracking and performance management. These features are designed to provide a sophisticated methodical system, enabling and promoting higher quality production. ❯

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Van Meeuwen Chemicals supplies several types of anti-static, denesting and anti-fogging agents. These are partly based upon functional chemicals. Or available in the form of masterbatch additives. The additives are successfully used in plastic extruded rigid sheets, thermoformed trays, containers and food packaging.

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Guidance system

Later this month at FachPack – held in Nuremberg, Germany – **BST Eltromat** will present its web guiding system called CompactGuide, for narrow and medium web widths with wide array sensor.

The web guiding system for narrow and medium web widths is available in six sizes. Thanks to its modular construction, it can be configured flexibly for individual requirements and equipped with different sensors and controllers. A more economical web guiding system, EcoGuide (for narrow-web applications), and the SmartGuide (for wide-web applications) complete BST's range.

The web guiding systems satisfy practically all possible requirements for the manufacture and converting of packaging foils, says the company.

BST will also present information on current requirements in web guiding, layer thickness and basis weight measurement, as well as web inspection and video-based web monitoring.

Lucky seven

Atlas Converting Equipment of the UK has supplied a 10.4m Atlas CW1040 primary slitter rewinder to Fujian Furong Technology Group of China.

Fujian Furong, one of the three largest producers of BOPP film in China, already has six Atlas CW1040 primary slitter rewinders – two at 8.3m and four at 8.7m. The machines are installed at three production sites in China: Fuqing, Fujian Province; Guangzhou, Guangdong province; and Nantong, Jiangsu Province. It uses a selection criterion based on machine performance, after-sales service, the global installed base of the manufacturer and of course the price.

Above: BST's CompactGuide web guiding system is available in various sizes and can be configured for individual requirements

Slitting range

At this year's Chinaplas, **Goebel IMS** showcased three of its machines: Monoslit, Interslit and Xtraslit 2.

The company's portfolio covers web widths from 1,800 to 12,000mm. All its slitter rewinders use a digital AC drive technology to reduce operational costs and energy consumption. The technology can recover energy from web tension or during the deceleration at the end of each winding cycle.

The Interslit is aimed at manufacturers of special films with a width between 4,000 and 7,000mm. These include biax, battery separator, optical or ultra-thin films as well as transfer printing applications. The slitter rewinder is suitable for foil thicknesses of 0.5 to 500 microns. Its winding stations can accommodate a roll weight of up to 5,000kg with an unwind diameter of up to 1,550mm and a rewind diameter of up to 1,300mm. Although working with sensitive materials and heavy rolls, it has top speeds of up to 1,200m/min.

Also at Chinaplas – during an open house at ExxonMobil's Shanghai Technology Center (STC) – visitors saw a multi-functional cast film line that had been newly installed by **SML** of Austria.

A special feature of the line is the mono-axial stretching unit (MDO), which can be operated in-line for breathable hygiene, MOPP and in-line, pre-stretch films. An additional unwinding unit on top of the MDO provides off-line testing from roll to roll.

Despite the complexity of the line, the machine is simple to operate and components are easy to access. Different web paths through the machine, combined with variable operation modes, allow efficient changes from one solution to another.

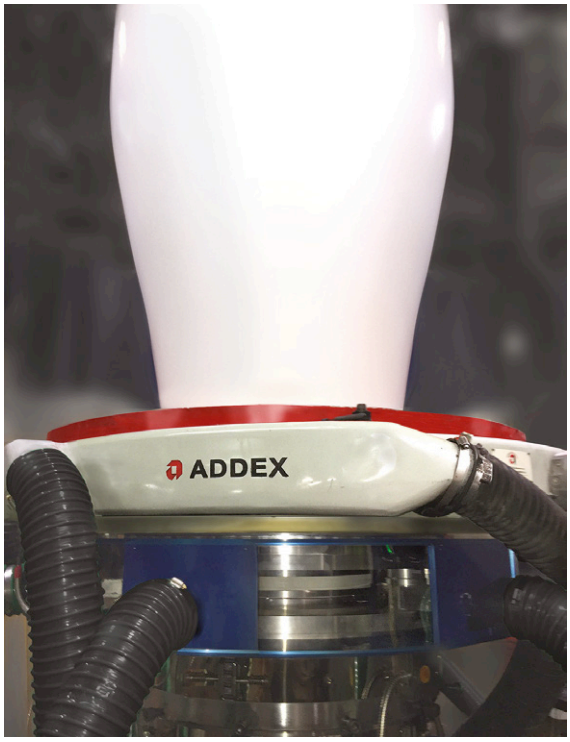
Cool technologies

At this year's NPE show in the USA, **Addex** – which supplies auto-profile and other cooling systems for blown film lines – showcased its latest Intensive Cooling technology

The company launched its 'Height-Adjustable' Intensive Cooling twin-stack system, designed to optimise performance for both high- and low-melt processes.

It offers an enclosed, two-level, stacked Intensive Cooling system with a lower element that mounts flat to the die and a second, height-adjustable element just below the air ring. The system is adaptable to changes in materials and supports fast changeovers.

The original fixed-height Twin-Stack system can increase output by 15-20% for very low-melt strength materials, and by 40-50% for high-melt strength materials. The Height-Adjustable version



Right: Intensive Cooling systems from Addex can boost output on blown film lines

of the Twin-Stack is expected to produce even greater increases.

At the same time, **Brampton Engineering** expanded its Vector air ring product line. Its new Vector S offers an auto gauge option by using segmented air. It reduces starting gauge by up to 80% compared to conventional air rings, says the company. It also has very high resolution, as it has 180 digital control points adjacent to the lip compared to the usual 60-80 controls in conventional air rings.

Brampton engineers used aerospace engineering to create the Vector line – distributing chilled air uniformly around the bubble using a single inlet while controlling the flow to secure stable 'bubble-lock' and boost output on the blown film line.

At the same time, Brampton says that its SCD 4.0 die technology will now be available for retrofit on all existing lines – regardless of age, model and manufacturer. It says that the die has a direct path from the extruders and streamlined melt channels, to achieve "the shortest melt residence time and lowest wetted surface area in the industry".

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PHOTO: EASTMAN

The plasticiser industry – and its customers – continue to face regulatory pressure. It is responding with better science and an array of new plasticiser options. Peter Mapleston finds out more

Plasticisers – science and regulation

The PVC industry has been battling detractors for decades. For a long time, the big issue was VCM (vinyl chloride monomer). Today, it is phthalate plasticisers. Opponents have their sights focused on low-molecular weight types in general and diethylhexylphthalate (DEHP) in particular, but other plasticiser types have been caught up in the action too. Some plasticiser producers may have breathed a sigh of relief at the EU's recent decision not to classify diisononyl phthalate (DINP) as reprotoxic. But DEHP still faces stormy weather and recent moves could spell the end for it in one key market, at least in Europe. Meanwhile, beyond the legal sector, researchers are hard at work developing new – and possibly better performing – plasticisers. This article takes a look at some of the latest regulatory and technical developments.

This March, the Risk Assessment Committee (RAC) of the **European Chemicals Agency** (ECHA) rejected a proposal by the Danish environmental authority to classify the plasticiser diisononyl phthalate (DINP) as reprotoxic. "Overall, RAC concluded that no classification for DINP for either effects on sexual function and fertility, or for developmental toxicity is warranted," it said in a statement. This means that classification in neither Category 1B nor Category 2 will not be required.

"This brings to a close a regulatory process which lasted over three years from the original Registry of Intent from Denmark, followed by a public consultation, a year-long assessment of the proposal by a RAC rapporteur and co-rapporteur, culminating in a conclusion by the full RAC committee in March 2018," says Michela Mastrantonio, Manager at trade association European Plasticisers. "The RAC opinion provides a further extensive regulatory assessment of DINP, demonstrating that there is no need for hazard classification and supporting that DINP is safe for use in current applications. We are confident this brings a strong reassuring message to the industry, the value chain and consumers on the safety and sustainability of DINP and flexible vinyl articles as well as other products made with DINP."

DINP producers **Evonik Performance Materials** and **ExxonMobil** both welcomed the decision. Evonik had participated intensively in technical discussion on the classification of DINP, says Dr Hendrik Fischer in Product Stewardship at Evonik. "The RAC's evaluation confirms the results of our many years of research in this area: DINP can be used with complete safety in all of its various

Main image: Medical bags are one of the key battle grounds for plasticiser producers

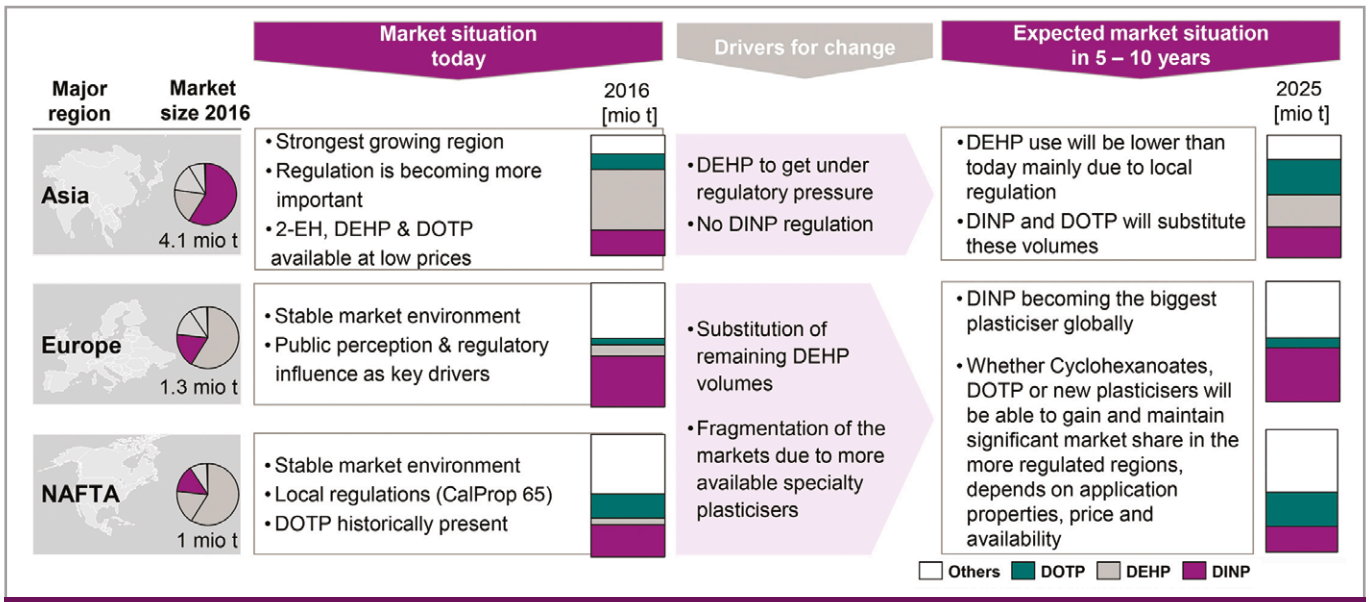
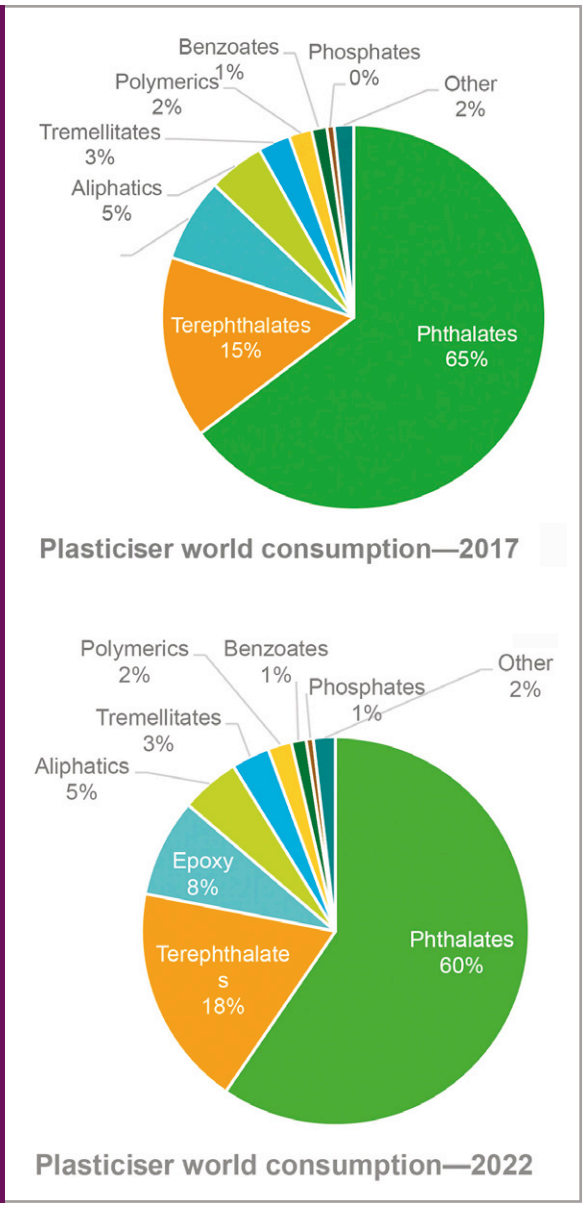


Figure 1: The challenges and drivers for change for plasticisers in the three key world regions differ significantly
Source: Evonik, ICIS, IHS, Roland Berger, Tecnon

Figure 2: The global plasticiser market is changing. Phthalates continue to dominate but the trend is towards non-ortho-phthalates and high molecular weight types. Annual growth is around 3%



Source: IHS Markit, Eastman

applications and contributes toward improving our everyday lives."

Nigel Sarginson, Oxo Europe REACH and Product Stewardship and Regulatory Affairs Advisor at ExxonMobil, echoes that sentiment: "DINP is one of the first plasticisers and chemical substances to have gone through such extensive reviews by regulators with the conclusion of no classification and no further risk management measures required, and confirms DINP as a major safe and sustainable general-purpose plasticiser in Europe (approximately 50% of the plasticiser market) and globally," he says.

LMW regulation

European Plasticisers has also been commenting on the public consultation initiated by ECHA on the future update of entries in Annex XIV (the Authorisation List) of four low-molecular-weight (LMW) phthalates, DIBP, BBP, DBP, and DEHP.

When the consultation was announced, ECHA said: "The Commission is preparing to amend the Authorisation List with the additional intrinsic properties of these four substances. This update means that some uses which until now have been exempted may require authorisation, such as: i) uses of the four phthalates in mixtures in concentrations above 0.1 % w/w [so far the concentration limit has been 0.3 % w/w]; ii) some uses of DEHP [for example in food contact materials or medical devices] that will no longer fall under the generic exemptions from the authorisation requirement due to the endocrine disrupting effects on the environment of DEHP."

European Plasticisers says that the European

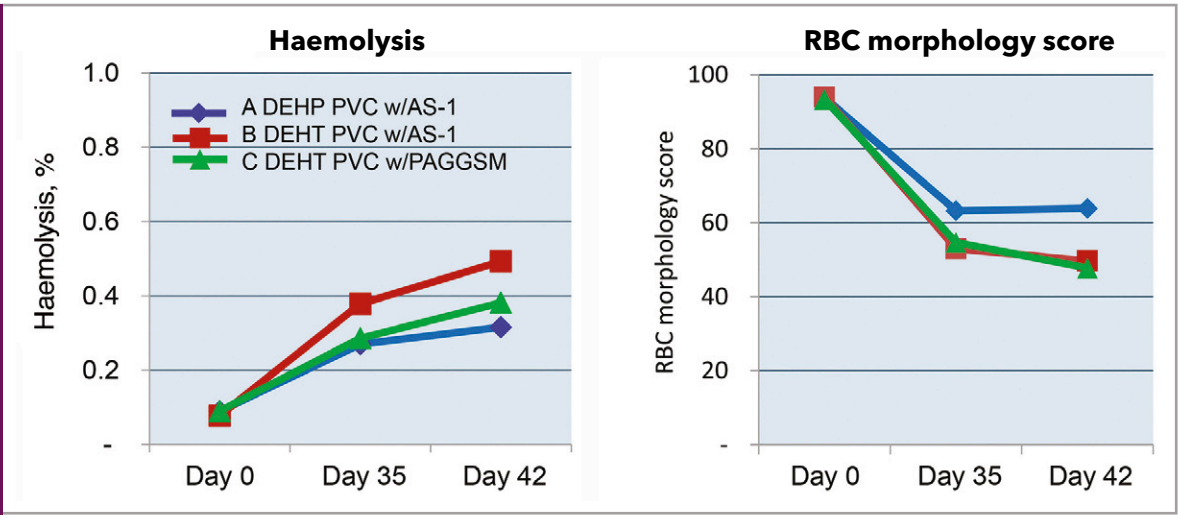


Figure 3: Haemolysis and morphology results from blood stored in bags of PVC plasticised with DEHP and DEHT (AS-1 and PAGGSM are preservative solutions)

Source: Eastman

plasticiser market "has already adapted to the regulatory and market pressures with an important major shift from the use of these classified LMW phthalates to the use of non-classified high molecular weight (HMW) phthalates and other plasticisers.

One close observer of the industry says that the major move away from LMW phthalates to non-classified HMW phthalates – and more recently to non-phthalate plasticisers – has been a 25-year process requiring an investment that probably amounts to more than €6bn by the industry in manufacturing process and plant, applications support for customer conversion, as well as investment in toxicology and environmental testing, regulatory and expert evaluations of the data, not forgetting conduct of LCA studies and extensive support for recycling via the VinylPlus sustainability initiative.

European Plasticisers does point out though that, "given that the four LMW phthalates are already regulated and Authorisation as well as Restriction procedures are ongoing, we believe that their double listing for the same adverse health effects in animals and inclusion in the Authorisation List for their ED [endocrine disruption] properties is unnecessary overregulation, and puts excessive burdens on the industry, weakens policy predictability and hence undermines the European industry from investing and staying competitive in a global market.

"Due to the fact that some uses of DEHP (for example in food contact materials or medical devices) will as a result no longer fall under the generic exemptions from the authorisation requirement, the update of the Annex XIV list will oblige DEHP producers, medical devices producers and recyclers of flexible PVC to face a new challenge regarding the Authorisation process."

Medical moves

In the medical sector, DEHP remains the plasticiser of choice in many applications. And the reason is simple – it provides a property set that is nigh-on unbeatable.

That position may not be unassailable, however. Speaking at AMI's Medical Fluid Bags 2018 conference in Cologne in June, Dr Angelika Langsch, Senior Manager of Regulatory Affairs at **BASF**, said regulators increasingly believe there is a lack of justification for exposing sensitive new-born children to DEHP.

French law already prohibits the use of tubes containing DEHP in paediatrics, neonatology and maternity. Countries in the Arabian Gulf also recently notified the WTO of their intention to essentially ban DEHP in all medical devices from 22 July 2021. And a ban on DEHP in blood transfusion products came into effect in South Korea this June. "Medical device producers need a competitive and technically suitable alternative plasticiser," said Langsch.

In addition, European Medical Device Regulation 2017/745 – which came into force in May 2017 and has a three-year transition period – says medical devices "need a specific justification if containing substances above 0.1% (w/w) with the following properties: CMR Cat 1A or 1B (carcinogenic, mutagenic or toxic to reproduction); or endocrine disrupting properties for which there is scientific evidence of serious effects to human health."

For a long time, the European Pharmacopoeia has listed only DEHP as a suitable PVC plasticiser for medical devices. That changed on 18 January this year, when four more plasticisers – DINCH, BTHC, TOTM and DEHT – were added.

BASF produces DINCH, which (like DEHT) exceeds REACH requirements. Langsch cited studies that demonstrate its suitability for use in various medical devices, such as bags for infusion

solutions, enteral nutrition, and blood. Blood bags made with PVC plasticised with DINCH have been approved in at least one European country for several years. "CE-marked medical devices based on alternative plasticisers are already in use not only on the European market, but are also available in Asia and North America," Langsch said.

At the same conference, Dr Martin Stimpson, Market Development & Account Manager at **Eastman Chemical** UK, looked at the suitability for DEHT (which Eastman manufactures as well as DEHP) for blood bags. He started by noting that one of the reasons why DEHP has been so favoured historically by bag makers is that, in addition to doing an excellent job as a plasticiser, it also stabilises the red blood cell (RBC) membrane, resulting in reduced haemolysis and good shelf life.

Although DEHP and DEHT are structurally and functionally similar, DEHT (di-(2ethylhexyl) terephthalate), which the company markets as Eastman 168 SG, "is distinct from a metabolic and toxicological standpoint," Stimpson said.

Stimpson presented results from an Eastman-supported study, which revealed that all RBC products stored in DEHT plasticised bags showed haemolysis under 1% after 42 days' storage (Figure 3). Pointing out that further work with a larger sample size is needed to validate performance, he said that, based on this initial study, "the clinical performance of Eastman 168 SG suggests it should be considered a lead alternative plasticiser for PVC blood bags."

In addition, he said that fresh frozen plasma (FFP) products stored in DEHT-plasticised bags for up to one year tested the same as products stored in DEHP-plasticised bags. "Based on this data, Eastman 168 SG is a potential replacement for DEHP in FFP storage bags," he said.

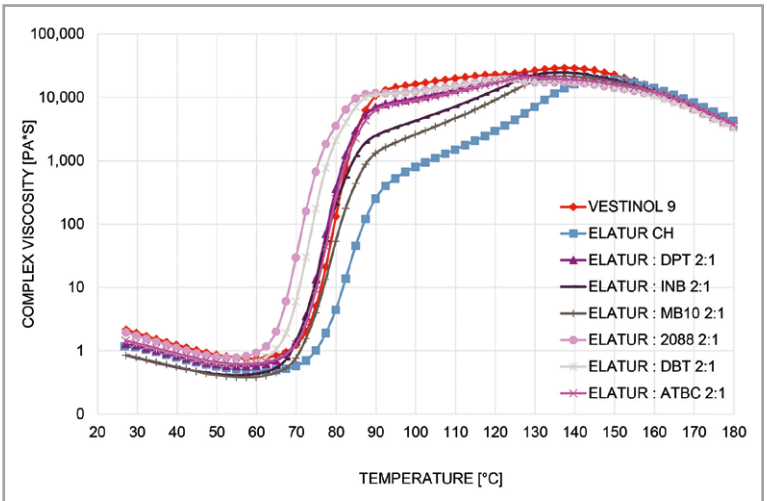


Figure 4: Gelation behaviour of an Elatur CH / DPT mixture (2:1) is almost on the level of DINP (Vestinol 9 is DINP; INB is isononyl benzoate; MB10 is isodecyl monobenzoate; 2088 is a reaction mass of several olefin glycol dibenzoates; DBT is dibutyl terephthalate; ATBC is acetyltributylcitrate
Source: Evonik

The scientific case

Back at ExxonMobil Chemical, Global Technical Plasticiser Advisor Didier Naert is campaigning for the use of "sound science" to make the case for plasticisers (preferably DINP, possibly in combination with MB10 to reduce viscosity and boost gelation and low temperature flexibility). He says because PVC and plasticisers are not chemically bound, but rather develop intermolecular forces such as dipole-dipole interaction, dispersion forces, and Van Der Waals forces, an optimum balance between polar and non-polar groups is needed to keep the two together. Ortho-phthalates like DEHP and DINP excel in this regard, with their polarised heads and non-polar tails, with polarising ester groups in the middle. Alternatives such as hydrogenated phthalates, terephthalates, adipates, citrates, and modified vegetable oil all fall short in at least one aspect, he says.

"Based on structural interaction and chemical structure, terephthalates or other alternatives are not able to cover the range of performance offered by HMW phthalates," according to Naert. "There is an ever-increasing need for plasticiser mixtures; specialty additives are shifting the flexible PVC industry into a foggier and more costly environment."

Consumer products and also technical articles have to be sustainable, Naert said. "Focusing on being non-phthalate does not mean that such plasticisers are automatically more sustainable. From raw material selection up to recycling, many considerations come into play when selecting sustainable plasticisers. We believe that the overall DINP attributes and performance makes it well positioned to address such considerations."

Alternative options

But DINP producers are not putting all their eggs in one basket. Discussing innovations to meet regulatory and economic challenges at AMI's PVC Formulation 2018 conference in Cologne in April, Dr Hinnerk Becker, Head of Marketing Segment Plasticisers at Evonik Performance Materials, introduced Elatur CH cyclohexanoate. He said this is a non-phthalate alternative to DINP. Its properties can be boosted by fast fusers, also made by the company.

Becker pointed out that DEHP stands out for its high gelation power. DINP, the best alternative to DEHP, has lower gelation power, and other alterna-

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Right: Emery Oleochemicals produces low-migration plasticisers that comply with legislation on substances for indirect food contact

tives such as cyclohexanoates and DOTP have an even greater need for fusing agents. Evonik's answer to the problem is Elatur DPT di(iso)-pentyl terephthalate (Figure 4).

Among various advantages cited for this product is its very low content of volatiles and semi-volatiles (VOCs and SVOCs). "Most of the current fast fusers at least partly contain SVOCs, Becker said. "Elatur DPT is over 99% VOC and SVOC-free." Elatur DPT also has very good cold storage properties, with no freezing down to –20°C.

Elatur DPT is registered under REACH and Evonik began producing it in commercial volumes in Q2 of this year. "Feedback from the market has been very positive," says Becker.

Lanxess says the trend towards non-phthalate solutions is "unbowed, especially in regulated markets. One alternative to phthalates is the alkylsulphonic acid ester Mesamoll." This product has fast gelling properties in PVC and shows good plasticising efficiency, not only in PVC, but also in polyurethanes, acrylates and rubbers.

Lanxess has also developed a range of new polymeric adipic acid esters – Ultramoll V and Ultramoll VII – with optimised processing behaviour. This can be seen in a lower dissolution

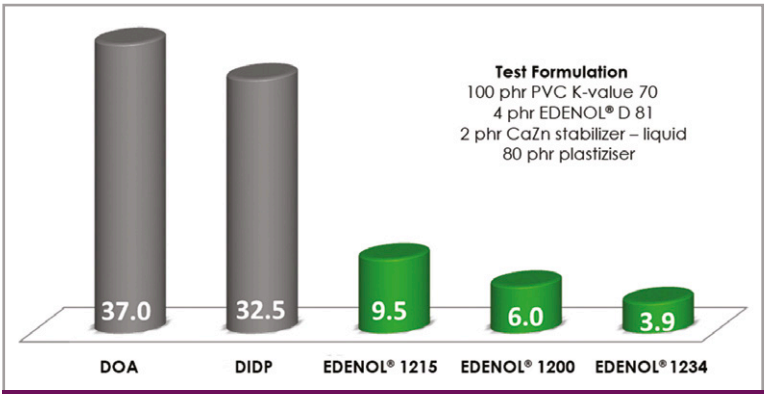

Figure 5: Migration resistance of monomeric and polymeric plasticisers. Comparison of weight loss (%) after immersion in iso-octane for 4h at 60 °C
Source: Emery Oleochemicals

PHOTO: EMERY OLEOCHEMICALS

temperature compared to Lanxess' standard grades. The company says the new grades also have an improved compatibility with PVC, which is demonstrated by reduced exudation especially in humid environments.

"Polymeric plasticisers from the Ultramoll range allow compliance with migration limits and the production of migration and extraction resistant goods," the supplier says. "In addition to technical applications, Ultramoll VII has also been developed for use in sensitive applications such as articles intended to come into contact with food." Ultramoll polymeric plasticisers differ in their average molecular chain lengths, which can be seen in their different viscosities, "to allow for diverse applications and the focus on processing conditions or migration behaviour."

Lanxess says its acquisition of Chemtura in 2017 significantly broadened its portfolio of organic phosphoric acid esters. Depending on type, Disflamoll and Reofos speciality plasticisers have a high gelling capacity and plasticising action or give plasticised PVC (and elastomers) good low-temperature flexibility, it says. The classification of Disflamoll DPO, diphenyl 2-ethylhexyl phosphate, was recently reviewed, with the result that since the end of 2017

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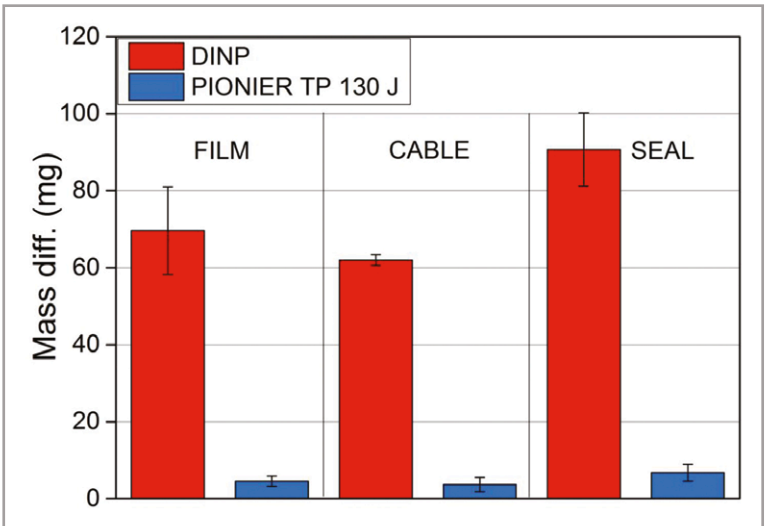

Figure 6: Comparison of plasticiser migration in different PVC products plasticised with DINP and Pionier TP 130 J
Source: SKZ

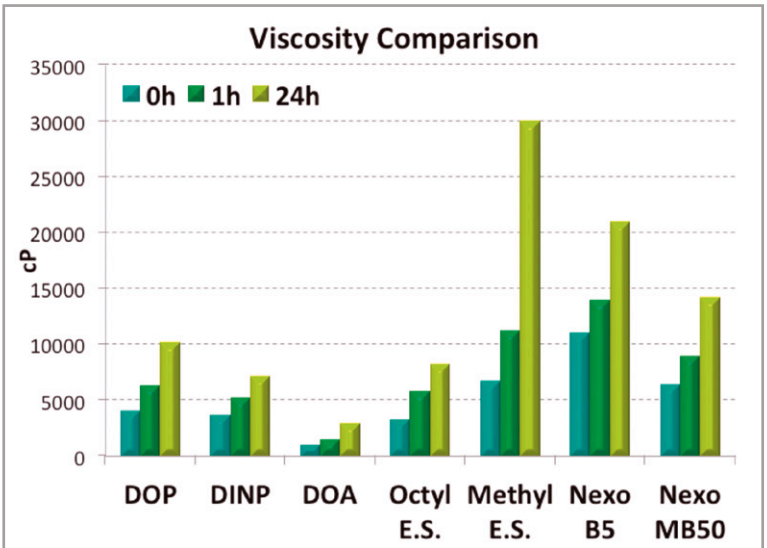

Figure 7: Viscosity comparison data for base coat PVC pastes plasticised with Nexoleum's Nexo B5 and MB50 bio-based plasticisers against conventional alternatives at same wt% (Brookfield viscometer, ASTM D 1824-95 (2010), 20rpm, 23°C
Source: Nexoleum

it no longer requires labelling under EU law.

Emerald says it continues to expand its portfolio of benzoate specialties. "Our goal is not to be closed in by the relatively narrow definition of a plasticiser as a flexibiliser; instead, we are utilising the versatile benzoate chemistry to solve a broad range of challenging formulation and performance hurdles," says a company spokesperson.

Recently introduced products are said to be useful as both plasticisers and modifiers. The company says their environmentally-friendly polymeric technology platform brings together an aliphatic polyester with some benzoate functionality to provide excellent compatibility with vinyl systems, together with permanence, flexibility, and stable surface energy characteristics. The latter is particularly important when creating multiple layer constructions or applying adhesives or printing.

Emerald says that its dibenzoates play an important part in plasticisation of VCT flooring materials as some general plasticisers have limited compatibility in vinyl. Incorporation of its K-FLEX 975P, 850P or PG products into a plasticiser blend can overcome this problem while also maintaining good rheology, enhancing stain resistance and lowering the fusion temperature. For newer LVT flooring products, which are more rigid, the company says new plasticisation technologies are being developed that help optimise characteristics such as resistance to indentation, impact and heat, and improve flexural modulus and melt rheology.

Bio-based developments

More bio-based alternatives to traditional plasticisers are emerging. **Emery Oleochemicals** for example, a global natural-based specialty chemical manufacturer, provides additives through its Green Polymer Additives business unit that are particularly suitable for the food packaging industry. The company has developed a portfolio of plasticisers with what it says are exceptionally low migration characteristics. They comply with EU Directive 10/2011, which sets migration limits of substances approved for indirect food contact.

To meet the demanding requirements of the food packaging industry, Emery Oleochemicals offers a full line of polymeric plasticisers over a viscosity range from 700 to 13,000 mPas (20°C); these plasticisers (in ascending order of viscosity) are Edenol 1208, Edenol 1215, Edenol 1200 and Edenol 1234.

Dr Nikola Kocić from the **SKZ** South German Plastics Centre introduced Pionier TP 130 J at the AMI conference on PVC Formulation. This is a 100% bio-based plasticiser obtained through modification of unsaturated triglyceride with hydrogen peroxide. Its properties can be adjusted through appropriate choice of alkyl rests. Kocić called the product a "green" alternative to DINP.

According to Kocić, Pionier TP 130 J scores over DINP in several ways. These include: faster incorporation into the PVC matrix; higher thermal stability; lower migration and chemical extraction; and better fogging properties. Efficiency is apparently comparable with DINP in achieving required mechanical properties.

Proviron is also working in the bio-based arena. Koen Engelen, Business Manager for Proviplast products says: "Over the last decade, Proviron

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Azoty to complete expansion this year

Polish chemicals group Grupa Azoty will complete a 30% capacity expansion for its non-phthalate Oxoviflex plasticiser by the end of the year and has started work on a 10,000 tonnes/year unit for new speciality polyester and polysuccinate plasticisers.

The moves are the company's response to the rapidly changing global regulatory position for plasticisers, which it said is particularly noticeable in Europe and the US but increasingly also in countries such as China. The investments follow the irm's announcement that its Oxo segment had ended production of DEHP, DOP (including medical grades) and DPHP and would cease all supply once it had cleared its inventories.

Grupa Azoty launched production of its Oxoviflex DEHT/DOTP plasticisers in 2015 and claims to be the largest player in the European market. The products are suitable for substitution of many currently used plasticisers and meet the requirements of EU toy and food contact regulations, according to the company.

The new investment in non-ortho-phthalate DEHT/DOTP plasticiser production will lift the company's annual capacity by 15,000 tonnes to 65,000 tonnes and justifies its decision to enter the sector, according to Oxo segment director Aleksander Grymel. "Growing demand for Oxoviflex proves that we have taken the right decision," he said.

The separate decision to build a new plant for production of polyester and biocompatible polysuccinate plasticisers is part of the company's previously initiated Special Esters Project and underlines the role that speciality plasticisers are expected to play in the Grupa Azoty business in the future.

The company already has a small-scale pilot speciality esters plant in operation, allowing it to supply sample quantities for testing in the company's own applications laboratory and by external PVC customers. The new 10,000 tonnes/year capacity unit will support commercial introduction of the new products.

› **www.grupaazoty.com**

noted a wide range of demands to justify the development of two general-purpose and two niche plasticisers. It is now launching a valerate plasticiser and an improved epoxidised plasticiser."

The valerate plasticiser is for applications where weatherability and hydrolytic stability are critical – in outdoor decorative film, for example. The upgraded epoxidised plasticiser is dedicated to indoor applications. It can be used in calendering or flexible profiles. "Besides being renewable, this epoxidised plasticiser delivers outstanding long-term stability and eases recycling, a main trend to lower the environmental footprint," Engelen says.

Medical citrate

Proviron is now also finalising the development of a medical citrate and a low-viscosity polymeric plasticiser, Engelen adds. "The medical citrate plasticiser aims to broaden the availability of this technology and to decrease the use of DOP in medical applications," he says.

"The low viscosity polymeric plasticiser delivers an optimised solution combining fat/oil extraction resistance and "manageable" viscosity for plastisol-coating processes."

Argentinian chemical firm **Varteco** worked with Spain-based Shin-Etsu group company Compuestos y Granzas (**CYGSA**) in the Bioviplas project to develop a PVC shoe sole compound with a 64% renewable carbon content as certified in accordance to the USDA Biopreferred Program. The project, completed at the end of last year, used Varteco's V-Ziclus GP bio-based plasticiser, which is derived mainly from epoxidised soybean oil.

Epoxidised soybean oil also forms the base for a new generation of bio-based plasticisers from Brazil's **Nexoleum Bioderivados**. The Nexo B5, MB25 and MB50 products are said to offer visocisty and compatibility to allow them to replace DOP and DINP in emulsion and suspension PVC formulations (Figure 7).

Nexoleum opened a subsidiary in the Netherlands in June and is in the process of REACH registering the new products. It hopes to complete that before the end of 2019.

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Lab-scale extruders are an invaluable addition, as they help extruder specialists develop new formulations and products

On the small scale: latest advances in lab extruders

While extruder manufacturers continue to develop larger and larger machines – with ever-expanding throughputs – there is also a crucial need for small machines that can be used to make samples for testing, or small production runs of highly specialised products.

EconCore, for instance, is making progress towards developing new all-thermoplastics continuous honeycomb cores by installing a laboratory-scale extrusion and forming line at its R&D facilities in Leuven, Belgium. At the heart of the line is a 50mm extruder from **Meaf** of the Netherlands, plus a 500mm sheet die from **EMO Extrusion Molding** of Micheldorf, Austria.

EconCore honeycomb structures are made from a single continuous thermoplastic sheet using its patented ThermHex technology. This involves a sequence of thermoforming, folding and bonding operations. Cell size, density and thickness of the honeycombs can be altered with simple hardware or process parameter adjustments. The process allows for inline bonding of solid skins to one or both sides of the honeycomb, to create a cost-effective finished composite panel.

Before the new extruder was installed, EconCore was carrying out its honeycomb developments using sheet unwound from a roll.

"Now that we can produce our own sheet in-line, we have more flexibility in our operations – and it is easier to make changes to the material formulations," said Wouter Winant, technical manager of EconCore.

The laboratory extruder can process multiple polymers including polyolefins, bioplastics and engineering thermoplastics such as polycarbonates, polyamides, and PPS.

The Meaf extruder has a 50mm barrel holding a screw with an L:D of 34:1, which is typical for polyolefins. However, it also has a superior heating capability, with each of its five zones rated at 5.8kW. Despite this high power rating, the extruder is very energy-efficient. A 600 litre dryer – for hygroscopic materials – is integrated into the production system. Maximum output is around 150 kg/h.

"We have been cooperating with Meaf for several years now, on various projects, and the results have always been very encouraging," said Tomasz Czarnecki, chief operating officer at EconCore. "Licensees of our ThermHex process

Main image: Meaf's lab-scale extruder will help EconCore develop new thermoplastic honeycomb

have no obligation to use Meaf extruders, but it quite often happens that they decide to choose this option, as they are encouraged seeing the results that this equipment delivers."

EconCore will exhibit at the FachPack exhibition in Germany later this month, which takes place in Nuremberg on 25-27 September.

Multiple options

Davis-Standard says that its three laboratories give customers multiple options to make parts for proof-of-concept, experiment with new resins, conduct materials development, or test equipment before making large capital investments.

It has R&D labs in Pawcatuck and Fulton in the USA, and another at its subsidiary in Suzhou, China.

"We have always prioritised technology development," said John Christiano, vice president of technology at Davis-Standard. "Over the past year, we've had more than 150 customer lab trials across our three lab locations – including screw design development for smooth bore, groove feed and high-speed extruders, and product development trials for medical tubing, cast film, sheet and liquid coating applications. We use a wide range of resins, including those for multi-layer coextrusion."

At its technical centre in Pawcatuck, the company offers labs for single screw extrusion and coextrusion sheet applications. The single screw extruder lab has both smooth bore and groove feed technology as well as a high-speed extruder, vented and non-vented options, and extruder L/D configurations ranging from 24:1 to 40:1 depending on application.

Last year, the company installed a Thermatic 4.5in (114mm) extruder at Pawcatuck. The extruder is used for internal R&D and product development.

Below: Davis-Standard's Thermatic extruder is available for trials at the company's technology development centre

Its modern platform was developed through a collaborative effort between Davis-Standard's mechanical, electrical, process and controls engineering departments to create optimal processing in applications ranging from blown film to wire and cable.

It features many enhancements, and provides multiple possibilities with L/D ratios of 24:1, 30:1 and 34:1, says the company.

"This new extruder platform is a reflection of experience and collaboration," said Christiano. "Because of its relevance across all extrusion applications, it will serve as an excellent platform to support our customer's extrusion needs."

Features of the new Thermatic include: 400hp water-cooled motor technology; a screw speed range up to 375rpm; advanced and conventional vent diverter geometry; improved barrel cooling; and next-generation gearbox technology. The extruder is also equipped with an EPIC III control system.

The extruder can be fitted with all of the company's DSB feedscrews, as well as the TS DSBM, TS Metering and TS DS-Blend – as well as a variety of metering screws and other specialised designs.

The Fulton lab offers capabilities for winding and unwinding, extrusion coating, lamination and cast film applications. Customers can evaluate different methods of unwinding, rewinding and automatic transfer, and technology for cost-effective roll changes and dual direction winding. For coating, lamination and cast film processes, the line is set up for cast films up to 54in (1,372mm) wide and for extrusion coating in widths up to 50in (1,270mm). The liquid coating production and pilot line features advantages such as a multifunctional cooling section with laminating nip, auxiliary single position unwind, turret winder roll changer, SurfaStart winder, and configurations for reverse gravure, direct gravure, slot die and contact die.

Most of Suzhou's work is devoted to medical tubing, but Davis-Standard is planning to add a DSX Flex-Pack 300S – a single station extrusion and lamination line – for customer demonstrations by the end of this year. This line is engineered for the Asian flexible packaging market in terms of machine footprint, speeds and output, and the ability to make shorter runs.

Model versatility

Brabender of Germany has redesigned its KE30 with a new processing length.

The stand-alone is extruder is highly versatile, says Brabender, and applicable in the fields of material development, quality control and low

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Right: Brabender's Marketplace is a platform to buy and sell used laboratory equipment

volume production. The relaunch also comes with enhanced options for material analysis.

Brabender says the multi-purpose KE30 machine is ideal for analysing the processability of numerous materials, including thermoplastics like PE, PP and PVC, thermoplastic elastomers such as TPU, and engineering thermoplastics such as polycarbonate and nylon.

By means of appropriate extrusion dies, it produces a wide range of products – including blown and flat film – on a lab scale. At the same time, Brabender offers a range of different screws and other tools – as well as other enhancement options that are connectable through the CANopen bus system.

These features – and a compact design – make the KE30 an ideal choice for small-scale production, making reference samples and quality profiles, and recipe development. The new version of the machine offers reduced processing heights – for an optional application for co-extrusion – while processing lengths of 32D are now available.

Measurement data such as operation and evaluation parameters can be stored in an MS Access database and converted for further processing with standard MS Office applications.

At the same time, the company has set up its Brabender Marketplace, a platform to buy and sell used laboratory equipment – from an "inexpensive, durable laboratory measuring device" to "a used, premium quality piece of equipment".

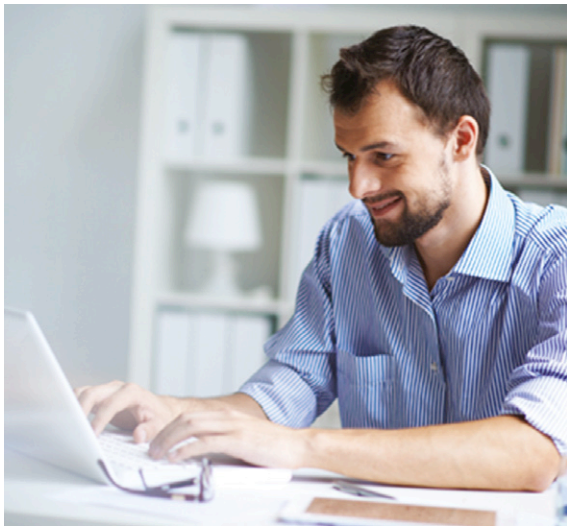
Sellers post their offers free of charge, after completing a one-off registration. The relevant data for the equipment can be entered quickly and easily. Buyers get in contact via the platform, and agree a price directly with the seller. Brabender does not charge a fee to either buyer or seller.

The Marketplace is accommodated within Brabender's website.

In-house testing

Italian screenchanger manufacturer **Cofit** has opened an in-house laboratory at its Lombardy headquarters, that is dedicated to material and equipment testing. The company says the lab will speed up technological innovation and product development.

"Our in-house lab lets us reach two goals," said Alessandro Fabbri, general manager. "It helps us meet our customers' needs, as they often ask for tests on their materials and we could not support them in that before. And, it allows us to test all our new products independently. This means we can expand our product range quickly, while enhancing and upgrading our portfolio."



The main investment in the lab is a single screw extruder – size 130.

"It is a clear sign of how much we are increasingly focusing on research and development and technical innovation," said Fabbri.

Before the lab was built, the company had to ask for customer support to carry out tests, which was not easy.

"Today, the whole process is faster," he said.

Compact control

Meanwhile, Austrian extrusion machinery manufacturer **MAS** Maschinen- und Anlagenbau Schulz says that its MAS 24 lab extruder was developed specifically for plastics manufacturers and compounders to develop formulas and produce them in very small volumes.

The compact extruder, which has a screw length of 400mm and a diameter of 48mm – narrowing to 24mm – is equipped with interchangeable mixing elements. The large feed opening means it can process regrind material, flaky material, and fine ground film or fibres.

Another benefit of the system is that it allows full control over shear strength – and thus the melt temperature of the material – by varying the screw speed (which is adjustable from 0 to 300rpm).

Maximum output of the MAS 24 – the smallest in the company's range of conical, co-rotating, twin-screw extruders – is 10-35kg/h.

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We preview AMI's North American Stretch & Shrink Film conference, which takes place in Florida in November

Looking ahead to Stretch & Shrink Film US 2018

Main image: Pallet film helps to ensure that logistics operations run more efficiently

As the stretch and shrink film market matures – and continues to develop new technologies – end users still face the usual challenges: compliance to increasingly stringent regulations related to road safety; achieving optimal load stability; reducing cost; and constantly improving the performance of transport packaging systems – such as through increased tear and puncture resistance, excellent visual properties and easy printability, but at thinner gauges – while also addressing the issue of post-industrial plastic waste.

Stretch and Shrink Film US offers a unique opportunity for business leaders to meet, network, learn and discuss the latest trends and issues affecting the industry with the leading experts from across the globe.

The two-day international conference takes place on 13-14 November at the Marriott Coral Springs Golf Resort in Fort Lauderdale, Florida. It will bring together industry leaders from marketing, brand awareness, R&D, engineering and technical specialists from across the supply chain including brand owners, raw material and machinery suppliers, film producers and consultants advising on pallet load stability and optimisation of the transit packaging systems.

The conference opens with **John Campin**, Senior Research Consultant at **AMI Consulting**, who will give an overview of the global stretch and shrink film markets and what will be in store in the coming years.

He is followed by **Ed McDonough**, Product Development Engineer at **Berry Global**, who will look at the craft beer market with a case study from a major beer producer – including what developments have been taking place in making the switch from traditional paperboard towards bundling shrink film over recent years.

Stable loads

After a coffee break, the discussion will move to issues around load stability. The session begins with **Jelle Dendauw**, CEO at **ESTL** who will talk about the difference that excellent tear resistance of film makes to end users in terms of having stable loads during transport. This is followed by **Jolien**

Stevels, Manager Innovation and R&D at **AFP (Jindal Films)** in the Netherlands, who will take delegates through issues surrounding load security, taking a view from a total cost of ownership perspective. Following lunch, the session continues with a talk by **Dr Kyle Dunno** and **Ric Lee** of **Atlantic Packaging**. They will discuss a unit load test system, which uses multi axis vibration. Continuing with the testing theme, **Dr Rishi Munj**, Associate Research scientist at **Dow Chemical Company**, will discuss how transportation testing can help define the performance of stretch wrap and the benefits of such a method. Next, **Luke Venechuk** and **Kurt Riemenschneider** from **Highlight Industries** will look at a case study of a brand owner addressing issues of cost reduction and road safety, which will go into more detail of what exactly brand owners are looking for in transit packaging films. Following a coffee break, **Alberto Tellechea** and **Carlos Mora** of **Safe Load Testing Technologies**, will explore how stretch film performs under transport simulation tests.

The first-day programme will end with a panel discussion during which panellists representing different parts of the supply chain will debate key issues faced by end users and the value the industry delivers to the retail, transport and logistics sectors which often seems to be so underestimated.

The first day of the conference will be wrapped up by a networking cocktail reception to which all attendees are invited.

Changing structure

Day Two begins with **Thomas E Blaige**, Chairman and CEO of **Blaige and Company Investment Banking**, who will discuss the future of the industry and the implications of global consolidation within the stretch and shrink sector. His paper is part of a session on the changing structure of the industry.

Speakers at the conference include (left-right): Ed McDonough, Product Development Engineer at Berry Global; and Alberto Tellechea and Carlos Mora of Safe Load Testing Technologies, who will explain how stretch film performs under transport simulation tests

The final session of the conference opens with a talk on equipment design and processing techniques for evolving high quality stretch films, from **Richard Kanarski**, Process Engineer at **Davis Standard**. Moving towards an important and crucial issue in the industry, recyclability, **Amy Laird**, Americas Polyolefin Customer Development, Global Polymer Technology at **ExxonMobil Chemical**, who will address innovations in shrink film. The next speaker, **Mike Horrocks**, CEO of **Erema North America,** will go into detail about one of the most innovative and interesting emerging topics of our time, the circular economy, and how following the film design, production and use, these film products can return into the supply chain and close the loop.

Finally, **Dale Brockman** and **Micah Scott** of **Biologiq** end the conference by looking further at innovative raw material solutions which contribute towards the production of more sustainable stretch and shrink films.

About Stretch & Shrink Film US 2018

Stretch & Shrink Film US 2018 hosts brand owners, retailers, stretch and shrink film producers and distributors, raw material suppliers, alongside research institutions and universities.

It will take place on November 13-14 at Ft. Lauderdale Marriott Coral Springs Golf Resort, Coral Springs, Florida, USA.

This edition – the 13th time it has been held – will look in detail at the strong demand from consumer industries. That, combined with a real competitive advantage against other plastics and traditional materials, stretch and shrink film has a rapidly increasing market demand.

The conference will offer a lively interaction between an international panel of speakers and delegates, in order to stimulate debate in all sectors. The event will also provide a comprehensive overview of the latest material, technology, and market trends.

In addition to the formal conference sessions, attendees will benefit from the chance to discuss and network during informal refreshment breaks and the first-day drinks reception.

To find out more about attending the conference, visit the **conference website**, or contact conference organiser Alexandra Fish (**alexandra.fish@ami.international**) on +44 (0)117 314 8111.

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Experts will share their breakthrough developments at AMI's third Polymers in Flooring Europe conference taking place in Germany in December

High value innovations in polymer flooring

Innovative high-quality flooring products enabled by new materials and process developments are changing customer perceptions and opening up new high-value markets. Due to its ease of cleaning and other benefits, polymer flooring looks to be the future of the flooring world for years to come. And then of course there are the dynamic design trends helping to capture the imagination of consumers and those specifying flooring products alike.

Following the two previous, highly successful events, AMI is pleased to announce the 3rd European edition of Polymers in Flooring, taking place in Berlin on 4-5 December 2018. The conference provides a unique forum bringing the polymer flooring industry together to debate technical and market trends, whilst networking with key stakeholders and experts from the industry.

Polymers in Flooring 2018 has an international line-up of expert speakers discussing material innovations and PVC formulations, developments in production, and enhancements in colour, protection and adhesive properties in flooring.

Expert panel

The opening session kicks off with **Myriam Tryjefaczka**, Director Sustainability and Public Affairs EMEA at **Tarkett** in France, exploring how sustainability is high on the agenda for flooring companies and the challenges and opportunities that exist for polymer flooring solutions. This theme is then carried into a panel discussion exploring sustainability within the polymer flooring landscape. Members of the panel include: **Myriam Tryjefaczka and Gert Van Bruggen**, Director Product Management and Design Vinyl at **Forbo Flooring** in the Netherlands, alongside other key representatives from the European industry.

The second session features **Didier Naert**, Global Plasticiser Advisor - Vinyls Market Technical Support at **ExxonMobil Chemical Europe** in Belgium, who presents a paper on safe, sustainable and high performing plasticisers. This is followed by **Martin Fischer**, Manager PVC/Leather Additives at **BYK-Chemie** in Germany, who investigates how wetting and dispersing additives can improve filled

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PVC floorings. Closing the session, **Anders Magnusson**, Technical Market Development Manager at **Perstorp** in Sweden, looks at how the sustainable profile of vinyl flooring can be improved by the choice of plasticiser.

Recycling

The conference's third session sees **Philippe Berckmoes**, EMEA Market & Sales Director at **Shark Solutions** in Belgium, providing a fascinating case study on recycling and sustainability with a look at how broken windshields are being converted into advanced raw materials for the flooring industry. **Bernard Merkx**, Project Director for ReVinylFloor at **EUPC PCE** in Belgium, then provides an update on the ReVinylFloor project and how flooring is going circular.

The final session of the first day features **Herbert Morgenstern**, Manager Technical Marketing Plasticizers Europe at **BASF** in Germany who showcases an efficient way of removing plasticisers from the exhaust gas of flexible PVC production. **Pascal Maerevoet**, Niche Manager PVC at **J-TEC Material Handling** in Belgium, then discusses how and where to introduce recycled material into your production process. And finally, **Simon Götzenberger**, Global Sales Director at **Extricom Extrusion** in Germany, speaks about high performance multi-screw extrusion for production excellence in flooring applications.

To round off the day's proceedings, a drinks reception will be held in the exhibition room.

Innovation

Day two of the conference begins with a big flooring story from **Pol Lombaert**, PhD, Senior Innovation Manager at **Beaulieu International Group** in Belgium, about the transformation of polymers into reality for the flooring industry. **Alexander Piontek**, Material Development, Bio-based Plastics at **Fraunhofer Institute for Environmental, Safety and Energy Technology Umsicht** in Germany, then focusses on new bio-based thermoplastic elastomers for flexible flooring and gives an update on the BioFlooring project. Following that, **Gabriella Sartori**, Marketing Manager Catalloy and PP Automotive at **Lyondellbasell** in The Netherlands, discusses an alternative material opportunity and whether polyolefins can be the new environmentally friendly materials in flooring.

After the morning refreshment break, a paper discussing new efficient blending resins for paste applications, for the wear and base layers of cushion vinyls and for carpet backing, is presented by **Claudine Bloyaert**, Technical Marketing & Development Specialty Vinyls at **Inovyn Europe** in Belgium. The session is brought to a close by **Marina Rodrigues**, Global Segment Manager, Construction at **Amorim Cork Composites** in Portugal, who looks at how the compatibility of cork with various polymers is creating new properties and functionalities for polymer floors.

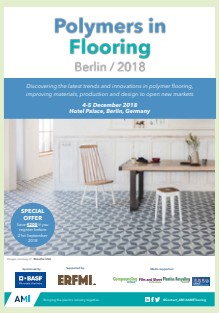
The final session of the conference begins with **Ron van der Leeuw**, Sales Manager Thermosets EMEA at **Chromaflo Technologies** in The Netherlands, exploring dedicated colourants for flooring applications and a fully integrated tinting system. Up next is a look at the principles of identifying a suitable antimicrobial for flooring products from **Thomas Robitaille**, Global Technical Marketing Lead – Plastics at **Lonza** in the US. Closing the conference is **Stan Claes**, MS Polymer Division, Performance Polymers Solution Vehicle at **Kaneka Belgium,** who looks at innovative polymers for bonding luxury vinyl tile floors and other plastics.






Speakers at the conference include (top-bottom): Pol Lombaert from Beaulieu International Group, Gabriella Sartori from Lyondellbasell, Philippe Berckmoes from Shark Solutions, Didier Naert from ExxonMobil Chemical Europe, Marina Rodrigues from Amorim Cork Composites and Claudine Bloyaert from Inovyn Europe

About Polymers in Flooring



Polymers in Flooring Europe 2018, on 4-5 December at Hotel Palace, Berlin, Germany, provides an international forum for all companies, through the entire value chain of polymer flooring, to come together and engage with each other over two days.

Don't miss out on this opportunity to hear from leading experts in the formal conference sessions, and to discuss key issues with industry peers during the extensive networking opportunities throughout the informal breaks.

To find out more about attending the conference, taking a table-top exhibition space, or becoming a conference sponsor, visit the **conference website** or contact Conference Organiser Sabrina Shutter **sabrina.shutter@ami.international** Tel +44 117 314 8111.

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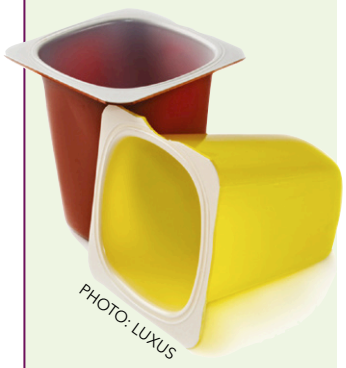


PHOTO: LUXUS

Test sees if plastic is recyclable

Luxus, a UK-based technical plastics recycling and compounding company, has launched a rapid analysis service for coloured plastics that tests for 'end-of-life' recyclability.

The test service, the company said, "enables producers to discover for the first time if the plastic packaging or products they make can be detected via near-infrared (NIR) sorting". NIR cannot detect black and many coloured plastics because the pigments strongly absorb infrared radiation.

The test relies on a new spectrophotometer capable of reading solar reflectance in the NIR spectrum. The machine is also being used in the €1.47m two-year NIRsort project, which is funded by the European Union's Horizon 2020 programme. Luxus and its partners, Polykemi of Sweden and Ireland's One51, aim to develop a new range of infra-red reflecting (IRR) colorants.

› **www.luxus.co.uk**

IML

Barrier film keeps single-serve soup fresh for longer

While ready-to-eat, single-serve soups have become far more popular, their shelf life can be quite short – especially once the soup comes into contact with oxygen. However, it has been extended using a special form of packaging that uses an IML label with an oxygen barrier.

Verstraete IML, and injection moulder ITC Packaging, solved the problem for Spanish food producer Dulcesol when it launched its Naturcrem range of single-serve soups.

The barrier in the IML ensures that the soups have a shelf life of up to one year without refrigeration. Benedict Adins, regional sales manager for Southern Europe at Verstraete IML, said: "By using an EVOH layer, the IML label reduces the oxygen permeability of the packaging. This means that the OTR value – the extent of the oxygen permeability – is up to 100 times less compared to packaging with a standard IML label."

The labels also had to withstand the heat and humidity of the pasteurization process, which was done with a combination of specific inks, a special lacquer, and a special pasteurization-resistant oxygen barrier film.

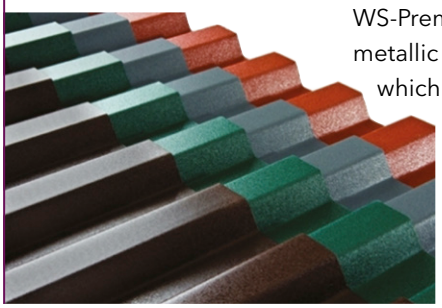
› **www.verstraete-iml.com**

PVC SHEET

Adding metallic colours makes for cooler corrugated sheet

German sheet extruder VPW Nink has started applying metallic colours to its range of corrugated PVC products – while using 50% recycled material in their construction.

As well as being in demand for design reasons, the metallic colours also help to reflect light.



"About two years ago we had an idea to give our coloured standard PVC sheets – called Salux WS-Premium – a more attractive and modern design," said Anja Schendzielorz, head of R&D at VPW Nink.

The team developed the second generation of Salux WS-Premium with a shiny metallic protection layer, which looks like a real aluminium surface.

Metallic particles increase the reflection of infrared radiation, which results in a lower surface temperature (around 15°C cooler) of the PVC sheet. The lower surface temperature helped to reduce the risk of material deformation of the sheets on hot summer days.

The company recently expanded the range with metallic colours in red, green and copper versions. At the same time, the lower side of the sheet contain a high amount of recycled plastic – up to 25% regranulate from post-consumer waste, plus 25% regrind from the company's own operations.

› **www.salux.com**

BLOWN FILM

Carnevalli of Brazil considers expansion of blown film operations in North America

Brazilian blown film line manufacturer Carnevalli is planning to expand exports to the US market, the company said during NPE 2018 in May.

"We are really interested in the US market," said Willian Carnevalli, head of the family-owned group.

Carnevalli is a leading supplier of blown film lines in South American countries and has an 80% market share in the Brazilian market. It already has some customers in North America and Europe, but wants to expand its business in those regions.

Willian Carnevalli said he wants to build a manufacturing plant in the US in the future, but the company has no current plans to do so.

The company operates a 25,000 sq m manufacturing facility in Guarulhos, São Paulo. Its expansion would be from a solid base, as there are 5,000 lines already installed at customers' facilities, he said.

The company makes blown film lines for all major PE applications, such as stretch, shrink and agricultural film. Its range includes multilayer lines up to nine layers. Other equipment includes sheet lines, winders, flexographic printers, dieheads and cooling rings.

At its NPE stand, Carnevalli featured its Polaris Plus 65 blown film line – which Willian Carnevalli said was the company's biggest selling machine, due to its size, productivity and cost. A POD version was shown producing five-layer, 1,800mm wide PE film.

› **www.carnevalli.com**

MIXING

Plasmec mixes up for TPEs

At Plast earlier this year, Plasmec highlighted its TRG series mixers, high capacity units for handling components for products such as TPEs.

The TRG mixer features a high hardness, thermally insulated stainless steel vessel with plasticiser injection valves, tungsten carbide coated stainless steel mixing blades, and stainless steel covers with horizontal swivel opening for ease of cleaning.

The company also offers mixers for PVC, WPCs and other applications.

› **www.plasmec.it**

SHEET EXTRUSION

Sheet line has smaller footprint

At the NPE show in May, Processing Technologies International (PTI) showed a new version of its Super-G High Speed sheet extruder with a reduced footprint.

The new design has a tuck-under motor which creates a smaller footprint for both Super-G High Speed models which are used to produce PP and HIPS sheet for the packaging market. The Super-G SGHS3000-36D model features a vertical U-configuration and tuck under motor which reduces the machine's footprint by more than 33% to 12 ft 8 in, compared to 17 ft 7 in for the original model.

The Super-G High-Speed is one of the sheet extrusion lines that PTi has installed at its new technology development centre which was opened at its Aurora, Illinois HQ in 2017.

Dana Hanson, president of PTI, called the 15,000 sq ft tech centre "a tremendous resource for us" at NPE. It enables PTI to offer customer production trials on a high vacuum twin-screw extruder as well as on the Super-G line. Training programmes are also held for customers' new employees at the centre.

Hanson said the new tech centre was part of a $10m plant expansion in Aurora designed to meet growing demand for PTI's extruders. The company has increased overall plant capacity by 50% and added 40,000 sq ft of manufacturing and office space.

› **www.ptiextruders.com**

Polyolefin Additives 2018

International conference on polyolefin performance, compounding, blending and additives

9-11 October 2018
Maritim Hotel, Cologne, Germany

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Compounding WORLD

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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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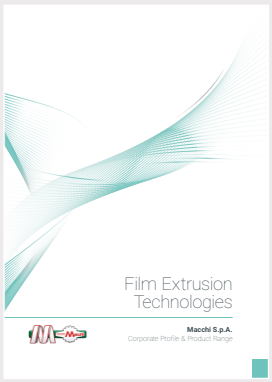
MACCHI: FILM EXTRUSION



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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W&H: VAREX II FILM SYSTEMS

Varex II is Windmöller & Hölscher's latest universal system for high output blown film production. This publication details the critical Varex II system features that ensure production of the highest quality films with minimal scrap and highest plant efficiency.

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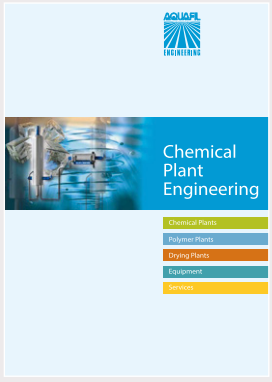
AQUAFIL: PLANT ENGINEERING



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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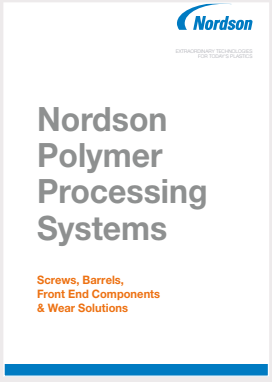
NORDSON: SCREWS & BARRELS



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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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

AGRICULTURAL FILM 2018

AMI's well-established Agricultural Film conference series continues on 17-19 September 2018, in Madrid, Spain, bringing together agricultural and horticultural cover specifiers, raw material and film manufacturers and agricultural stakeholders.

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SMART PACKAGING 2018

Taking place in Hamburg in Germany on 9-10 October, AMI's Smart Packaging conference brings together brand owners, retailers, packaging producers, plastics and technology suppliers to explore active and intelligent packaging solutions.

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POLYMERS IN FLOORING USA

The second North American edition of AMI's Polymers in Flooring conference takes place in Atlanta, GA, USA, on 20-21 September 2018. It provides a unique forum in which to explore the latest flooring market, materials and technology trends.

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THIN WALL PACKAGING ASIA

The 3rd edition of AMI's Thin Wall Packaging Asia conference will take place on 25-26 September 2018 in Bangkok, Thailand. The conference has established itself as the must-attend event for the flexible plastic packaging industry in South East Asia.

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STRETCH & SHRINK FILM USA 2018

The 13th Stretch & Shrink Film USA returns to Ft Lauderdale, FL, USA, on November 13-14. The event provides a comprehensive overview of the latest material, technology, and market trends.

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MULTILAYER FLEXIBLE PACKAGING 2018

The 11th edition of AMI's international Multilayer Flexible Packaging conference will take place on 19-21 November in Vienna, Austria. The three-day programme will cover the latest technical developments and market trends in this dynamic sector.

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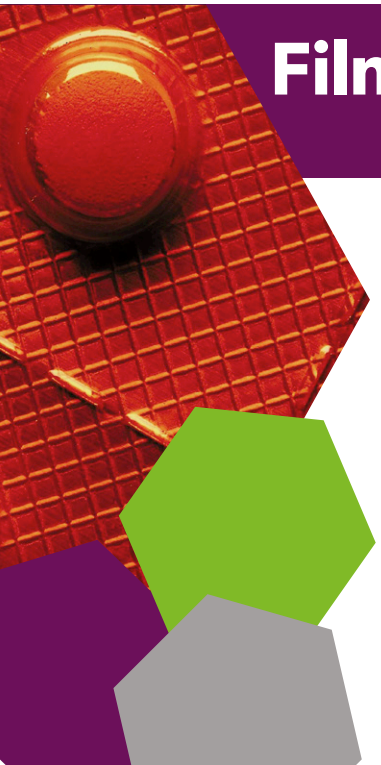
Manucor

Head office:	Sessa Aurunca, Italy
CEO:	Luigi Scagliotti
Founded:	1987
Ownership:	Private (owned by private equity firm Pillarstone)
Employees:	250
Turnover (2017):	Around €170m
Profile:	Manucor, established in 1987 as Manuli Films, has become a leading producer of bioriented polypropylene (BOPP) packaging and film labels. Around 55% of its sales are accounted for by exports. Earlier this year, the firm was taken over by private equity firm Pillarstone. Its products are used for a range of applications, including baked goods, confectionery and frozen food.
Product lines:	The company supplies a wide range of BOPP film, for a variety of markets – and with many different characteristics. Its HBM film, for instance, is designed as an inner web for extrusion or adhesive laminations, to resist crazing and barrier degradation, while its HCM product is for cold-seal applications, with an inner web of adhesive laminates that has superior oxygen and moisture barrier. In labels, its LLGM material is a high yield, white cavitated metallised film with superior appearance, while its LMA is a smooth matte film with a paper-like appearance.
Factory location:	The company makes all of its products – amounting to around 80,000 tonnes/year – at its production plant in Sessa Aurunca, Italy. It also has a metallisation capacity of 15,000 tonnes/year. Around half of its output is speciality film. Following the recent takeover by Pillarstone, the new owner says it will invest around €15m under a five-year plan to boost production capacity.

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



Film and Sheet EXTRUSION FORTHCOMING FEATURES

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

October 2018
Additives for polyolefins
Thin-wall packaging
Construction applications
Active & intelligent packaging

November 2018
Developments in sheet materials
Thin-wall packaging
Construction applications
Active/intelligent packaging

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

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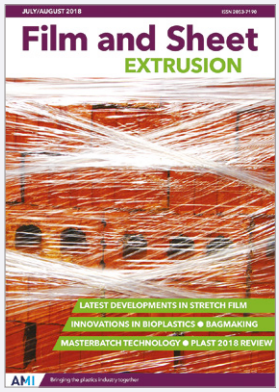

Film and Sheet
July/August 2018
The July/August issue of Film and Sheet Extrusion examines the latest innovations in stretch and shrink films as well as exploring developments in bioplastics, bag-making and masterbatch technologies. It also reviews the Plast 2018 show in Italy.

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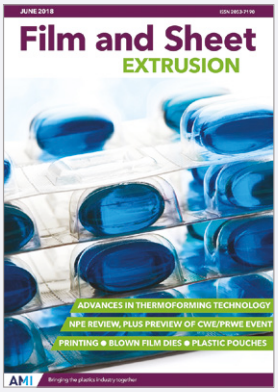

Film and Sheet
June 2018
The June edition of Film and Sheet Extrusion looks at the latest developments in thermoforming. It also explores the latest innovations in blown film dies, printing technology and plastic pouches.

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Compounding World
August 2018
The August edition of Compounding World magazine takes a look at the latest regulatory and technical developments in the world of plasticisers. It also details some innovations in functional fillers, dosing technology and screw and barrel design.

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Plastics Recycling World
July/August 2018
The July/August edition of Plastics Recycling World looks at technologies to tackle odours. It also explores recycling developments for the car industry and and the latest washing systems innovations. PLUS, reviews of the Plast 2018 and the Plastics Recycling World Exhibition.

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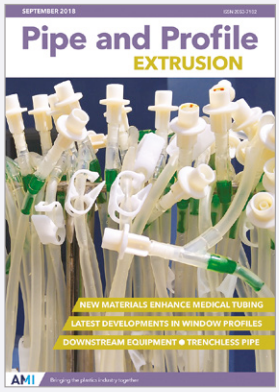

Pipe and Profile
September 2018
The September edition of Pipe and Profile Extrusion features medical tubing, window profiles, trenchless pipe technology, PVC additives and news of AMI's first Extrusion Expo in Cleveland, US, in May 2019.

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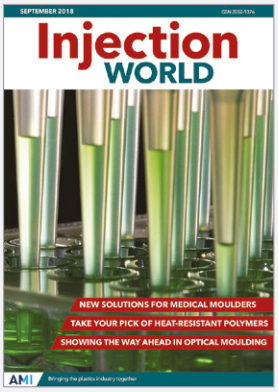

Injection World
September 2018
The September edition of Injection World magazine takes a close up look at the latest medical polymers and processing technologies. It also reviews developments in heat-resistant polymers and moulding of optical parts.

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Pipe and Profile EXTRUSION
Injection WORLD
Plastics Recycling WORLD

GLOBAL EXHIBITION GUIDE

2018	**19-22 September**	Indoplast, Jakarta, Indonesia	www.indoprintpackplas.com
	24-28 September	ColombiaPlast, Bogota, Colombia	www.colombiaplast.org
	14-17 October	Pack Expo, Chicago, USA	www.packexpointernational.com
	16-20 October	Fakuma, Friedrichshafen, Germany	www.fakuma-messe.de
	7-9 November	Expo Plasticos, Guadalajara, Mexico	www.expoplasticos.com.mx
	26-29 November	All4Pack, Paris, France	www.all4pack.com
	5-7 December	Plastic Japan, Chiba, Japan	www.plas.jp/en
	5-8 December	Plast Eurasia, Istanbul, Turkey	www.plasteurasia.com/en
2019	**5-8 January**	ArabPlast, Dubai	www.arabplast.info
	12-15 March	Pro-Pack Africa, Johannesburg, South Africa	www.propakafrica.co.za
	12-16 March	Koplas, Seoul, South Korea	www.koplas.com
	19-21 March	EU Coatings Show, Nuremberg, Germany	www.european-coatings-show.com
	25-29 March	Plástico Brasil, São Paulo, Brazil	www.plasticobrasil.com.br
	8-12 April	Feiplastic, Sao Paulo, Brazil	www.feiplastic.com.br
	8-9 May	Compounding World Expo, Cleveland, USA	www.compoundingworldexpo.com
	21-24 May	Chinaplas, Guangzhou, China	www.chinaplasonline.com
	21-24 May	Moulding Expo, Stuttgart, Germany	www.moulding-expo.com
	18-21 September	T-Plas/Tiprex, Bangkok, Thailand	www.tplas.com
	16-23 October	K2019, Dusseldorf, Germany	www.k-online.com

AMI CONFERENCES

17-19 September 2018	Agricultural Film, Madrid, Spain
25-26 September 2018	Thin Wall Packaging Asia, Bangkok, Thailand
4-5 October 2018	Medical Fluid Bags, Woburn, USA
9-10 October 2018	Smart Packaging, Hamburg, Germany
5-7 November 2018	Waterproof Membranes, Dusseldorf, Germany
13-14 November 2018	Stretch & Shrink Film US, Coral Springs, Florida
11-13 December 2018	Thin Wall Packaging, Cologne, Germany
5-7 February 2019	Polyethylene Films, Coral Springs, Florida, USA

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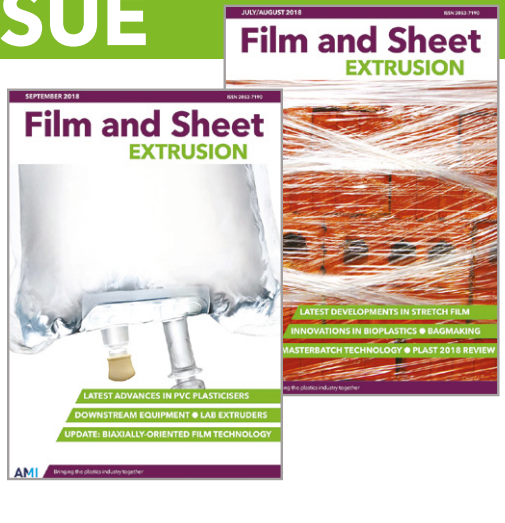

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