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AMI
Third Floor, One Brunswick Square,
Bristol, BS2 8PE, United Kingdom
Tel:+44 (0)117 924 9442
Fax:+44 (0)117 311 1534
www.ami.international
www.twitter.com/plasticsworld
Registered in England No: 2140318

EDITORIAL

Editor-in-Chief: Chris Smith
chris.smith@ami.international

Editor: Lou Reade
lou@filmandsheet.com

Events and magazines director:
Andy Beevers
andy.beevers@ami.international

ADVERTISING

Sales & commercial manager: Levent Tounjer
levent.tounjer@ami.international +44 (0)117 924 9442

Advertisement manager: Claire Bishop
claire.bishop@ami.international +44 (0)1732 682948

Sales manager (China): Jenny Zhou
jenny.zhou@ami.international +86 13651 985526

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Constantia invests to expand capacity in India and Poland

Constantia Flexibles is investing a double-digit million Euro amount to expand production at its Indian subsidiary Parikh Packaging, in Ahmedabad, Gujarat.

At the same time it will invest a single-digit million Euro amount to expand production at its topper plant in Rybnik, southern Poland.

In India, the company broke ground on the new facility in mid-2017, on a greenfield site close to the existing production plant.

The site is now being built, and will house a polyethylene blown film extruder, flexo printing press and laminators to produce high barrier, recyclable laminates.

The extra capacity will come onstream in 2019, to serve growing demand from multinationals in the food and home and personal care industries in India. The flexible packaging market in India is expected to show double-digit growth in the mid-term.

"Our investment strengthens Parikh Packaging's credentials as a leading provider of innovation and service to customers in the Indian subcontinent," said Stefan Grote, executive vice president of the food division at Constantia Flexibles.

Parikh Packaging has owned by Constantia since 2013 and already has a production unit in Ahmedabad – including rotogravure printing machines, PE extruders, various lamination technologies and pouch making.

In Poland, investment in plant infrastructure and new machinery for long runs will almost double annual capacity, said the company. This expansion – which comes in response to growing demand from the dairy industry – is expected to be ready in the first quarter of 2019.

"The extra capacity will open up new product areas such as pet food, liquid food and ice-cream," said Grote.

› **www.cflex.com**

Investing in training

Machinery specialst Kiefel has has begun building a new training centre at its Freilassing headquarters in Germany. The centre, which should be complete by early next year, is the result of a "double-digit million" Euro investment.

Peter Eisl, managing director and CFO of Kiefel, said: "We are investing in our future specialists and executives, and in the education and training of our experienced staff."

Currently, 50 or the company's 500-plus employees are apprentices. The new centre – which covers more than 1,500 sq m, and is built over three floors – will help to raise this to 80 apprentices, said Kiefel.

› **www.kiefel.com**

Fisher rebrands following 2017 acquisition

Fisher Container, a US-based custom flexible packaging producer, has rebranded into a new entity – called PPC Flexible Packaging.

This follows its acquisition of Packaging Products Corporation (PPC) last year.

"Fisher Container and PPC are both successful leaders in the packaging industry," said Kevin Keneally, CEO of the company. "After the merger, we knew we had an opportunity to create a new brand identity that would showcase our innovation and speed to market."

The rebrand will highlight PPC Flexible Packaging's focus on two primary markets: consumer packaging – which focuses on applications such as produce, bakery and pet food retail packaging; and precision clean packaging, which concentrates on healthcare, clean room and microelectronic packaging.

The company – which is privately owned by management, and by Morgan Stanley Capital Partners – recently added Dan Donofrio to its team as chief operations officer.

Donofrio has previously worked in a number of packaging-related businesses, including Solo Cup and Pregis.

› **www.fishercontainer.com**

NEWS IN BRIEF...

Capital Partners has acquired US-based food packaging company **Flavorseal** – which becomes part of its packaging division, M&Q Holdings. Flavorseal will maintain its headquarters and manufacturing facility in Avon, Ohio, along with all its staff and management – including president and CEO Chris Carroll. However, Capital says "there will be opportunities to share resources" with the other companies in the division – M&Q Packaging, which makes high-temperature, ovenable packaging, and Outlook Group.
www.flavorseal.com

Solmax, a Canada-based producer of polyethylene geomembranes, has acquired US-based **GSE Environmental**. Both companies are global operators in geosynthetic products, supplying containment systems for domestic, hazardous or industrial waste burial sites, retention ponds, fracking and heap leaching pads. Jean-Louis Vangeluwe, president of Solmax, said the combination of Solmax and GSE would create a company that can compete "in the highly fragmented market of PE geomembrane manufacturing". He added that the merged company would have a broader manufacturing footprint and expanded commercial network.
www.solmax.com
www.gseworld.com

Flexible plastics recycling capacity rises in Europe

The installed capacity for recycling flexible polyethylene in Europe has risen by nearly 50% since 2015, according to Plastics Recyclers Europe.

The organisation says that installed capacity for recycling flexible PE has grown from around 1.5m to 2.3m tonnes/year. Assuming Europe has an extrusion capacity of 7.4m tonnes/year of flexible PE, this means the EU recycling rate for these materials is roughly 31%, says PRE.

PRE analysed 174 plastics recyclers across Europe. Five countries – Spain (18%), Germany (17%), Italy (13%), Poland (10%) and France (6%) – represent nearly two-thirds of the installed recycling capacity, according to PRE.

The sources of the flexible PE plastics waste are: commercial and retailer waste (43%); production waste (23%); agricultural waste (17%); and household packaging (13%).

Ton Emans, president of PRE, said that the European Union's Plastics Strategy – and China's ban on imports of plastic waste – were driving investments in the sector.

"We see an acceleration of new projects across Europe, especially for household flexible plastics waste," he said. "However, much effort is still needed: multi-layer materials remain unrecyclable, so there is a need to move to mono-material alternatives. This will enable further developments in recycling of flexible plastics in Europe."

› **www.plasticsrecyclers.eu**

BOPP expansion underway in Poland

The new plant has an annual BOPP film capacity of 40,000 tonnes

Poligal has invested €40 million on a BOPP film extrusion line at a new plant in Poland.

The new plant initially includes a Brückner five-layer, 8.7m wide extrusion line, with a production capacity of 40,000 tonnes/year of BOPP film. In 2018, the company will install a new metallisation line.

The plant is in Skarbimierz, 60km south-east of the city of Wroclaw. The plant will improve service in Central Europe, offering quicker response times. The location is only two hours from Germany, and in the heart of the growing flexible packaging market in Poland.

This new line will help Poligal be more competitive in product segments such as films for labels, and strengthen its capacity to develop new films for special applications. It will also allow the company to offer coverage across the continent along with its existing plants in Spain and Portugal.

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SW nanotubes deliver for anti-static films

Single wall carbon nanotube (SWCNT) producer OCSiAl has revealed that one of its development customers – a European-based film producer – has successfully produced a transparent and permanently anti-static PE blown film for electronics packaging using an addition of just 0.01wt% of SWCNTs.

SWCNTs reduce static in the new PE film (left)

The company used OCSiAl's Tuball Matrix 810 SWCNT concentrate, achieving a surface resistivity in the range 5×10^{9} to 10^{11} Ω/sq. This meets ANSI/ESD S541-2003 and IEC 61340-5-1-2007 standards on protection against electrostatic effects for packaging, OCSiAl says.

Conventional anti-static additives such as carbon black can lead to compromised mechanical performance and a darkening of the film; light transmittance of the SWCNT anti-static PE film is 90% in comparison with the natural PE while stress at break in the cross-direction is increased by around 60%, according to OCSiAl.

Use of the SWCNT concentrate has also avoided dust problems associated with using carbon black, according to the company.

› **www.ocsial.com**

Plaskolite expands in acrylic sheet

US-based acrylic sheet manufacturer Plaskolite is to acquire Lucite International's continuous cast acrylic sheet business – including general-purpose, sanitary ware spa and bath sheet.

The transaction includes Lucite's 93,000 sq ft sheet manufacturing facility in Memphis, Tennessee. Terms of the deal, which should be completed by the end of the first quarter of 2018, have not been disclosed.

The two companies have had an ongoing business relationship for 40 years, with Plaskolite buying acrylic monomers from Lucite – which is part of Mitsubishi Chemical Corporation.

Plaskolite's customised products are used in a variety of applications including windows, doors, lighting, signs, point-of-purchase displays and bath products.

"Our goal is to be the industry leader while strengthening our marketplace position," said Mitchell Grindley, Plaskolite president and CEO.

› **www.plaskolite.com**

Schur on verge of UNI buy

Schur Flexibles is negotiating to acquire UNI Packaging, a French company that is a specialist in digital printing.

The deal is expected to conclude in the next few weeks.

UNI Packaging has seven production sites and five logistics hubs located across European countries including France, the UK and Austria.

It is a major player in digital printing for flexible packaging in Europe, which is ideally used for ultra-short runs with no upfront costs. Schur plans to benefit from UNI's know-how in this area and aims to access the digital printing technology.

Michael Schernthaner, managing director of Schur, said: "UNI is an established player which keeps breaking new ground. It would perfectly complement and enhance our business."

› **www.schurflexibles.com**

Pregis expands in foam with Rex acquisition

US-based packaging company Pregis has acquired foam specialist Rex Performance Products for an undisclosed sum.

Pregis says the acquisition will help it build on its position as one of the largest foam producers in North America.

"This strengthens our position as a producer of engineered foam," said Kevin Baudhuin, president and CEO of Pregis. "We will now have five engineered foam manufacturing locations across the continent. The combined organisation will offer an expanded portfolio of protective packaging solutions."

RPP's engineered foam products have been used for protective packaging for a wide variety of products and markets. Its product line includes polyethylene foam and laminated planks.

› **www.pregis.com**

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Flexible film recycling has more than doubled in the USA since 2015

Packaging recycling in US rises by 10%

Recycling in two major categories of plastics packaging – rigid and flexible – jumped by around 10% in the USA in 2016.

Recycling of rigid packaging reached a minimum of 1.46 billion lbs (662,000 tonnes) while film climbed to 1.3bn lbs (590,000 tonnes) collected for recycling, according to reports from the American Chemistry Council.

The reports are the *2016 National Post-Consumer Non-Bottle Rigid Plastic Recycling Report* and the *2016 National Post-Consumer Plastic Bag and Film Recycling Report*.

The reports also show long-term growth in both categories: the volume of rigid plastics collected for recycling in 2016 was nearly 4.5 times greater than that collected in 2007, while plastic film recycling has grown for 12 consecutive years – and more than doubled since the first report in 2005.

Collection and recycling of plastic bottles is dealt with in a separate report.

"We are pleased to see the increase in plastic film and rigid plastics recycling in 2016 and the dramatic growth over the last decade," said Steve Russell, vice president of ACC's plastics division.

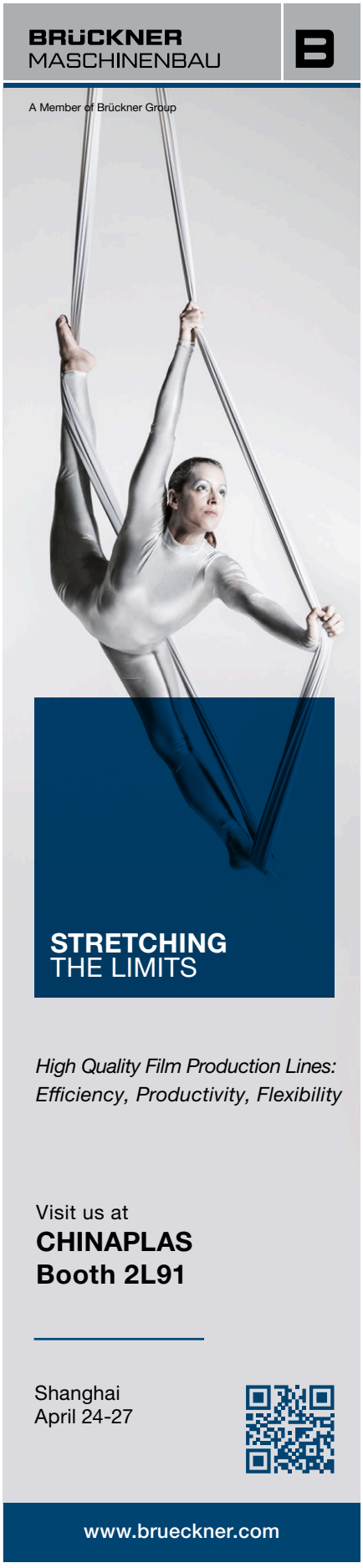
Both reports attribute the increase in collected material partly to a change in demand from export markets – such as China's 2017 policy restricting imports of scrap materials, including plastics.

"From investments in recycling facilities and advanced technologies, to public commitments to use more recycled plastics in products and packaging, we see real dedication from the recyclers and end users to grow end-market opportunities for plastics recycling here in the U.S.," said Russell.

Recycled plastic film is typically used in wood-plastic composites (WPCs), new film and sheet, and agricultural products. Typical end markets for rigid packaging include automotive parts, lawn and garden products, and thick-walled injection moulded products.

Both reports were based on an annual survey of reclaimers conducted by More Recycling.

› **www.americanchemistry.com**



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Thermoforming goes flat out

*Applications in thermoformed parts continue to expand – from packaging and automotive to solar power. **Lou Reade** reports*

As thermoforming becomes faster and more accurate, its influence in the plastics industry is growing. It is now being specified in a wide range of applications, far beyond its traditional market of packaging – though that remains an important area.

Total Corbion PLA, for instance, will showcase some of the capabilities of its bio-based Luminy material at Chinaplas in April – including thermoforming.

The Luminy PLA portfolio includes both high heat and standard PLA grades and is used in markets from packaging to durable consumer goods and electronics.

Among the highlighted applications is a thermoformed black platter to present foods such as cheese, sushi and hors d'oeuvres. It was developed by Pack & Proper and has been designed to exhibit a slate-like appearance thanks to its surface shape – giving a more exclusive appearance to a disposable application, says Total Corbion.

Honeycomb cores

EconCore says that its thermoplastic honeycomb sandwich panel technology – which is based on thermoforming – has been used in a number of new applications recently, including a new design of solar panel.

The panel, from Armageddon Energy, is one-third of the weight of a standard glass equivalent solar panel, due mainly to the design being based on EconCore technology.

"The potential of a lightweight, durable solar panel is huge and this development opens up new markets and application perspectives, including those beyond photovoltaics," said Tomasz Czarnecki, COO of EconCore.

The substrate is Zytel polyamide from **DuPont** that is produced continuously and can be in-line laminated with skin layers (DuPont's Vizilon thermoplastic composite) to deliver a cost-effective sandwich product uniquely suited to high volume production. The development won a JEC Innovation Award in the US last year.

EconCore has also helped automotive and aerospace customers create new products using its technology.

In automotive, Toyota has used EconCore honeycomb technology in the trunk cover of its Prius PHV vehicle. The part was made by Gifu Plastics of Japan, which had previously used the technology to make parts for packaging and logistics applications. The new trunk cover is around half the weight of conventional products made from metal and cardboard, said the company.

In aerospace, Diehl Aircabin has used the technology to create lightweight aircraft interior modules as part of the pan-European Incom project. The project applies EconCore's HexTherm process to a special grade of polycarbonate, which has high fire-smoke-toxicity performance. The resultant sandwich structure costs far less than conventional honeycomb solutions based on materials like aramid, said the company.

"We are excited about creating mono-material thermoplastic honeycomb sandwich panels that could be very efficiently one-shot thermoformed and functionalised into final aircraft interior modules," said Czarnecki. ›

Main image: Pack & Proper's thermoformed platters, made using Luminy PLA, offer a slate-like appearance

Electric performance

US car manufacturer Tesla is using vacuum laminating technology from **Kiefel** to produce internal door panelling for its Model X and Model 3 electric cars.

For the Model X – an SUV – a PP door carrier is given a surface of TPO film with foam backing using vacuum lamination on an inline Kiefel machine. Kiefel machines also handle the next step in the process – called edge-folding.

After success on this project, Tesla scaled up production and used the technology for its higher volume Model 3. Four inline vacuum laminating systems are used to produce paneling for the vehicle – laminating the film onto door frames and door upper panels in a cycle time of 50 seconds.

Kiefel developed a new inline system concept – including tools that can be changed in just six minutes – for the edge folding.

"Tesla will make more than 2,000 Model 3 vehicles per day – so short cycle times and rapid tool changes are indispensable," said Wolfgang Eglseer, sales manager at Kiefel.

Tesla has two plants in the US and two in Mexico that use this technology.

"In the US, we can provide our own local tooling, and a well-equipped technology centre," said Eglseer.

Right: The door trim of Tesla's Model X and Model 3 cars is made using Kiefel's inline vacuum lamination system

Lighter load

UK-based thermoforming specialist **Belgrade Polymer Products** has developed a bespoke lightweight wheel box for an automotive client.

Belgrade produced a wooden prototype mould – and later and aluminium mould – from which it produced 40 wheel box samples for Doyle's Commercial Bodybuilding. Doyle's makes lightweight van bodies for manufacturers such as Renault Trucks. The wheel boxes protect the rear wheels in the van's interior.

Tony Harris, a pattern maker at Belgrade, said that size was the main challenge in developing the component.

"Having successfully proved the design with the wooden prototype mould, we moved into full-scale production with the aluminium tool. There is potential for other wheel box sizes in the future."

The wheel box, which is much lighter than traditional steel products, is made from 6mm thick ABS sheet. Its lightness helps to increase the payload and fuel efficiency of the 3.5 tonne box vans on which it is used.

More recently, Belgrade won extra business from a local supplier of radiator fan cowls for commercial and agricultural vehicles.

"Our convenient location helped to finalise our customer's decision. Their business is growing notably – and keeping us busy thermoforming thousands of fan cowls per year," said Patrick Burke, general manager at Belgrade.

Belgrade manufactures seven different sizes of ABS fan cowl that are fitted as original equipment into vehicles destined for markets such as the US and Middle East.

"We have been supplying this customer with three-quarters of their needs for several years. Over the last 18 months we have secured 100% of their business," he added.

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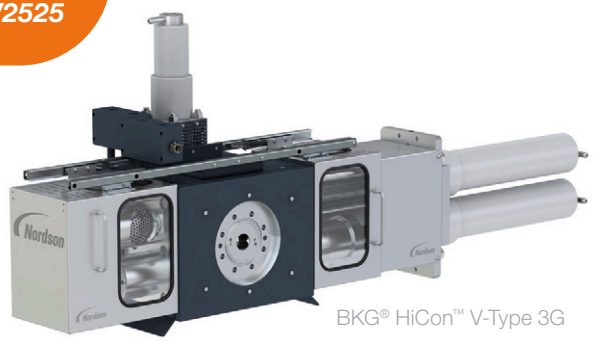

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Above: Tony Harris, a pattern maker at Belgrade, puts the finishing touches on an aluminium mould to make ABS wheel boxes

Speedy service

WM Thermoforming Machines of Switzerland has delivered an FC 780 E HP Extended Speedmaster Plus vacuum/high pressure forming machine to Ireland-based packaging company Holfeld Plastics.

The digital thermoforming machine has maximum tool dimensions of 780 x 570mm and a maximum forming height positive/negative of 130mm. The sheet heating section has both upper and lower heater banks with HTS black infrared ceramic heating elements with independently controlled zones – which saves around 15% in heating energy consumption, says WM.

The machine includes a punching press for holes and the space to insert an in-line padding machine made by the UK based company Forming Automation for absorbent or bubble padding.

The customer uses the machine to make soft fruits punnets in clear r-APET with or without an internal bubble pad. The punnets are simple and effective with a separate lid, and they are available in different dimensions and volumes, vented or unvented, says WM.

Forming is achieved by means of compressed air up 7bars and vacuum, which can be programmed in the required sequence. The forming process can be quickly changed between the upper and lower platen.

Right: Illig produced two parts from TPU/ABS in a live demonstration at Fakuma

Part demonstration

At last year's Fakuma, **Illig** showcased continuous part production on a UA 100g sheet processing machine with subsequent finishing on a steel rule punch press.

During live demonstrations, a stackable storage shelf and an organiser box for screws were manufactured at the same time on a UA 100g out of 2mm TPU/ABS sheet. Subsequently, a 2-up punching tool punched the parts out of the sheet material in one stroke in a rimless, dust-free way.

Up to 8 cycles per minute can be achieved thanks to a fast and easy sheet change, says Illig.

Accurate algorithm

Jim Throne, a US-based plastics consultant, told delegates at last year's Antec conference in the USA about an improved algorithm to determine the energy exchange between heaters and sheet in the thermoforming process.

Although heaters are usually multi-segmented, with each being controllable in order to target energy input to different parts of the sheet, calculating the exact amount of energy transfer can be difficult.

Calculating the energy transferred from a single heater element to a single sheet element – using Stokes' Theorem – is straightforward, but things become more complicated when dealing with multiple elements, he said.

"When the parsed elements become many, the arithmetic becomes tedious at best – and very prone to 'juggling errors'," he said.

Also, the method cannot account for all energy interchanges – such as those between a heating element and a part of the sheet that is some distance from it.

Throne has previously developed calculations that generate an 'energy dome' for equal-sized square heater and sheet elements – but realised it was difficult to apply to 'real' situations.

Instead, he used a general mathematical form for energy interchange – where the sheet element can be placed anywhere in the x-y plane, and the heater element anywhere in the a-b plane. Using this method, there was no restriction on the relative dimensions of either the heating element or sheet element.

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Adding performance to films

*Additive manufacturers have introduced a number of new products that can lift performance and productivity in the films sector. **Peter Mapleston** finds out more*

Plastic films is a highly competitive market where performance counts and small improvements in production efficiency can really add up. In recent months, leading additive suppliers have taken some interesting and unusual steps forward in helping compounders and converters improve film product quality and processability. These developments include a better way to create slip in BOPP films, a highly-efficient means to improve barrier while enhancing optics, a step-up in stabilisation performance, and some novel anti-fog additives, as well as several new processing aids.

Dow Performance Silicones (previously Dow Corning) introduced its HMB-6301 Masterbatch for biaxially oriented polypropylene (BOPP) film at the Fakuma plastics processing show last October. The company says the product, a pelletised formulation containing 25% ultra-high molecular weight siloxane polymer reacted with a polypropylene homopolymer, provides a low dynamic coefficient of friction (COF) at low loadings – for example 0.2 to 0.3 film-on-film at an addition rate of 2-5 wt% (Figure 1). It is also said to deliver stable, long-term slip performance without migration. HMB-6301 complies with EU 10-2011 food contact regulation and FDA approval is currently being obtained. Dow envisages applications in films for food bags, wrappers, packages and pouches.

Christophe Paulo, Global Segment Leader Plastic Additives at the company, says HMB-6301's advanced technology addresses key drawbacks of standard slip agents, including continuous migration from the film surface and degradation over time and under elevated temperatures. He says the

Main image: Film barrier, optics, oxidative stability, slip and fogging can all be improved using the latest additive technologies

PHOTO: DOWCORNING

Above: BOPP for candy wrappers is one target application for Dow Performance Silicones' new silicone-based additive

masterbatch will enable superior printing and metallization.

Organic waxes such as erucamide are widely used as slip agents in BOPP film, but their migration can increase haze in clear products. In addition, when the additive transfers from the slip-treated face to the corona-treated face during film winding and storage, printability can suffer. The Dow Corning HMB-6301 Masterbatch is added only to the outer layer of the BOPP film and, because it is non-migrating, there is no transfer from the silicone-treated face to the corona-treated face. The masterbatch can also be used in cast PP film.

"Friction is a recurring problem in packaging production using BOPP film (for example, form-fill-seal operations) because it can negatively affect the film's appearance, cause deformations and even rupture, which interrupts throughput," says Paulo. "This masterbatch not only addresses these issues, but can free customers from storage time and temperature constraints and relieve worries about additive migration, enabling them to maximise quality, consistency and productivity."

Several other companies have also been developing alternatives to erucamides for slip agents. These include Croda, with its Incroslip SL, and Ampacet with its Lamslip 754 product. **Croda**'s Incroslip SL has been covered previously in *Compounding World*. It is a food approved product offering good slip, colour, organoleptic performance and oxidative stability.

Ampacet says its Lamslip 754 masterbatch is designed to provide high and consistent slip properties in laminated film structures for conversion and packing operations for food and non-food applications. The supplier says that, compared to conventional slip masterbatches, Lamslip 754 maintains a low and consistent COF even after adhesive lamination and avoids transfer of slip additive on the opposite side of the laminate. "Being highly efficient at low addition rate, it limits converting and packing problems typically linked to fluctuating slip properties of the packaging film and prevents efficiency losses during automatic packaging process," says the supplier.

Tackling film fogging

New from **Tosaf** is AF7380PE anti-fog masterbatch. "Anti-fog additives for plain polyethylene (PE) films are well-known and widely used," the company says. "However, as film structure becomes more complex and film producers require the same anti-fog masterbatch for a variety of production processes, demand has grown for new solutions and more sophisticated formulations." It describes AF7380PE as a novel third generation anti-fog that "combines the company's broad experience working with the most sophisticated anti-fog materials with its profound understanding of the market's needs."

PHOTO: TOSAF

Right: Tosaf's AFT380PE anti-fog additive improves clarity of films for prepared food dishes

According to Tosaf's Film Additives R&D Manager, Dr Evgeni Zelikman, the benefits of AF7380PE lie in its "combination of excellent anti-fog activity and superb optical properties." The new masterbatch is suitable for a wide range of production processes, from laminated polyethylene films, multi-layer co-ex barrier films produced by blown and cast extrusion, and oriented films produced by double- and triple-bubble production technology.

Ampacet also has new antifogs, but the latest grades are targeted at agricultural film producers. A typical problem in greenhouses and low tunnels is linked to fogging phenomena, the company claims, so it has broadened its existing Agroclear range to include Agroclear 752 for one-to-two season greenhouses, low tunnels and early harvest crop protection films. Even at very low addition rates, it is said to provide what the supplier describes as "outstanding and consistent" antifog properties. "It maintains an excellent film transpar-

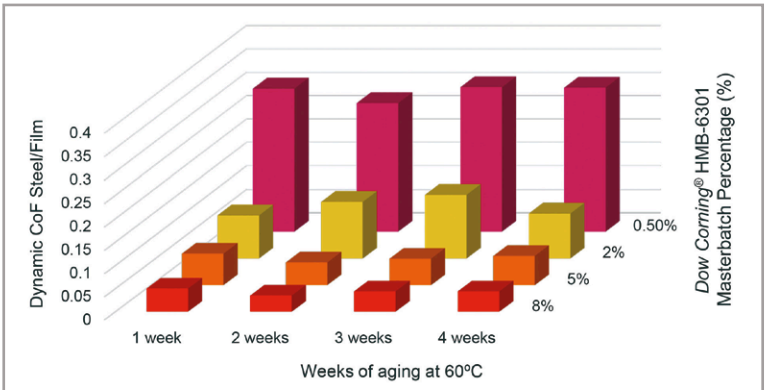

Figure 1: Dynamic coefficient of friction (film/steel) of low-SIT skin layer of BOPP film versus amount of Dow Corning HMB-6301 Masterbatch over time at 60°C
Source: Dow Performance Silicones

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Above: Agroclear additives from Ampacet reduce fogging in agricultural films, contributing to improved yields

ency, avoids problems linked to fog formation (light transmission reduction and plant damages), optimises plant growth and supports crop yield," Ampacet claims.

Finally, the company has developed what it claims is a highly effective range of masterbatches for food shelf-life extension, including the UVBlock 347 and UVBlock 347 PP offerings. These products, for PE and PP films (BOPP and cast PP) respectively provide a high barrier to UV radiation in thin clear films used in food and non-food packaging structures. The supplier says the masterbatches allow the films to retain their transparency and do not generate the blooming problems it describes as inherent with some conventional migratory chemistries.

Right: Ampacet's UVBlock 347 PP helps prevent degradation of food products in PP pouches

Improved hydrolytic stability

In recent years, numerous additive suppliers have been upping their game in stabilisation systems for film-grade polyolefins. *Compounding World* has recently covered developments from companies including Addivant, BASF, Cytec (now Solvay), Songwon and BASF, which introduced its Tinuvin XT 55 light stabiliser in the run-up to K 2016. Tinuvin XT 55 is primarily aimed at artificial turf and technical textiles, but can also be used in films.

Another key player in this area is **Clariant**, which introduced AddWorks LXR 568 as one of its latest additive solutions at K 2016. This is a high-performance phosphorus-based process stabiliser (a secondary antioxidant) that combines outstanding colour and melt flow protection with a good resistance to hydrolysis (Figure 2). The product's hydrolytic stability helps processors to prevent degradation of plastic resins used to produce a wide range of end-use applications including packaging films, ensuring that consistent product performance is maintained.

At the Flexible Packaging Middle East conference organised by *Compounding World* publisher AMI in Dubai in December last year, Hartmut Sibert,

PHOTO: AMPACET

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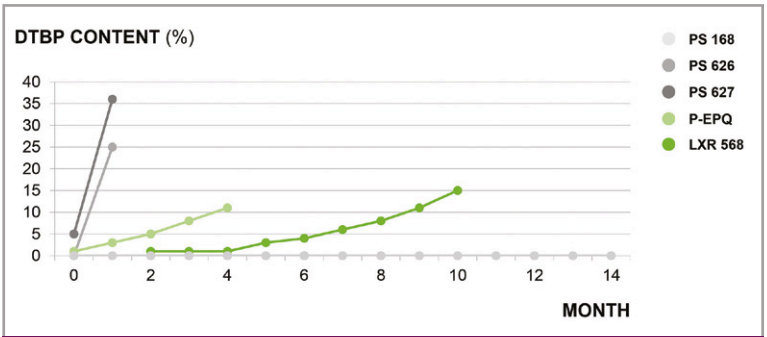

Figure 2: Hydrolysis stability in PE zip bags using LXR 568 and other phosphorus-containing stabilisers. Level of free DTBP (di-ter-butyl peroxide) is a measure of level of hydrolysis
Source: Clariant

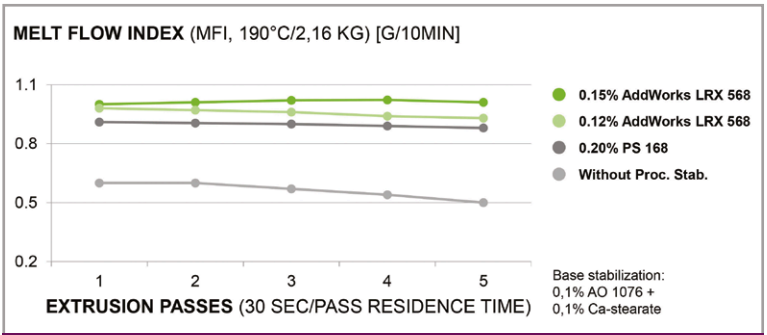

Figure 3: Effect of multiple extrusion passes at 240°C on MFI of LLDPE (0.918 density) containing different stabilisation packages
Source: Clariant

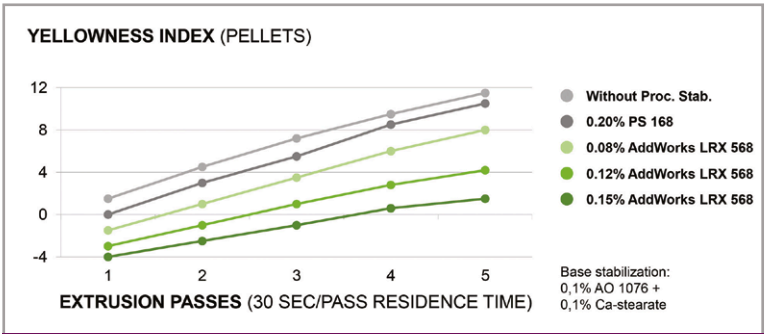

Figure 4: Effect of multiple extrusion passes at 240°C on yellowness index of LLDPE (0.918 density) containing different stabilisation packages
Source: Clariant

Business Development Manager for Polyolefin Additives, went into a detail about the advantages of using AddWorks LXR 568 in polyethylene and polypropylene films. He said that the additive has a much lower melting point than single phosphite stabilisers (around 90°C against 180°C or so), which contributes to superior melt homogeneity and an efficient reduction of gels in films.

Sibert went on to discuss the advantages of the new additive in production of BOPP and LLDPE films. In BOPP film production, he said AddWorks LXR 568 gives 44% better MFR protection than PS 168, as well as 68% better colour protection and a two thirds reduction in the number of gels. When processing LLDPE, stabilisation solutions based on AddWorks LXR 568 provide superior retention of melt flow during multiple passes, as well as better resistance to yellowing (Figures 3 and 4).

Better barrier

Milliken has adopted a more hands-on approach in recent months in advancing the use of an additive system based on its established nucleating technology that can significantly improve not only the optics of polyethylene films but barrier properties too. Optics are improved because the additives provide more nucleation sites and so smaller crystals, while barrier is improved by changes the additives induce in crystal orientation.

The company has offered its Hyperform HPN nucleating agents for several years. Last year, it launched a family of masterbatches containing the additives under the UltraGuard banner. "By producing masterbatches, we can tailor our solutions per industry and class," says Cliff Bynum, Leader UltraGuard Technical Team. The new masterbatches, which area available in pellet form and can also contain additives such as process aids and pigments, are being targeted predominantly at film converters, but also at compounders.

The additives modify the crystalline structure of polyolefins, creating networks that considerably increase barrier to oxygen and water vapour as

PHOTO: CLARIANT

Above: AddWorks LXR 568 is available as free-flowing dust-free micro-pellets

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PHOTO: MILLIKEN

Right: UltraGuard nucleated HDPE bag-in-box film for packaging dry foods provides improved barrier, gloss and clarity

well as the larger molecules that are found, for example, in aromas. The improvements can range from 30% up to around 60%, depending on the host polymer.

"Some polymers are less favourable to the solution than others and working out where it works best has been a hard nut to crack," says Bynum. "But we've come a long way. We have developed lots of very effective screening techniques so we can now predict outcomes quite well." He says the expertise required in using the additives has seen Milliken change the way it interfaces with the market for this type of product.

Bynum points out that UltraGuard may produce greater improvements in polymers that have lower inherent barrier than higher-barrier polymers. Factors that need to be taken into consideration include density, melt flow index and molecular weight distribution. UltraGuard also changes the role that film thickness plays (Figure 5) and results in improved optics.

Processing aids

Polyfil Corp has developed a high-performance line of polymer processing aid (PPA) concentrates based on what it says are superior chemistries together with optimised particle size dispersion. "This combination brings previously unattainable performance and efficiency to the extrusion industry allowing processors to improve yields and productivity," it says. "A unique interfacial agent and the most advanced fluoroelastomer technology combine to make these PPAs the most versatile in the industry today."

The company says that to make these concentrates even more potent, it employs specialised compounding methods that ensure the fluoroelastomer particles are dispersed for optimised performance at the film extrusion stage. "Polyfil's PPAs more than pay for themselves by allowing extruders to reduce start-up waste, increase production rates, and improve extrusion line utility," the company claims. "On blown film lines, excellent flatness is achieved while melt fracture and port lines are easily eliminated twice as fast using only half as much additive compared to conventional processing aids.

"Perhaps the greatest advantage of this new technology, however, is its ability to be used in higher temperature applications. Cast film extruders and extrusion coaters are able to utilise these new PPA grades at temperatures as high as 300°C, unlike most other PPAs on the market which cannot be used effectively above 240°C," the company claims.

Time between die-lip cleanings due to build-up are said to be greatly extended due to combination of additive performance and thermal stability. Polyfil says a recent study showed it was able to extend the time between die cleanings by 400% for a multilayer extrusion customer using a 1% loading of its PAC-0001-21LL concentrate.

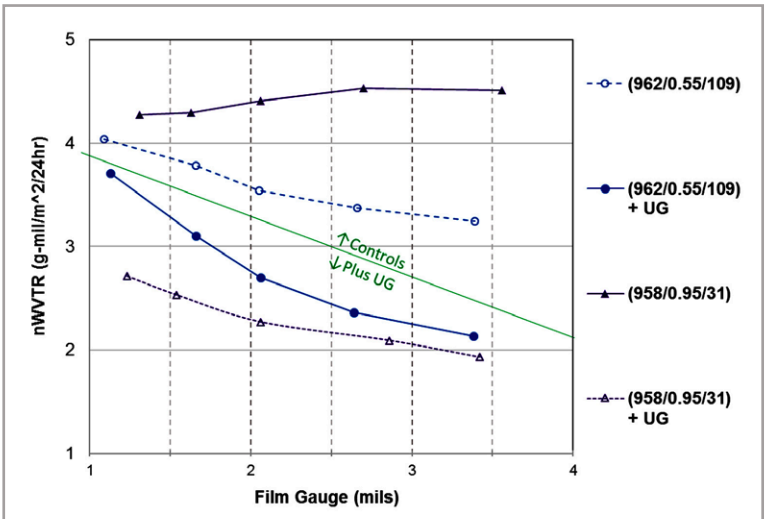

Figure 5: Effect of UltraGuard and film thickness on water vapour transmission rate of two different grades of PE. Grades differ in density, melt index, and ratio of indices at high (21.6 kg) and standard (2.16 kg) loads – a measure of molecular weight distribution.
Source: Milliken

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US-firm Stabilization Technologies claims its plasmonic UV absorbers offer a new and more sustainable option in terms of UV protection. Mark Holmes finds out more

PHOTO: SHUTTERSTOCK

Plasmonic protection from UV

A new technology area in UV stabilisation is claimed to be plasmonic UV absorbers and spectra enhancers - a category of select sustainable green chemistry materials that are said to deliver broad, permanently non-migrating, non-blooming UV protection while providing for long term absorbance.

"Synergisms with HALS and conventional hydroxyl substituted benzophenones and benzotriazoles, and other plasmonic materials are now being discovered," according to Dr Joe Webster, President of US-based **Stabilization Technologies**. "In addition, the materials provide mid-infrared and far-infrared absorbance and absorb broadly from the 200-800nm electromagnetic region of the spectrum. With changes in European Chemicals Agency (ECHA) regulations and bioactive chemicals in the environment, particularly those from hydroxyl substituted benzotriazoles, substitutes are needed. With the plasmonic enhancer UVITA SME 3811 and known synergisms with Maxgard 2700 series UV absorbers from **Lycus Chemicals**, a range of substitutes is now commercially available for plastics and coatings," he says.

"UVITA SME plasmonic UV protection alone can stabilise plastics and coatings without hypsochromic or bathochromic shifts typically observed with organic ultraviolet absorbers. However, UVITA SME in combination with Maxgard 2700 series ultraviolet absorbers shows strong hyperchromic effects and bathochromic (red shifts). Instead, its presence produces a consistent hyperchromic shift with other UV light stabilisers."

Hypsochromic and bathochromic shift is defined as a change in the spectral band position in the absorption, reflectance, transmittance or emission spectrum of a molecule to a shorter or longer wavelength, respectively. Hyperchromicity is the increasing ability of a material to absorb light (the opposite is hypochromicity).

Webster says discussions on the subject of

Main image: Plasmonic UV stabilisers could increase UV absorbance in films in the 410-440nm region without recourse to pigments

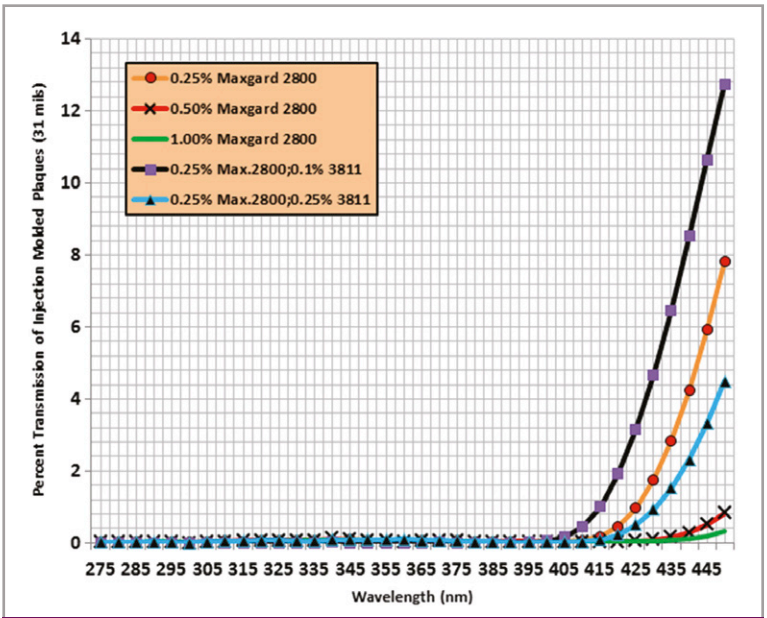

Figure 1: Effect of UVITA SME 3811 plasmonic enhancer on transmittance of polypropylene homopolymer injection moulded plaques containing Maxgard 2800 UV absorber
Source: Stabilization Technologies

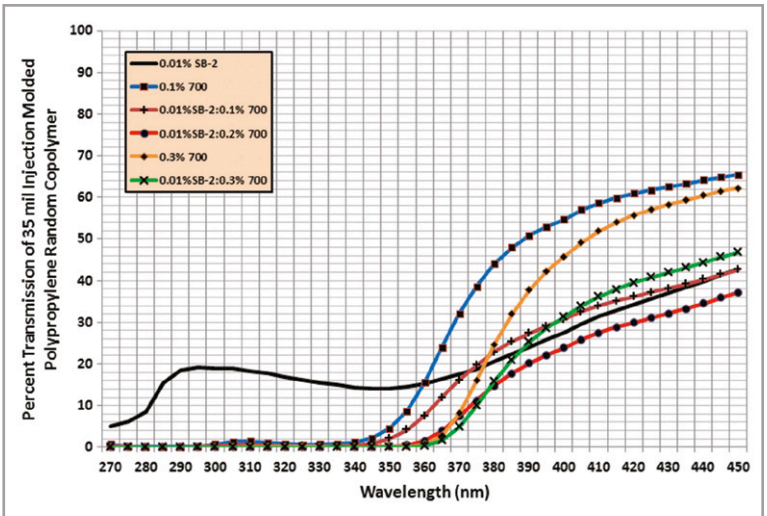

Figure 2: Effect or spectral enhancer SB-2 on synergism with conventional organic UVA M-700 in clarified random PP copolymer
Source: Stabilization Technologies

plasmonics usually concentrate on the topic of surface plasmons on metal nanoparticles. However, in the case of UVITA SME, he says there is an electromagnetic transfer of excited electrons from the surface of the particle to form a plasmon cloud over the insulative particle. The transference of that energy to the conductive band of the organic UV absorbers is the cause of the hyperchromicity, he claims.

He adds that the material can be used to produce a broad UV absorber having no migration, no volatility and that is highly synergistic with current light stabiliser technology used globally.

"We have shown that current light stabiliser technologies have limitations with volatility, migration and blooming, compatibility, antagonisms with condensation polymers and other additives in the system, and are generally expensive and fugitive over time having little permanence," Webster says.

"UVITA SME 3811 and its doped versions are not only cost-effective, but provide broader initial and post-protection to both coatings and plastics, while extending current light stabilisers by acting as spectral enhancers to boost the performance of both HALS and organic UV absorbers. Permanence in UV protection by UVITA SME and synergisms with organic light stabilisers, and initial hyperchromic increases in absorbance with Maxgard series UVA, makes for a cost-benefit performance in any plastic and coating formulation."

Webster says that in-situ conversion rates of organic UV absorbers are slowed down by the presence of UVITA SME. He adds that studies with hydroxyl substituted benzophenones and benzotriazoles show significant reductions of in-situ transformation of the organic UVA. The company has also demonstrated synergisms of UVITA SME 3811 with Maxgard organic UV absorbers and the new Maxgard 2000 series from Lycus Chemicals.

"These alternatives are designed for many of the REACH ECHA-targeted hydroxy-substituted benzotriazoles, which are reported to be bio-toxic and bio-accumulative in the environment. These synergisms have extended the global market window of opportunity beyond 380nm, into the visible and infrared regions," he says. "For those designing a new cap stock for plastic compounds or artificial wood, the ability to have long-term permanence under any outdoor environmental conditions is a plus."

Webster says the technology makes the development of new packaging materials that require greater absorbance at wavelengths in the 410-440 nm region (to control rancidity) possible without pigments. He says there are agricultural and military applications to produce a material that absorbs from 200-800nm in the actinic to visible regions to near-infrared mid-thermic region of the infrared and also far-infrared region of the electromagnetic region.

"New end-use applications are emerging as we understand the full implications of this technology better," he claims.

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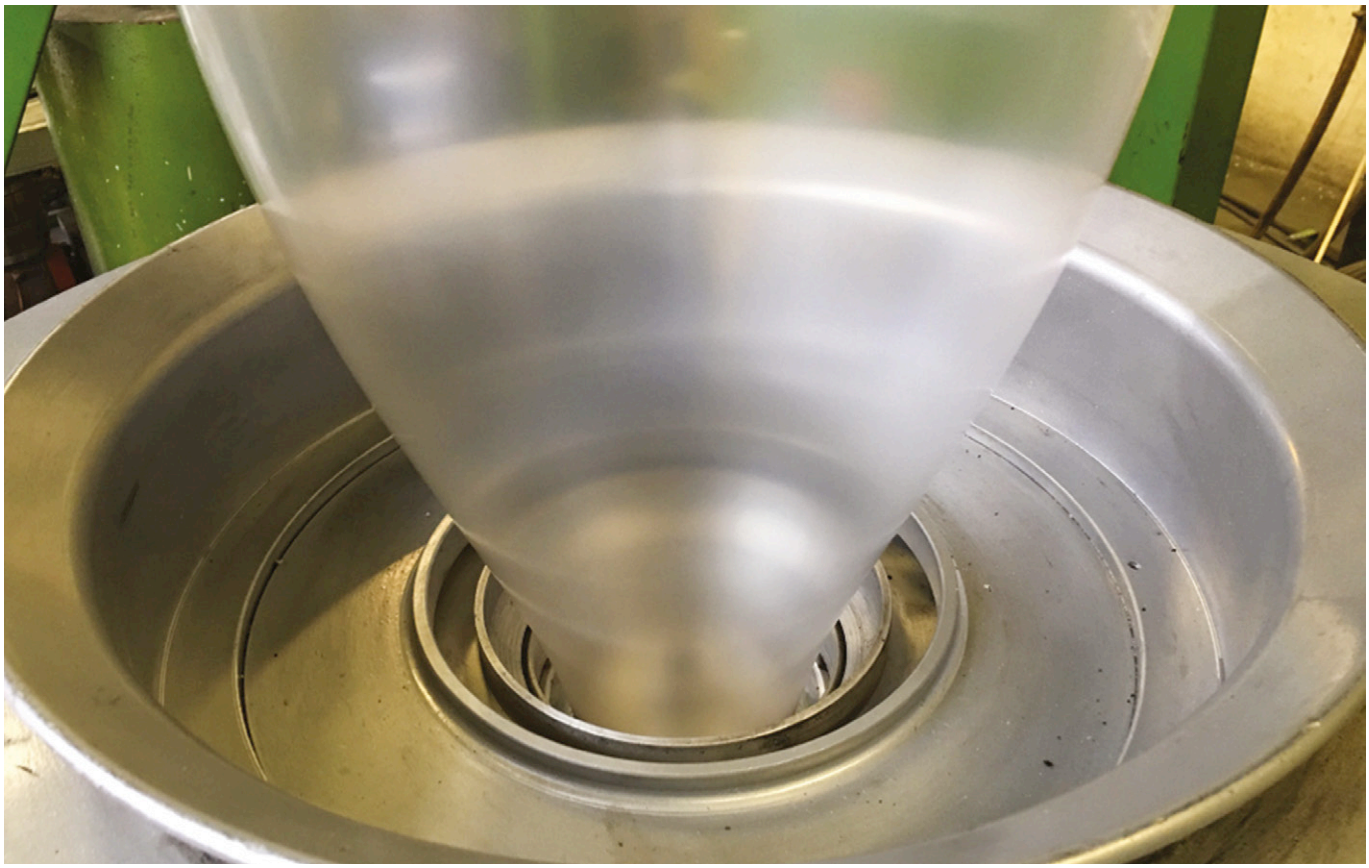


PHOTO: SHUTTERSTOCK

Close control: boosting the extrusion process

*Specialist software and measurement equipment can help to maintain precision in the extrusion process. **Lou Reade** reports*

Computer control – and modelling – of the extrusion process can help to squeeze out extra performance and throughput.

Researchers from the **University of Duisburg-Essen** in Germany have used computer modeling to boost the output on a blown film line by around 10% – without affecting film quality.

The researchers said that the limiting factor in boosting output is usually the air cooling ring – which must be substituted or modified in order to increase throughput. This is time- and cost-intensive, they said – and the outcome is also uncertain.

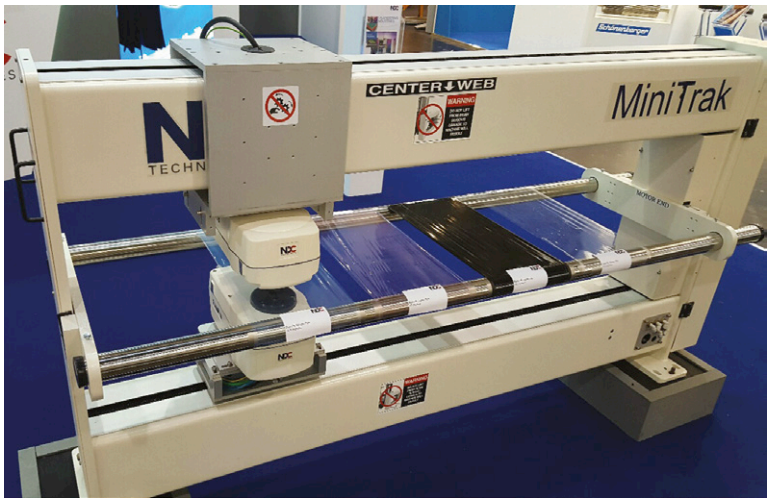
"Not all thermodynamic and fluidic phenomena caused by the changing cooling configuration – and their impact on the formation of the bubble – are predictable in advance," said Benedikt Neubert, of the Institute of Product Engineering, in a presentation at Antec last year.

This research adapts the well-established Process Model, and applies it to high capacity blown film lines with a throughput of more than 750kg/h. It uses Computational Fluid Dynamics (CFD) to optimise the design of cooling devices that work both inside and outside the bubble.

Generating an accurate simulation requires various input data: the biaxial stretching of the film – and subsequent stress on it – must be adequately modelled, for instance. Other data includes frost line height and film velocity. The calculation is split into two modules: one uses Matlab to calculate film contours and thickness profiles; the second uses CFD to calculate the film's temperature profile and streaming velocity of the cooling air.

"The goal lies in modifying the oncoming flow

Main image: Researchers have used CDF to boost blown film line output



Above: Among the products on show at NPE will be NDC's Mini-Trak O-Frame Scanner

conditions so that the average and maximum streaming velocity increases," said Neubert.

The researchers said that more intense cooling could be delivered with an additional air-guiding element – and the simulation results were used to test one in a virtual environment. This was then validated experimentally and showed good correlation: for instance, the normalised from height line of the simulated contour was just 2% higher than that seen in the experiment.

"Further work will investigate the potentials in increasing the mass flow rate of high capacity blown film lines," said the researchers. "Additional air guiding elements will be tested on a virtual and experimental basis. The basic idea of pre-cooling the aspirates air is also of interest."

At the same event, researchers from **Dow Chemical** used UV-Visible spectroscopy and optical imaging of the film bubble to study residence time distribution (RTD) on blown film lines.

RTD is an important characteristic in extrusion – but few experiments have focused on production processes like blown film production, said the researchers.

UV-Vis and optical imaging were used to measure RTD on a lab-scale film line using copper phthalocyanine tracer pulses.

A small amount of tracer – which can be a number of substances – is introduced to the feed in a short 'pulse' and its concentration over time is then measured.

Overall, the results showed that – as expected – rate was the strongest factor for RTD. Blow-up ratio was found to have no effect, while the tracer type and tracer concentration had some minor effects, the researchers said.

They found that UV-Vis spectroscopy was more accurate at lower tracer concentration but was more expensive and difficult to scale up, while optical imaging was more economical and easy to install on large scale lines – but had lower sensitivity and was limited to coloured tracers.

Measured response

NDC Technologies will introduce several new measurement systems at the forthcoming NPE exhibition in the USA, including its latest FilmPro infrared gauge for the film, sheet and coating industries.

The gauge uses advanced optical techniques to measure a wide range of film and sheet properties with high precision. The modular FilmPro gauge can measure the thickness of clear, voided, pigmented, cavitated, porous, translucent coloured and even black-tinted films, says the company.

The measurement capability of FilmPro extends to single- or multi-layer products including thin, biaxially-orientated films, cast films and CPE stretch films. It can simultaneously measure the individual thicknesses of up to six different layers in co-extruded films. At NPE it will run on NDC's Mini-Trak O-Frame Scanner and Pro.Net TDi Web Gauging System platform.

At the same time, its Low Energy X-Ray Sensor is for thickness and basis weight measurements of lightweight extruded film and sheet.

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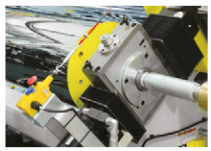
US Pat. #9,182,067 Chrome Roll Skew Mechanism


US Pat. #9,139,393 Roll Lock-Out Safety System


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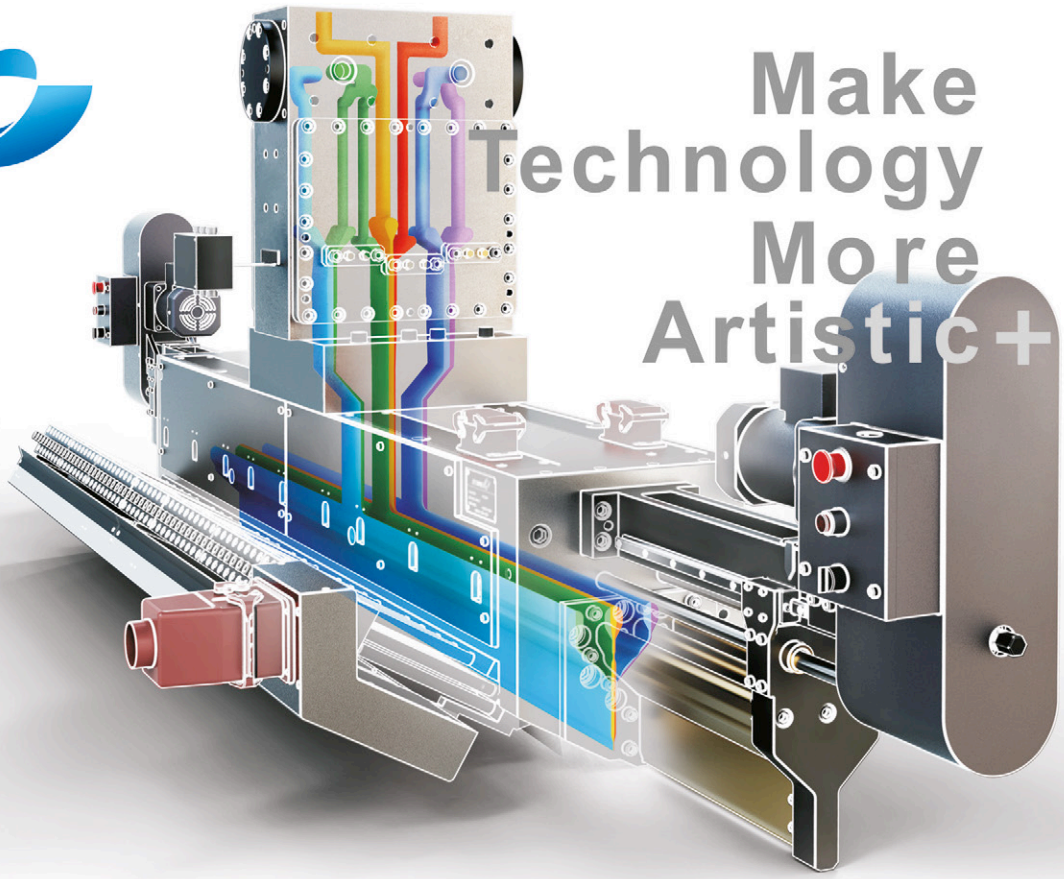

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Right: BST showed its CompactGuide at the recent LabelExpo show

Converting optimisation

Isovolta, an Austrian supplier of electrical insulating materials, has installed X-Trim – a trim optimisation system from UK-based **Greycon** – to improve production at one of its plants in Barcelona, Spain.

The plant has six slitters and is dedicated to converting PET films, papers and laminates. Some of the challenges Isovolta experienced were two-stage "slitters-secondary slitters" optimisation with very narrow order widths and a range of master rolls stock sizes.

The company chose Greycon because X-Trim was able to handle this complexity, plus other benefits in terms of waste reduction, reducing knife changes and pattern count.

"A successful trial cemented our decision to work with Greycon," said Xavier Pérez, head of process engineering at Isovolta. "We were very happy with the results and are looking forward to reaping the benefits of the solution."

Abder Guezour, global business development manager at Greycon, added: "We have worked with a number of converting plants like Isovolta's. While these plants can be seen as medium size, the planning and the optimisation challenge is by no means trivial."

Greycon recently completed the 9.2 release of X-Trim.

Some of the new developments within it include: load planning Phase II – allowing optimal decomposition of the trim solution into container/truck loads; length tolerance – so the system can now consider mixed-length reels when reel lengths or diameters vary slightly; and better algorithmic performance improvement – being 6% faster on smaller problems and nearly 20% faster on difficult problems.

The company also made updates to its Opt-Studio product.

"Trials at one of our plastic film clients resulted in a waste reduction from 8% to 3% in one instance, which fits with our goal of maximising efficiencies – be it by improving material utilisation, productivity or rapid responses to unforeseen problems," said Constantine Goulimis, CEO of Greycon.

Label highlights

BST Eltromat showcased a number of systems at the recent Labelexpo Europe that can help label manufacturers improve their production processes.

One highlight was the EKR Commander for the EKR 500 digital controller, which has revised hardware, new software and a higher-resolution graphical display. Its flexible touchscreen offers high operating convenience, says BST, and the system is useful in all areas where it makes sense to use a touchscreen – such as during setup or for direct data input.

It is 100% downward compatible. In machines that already operate with EKR 500 digital controllers, it can replace the current commanders at any time. For web guiding systems installed in machines, customers can connect an second, optional EKR Commander.

It also showed a CompactGuide with CLS Pro 600 digital line and contrast sensor, and a CompactGuide with a Wide Array sensor. With its wide field of vision, the sensor is particularly useful in difficult web guiding options such as in cases of alternating web widths. Thanks to the sensors' wide measuring range, manual adjustment is a thing of the past.

ERP for flexpack

Open Systems, a US-based ERP software developer, has released the latest version of its Traverse Flex-Pack – which provides integrated accounting, distribution and manufacturing functionality for flexible packaging manufacturers.

Version 11 of the software is built on a new platform that helps users take advantage of mobile technology. It can be used across the range of flexible packaging formats and operations, including blown film extrusion, bag making and stand-up pouches, printing and laminating.

Paul Lundquist, vice president of corporate development, said: "It handles the complex needs and standards unique to the flexible packaging industry."

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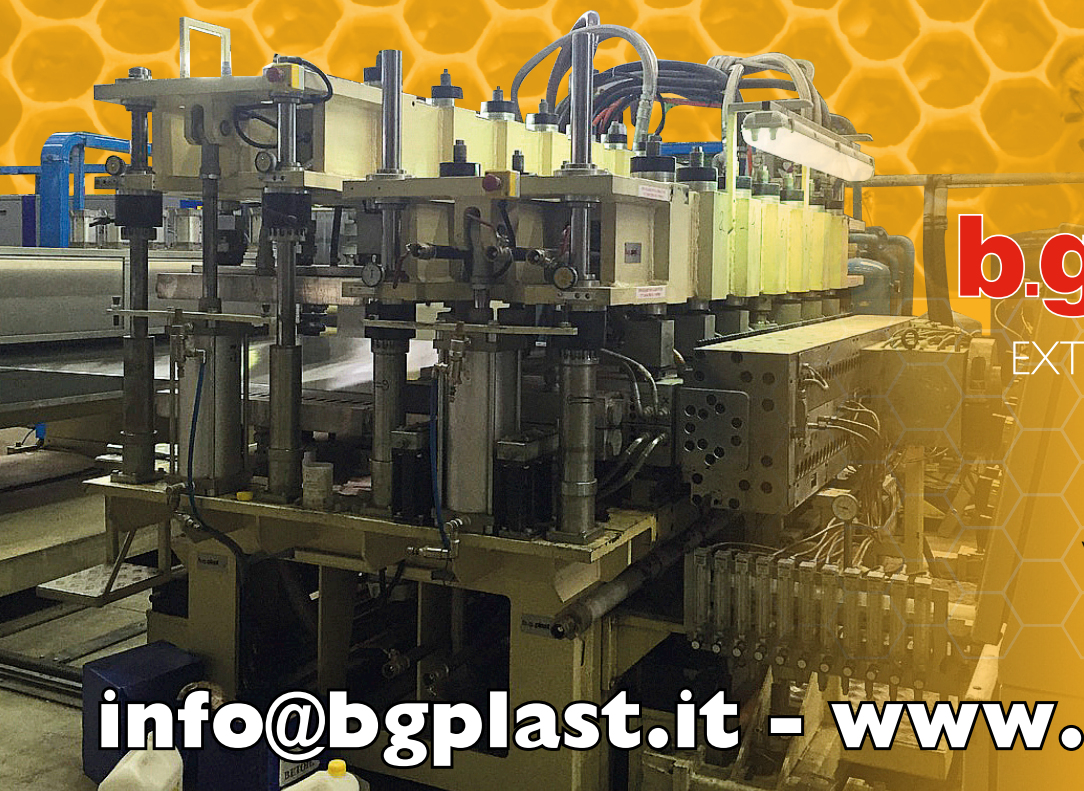

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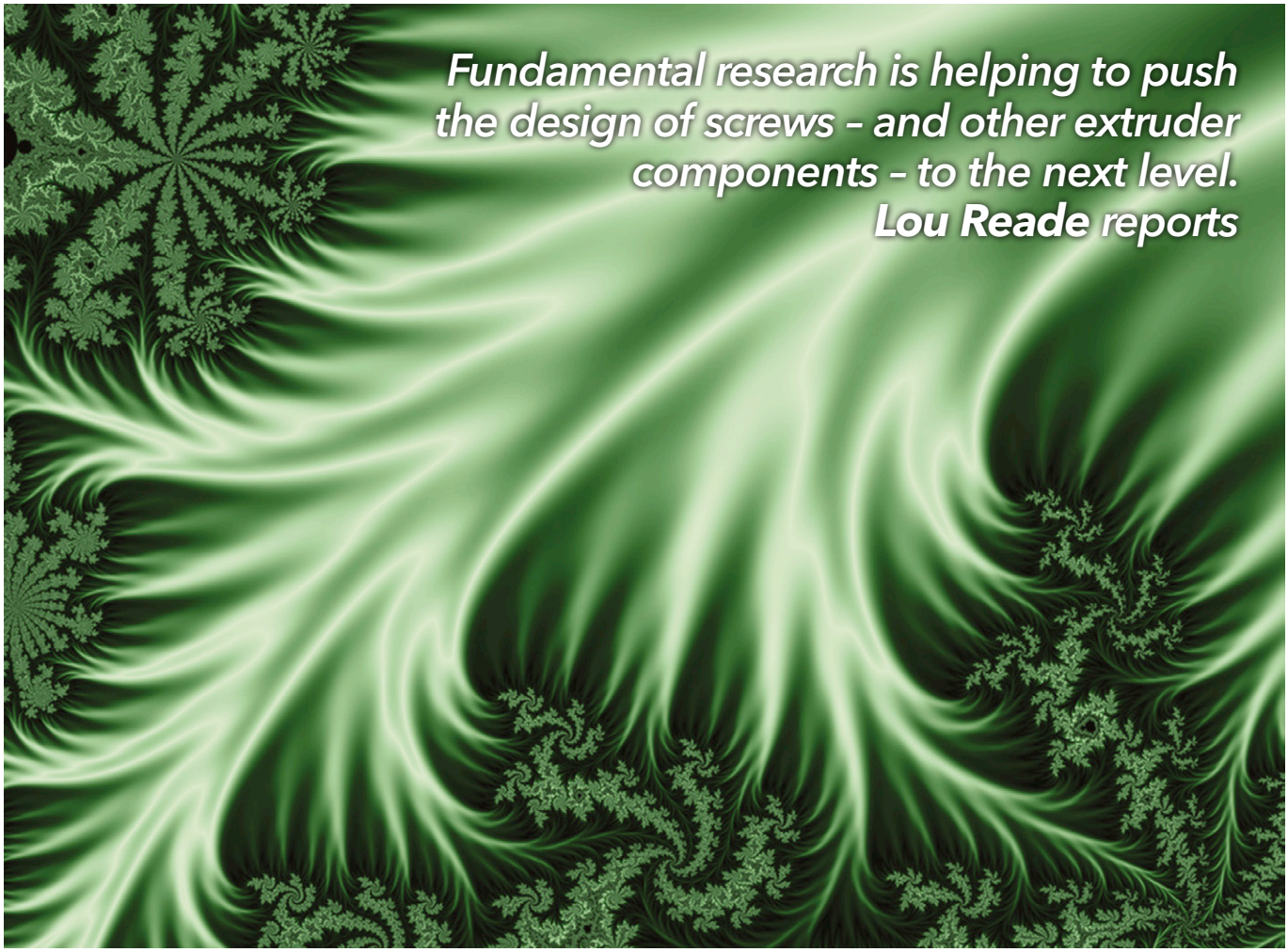

Fundamental research is helping to push the design of screws – and other extruder components – to the next level. ***Lou Reade*** *reports*

Innovations in screw design

Screw design is critical to extruder performance – such as throughput and product quality – yet the process is often far from perfect, and can create screws that perform poorly.

While more designers are using the latest software tools to perfect their designs, academic researchers are working hard to create new concepts that could lead to better-performing screws in future.

Fractal design

David Kazmer, professor of plastics enginering at the **University of Massachusetts Lowell**, has designed a screw using 'fractal' design that helps control the plastication path of materials in single screw extrusion.

He told delegates at last year's Antec conference in the USA that the design uses multiple channels in the transition and feed sections to improve control of extrusion scale up.

"Screw design guidelines are based on rules of thumb – and often inaccurate analysis – that leads to sub-optimal designs," he said.

He cited several examples of research that improve on these general rules – including work by Covas which "found the results from experimental validation with the implemented screw designs to be inferior, due to the poor accuracy of the underlying models of simulations".

Scale-up rules are notoriously unreliable, he said. While some follow the rules, others deviate from them: for instance, flow rate increases with the cube of the extruder scale, while head conduction decreases according to the square of the scale. Other factors – such as shear rate and residence time – should be independent of scale, but are much more complex due to conveyance and recirculation dynamics of the materials being processed, he said.

"The conveyance and melting of thermoplastic feedstock remains neither efficient nor consistent," he said. "It seems that improved extrusion processes could be more reliably developed with lower equipment and processing costs." ›

Main image: David Kozmer used the principle of fractals to design a screw with better control of plastication

Design matrix linking screw Design Parameters (DPs) and Functional Requirements (FRs)

	DPs				
FRs	**DP1**	**DP2**	**DP3**	**DP4**	**DP5**
Flow rate (high)	↑↑		↑↑	↑↑	↑↓
Shear rate (medium-high)				↓↓	
Residence time (low)	↓	↓↓	↓	↓	↑
Heat conduction (high)	↓	↑↑	↓	↓↓	
Leakage flow (low)	↓	↓	↑		↑↑
Efficiency (high)			↓	↓	↑
Melt pressure (high)		↑↑	↑	↓	↑

DP1 = Screw diameter DP2 = Screw length DP3 = Channel width(s)
DP4 = Channel depth(s) DP5 = Flight width(s)

Increasing the DP either IMPROVES (↑) or DEGRADES (↓) FR

Source: David Kazmer/UMass Lowell

He presented a fractal screw design that he said would provide the same processing for each pellet "regardless of extruder scale". The intent is to "maintain the same – or rationally adjusted – channel height and width across different extruder sizes".

Fractals are endlessly repeating patterns that are often found in nature – such as a line constantly splitting into new channels. Kazmer said that the principle can be applied to screw design. In his case, a large channel section is divided into many smaller downstream channels.

Second principle

A second principle guiding the screw concept was that of axiomatic design – which says that each functional requirement (FR) is controlled by one design parameter (DP). FRs include flow rate and melt pressure, while DPs include screw diameter and flight widths.

Kazmer notes that there is "significant coupling" between screw design parameters and extrusion functional requirements.

"Changing most DPs has both beneficial and negative impacts on the FRs," he said.

Kazmer has designed a 38mm diameter screw with one channel in the feed section, two in the transition section and four in the metering section. Each channel has been designed to achieve a specific objective.

In the feed section, the screw uses a single channel to ensure efficient loading with pelletised and granulated feedstock from the feed throat. The lead, channel width and channel depth in this section are 100%, 90% and 20% of the screw diameter, respectively.

After four turns of the screw, the feed channel splits into two transition channels – each with a flight thickness of 10% and new helix angle of 20°. There are two objectives: to physically break up the solidified bed and impart more work on the feedstock; and to provide more uniform – and greater – shear on the processed material.

The metering section introduces an extra set of flights at a helix angle of 24°. Each has a channel width of 25.1% of the screw diameter and final channel depth of 9%.

An alternative design – suggested by other researchers – was to have an intermediate mixing between the transition and metering zones. It can help to homogenise melt variations while ensuring uniform flow.

According to Kazmer, the screw design is particularly relevant to larger extrusion screws. The designs are currently being machined, and performance measures – including output volumetric flow rate, melt pressure, melt homogeneity, residence time and energy efficiency – will be compared to general purpose and barrier screws, he said.

"In the long term, the research should lead to new methods for analysing and designing complete extrusion systems – including screws, dies and other control subsystems," said Kazmer.

Screw and barrel research

NewEx is a pan-European research project – involving six organisations – that aims to build and test an "innovative new extruder" that can process composite and nanocomposite materials.

The main approach will be to develop a new plasticising system – with parts including an innovative active grooved feed section (IAGFS), original rotational barrel segment (ORBS) and special screw (SS).

A key central part of the project relies on a screw designed jointly by some of the researcher partners – which is subject to a patent application.

At a project meeting at machinery manufacturer Zamak Mercator – one of the partners, which is based in Poland – participants discussed the feasibility of making the extruder's rotating barrel segments. Several design concepts were presented, which variously addressed: how to heat the barrel; how to transfer the drive onto the rotating segment; and how to assemble – and especially seal – the rotating barrel segment with the stationary elements of the barrel.

An afternoon workshop included an extrusion demonstration, using polyethylene (PE) with MDF (medium density fibreboard) flour and compatibiliser. The tests were conducted at 145˚C, at screw speeds of 10-200rpm, and filler content of 30-60%.

Other partners include project coordinator Lublin University of Technology in Poland, and the

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Right: Xaloy MPX incorporates small spherical tungsten carbide particles to create a dense, abrasion resistant surface

University of Minho in Portugal.

Minho University will carry out extrusion modelling of elements including the screw and barrel geometry. Antonio Gaspar-Cunha, of its Institute of Polymers and Composites, said that two potential challenges in the project would be: the difficulty in measuring the 'real' friction coefficients; and, modeling the real behaviour of the pellet flow in the grooves.

Diamond protection

Finnish material specialist **Carbodeon** and German metal finishing specialist **CCT Plating** have developed an electroless nickel plating technology for wear protection, called NanoDiamond.

Although it was developed for sliding wear applications, Carbodeon says it considers the technology suitable for applications in extruder screw and barrel protection as it overcomes the traditional susceptibility of electroless nickel coatings to adhesive wear.

Electroless nickel coatings provide good corrosion and abrasion resistance and allow an even coating thickness to be applied to complex geometries at relatively low cost, says the company. However, they do not perform well in tribological applications involving moving metal parts, where adhesive wear and galling tend to lead to rapid wear or failure. Carbodeon says that incorporating its NanoDiamond materials into the coating overcomes this problem.

The spherical diamond nanoparticles are treated to carry a positive electrical charge to help dispersion. This means that, during plating, the diamond particles behave similarly to the positively charged metal ions and co-deposit onto the component surface with them. The resulting metal-diamond composite surface treatments have already shown their value in abrasion resistant coatings, but optimising the process is said to have created a new generation of coatings that combat the adhesive wear that occurs when plated parts are in sliding contact with other metals.

Below: The NewEx project aims to develop a new type of extruder, with a special focus on the screw and barrel

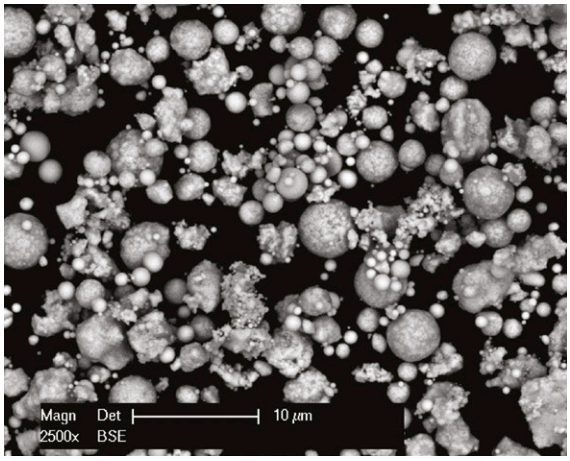

PHOTO: NORDSON CORPORATION

The coatings can be used "as plated", which does not affect the substrate's heat treatment condition, or can be annealed for higher performance. Abrasive wear is said to be three times better than standard electroless nickel, while adhesive wear rate is cut by 30% in the "as plated" form and by 85% in the annealed state. Coating hardness is increased when annealed.

Abrasion award

Meanwhile, **Nordson's** Xaloy MPX wear coating technology, which increases the abrasion- and corrosion-resistance of single and twin plasticating screws, won an innovation award at last year's Plastpol exhibition in Poland.

"With the new Xaloy MPX technology, we continue our history of leading-edge innovations," said Norbert Zając, Eastern Europe sales manager for Nordson's polymer processing systems brands.

The technology is recommended for resisting abrasion from compounds with medium (15 to 35%) filler loadings and for resisting corrosion from halogenated materials, including flame retardants and PVC. It uses tiny tungsten carbide spheres to make a coating that resists wear better than standard coatings applied by high-velocity oxygen fuel (HVOF) thermal spray, said the company.

Compared with standard HVOF tungsten carbide coatings, it has 61% less mass loss in ASTM G65 abrasion testing, 18% less mass loss in ASTM G77 sliding wear testing, and 8.5% greater bond strength in ASTM C633 bond testing, said Nordson.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.uml.edu**
- **http://newex.pollub.pl/**
- **www.carbodeon.net**
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Pouches: full of innovation

We preview AMI's fourth annual Plastic Pouches conference, which takes place in Vienna, Austria in April

Main image: The convenience of plastic pouches has made them a popular choice for beverage packaging

Pouches are one of the fastest growing flexible packaging formats, thanks largely to their widespread acceptance across end use segments. The favourable development of the total supply chain cost and their ability to promote sustainability – compared with rigid packaging – will continue to be the key drivers. Although improvements continue to arrive on the market, there are still technology gaps to meeting complex customer requirements – especially in high-performance applications that balance costs and technical requirements. These provide opportunities for innovative companies.

Now in its fourth year, AMI's Plastic Pouches conference brings together leading industry participants from across the supply chain including brand owners, fillers, flexible packaging converters and packaging system providers, film producers, and suppliers of both material and machinery. Participants gather to discuss new pouch and laminates developments as well as the materials and technology advances that improve performance and processes. Delegates gain valuable insights into global market and consumer trends, getting an up-to-date view on how end user demands are shaping product development.

Here we preview the event, with a closer look at the line-up of expert speakers, focusing on different areas of plastic pouches.

Market trends

The opening session looks to understand the changing face of plastic pouches. **Márta Babits**, Consultant for Consumer Packaging at **AMI**, starts proceedings by providing an overview of the global market. **Graham Houlder,** Managing Director of **Sloop Consulting** in The Netherlands, takes a look at circular economy guidelines for the industry.

The second session focuses on developments in pouch making, with a focus on technically demanding pouch applications, specifications and processes. **Sal Pellingra**, Vice President of Global Application & Innovation Development at **ProAmpac** focuses on global trends in rigid replacement. **Jérôme Detais**, Marketing Director of **Coveris Firminy**, presents a case study on maximising pouch performance with specifications and production processes. **Prof. Dr. Achim Grefenstein,** SVP Group R&D & CC Films at **Constantia Flexibles Germany**, discusses the latest developments in sustainable laminates. Concluding the session, **Lila Shpakovsky**, CTO at **CLP Industrial** in Israel, talks about advancements in retort stand-up pouches.

Material developments

Discovering new and innovative materials are paramount in any industry, and the conference's third session provides an opportunity for delegates to find out about the latest material developments in plastic pouches.

The session begins with **Minoru Kitazawa**, Business Development and Technical Manager at **Toppan Printing**, whose presentation covers developments in transparent high barrier films for pouches. **Robin Cooper**, Marketing Strategic Program Manager at **Michelman** in Luxembourg looks at new oxygen barriers, while **Jose Novo**, Key Account Manager at **Toyo Ink** in Japan, introduces a new generation of water-based inks. Also in this session, **Marco Izzi**, Application Development &

Speakers at the forthcoming Plastic Pouches 2018 conference include (clockwise, from top left): Márta Babits of AMI; Matt Baldock of Vow Packaging Partners; Amaury Patin of Nestle Research Center; Robin Cooper of Michelman; Sal Pellingra of ProAmpac; and Renata Tomerlin of Podravka

Technical Service Engineer at **Basell Polyolefine,** presents new retort pouch grades, while **Stephan Ortner**, Application Technology Manager for Flexible Packaging at **Borealis Polyolefine**, looks at the latest developments in PP mono material solutions.

The first day ends with a cocktail reception, held in the conference exhibition area, where participants gather to network, make new contacts and conduct business with the international supply chain, whilst enjoying drinks and canapes.

End user perspectives

Day two begins with an in-depth look at the end user standpoint. **Fredric Mathis**, Vice President of Technology at **MOM Group** in France, opens the day with a look at Materne's stand-up pouch development. **Renata Tomerlin,** Head of Packaging, Development and Design at **Podravka**, discusses technical requirements of stand-up retort and high-pressure pouches, while **Amaury Patin,** Senior R&D Specialist at **Nestlé Research Center** shares a global brand owner's multi-disciplinary approach – and its application to pouches.

The fast pace of technology affects the industry at every level. **Matt Baldock**, Founder and Managing Director of **Vow Packaging Partners**, looks at the use of nanotechnology in pouch applications, revealing the results of a recent study. **Christian Groh**, Project Manager for Colour Cloud Integrations at **Saueressig** in Germany, introduces cloud-based colour solutions that are designed to save time and money.

Innovations and trends

The final session of the conference looks at the latest innovative technologies in the industry. **Michael Greely**, Senior Vice President of **Totani America,** presents the latest pouch-making machine technology trends. **André Philipp**, Manager of the Centre of Technology at **Robert Bosch Packaging Technology**, looks at innovations in food safety and consumer convenience, with a focus on VFFS. After lunch, **Amir Raziel**, Business Manager for HP Indigo Flexible Packaging at **HP**, showcases digital print case studies and technical considerations. Wrapping up the conference is **Oliver Stauffer**, Chief Operating Officer at **Packaging Technologies and Inspections,** discussing pouch quality control and seal integrity.

For more information contact the conference organiser, Emily Renshaw on +44 (0) 117 314 8111, (**emily.renshaw@ami.international**).

About the Plastic Pouches 2018 conference

AMI's fourth *Plastics Pouches* conference takes place in Vienna in Austria on 24-25 April 2018 and once again brings together key players in the European pouch market. Over two days, attendees will hear expert speakers address current and developing trends in the pouch market, with an assessment of the challenges and drivers in terms of regulation, sustainability, materials, closures, processing and safety.

The event brings together brand owners, retailers, converters, film producers and suppliers to learn and exchange views on this dynamic market sector. In addition to the high level formal programme, *Plastic Pouches 2018* will provide extensive networking opportunities during the informal break sessions and evening cocktail reception.

To book your place at *Plastic Pouches 2018*, or to find out more about exhibiting and sponsorship opportunities, visit the **conference website** or contact Conference Organiser Emily Renshaw (**emily.renshaw@ami.international**) on +44 (0)117 314 8111.

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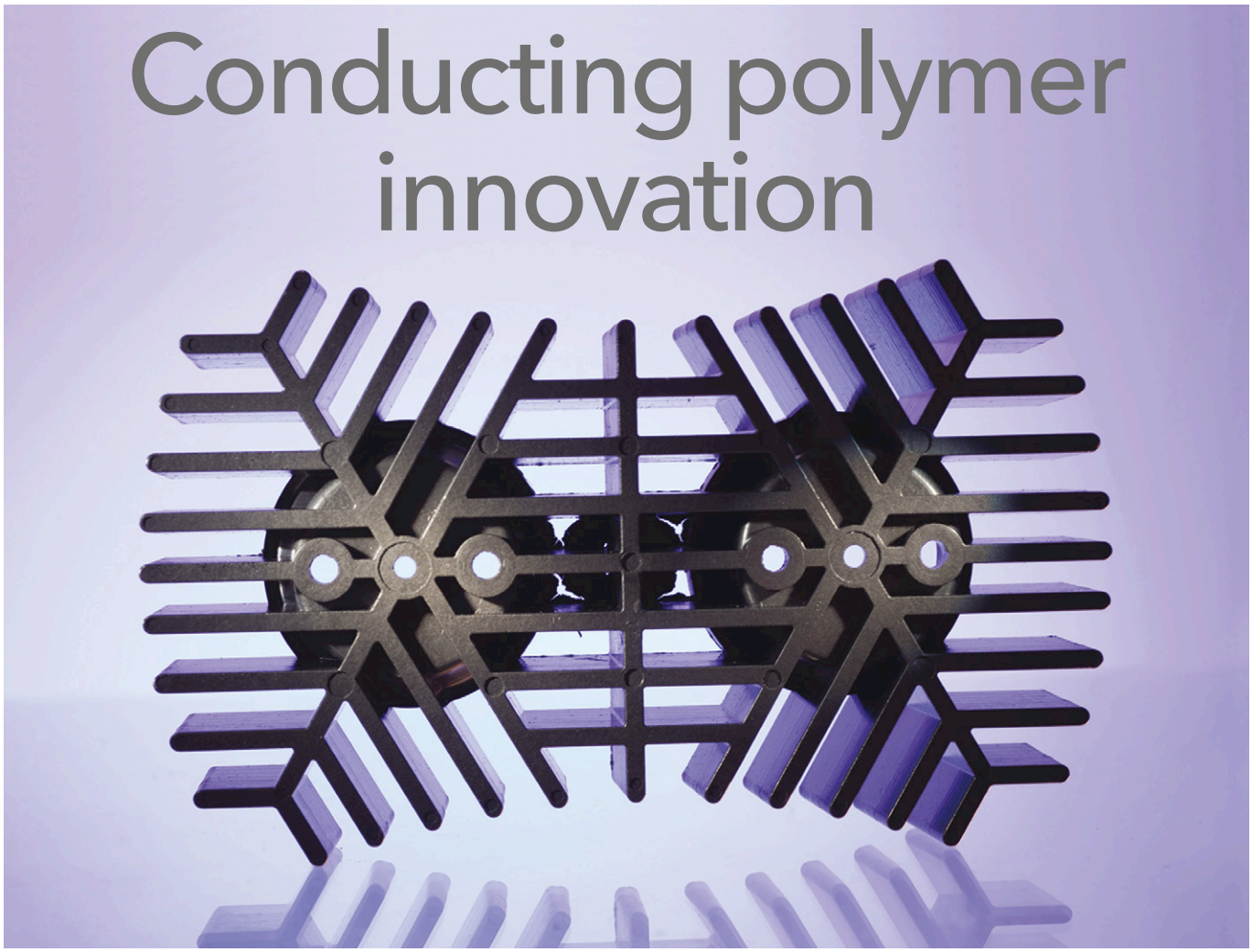
Conducting polymer innovation



AMI's upcoming Conductive Plastics USA conference in Pittsburgh provides an opportunity to update on the latest developments in modification of electrical and thermal properties of plastics. We preview the event

Electronics play a vital and growing role in modern life. Whether it's smart appliances, autonomous vehicles, energy efficient LED lighting, or mobile information devices, more and more products today include electronic components and that is placing new challenges on designers and manufacturers. Sensitive electronic components must be protected not only from physical damage but also from electromagnetic interference, static charge and thermal overload. And that protection must be provided in an effective and affordable manner.

Plastics are well-proven challengers to conventional materials such as metal where, in many cases, designers have harnessed their unique performance and processing benefits, including their high levels of electrical and thermal insulation.

However, many emerging electronics applications require plastics that offer improved conductivity in either or both areas. Fortunately, additive solutions are available that can deliver electrical and/or thermal conductivity in a wide range of base polymers and the latest developments in this area will come under the spotlight at AMI's second North American Conductive Plastics conference, which is supported by *Compounding World* and *Injection World* magazines.

Taking place on 20-21 March 2018 in Pittsburgh, PA, US, Conductive Plastics USA 2018 is a two-day event that brings together expert speakers to explain the latest advances in electrically and thermally conductive additives, and how they can be used to design and develop plastics that offer a

Main image: Increasing penetration of electronics into everyday products is driving interest in polymer-based parts such as heat sinks

novel set of performance characteristics.

The conference will be opened by Chris Smith, Editor-in-Chief at AMI Magazines and Editor of Compounding World, who will present a brief introduction to conductive plastics, highlighting some of the key areas of application today and for the future. Then **Dr Michael Claes**, Chief Technology Officer and Global Strategic Account Manager at **Nanocyl** in Belgium, will open the event's technical programme with a presentation looking at examples of how and where multi-wall carbon nanotubes (MWCNTs) are being used to improve electrical conductivity.

Switching the focus to the future, **Dr Xiao Zhong**, Analyst at **Lux Research** in the US, will discuss 3D printing of electrically conductive plastics, reviewing market opportunities, industry strategies and some of the likely enabling technologies. **Luigi Alzati**, Market Leader Americas at **Imerys Graphite & Carbon** in the US, will discuss carbon black-based solutions for production of conductive electronic packaging. And **Jukka Hillberg**, Research and Technology Manager at **Croda** in Finland, will explain the functioning and application of inherently dissipative polymers for electrical modification (Croda recently acquired the **IonPhasE** IDP business).

Thermal options

The conference will then move over to thermal conductivity modification, beginning with two examples of formulated compounds. **Terry Davis**, Principal Engineer/FTR Manager at **Covestro** in the US will present a review of some thermally conductive polycarbonate polymer grades developed for applications in LED lighting. **Darin Grinsteinner**, Product Developer at **Celanese** in the US, will follow that with a discussion of how the thermal and impact performance of polymer compounds can be improved for automotive heat sink applications.

Additives for thermal conductivity enhancement are next on the agenda with **Péter Sebö**, Head of Marketing and Development at **Quarzwerke** in Germany, sharing some of the latest developments in thermally conductive fillers for development of white and coloured compounds. He will be followed by **Kerry Smith**, Product Manager Americas with **Nabaltec** in the US, who will look at how mineral flame retardants and conductive fillers can be combined to achieve fire retardant thermally conductive compounds. **Dr Martijn Mies**, Research and Development Manager at **Huber Engineered Materials** in the US will end the session with an examination of the use of aluminium oxides to enhance thermal conductivity in polyamides.

The final session of the first day of Conductive Plastics turns the spotlight onto some of the emerging additive technologies. **Dr Daniel Stolyarov**, President of **Graphene 3D Lab** in the US, will open with a discussion of the use of graphene nanoplatelets in high performance electrically conductive polymer composites. **Dr Eugeniy Ilin**, Head of the Department of Polymer Materials and Vice President at **OCSiAl** in Russia, will explain how single-wall carbon nanotubes (SWCNTs) can be used to enhance conductivity and to reinforce thermoplastic compounds. And **Dr Edward Chan**, Vice President at **Global Graphene Group** will detail how graphene can improve the thermal properties of thermoplastic and thermoset polymers. ›

About Conductive Plastics USA 2018

Conductive Plastics USA 2018 is AMI's fourth conference focused on this fast developing market sector and the second to be held in North America. It takes place on 20-21 March 2018 at the Pittsburgh Marriott City Center hotel in Pittsburgh, PA, US, and is sponsored by **Modern Dispersions Inc** and **Premix Oy** and supported by *Compounding World* and *Injection World* magazines.

The conference will bring together a variety of expert speakers to detail the latest additive and process developments available for enhancing the electrical and/or thermal conductivity of plastic compounds.

Aside from the formal presentations, Conductive Plastics USA 2018 will include a mini-exhibition and will provide extensive networking opportunities during the break-out sessions and refreshment breaks. All attendees are also invited to attend the informal networking cocktail reception at the end of the first day of the conference.

To find out more about attending, sponsoring or exhibiting at Conductive Plastics USA 2018, contact the conference coordinator, Christina Winegarden. Email: **Christina.winegarden@ami.international**, Tel: +1 610 478 0800, or visit the **conference website**

EMI and ESD

The second day of the conference will commence with a review of some of the latest developments in the area of EMI (electromagnetic interference) and ESD management (electrostatic discharge). **Elijah Grant**, Product Development Engineer at **RTP Company** in the US, will open the session with some guidance on how to select a thermoplastic material for use in hazardous and ATEX environments. **Dr Dimitri Rousseaux**, Composites and Compounds R&D Manger at **Total Research & Technology** in Belgium, will discuss the development and application of carbon nanotube modified compounds in ATEX and ESD applications. And **Kari Alha**, R&D Director at **Premix** in Finland, will speak about electrostatic discharge attenuation in electrically conductive carbon black loaded compounds.

Achieving high levels of electrical and thermal conductivity in plastics can require working with high filler loadings and very often needs careful dispersion and handling of additives. The conference will consider how this can be achieved in compound preparation. **Dr Paul Andersen**, Process Engineering Consultant at **Coperion** in the US, will explain some of the difficulties that producers of conductive plastics may face and detail some of the techniques that can be applied in twin screw compounding to overcome them. Then **Slayton Altenburg**, Application Specialist at **Technical Process & Engineering (TPEI)** will discuss compounding of conductive masterbatches using continuous mixer technology.

The final session of Conductive Plastics is focused on the challenges of measuring thermal conductivity. **Justin Wynn**, Application Engineer Thermophysical Properties at **TA Instruments-Waters** in the US, will detail the use of steady-state and flash diffusivity measurement techniques to measure out-of-plane and in-plane thermal conductivity. Then **Alex Makitka**, Applications Manager at **Linseis** in the US, will bring the conference to a close with an explanation of the use of the transient hot bridge (THB) technique for high speed measurement of thermal conductivity in polymer pads and parts. **Download the brochure**

Conductive Plastics USA will bring together a line-up of expert speakers including (from left, top) Lux Research Analyst Dr Xiao Zhong, Covestro Principal Engineer/FTR Manager Terry Davis, Quarzwerke Head of Marketing and Development Péter Sebö, OCSiAl Head of the Department of Polymer Materials and Vice President Dr Eugeniy Ilin, (bottom row) RTP Company Product Development Engineer Elijah Grant, Coperion Process Engineering Consultant Dr Paul Andersen, TPEI Application Specialist Slayton Altenburg, and AMI Magazines Editor-in-Chief Chris Smith

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AMI is seeking an expert in polymer technology to research and create compelling conference programmes for its expanding portfolio of highly respected events for the international plastics industry.

The Conference Producer role involves identifying key market trends, crafting focused agendas and securing high calibre speakers to attract large and influential global audiences. Candidates should have a broad knowledge of plastics materials and processes, have strong interpersonal skills, be highly organised with the ability to manage multiple projects and a keen, intellectually curious mind.

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Founded in 1986, AMI is a leading provider of information, market intelligence, and events for the global plastics industry, with offices in the UK and USA. Our teams of consultants, researchers, writers, and event organisers include many of the most respected experts in their fields.

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To apply please email your CV and covering note telling us why this role is perfect for you to Charmaine Russell, Head of Conference Production charmaine.russell@ami.international

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Single-Serve Capsules 2018

Identifying opportunities and overcoming obstacles in the single-serve capsules industry

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Single-Serve Capsules USA brings together industry-elite speakers to debate and evaluate the trends, innovations, challenges and opportunities facing the industry through the entire value chain of plastic and metal capsules. Following the hugely successful launch event in Europe, this unique forum includes coffee roasters, brand owners, capsule fillers, capsule moulders, material suppliers, technology and machinery suppliers.

In addition to a packed programme of expert presentations, the forum provides numerous opportunities to network with key industry stakeholders, as well as an exhibition showcasing the latest innovations.

PS: Great sponsorship opportunities available!

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Film and Sheet EXTRUSION

Injection WORLD

AUTOMOTIVE

Bioplastic boosts car door handles

Teijin has developed a formable gasoline-resistant film – made from its Planext bioplastic – for use on car door handles.

The film was developed using a special metal-evaporation technology supplied by a processing partner, says the company. It uses Planext SN4600, which is derived from isosorbide. As well as transparency, chemical resistance and surface hardness, it has extra capabilities such as gasoline resistance and UV resistance.

It is intended to be a replacement for chrome plating, and has been used in this way by Honda Lock as a covering layer on a door handle for a smart entry system.

"Optimised heat resistance and film technology enable high formability for fashioning into complicated shapes," says Teijin. "UV protection helps to shield the base material and prevent discoloration."

Smart entry systems enable doors to be locked and unlocked by simply touching the handle sensor – but this requires the material surrounding the sensor to be non-conductive. This is why conductive chrome plating was replaced by the conducting film layer.

› **www.teijin.co.jp**

PET

Mono-material APET meat packaging boosts recycling

Krehalon and Dunbia have developed mono-material packaging for UK supermarket Co-Op.

The modified atmosphere packaging, for packaging minced beef, uses only amorphous PET. Ordinarily, this type of packaging uses a polyethylene sealing layer – but the new design uses a special design of lidding film that removes the need for the extra layer.

The film achieved a strong fused seal to the mono-APET base – and makes the all-PET packaging easier to recyle. In addition, it could reduce pack weight – and therefore costs – through downgauging

"Sealing to a mono APET layer, unsupported by a PE sealant layer, was a challenging project as it required us to come up with a radical alternative to PE sealing mechanisms while maintaining strong hermetically sealed packs," said Krehalon.

The high barrier top film also includes anti-fog properties for optimum pack clarity and visual appeal.

Dunbia used its existing manufacturing equipment – without modifications – to make the new packaging. It experienced no reduction in production output or machine efficiencies, it said.

Future opportunities within this project include the ability to fully sandwich print the top film to remove the need of labels (or other added surface decoration), offering further environmental and cost benefits. When sealed to CPET, the film is approved for 'direct to oven' applications (200°C for two hours).

"The Mono-APET project has been a great step forward in our ambition to make all of our packaging easy to recycle," said Rob Thompson, packaging technologist at Co-Op. "By simplifying the plastic trays to just one polymer type, we have made Co-op branded packaging more attractive to recyclers."

› **www.krehalon.com**

CONSTRUCTION

Animal crossing is blown into place

PHOTO: BENJAMIN KROSOMER

Engineers from the Technical University of Vienna in Austria have built a bridge using a plastic air cushion to inflate it to its correct shape.

The structure begins as a flat sheet of concrete that has incisions cut into it. Then, an enormous plastic air cushion – positioned underneath the concrete – is inflated. Over the course of five hours, the flat sheet is transformed into a concrete dome. The ends of the dome are then cut away, to form a bridge.

The bridge is used as a wildlife crossing over the Koralm railway, which is currently being built.

› **www.tuwien.ac.at**

TESTING

Spectrophotometer offers no contact

X-Rite has developed a version of its MetaVue family of non-contact imaging spectrophotometers that is tailored to meet the needs of the plastics industry.

It says that the MetaVue VS3200 is the first non-contact instrument for industrial applications that combines spectrophotometry with colour imaging, to characterise complex materials.

"Many quality control programs rely solely on visual colour evaluation due to the shape and size of the sample," said Dave Visnovsky, product manager at X-Rite. "MetaVue's flexibility allows manufacturers to add instrument-based quality control to their process in order to ensure colour accuracy – eliminating waste and rework."

The device has an adjustable aperture size, ranging from 2 to 12mm, enabling measurement of a wide range of samples. Users can measure difficult samples such as small and non-planar items. Adaptable accessories include: an instrument stand to place the instrument three inches above a table with replaceable trays that slide in and out; an adjustable stand for accurate measurement of samples with varying thickness; and a benchtop stand that converts the instrument to a benchtop with a sample arm for objects like plastic parts.

The MetaVue VS3200 also includes an on-board camera allowing precise digital targeting of the sample. Operators can quickly and easily see the target area being measured and change the aperture size or location. The camera enables the Smart Spot advanced image feature that compensates for texture, gloss and other appearance effects for more accurate measurements of vinyl, for instance.

› **www.xrite.com**

TOOLING

Jindal adds five-layer CPP line

Jindal Poly Films of India has commissioned its first cast polypropylene (CPP) line, at its Nashik plant in Maharashtra.

The five-layer line from Reifenhauser is 4.8m wide and has an annual capacity of 15,000 tonnes. It will produce a wide range of CPP films, for both regular applications and for specialist applications such as high barrier and retort film.

Jindal says the line is the widest of its type in the country.

› **www.reifenhauser.com**
› **http://jindalpoly.com**

BLOWN FILM

Module now available as retrofit

Windmöller & Hölscher says that its Turboclean automation module is now available to be retrofitted on any of its blown film lines.

Previously, it was only available as an integral part of the company's Varex II blown film line.

W&H says the module can increase the productivity of an extrusion machine due to short flushing times and fast material changes.

"Instead of up to 40 minutes, the order change time can be as little as 12 minutes," said Hendrik Steen, who is responsible for the company's retrofit business.

He adds that retrofitting the module to machines made after 2010 should take no longer than two days.

With the automation module, the extrusion system completes the material change almost completely automatically. Work steps are now automated and parallel, rather than having to be changed step-by-step, by a machinery operator.

› **www.wuh-group.com**

Robust research and expert data for the BOPP film industry

Reports published by AMI consulting:

Is BOPP facing its most challenging times yet? Over investment, rising costs, falling prices, commoditisation and wafer thin margins are pushing producers close to the edge. Who will be the winners and losers in this increasingly competitive industry? Differing strategies are at play which include diversification, rationalisation and specialisation. Which will succeed and where will this take the industry over the next five-years?

For over 20 years AMI has been chronicling the development of this dynamic and fast-changing industry in its biennial global report the 2018 edition of which will be out in April 2018.

BOPP films – the global market 2018

Get the latest edition of AMI Consulting's authoritative report for an accurate and detailed assessment of the current state of the BOPP film market around the world and detail demand in each region by film type and end use markets.

5 key things this report will give you:

- ✔ The status of the current market: demand by type of film (plain, heat sealable coex, opaque and coated) and forecast growth to 2022.
- ✔ Current demand by end use applications (food versus non-food) and forecast growth to 2022.
- ✔ Implications of new capacity and new players on the competitive intensity of the industry.
- ✔ Review of industry structure and market shares for the leading groups globally and within each region.
- ✔ Overview of the trends within key end use segments for BOPP film and the main competitive materials.

AMI Consulting offers a full range of strategic client services and is Europe's largest consultancy dedicated to providing business research and analysis for the global plastics industry.

Also included is a comprehensive statistical appendix giving capacity for every producer by country and BOPP film demand for more than **100** individual country markets

To be Published April 2018

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Download these new product brochures

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

BG PLAST: FOIL AND SHEET PLANTS

This brochure provides information on BG Plast's Complete Extrusion Plants for producing foils and sheets for multiple uses including thermoformed packaging, chemical tanks and containers, applications in cars, household appliances, footwear, lighting and construction.

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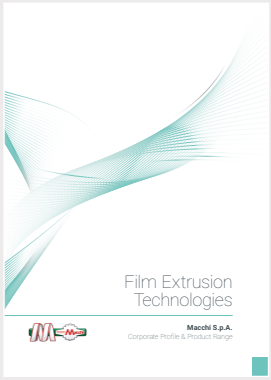
MACCHI: FILM EXTRUSION



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.

❯ CLICK HERE TO DOWNLOAD

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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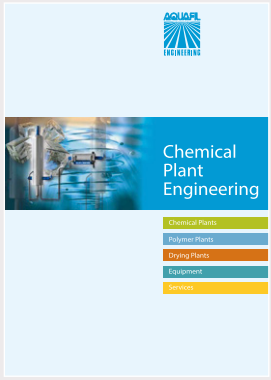
AQUAFIL: PLANT ENGINEERING



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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DAVIS-STANDARD: EXTRUDERS

The Super Blue range of single screw extruders from Davis-Standard is designed for cost effective production of a wide variety of polymer products. This brochure details the key features of the range, which extends from 50.8mm to 114.3mm screw diameter.

❯ CLICK HERE TO DOWNLOAD

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

SPECIALITY PACKAGING FILMS ASIA

AMI's fifth conference focused on the Asia-Pacific packaging films market will convene in Bangkok, Thailand, on 13-14 March 2018. Its expert speaker liner up will address the latest application trends and materials innovations, including high barrier.

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PLASTICS REGULATIONS 2018

AMI's second Plastics Regulations conference takes place in Cologne, Germany, on 14-15 March 2018, bringing together expert speakers to deliver critical advice on REACH, biocides, nanomaterials, the circular economy, printing inks and food contact polymers.

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THIN WALL PACKAGING USA 2018

The 7th AMI international conference on thin wall packaging will take place on March 20-21, 2018 in Chicago, IL, USA. The event offers a unique networking opportunity for buyers and suppliers to debate the latest developments in light weight plastics packaging.

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PVC FORMULATION 2018 EUROPE

The 10th anniversary edition of AMI's European PVC Formulation conference takes place in Cologne in Germany on 10-12 April 2018. This industry-leading event covers business developments and technical innovations in all PVC markets.

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MULTILAYER FLEXIBLE PACKAGING USA

AMI's 9th North American conference on Multilayer Flexible Packaging will be happening on 10-11 April 2018, in Chicago, IL, USA. The event covers a range of current technical and commercial issues including new films and materials, barrier properties and production technology.

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STRETCH & SHRINK FILM 2018 EUROPE

AMI's long-established Stretch & Shrink Film conference will take place for the 15th time on 16-18 April 2018 in Madrid, Spain. The event attracts the key players from across the whole supply chain: film extruders, polymer suppliers, machinery producers and end customers.

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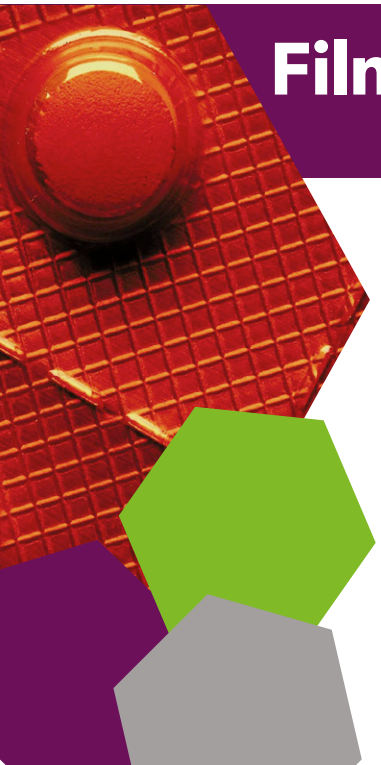
Schur Flexibles

Head office:	Baden, Austria
Managing director:	Michael Schernthaner
Founded:	2012
Employees:	Around 1,400
Annual sales (2017):	More than €350m
Ownership:	Private (owned by investment firm Lindsay Goldberg)
Profile:	Although only founded in 2012, Schur Flexibles was created by the amalgamation of several established flexible packaging companies – including Danapak Flexibles (established in 1955), Drukkerij Zwart (1929) and Vacufol. The company continues to make acquisitions in flexible packaging, and is currently negotiating to buy UNI Packaging in France.
Product lines:	The company offers a wide range of products, from films and form-fill-seal (FFS) packaging, to lidding and bottom films, bags and pouches and shrink film. This reflects the diversity of its daughter companies. For instance, Danapak Flexibles is a specialist in pharmaceutical packaging – though also supplies to the food and tobacco industries; Drukkerij Zwart concentrates on printing, and has facilities in The Netherlands and Russia; and Vacufol is an established player in barrier film, offering EVOH shrink films, as well as PA/PE films for thermoforming, and a range of shrink bags.
Factory locations:	Following its many acquisitions, Schur currently has 14 manufacturing facilities in 12 European countries, including Germany, Finland, Poland, Slovakia and Greece. This total would rise to 21 if it successfully acquires UNI (which has seven production facilities across Europe).

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



Film and Sheet FORTHCOMING FEATURES
EXTRUSION

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

April 2018
Flat die developments
Agricultural films
Film winders
Show preview: Chinaplas 2018

May 2018
Waterproof membranes
Materials handling
Photovoltaics • Barrier film
Show previews: NPE 2018; Plast 2018

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
Claire Bishop: claire.bishop@ami.international Tel: +44 (0)1732 682948

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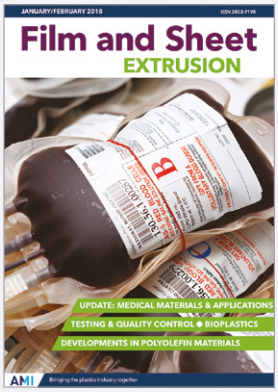

Film and Sheet
January/February 2018
The January/February edition of Film and Sheet Extrusion looks at some of the latest medical materials and applications. It also highlights developments in polyolefin resins and materials testing, as well as reviewing progress in bio-based polymer sourcing.

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Film and Sheet
December 2017
The December edition of Film and Sheet Extrusion magazine looks at new developments in foamed sheet production. It also reviews the agricultural films market and highlights some innovations in plastics recycling, melt filtration and static management.

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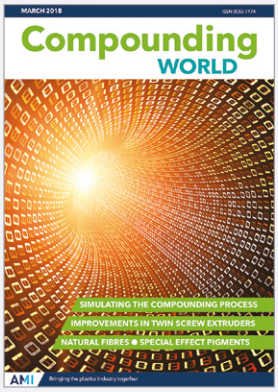

Compounding World
March 2018
The March edition of Compounding World discusses the continuing success and new technical developments in twin-screw co-rotating extruders. Plus features on modelling software for compounding, natural fibre reinforcement and special effect pigments.

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Plastics Recycling World
January/February 2018
The January/February edition of AMI's new digital magazine – Plastics Recycling World – takes a detailed look at the latest innovations in recycling of packaging films. It also explores developments in pelletising and material separation technologies.

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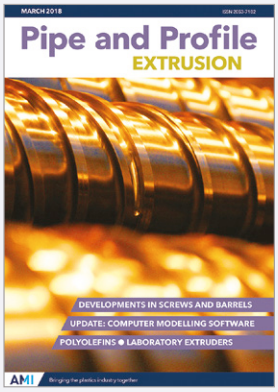

Pipe and Profile
March 2018
The March edition of Pipe and Profile Extrusion magazine looks at innovations in screw design. It also reviews developments in polyolefins for pipe applications and examines the latest in process simulation and laboratory extruders.

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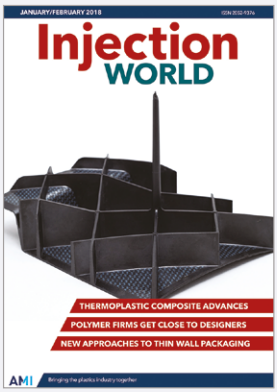

Injection World
January/February 2018
The January-February issue of Injection World examines the advances being made with overmoulding thermoplastic composites. It also looks at how polymer firms are collaborating with product designers, and the latest in thin wall packaging.

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Compounding WORLD
Film and Sheet EXTRUSION
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Plastics Recycling WORLD

GLOBAL EXHIBITION GUIDE

2018

11-13 March	Plast Alger, Algiers, Algeria	www.plastalger.com
20-22 March	Plastics & Rubber Vietnam, Ho Chi Minh City	http://plasticsvietnam.com
22-24 March	MECCSPE, Parma, Italy	www.mecspe.com
27-29 March	Plastprintpak Nigeria, Lagos, Nigeria	www.ppp-nigeria.com
24-27 April	Chinaplas, Shanghai, China	www.chinaplasonline.com
7-11 May	NPE, Orlando, USA	www.npe.org
9-11 May	Plastic Japan, Osaka, Japan	www.plas.jp
15-18 May	Elmia Polymer, Jönköping, Sweden	www.elmia.se
22-25 May	Plastpol, Kielce, Poland	www.targikielce.pl
29 May-1 June	Plast, Milan, Italy	www.plastonline.org/en
11-14 June	Argenplas, Buenos Aires, Argentina	www.argenplas.com.ar/en
19-20 June	Plastics Design & Moulding, Telford, UK	www.pdmevent.com
20-23 June	Interplas Thailand, Bangkok	www.interplasthailand.com
27-28 June	Compounding World Expo, Essen, Germany	www.compoundingworldexpo.com
27-28 June	Plastics Recycling World Expo, Essen, Germany	www.prwexhibition.com
2-4 August	Plasti & Pack, Lahore, Pakistan	www.plastipacpackistan.com
15-19 August	Taipei Plas, Tapei, Taiwan	www.taipeiplas.com.tw
19-22 September	Indoplast, Jakarta, Indonesia	www.indoprintpackplas.com
24-28 September	ColombiaPlast, Bogota, Colombia	www.colombiaplast.org
28 September-1 October	Koplas, Seoul, South Korea	www.koplas.com

AMI CONFERENCES

13-14 March 2018	Specialty Packaging Films, Bangkok, Thailand
14-15 March 2018	Plastics Regulations, Cologne, Germany
20-21 March 2018	Thin Wall Packaging, Chicago, USA
10-11 April 2018	Multilayer Flexible Packaging, Chicago, USA
16-18 April 2018	Stretch & Shrink Film, Madrid, Spain
24-25 April 2018	Plastic Pouches, Vienna, Austria
19-20 June 2018	Heavy Duty Sacks, Cologne, Germany
19-21 June 2018	Biax Film, Vienna, Austria

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