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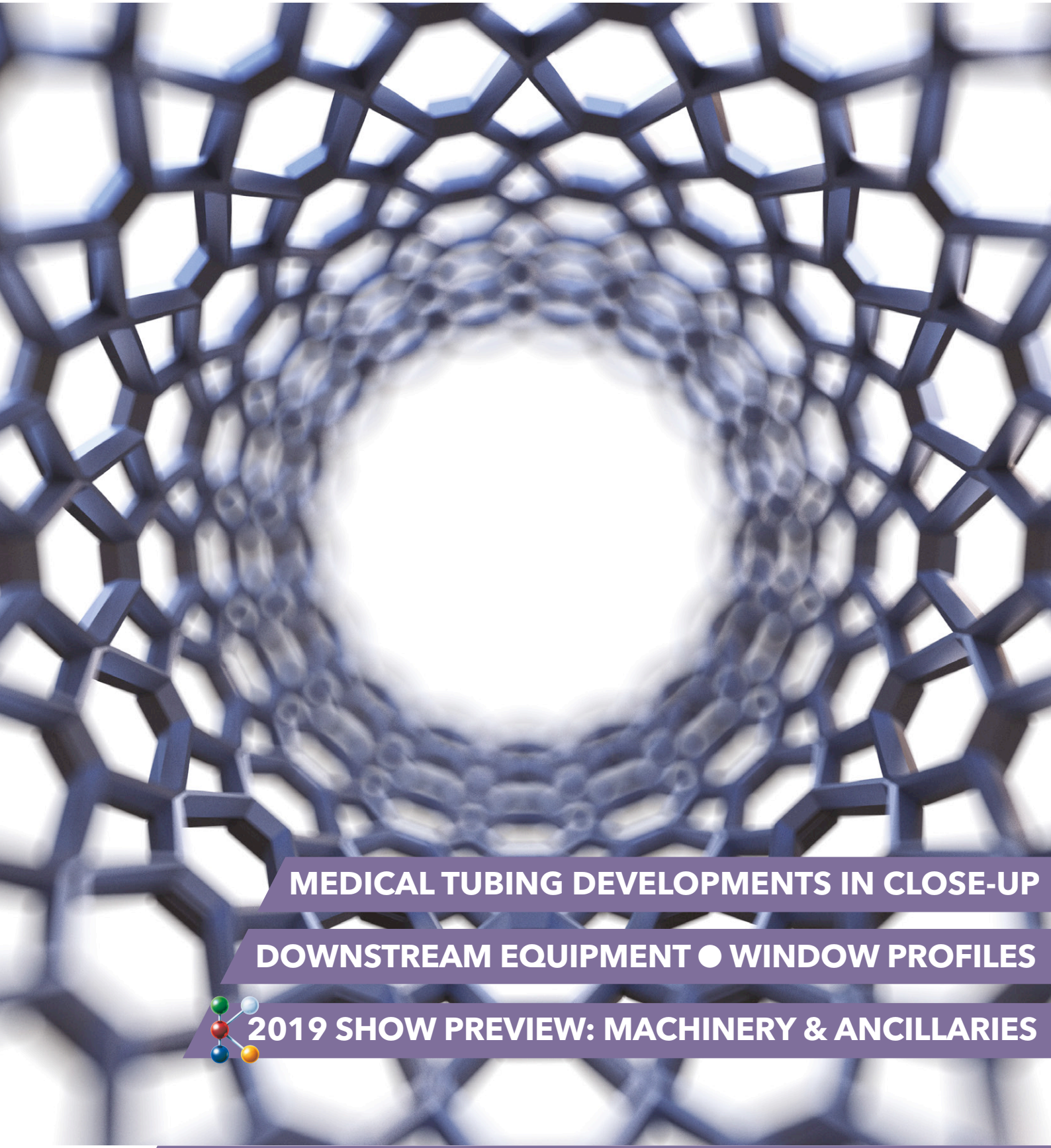

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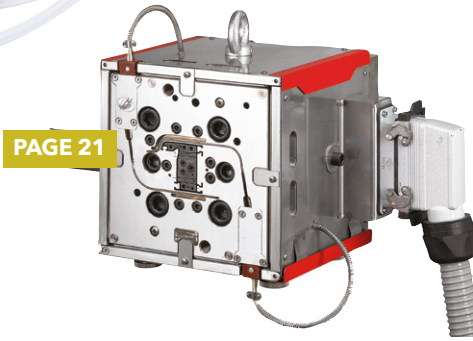
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Aliaxis buys Silver-Line in USA

Belgium-based pipe manufacturer Aliaxis – and its North American subsidiary Ipex – are to acquire US-based pipe maker Silver-Line Plastics.

The sale is subject to regulatory approval. Both parties agreed not to disclose the sale price or terms of the deal – and expect the transaction to be complete during September.

"Consistent with our strategy, this acquisition strengthens our leadership position in North America, expands our footprint and reinforces our value proposition in the USA," said Laurent Lenoir, CEO of Aliaxis.

The company added that Silver-Line has a strong reputation for being customer focused and supplying high quality products.

› **www.aliaxis.com**

Eurocell boosts output and raises sales by 10%

UK-based profiles manufacturer Eurocell has posted a sales growth of 10% for the first half of 2019.

It reported sales of more than £136m (US$162m) for the period – a 'like for like' increase that excludes acquisitions and new branch openings. Actual growth was 15%, said the company.

Profitability, in the form of EBITDA, rose by 4% to nearly £15m (US$18m).

"We have delivered another period of strong sales growth, albeit against weaker comparatives after bad weather in the early part of 2018," said Mark Kelly, CEO of Eurocell. "Higher EBITDA includes the benefit of selling price increases and continued growth in our use of recycled material."

Production increased by around 14% in the period, as the company made around 26,600 tonnes of rigid and foam PVC profiles. This fulfilled increased orders and helped Eurocell to increase stock holding at its branches, in order to improve availability. This year, Eurocell plans to boost co-extrusion capacity by 30% (with five new lines) and foam capacity by 15% (with three new lines).

Kelly: "Higher profits from selling price increases and continued growth in our use of recycled material"

"We are on track with these investments, with four of the new lines now in service and the remainder on schedule to be commissioned by the end of Q3," said Kelly.

The company used 6,400 tonnes of recycled PVC in co-extruded rigid profiles in the first half of the year, representing 22% of overall material consumption. This compared with 4,300 tonnes (17% of the total) in the same period in 2018.

This increase was possible thanks to an expansion of its Ecoplas recycling facility and by investing in new tooling that allows more recyclate to be used. Eurocell expects to invest around £2.5m (US$3m) in 2019 – leading to a 3,000 tonnes/year increase in the use of recycled material this year.

› **www.eurocell.co.uk**

Pexco makes more extrusion acquisitions

US-based Pexco further expanded its speciality extruder operations during August with two acquisitions.

Firstly, it has bought Pennsylvania-based HPE Extrusion Solutions, a manufacturer of custom profile, tube, and rod extrusions. The company was founded in 1972

Sam Patel, CEO of Pexco, said: "HPE's competencies blend very well with Pexco's long-term strategy – to enhance our capabilities as a premier custom extruder through ongoing product and process innovation."

Pexco has also acquired American Extruded Plastics (AEP) – and its sister company American Injection Molding (AIM).

The two companies operate out of a single facility in Greensboro, North Carolina.

AEP has operated since 1984, AIM since 1993. The companies supply custom tube, pipe and profile extrusion to customers in the life sciences and diagnostics, telecommunications, agriculture, automotive, construction, consumer goods and packaging industries.

Marshall Eakes, the owner of AEP and AMI, said: "Pexco's reputation, scale, and well-established history in custom extrusion creates an excellent partnership for our organisation and for our customers, providing an outstanding platform for strategic future growth."

Pexco's Patel added: "The addition of moulded plastics to our existing base of core competencies aligns well with our ongoing desire to broaden Pexco's overall value proposition."

Since last year, Pexco has been owned by private equity group AEA Investors. These two acquisitions are the fourth and fifth it has made in this time.

› **www.pexco.com**

Uponor reports flat sales in first half of this year

Pipe manufacturer Uponor reported flat sales for the first half of this year, though profitability rose sharply.

The company divested two businesses in 2018 – including its North American infrastructure division – and these have been accounted for in the figures.

Comparable sales were almost unchanged at nearly €542m (US$589m). A decline in its European business was offset by an increase in North America. In the period, operating group profit rose by nearly 11%, to almost €40m (US$43m).

"The strategic divestitures from 2018 supported our margin improvement," said Jyri Luomakoski, president and CEO of Uponor. "However, the second quarter was twofold: on the one hand, North America came back on track after a slow start for the year. But building solutions in Europe had some temporary production challenges in the second quarter."

Uponor opened its Hutchinson facility in the USA last year

Construction in both Europe and North America continued to perform at a healthy level during the second quarter of the year, said the company.

In North America, the growth in residential segment slowed but remained near the previous year's production levels.

In Germany, construction remained healthy despite trade concerns in the rest of the economy.

In the Nordic region, building activity was strong in Finland, while a slowdown in residential building in Sweden was compensated for by increased public works projects.

› **www.uponor.com**

Pipes add profit at Tessenderlo

Tessenderlo, the diversified Belgian industrial company whose operations include plastic extrusion, reported an increase in sales and profits for the first six months of the year.

Sales in its industrial solutions division, which includes extrusion operations, rose 3% to around €272m (US$297m). Adjusted EBITDA in the division rose by one-third to nearly €25m (US$27m).

The main contributor was the Dyka pipe extrusion business, which opened new branches in Belgium and the Czech Republic in the first half of this year. Profits in the division rose, thanks to higher volumes and an increase in production efficiency due to earlier investments, said the company.

› **www.tessenderlo.com**

Trex offers recyclability testing to film users

US-based Trex, a leading manufacturer of wood-plastic composite decking, is offering free recyclability testing to users of plastic packaging.

By doing this, it hopes to sign up more partners to its NexTrex recycling programme – which sources used plastic film to use in its decking products.

Each year, the company says it uses more than 400 million lbs (around 180,000 tonnes) of used plastic film in its products – which is made from 95% recycled material. Its main sources of raw material are retailers and makers of consumer-packaged goods. The testing process validates whether material is capable of being recycled in the Trex recycling stream.

"Trex invented composite decking more than 25 years ago as a way to reduce waste generated from plastic bags," said Dave Heglas, senior director of material management at Trex. "We are one of the largest recyclers of plastic film in North America."

Packaging designers, producers, and brand owners submit a packaged product sample, and Trex will test it for free – and provide a report assessing three areas for acceptance: package/film recyclability; affect/risk of product contamination; and affect/risk of non-recyclable 'lookalike' package contamination. This will allow adjustments to be made, in order to meet recyclability standards.

"Our testing program is intended to encourage more manufacturers to participate and take advantage of this scenario, while ensuring that the plastic we are collecting meets our high standards for production," said Heglas.

Trex says that, as well as providing compensation for recycled materials, it works with its recycling partners to make the collection and transportation of materials as easy as possible.

› **www.trex.com**

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North American plastics machinery deliveries "encouraging" in Q2

Deliveries of primary plastics machinery (extrusion and injection moulding equipment) in North America increased in the second quarter of this year, according to the Plastics Industry Association's Committee on Equipment Statistics (CES).

After declining by more than 27% in the first quarter, deliveries increased by more than 8% in the second quarter. However, compared with the corresponding period of last year, the figures were down by nearly 13%.

The preliminary estimate of deliveries exceeded US$295 million. Those for single- and twin-screw extrusion equipment both increased by more than 13%. (For comparison, those for injection moulding rose by more than 7%.) While the value of deliveries of single-screw extruders rose by more than 4% compared to one year ago, the value for twin-screw extruders was down by nearly 30%.

Pineda: "Second quarter numbers are encouraging, but shipments remain comparatively low"

"The second quarter numbers are encouraging, but machinery shipments remain comparatively lower than the previous quarters," said Perc Pineda, chief economist at the association. "What's happening is not surprising, judging from the macroeconomic environment. Real business investment spending in the second quarter fell, and investment spending in industrial equipment flattened in the second quarter."

The CES also conducts a quarterly survey of plastics machinery suppliers that asks about present market conditions and expectations for the future. In the coming quarter, 56% of respondents expect conditions to improve or hold steady – lower than the 70% that felt this way in the previous quarter. Over the next 12 months, 53% expect market conditions to be steady-to-better – down from 60% in the previous quarter's survey.

Exports in the second quarter reached nearly $379m – a 4.3% increase from the previous quarter. Mexico, Canada and Germany remained the largest US export markets – and together accounted for 53% of the total.

Exports to China rose more than 11% in the second quarter, but this was 37% lower than during the same period in 2018.

There are also trade issues to be resolved, he said.

"Mexico has ratified the US-Mexico-Canada Agreement (USMCA), but the US and Canada have yet to sign off on this trade pact. Unless that is resolved, the uncertainty from the ongoing US-China trade dispute will continue to run high and will negatively impact not only the plastics industry but the global economy," said Pineda.

› **www.plasticsindustry.org**

Turkish slowdown hits Deceuninck

Belgian plastic profiles extruder Deceuninck blamed a slowdown in the Turkish economy for a fall in performance in the first half of the year.

Sales decreased by more than 8% to around €312 million (US$341m). This led to an 8% decline in EBITDA to around €26m (US$28m).

"The effects of the economic downturn in Turkey continued into 2019," said Francis Van Eeckhout, CEO of Deceuninck. "We remain convinced of its long term potential – because of its large domestic market and its potential as export hub. However the timing of the recovery remains difficult to predict."

Poor sales to Turkey were slightly offset by growth in emerging markets – but combined sales to these territories fell by 28%. Sales in the USA rose by nearly 2%, while sales in Europe – the company's main market – remained stable at around €171m (US$187m) for the period. Strong performances in Spain, the UK and Poland was offset by weaker demand in France.

"In Europe we are making good progress with the integration of Western and Central Europe and the launch of our new product ranges," said Van Eeckhout. "We are also happy that our new recycling plant is ramping up as this is a key element in our sustainability commitment."

The recycling plant, in Diksmuide in Belgium, will eventually allow the company to recycle up to 45,000 tonnes/year of PVC – equivalent to around 2m window frames.

In addition, the company is optimising its product range and integrating its Western and Central Europe regions under a single management team.

› **www.deceuninck.com**

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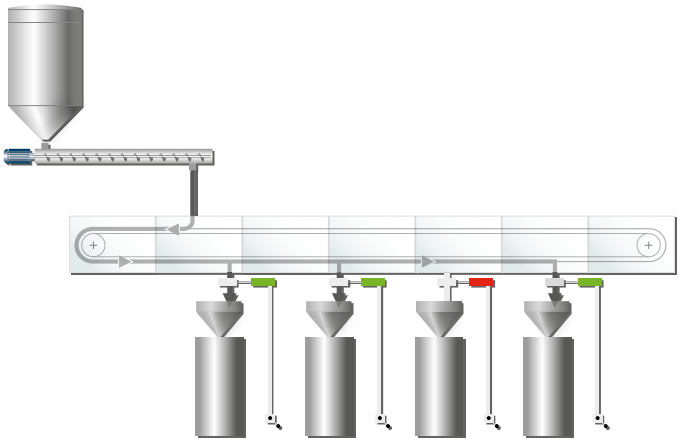

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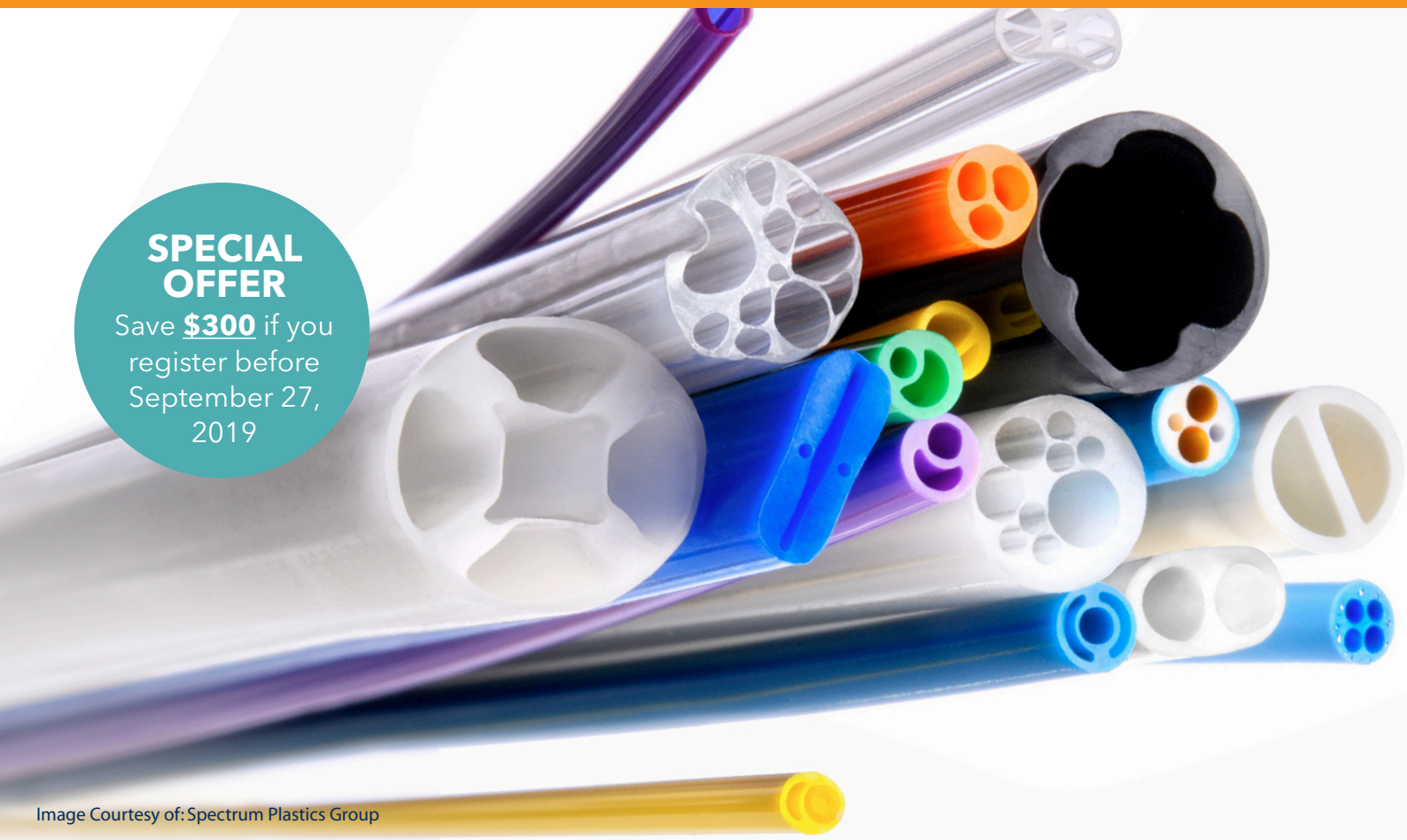

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Simona's pipes and fitting division performed well in the first half of the year

Simona boosts sales as profits decline by 3%

Simona of Germany has posted increased first-half sales – though profitability dipped slightly.

The company says that sales grew by 11% to exceed €227 million (US$247m) in the first six months of the year. This was fuelled by a solid performance in the USA and a healthy pipes and fittings business in Europe – though revenue remained stagnant in Asia.

Overall, the USA accounted for almost one-third of revenue for the period, with sales of nearly €70m (US$76m). Sales in Europe rose more than 2% to €142m (US$154m). Sales in Asia declined slightly, to just over €15m (US$16m).

The pipes and fittings division increased revenue by nearly 17%, to more than €46m (US$50m).

Operating profit, in the form of EBIT (earnings before interest and taxes), was just over €18m (US$20m) – a dip of around 3% compared with the corresponding period in 2018.

"The substantial contribution made by our US business stands in contrast to a downturn in earnings in our semi-finished products business in Europe," said Wolfgang Moyses, CEO of Simona. "We are highly satisfied with profitability levels in the pipes and fittings division."

The outlook for the second half of the year is dampened by a deterioration in economic conditions, said the company – though it still expects to meet its guidance target of €435-450m (US$473-489m) in annual group revenue. It added that its projected EBIT margin of 6-8% was "ambitious but achievable".

› **www.simona.de**

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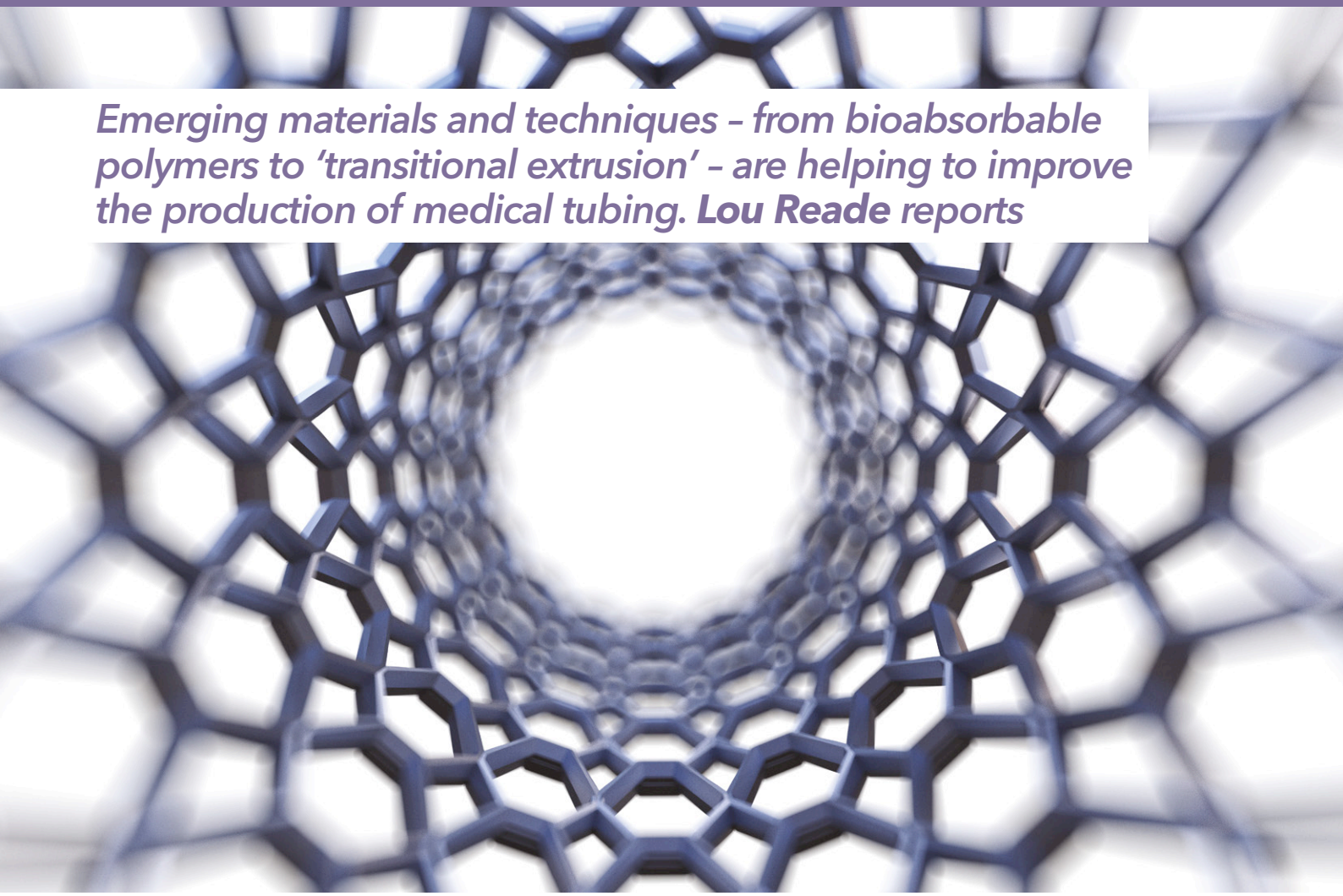


Emerging materials and techniques – from bioabsorbable polymers to 'transitional extrusion' – are helping to improve the production of medical tubing. ***Lou Reade*** *reports*

Extrusion offers healthy future for medical tubing

Delegates at the recent Medical Tubing conference in Berlin, organised by **AMI**, learnt about some of the challenges of producing these intricate products.

Brian Dillon, principal polymer engineer at **Boston Scientific** in Ireland, pointed out the importance of bioabsorbable polymers – which degrade in the body over time. These are used as the basis for a number of medical devices, including stents.

A number of polymers can be applied here, including the L-version of polylactic acid. This polymer is referred to as PLLA (or poly L-lactic acid). It has a number of properties that are useful for making medical tubing, he said, which are strongly influenced by molecular weight and percentage crystallinity.

He told delegates that extrusion conditions have a big influence over the properties of the final tubing product. He is part of a team that studied the use of microbore extruders for processing the material. The research was published in the journal *Polymers*.

In the research, high molecular weight (medical grade) PLLA was processed using low shear microbore extrusion machinery. The material had a low moisture content (less than 100ppm) and was used to make tubes of 1.9mm outside diameter and 0.6mm wall thickness.

Dillon pointed out the importance of resin drying, in a material that was highly susceptible to thermal degradation and melt fracture.

The tubing produced was tested by a variety of methods, including gas chromatography, DSC, tensile tests and DMA.

Extrusion processing – including drying – caused molecular weight loss of at least 17%, said the researchers.

"Longer melt residence times results in greater

Main image: Stents are manufactured by extruding polymer with a wire support structure

Above: Raumedic has developed a number of special materials for catheters

molecular weight loss, even at low shear rates," said Dillon. "PLLA's properties are both temperature- and strain rate-dependent."

Wire in the tube

Medical tubing is a precision product, and the most modern products need to do more than simply transport liquids. By co-extruding tubes with wires – or special coatings – manufacturers can make more sophisticated products.

"Wire inlays can produce smart tubes with functional integration," said Daniel Riechelmann, product manager for application technology at **Raumedic** in Germany.

Examples include catheters with integrated functions. These can measure patient parameters – such as temperature, oxygen content and pH – and transmit the data wirelessly.

Similarly, wires can add mechanical strength to tubing – raising stiffness, in order to resist kinking and bending. This is useful for products such as endoscopes and cannulas, he said.

Both conductive and non-conductive materials can be co-extruded. A range of different wire materials can be incorporated, from stainless steel and copper, to platinum-iridium and special material like Nitinol, said Riechelmann.

An extrusion line to extrude these products needs careful control – and will include, for instance, close measurement of eccentricity, dimensions and the presence of defects such as pin holes.

Pushing ahead

Steve Maxson, vice president of sales for vascular technologies at **Spectrum Plastics**, explained the rigours of producing low profile delivery systems – such as catheter shafts – that are pushed through long pathways in the body.

"Non-reinforced catheter shafts are generally flimsy, and require a continuous braid embedded into catheter tubing," he said. "This provides torquability and pushability to advance the device, while retaining flexibility and kink resistance to navigate the tortuous anatomy."

A braided catheter shaft might involve five layers of material, including the core, liner, braiding, jacket and outer layer. These need to bond with one another, while the overall structure needs to be strong – with a low friction outer layer.

There are several ways of addressing the challenges. In one case, Maxson said that the outer PTFE layer was delaminating from an internal polyimide (PI) layer. This is because thin-wall PTFE coatings have weak tensile strength, while PI has a high tensile modulus.

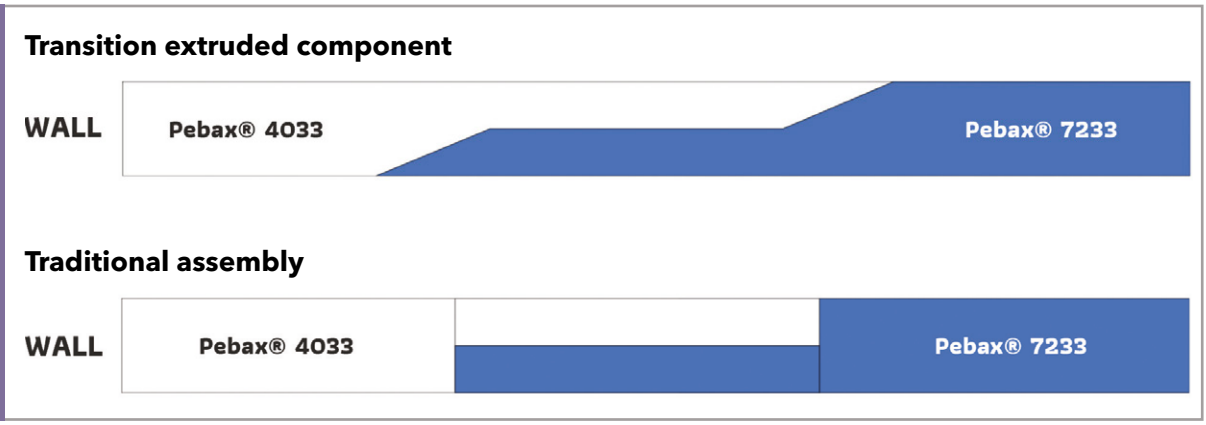
The answer was to blend the two polymers, to create a material with good mechanical properties and a low coefficient of friction.

Another way of adapting properties is to vary the braiding density along the tube's length. So, close braiding helps to retain flexibility, while a shallower braid angle makes that part of the tube stiffer.

Transition period

Stephen Davis, a scientist at Switzerland-based **Exgineering**, explained how 'transitional extrusions' could help to improve the quality – and lower the cost – of extruded medical devices.

Transitional extrusion allows the 'blending' of



Exgineering says that transitional extrusion integrates dissimilar materials more smoothly, which can improve quality and lower cost

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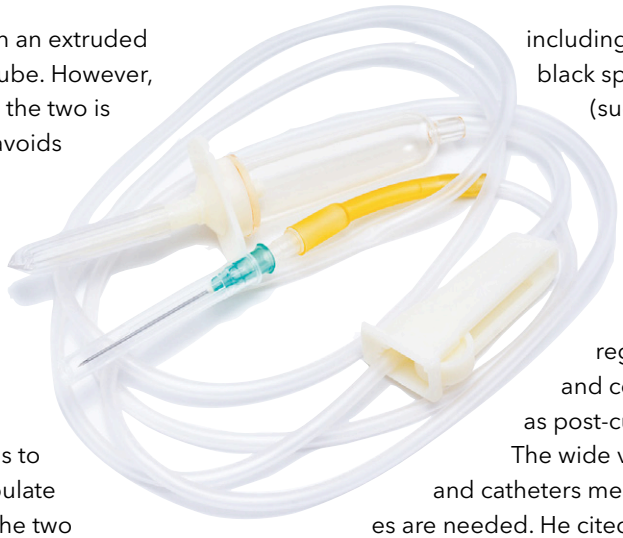

Right: Ineos Styrolution's Styroflex 4G80 TPE imbues tubing with rubber-like mechanical properties, plus high puncture resistance

two separate materials in an extruded product like a catheter tube. However, the integration between the two is smoother, he said, and avoids the traditional 'stepped' approach.

"The goal of this technology is meant to generate a paradigm shift around the way catheters are designed," he said.

Part of the approach is to understand – and manipulate – the flow behaviour of the two different materials, he said. In Exgineering's case, it was using two different grades of Pebax.

The ability to make the catheter tube in a single operation has several advantages, including: a wider variety in Shore D hardness between the materials; simpler production; greater bond strength between the two materials; and better pushability and kink resistance.

Davis said one advantage of this method included was that it allowed direct extrusion through the braid.

"It's an enabler of complex design – optimising device performance based on material properties required rather than assembly limitations," he said.

The company has collaborated with a number of others in the development, including Gimac, Arkema and Optinova.

Tube selection

Ruediger Gall, general manager of **Freudenberg Medical Europe**, explained the key steps behind designing medical tubing – including correct material selection and determining which features to include.

This is partly to avoid a host of potential pitfalls, including burst failure, gels and black spots, structural failure (such as delamination).

As well as communication, he said that correct specification was critical. This includes defining the right material, assessing regulatory requirements and considering factors such as post-curing and UV-absorption.

The wide variety of medical tubes and catheters means that many approaches are needed. He cited a number of case studies: a venous access port catheter had to be of customised length, and pad printed; a cardio-vascular catheter was produced by micro-extrusion, from an implant-grade material with increased torquability and kind resistance; and, a percutaneous endoscopic gastrostomy (PEG) tube needed a modified surface in order to reduce friction.

Silicone supply

Dan Sanchez, product manager at **Trelleborg Healthcare & Medical**, explained how silicones are finding wider use in medical tubing, due to their stability in harsh environments, plus attributes such as customisability, permeability and biocompatibility. He cited several case studies, in which silicone had proved an effective base material.

In layered micro extrusion, a large medical OEM requested a component for a long-term implant. A silicone extrusion with a diameter below 0.38mm was required. Using two-component extrusion – involving a core with a special additive, and custom tooling to produce a thin outer layer that controlled elusion rate – Trelleborg made a tube with a diameter below 0.3mm.

In a separate example, a customer required reinforced tubing – with improved kink resistance

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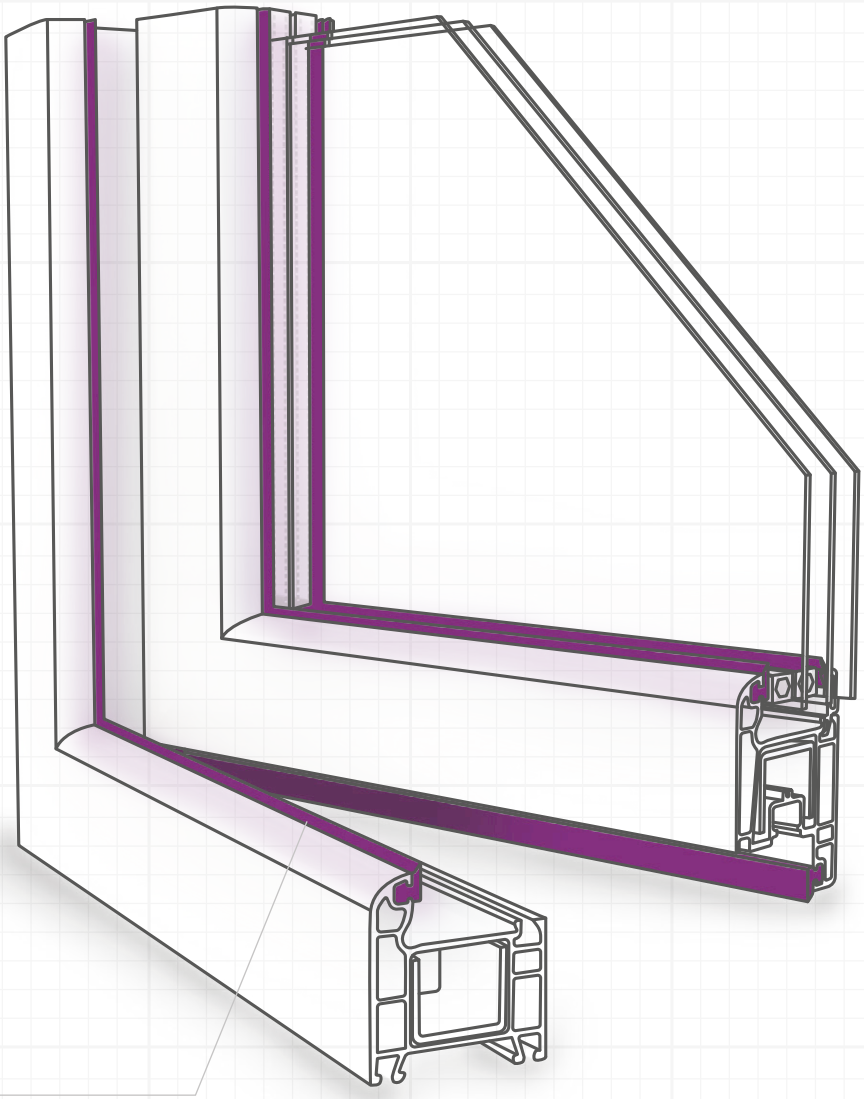

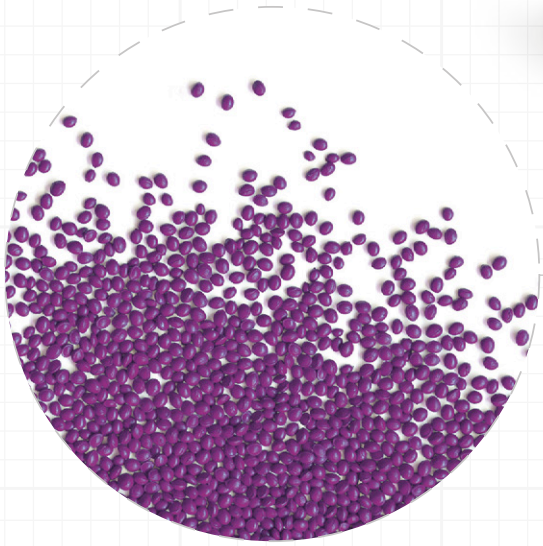

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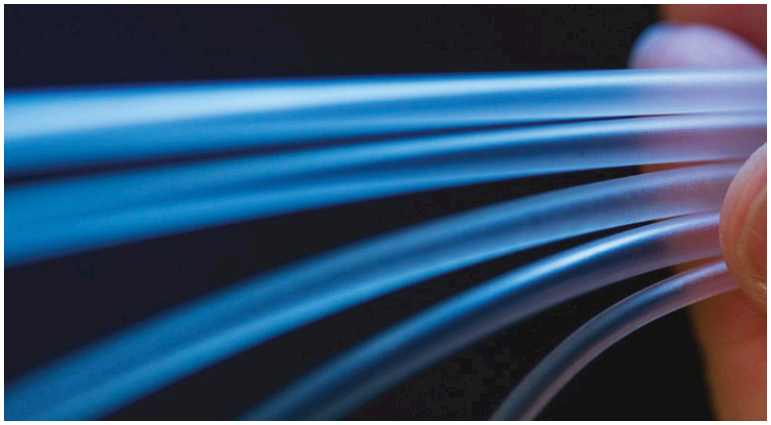

Above: Purell KT MR 07 PB-1 plastomer from LyondellBasell enhances low temperature toughness and impact resistance of PP medical tubing

– for an implant. Trelleborg needed to overcome several dimensional and visual quality issues on an existing design. To do this, it determined a specification for design of spiral winding equipment, and created processes to control final length and remove the core.

Overall, it achieved 99% yield, advanced the process technology and capabilities, and received customer validation for the manufacturing processes.

Part of the reason for the project's success was early – and frequent – collaboration during the design process, he said. Final benefits included faster time to market and reduced operating costs.

Multi-layer choice

Choosing the correct materials in a multi-layer design is important for medical tubing. Bernd Elbert, business development manager for healthcare and packaging at **Ineos Styrolution**, told delegates that its new Styroflex thermoplastic elastomers (S-TPEs) help to imbue tubing with rubber-like mechanical properties, high puncture resistance and good transparency and heat resistance.

Its Styroflex 4G80 grade has a range of properties making it suitable for medical tubing, including good kink resistance and good bondability to other parts of an IV system. It has been used for both mono- and multi-layer tubing.

It showed stable performance over time when pumping saline solution, and produced accurately sized tubes over a range of processing temperatures. In combination with Styrolux, it has been used to make multi-lumen tubes.

Overall, the Styroflex grade maintained clarity and lubricity, gave sufficient roller clamp performance and was cost competitive, he said.

PO replacing PVC

A joint project from materials supplier **LyondellBasell** and extrusion specialist **Maillefer** has shown that polyolefin tubing can replace traditional PVC tubing in certain applications.

A new polybutene grade of polypropylene (PP), called Purell KT Mr 07, is a high molecular weight material. It offers relatively low oligomer content, low extractables and a plasticiser-free formulation. The material is also soft, flexible and transparent.

Its reduced adsorption of active pharmaceutical ingredients allows more precise dosage of medicines to be used, it said.

The grade is around 25% less dense than an equivalent grade of soft PVC. It can also be blended with similar grades to create a compound with superior properties.

"The material is a cost-competitive alternative to traditional materials, which is easily processable in the form of a compound or as a dry blend," said Ankur Rastogi, of Basell Polyolefine.

The material was processed on Maillefer's PML-32 medical extrusion line, which runs at 240 m/min. It was used to produce a variety of different samples, using various product formulations and production speeds – in order to test both dimensions and surface qualities.

A barrier screw with a pin mixing section was used, and both barrel head and extrusion head temperatures were held close to 180°C. A variety of tubes were produced at lines speeds between 72 and 150 m/min.

Both dry blends and compounds processed in a similar way to medical PVC. Surface properties depended on the formulation, while extrusion tool size had to be adapted to account for die swell.

"The softer the material, the more it is elastically stretched in the cooling line," said Daniel Schläfli, R&D project leader and patent manager at Maillefer. "This translates to a reduction of the diameter in-line – for identical product diameter – but it recovers off-line."

■ The next Medical Tubing conference is held in Minneapolis, USA on 5-6 November 2019.

For more details, contact Charmaine Russell (**charmaine.russell@ami.international**) on +44 (0) 117 924 9442.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.ami.international**
- **www.bostonscientific.com**
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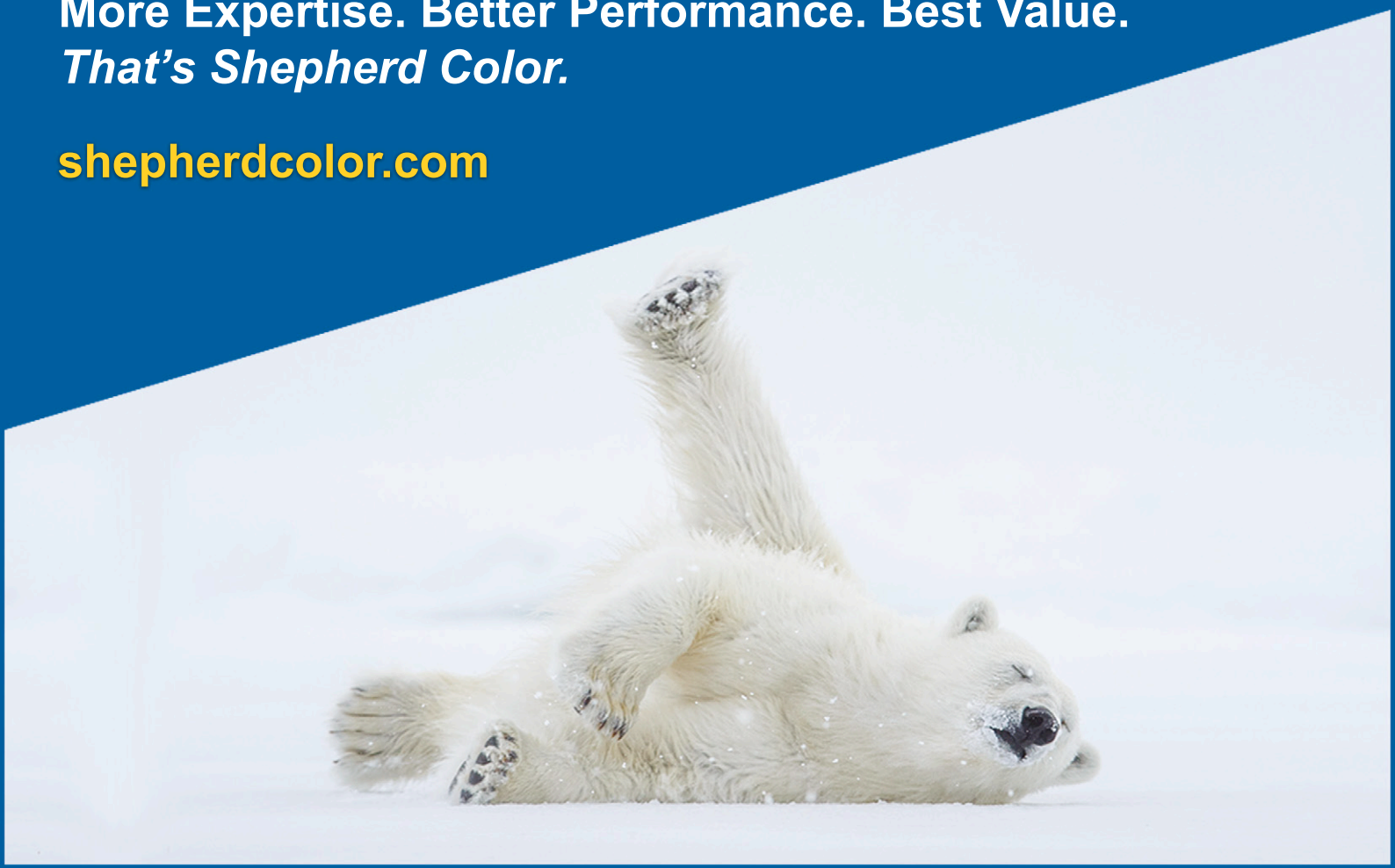

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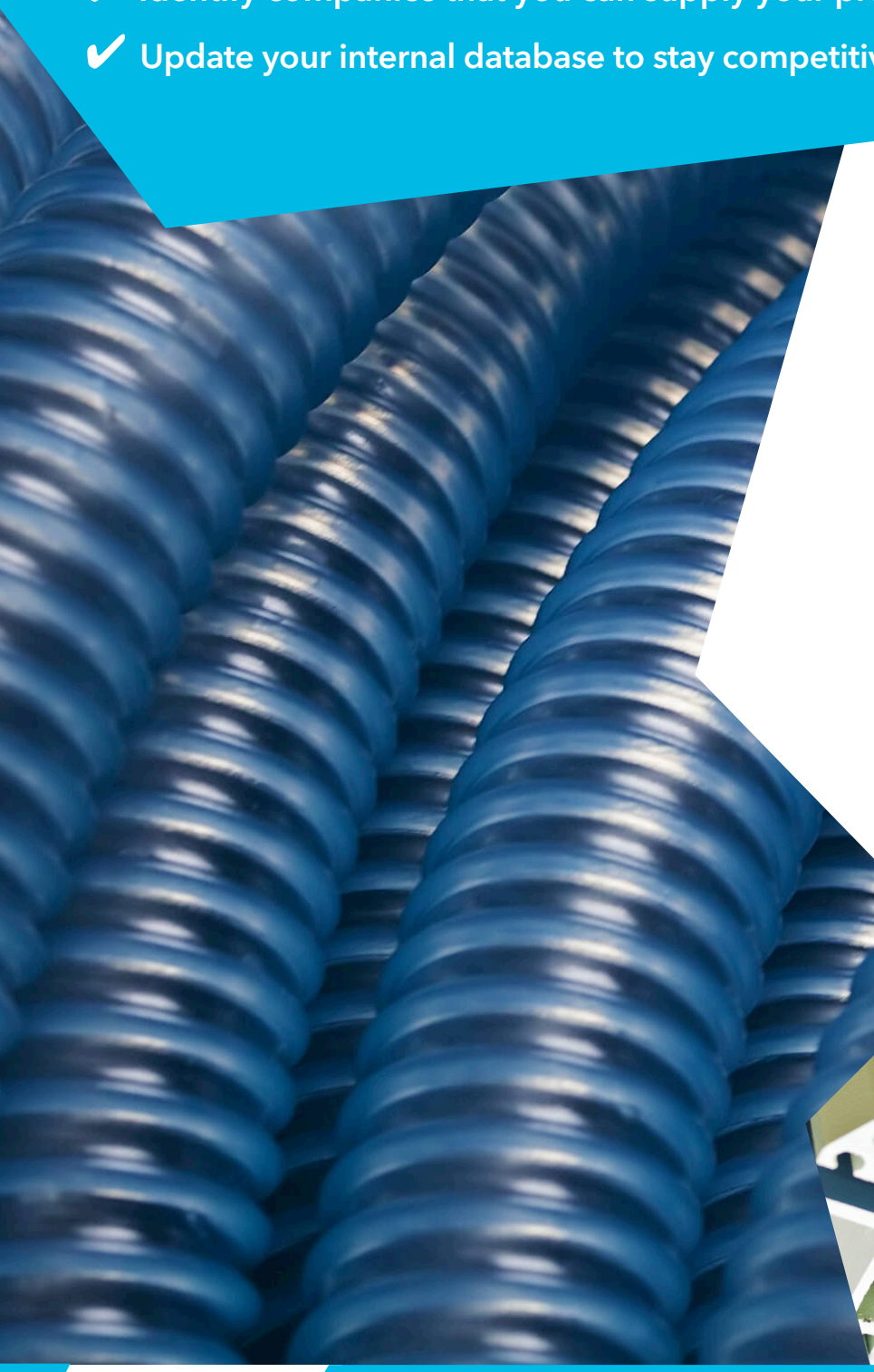

Access the following information for profile, tube and hose extrusion sites:

- Managerial contact details
- All polymers processed
  Rigid and flexible PVC, LDPE, PP, TPEs
- End use markets supplied/ products manufactured
- Number of extrusion lines
- Compounding details

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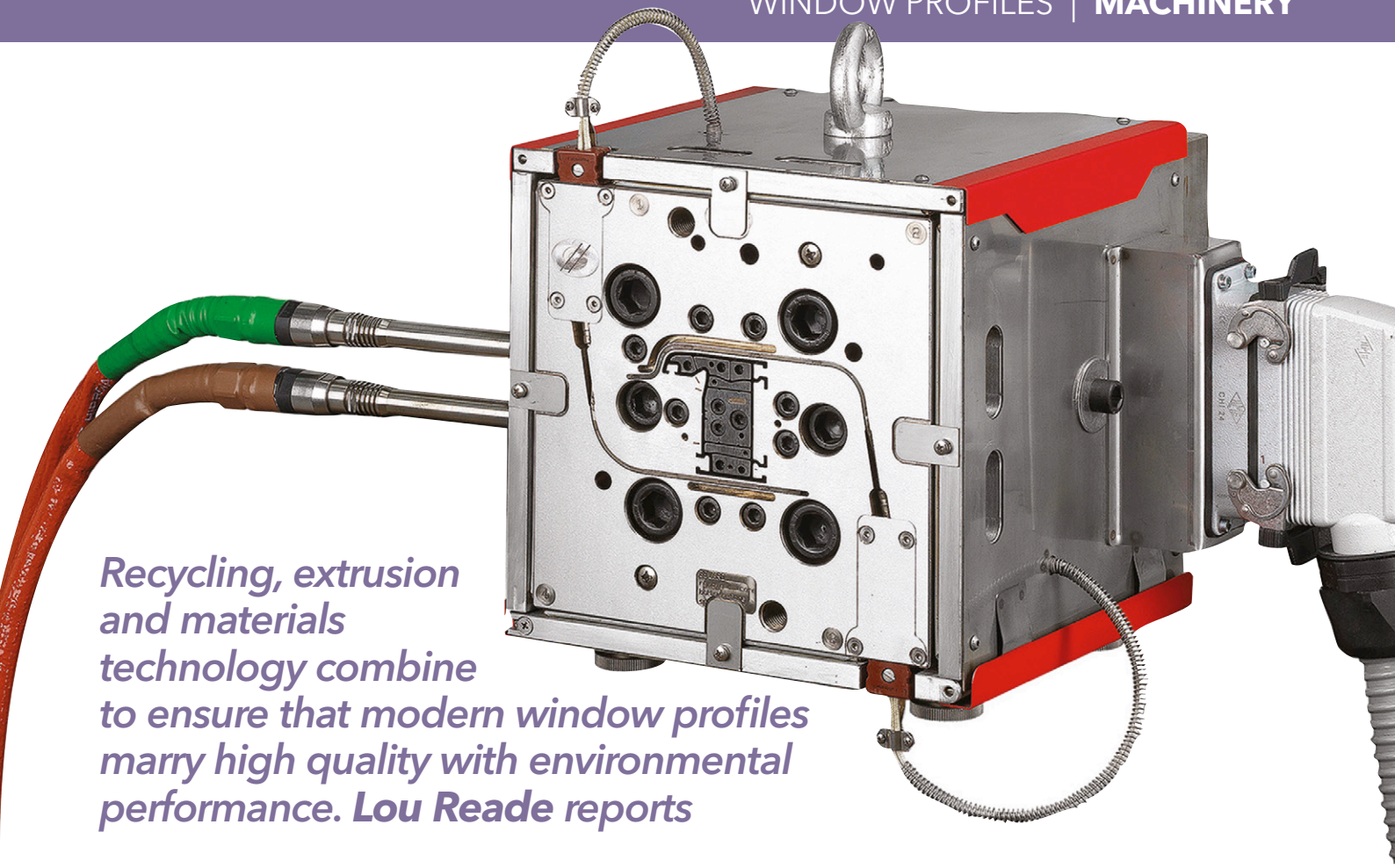

Recycling, extrusion and materials technology combine to ensure that modern window profiles marry high quality with environmental performance. ***Lou Reade*** *reports*

Windows update: latest in profiles technology

As with all extruded products, window profile quality can be improved through a combination of material, machinery and control technology.

Sophisticated tooling can also play a key role. Tecnoperfiles, a PVC profile extruder based in Argentina, is an existing **Greiner Extrusion** customer, and recently invested in a Red Tooling system for co-extrusion. It is Greiner's first Red Tooling sale to South America.

Red Tooling allowed Tecnoperfiles to produce several new products, such as a new turn-and-tilt window system for a height of up to 3m (called Jumbo-Line), and two new sliding systems. Total capacity is around 5,000 tonnes/year, representing around 240,000 windows.

"Red Tooling allowed us to optimise our production and to drastically reduce our set-up and start- up times," said Pablo Longhi, plant manager at Tecnoperfiles.

PVC windows are still a relatively unknown quantity in Argentina – which Longhi says makes it difficult to explain their advantages to potential users. However, he says the market is beginning to grow rapidly – as energy saving is an important issue.

"We would like to switch our entire production to Red Tooling immediately, but this process has to be done step by step," he said. "The initial investment is higher, but it's worth it because of the cost-effectiveness."

Automatic control

Greiner has also developed its Flow Matic technology, which automatically controls the dimensions of profile sections.

Based on its earlier Flow Control technology, it controls temperature and melt flow directly in the die by heating or cooling. It measures the filling level of individual profile sections and – with the Flow Control die function – builds up an automatic control loop.

"The reaction takes place in a few seconds," said the company. "This results in constant profile measurements even when process fluctuations occur."

Separate to this, Greiner adds that its Layer Coex

Main image: Tecnoperfiles, an Argentina-based PVC profile extruder, has bought its first Red Tooling system from Greiner

Above: Deceuninck's recycling line will eventually be able to recycle 45,000 tonnes/year of PVC

Plus technology allows higher amounts of regrind to be used in co-extruded profiles – which maintaining maximum processing safety.

"Compared to mono-extrusion with virgin PVC, the total cost saving is 18%," said the company.

The technology allows 55-65% of recycled content to be used in the core, while its Thick-Layer technology coats up to 75% of the profile.

Back through the window

Recycling has become a key dynamic in the production of window profiles, with suppliers keen to ensure that they maximise their use of recyclate.

For instance, Belgian profile extruder **Deceuninck** recently opened a new recycling line in Diksmuide, Belgium – which will eventually allow it to recycle up to 45,000 tonnes/year of PVC. As well as giving a four-fold increase of capacity, the new line is capable of recycling post-consumer as well as post-industrial PVC waste.

"This will further reduce the ecological footprint of our products, and reduce dependency from virgin raw material," said the company.

Input materials will be sourced from post industrial waste (customers' offcuts as well as its own process scrap) and from first-generation PVC windows that are gradually being replaced after 30-40 years.

The company expects the new facility to save more than 2 million windows per year from landfill or incineration. It is using recycling technology that enables recycling of PVC profiles of all colours and of all different compositions – including profiles containing glass fibre reinforcement.

Boundary conditions

At **AMI**'s recent Profiles conference in Pittsburgh, USA, Scott Grant, engineering manager at US-based **Ecopuro**, told delegates that the company's Boundary Breaker additive technology helps to improve a range of properties – such as colour dispersion, energy reduction and extrusion throughput – in products including window profiles.

The additive, when incorporated at loadings of 0.25-3%, reduces surface friction, increases bulk flow and improves formula dispersion at the boundary layer.

He demonstrated how colour dispersion was improved, and how the amount of flame retardant could be reduced. In window profiles, he said a 16% increase in throughput had been achieved, with an impact strength matched base and colour matches base. It led to savings of around US$100,000 per line for one customer, he said.

Optimised stability

Robert Smith, technical service manager at **PMC Organometallix**, said that using optimised stabilisers can help reduce formulation costs for products such as window profiles.

Tests showed that tin stabiliser composition – including the % tin, mono/di ratio, alkyl group, ligand group and co-stabilisers – can all have a large effect on processing and performance.

For instance, 16.2% Sn was shown to offer equivalent processing and performance to traditional 19% Sn TGA stabilisers.

"Selection of the optimum composition is vital to achieving desired performance," he said.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.greinerextrusion.com**
- **www.deceuninck.com**
- **www.ami.international**
- **www.ecopuro.com**
- **www.pmcorganometallix.com**

The next edition of AMI's Profiles conference runs in Cologne, Germany on 12-13 November. Several presentations are directly relevant to window profile production.

Window profile extruder Aluplast will address the future of window technologies; Compolytics of Germany will present a PVC-based WPC material for use in window frames; EPPA will address the question: 'What is a sustainable PVC window?'; and Dow Europe will showcase new EPDM-based sealing systems for window profiles.

For more details, contact conference organiser Emily Nicholson on +44 (0) 117 314 8111 (**emily.nicholson@ami.international**).

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This new identity more accurately reflects the focus of the conference program, which has always been about adding functionality and value to high-performance polymers, including engineering plastics, TPOs and TPEs. Target end-use markets include the transport, electrical & electronic, medical, industrial and consumer goods sectors.

Dedicated sessions will feature hot topics such as wear-resistant plastics, conductive compounds, light-weight solutions for metal replacement, polymers for the car of the future, and materials for 3D printing.

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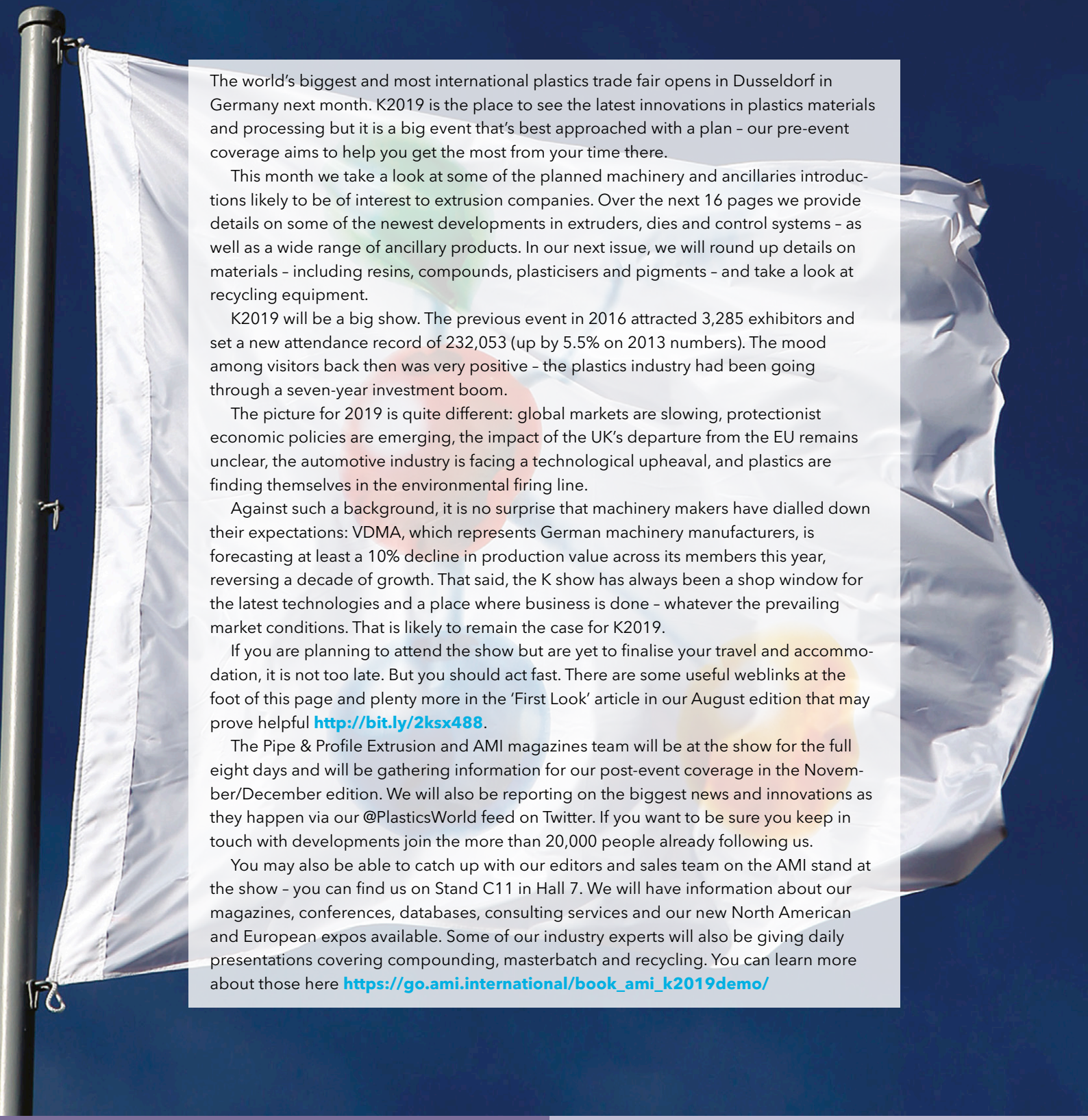
Extruders' guide to K 2019

Part 1: Machinery and ancillaries



The world's biggest and most international plastics trade fair opens in Dusseldorf in Germany next month. K2019 is the place to see the latest innovations in plastics materials and processing but it is a big event that's best approached with a plan – our pre-event coverage aims to help you get the most from your time there.

This month we take a look at some of the planned machinery and ancillaries introductions likely to be of interest to extrusion companies. Over the next 16 pages we provide details on some of the newest developments in extruders, dies and control systems – as well as a wide range of ancillary products. In our next issue, we will round up details on materials – including resins, compounds, plasticisers and pigments – and take a look at recycling equipment.

K2019 will be a big show. The previous event in 2016 attracted 3,285 exhibitors and set a new attendance record of 232,053 (up by 5.5% on 2013 numbers). The mood among visitors back then was very positive – the plastics industry had been going through a seven-year investment boom.

The picture for 2019 is quite different: global markets are slowing, protectionist economic policies are emerging, the impact of the UK's departure from the EU remains unclear, the automotive industry is facing a technological upheaval, and plastics are finding themselves in the environmental firing line.

Against such a background, it is no surprise that machinery makers have dialled down their expectations: VDMA, which represents German machinery manufacturers, is forecasting at least a 10% decline in production value across its members this year, reversing a decade of growth. That said, the K show has always been a shop window for the latest technologies and a place where business is done – whatever the prevailing market conditions. That is likely to remain the case for K2019.

If you are planning to attend the show but are yet to finalise your travel and accommodation, it is not too late. But you should act fast. There are some useful weblinks at the foot of this page and plenty more in the 'First Look' article in our August edition that may prove helpful **http://bit.ly/2ksx488**.

The Pipe & Profile Extrusion and AMI magazines team will be at the show for the full eight days and will be gathering information for our post-event coverage in the November/December edition. We will also be reporting on the biggest news and innovations as they happen via our @PlasticsWorld feed on Twitter. If you want to be sure you keep in touch with developments join the more than 20,000 people already following us.

You may also be able to catch up with our editors and sales team on the AMI stand at the show – you can find us on Stand C11 in Hall 7. We will have information about our magazines, conferences, databases, consulting services and our new North American and European expos available. Some of our industry experts will also be giving daily presentations covering compounding, masterbatch and recycling. You can learn more about those here **https://go.ami.international/book_ami_k2019demo/**

Dates: 16-23 October 2019
Venue: Messe Dusseldorf, Dusseldorf, Germany
Hours: 10:00-18:30 daily
Tickets: One-day €75, three-day €155 (€49/€108 online). All include free local transport and on-site wifi
Organiser: Messe Dusseldorf
Website: www.k-online.com

Use the following links to go direct to essential show information:

K2019 hotel booking – http://bit.ly/k2019hotel
K2019 online ticket purchase – http://bit.ly/K2019tickets
K2019 exhibitor search – http://bit.ly/K2019exhibitorsearch
K2019 iOS/Android apps – http://bit.ly/K2019mobile

Right: Battenfeld-Cincinnati's Alpha Plus extruder includes its BCtouch UX compact control system

Battenfeld-Cincinnati will launch its Alpha Plus extruder – an upgrade of its established Alpha version – which includes its BCtouch UX compact control system.

The basic extruder remains the same, says the company: it is used as a universal extruder to make small technical profiles or small pipe, or as a co-extruder in other applications. It is compact, and suitable for use in production halls with limited space. Alpha extruders are available in sizes of 45, 60 and 75mm as standard models, with the option to incorporate a feed zone with either fine or coarse grooves.

The new control unit will be seen for the first time at K2019. Until now, Alpha extruders were fitted with a relay control as standard. The new version includes the BCtouch UX compact control system, which is fitted as standard in all Battenfeld-Cincinnati extruders.

BCtouch UX has a simple, intuitive operation and optimised software, says the company. The compact version, used in Alpha Plus extruders, comes with a 12in screen to provide a clear overview of all the necessary features. Pop-ups for settings and data entries mean that the system can be operated with limited training. A high-performance temperature- monitoring module is integrated in the compact control system, which is critical for temperature-sensitive raw materials.

Two gravimetric dosing systems can be integrated in order to keep energy and material costs to a minimum. The Alpha Plus extruder combines a cost-effective and readily available standard extruder with an intuitive, easy-to-operate control system, says the company. As before, the version with relay control is available in the 'Alpha basic' variant. The modular structure of the newly developed control cabinet also makes it possible to retrofit the BCtouch UX compact at a later date.

As well as showing an Alpha Plus 60-25 B at the show, Battenfeld-Cincinnati will also demonstrate a SolEx NG 75-40D – a high-performance, single-screw extruder that offers high melt homogeneity, low melt temperatures and low energy consumption.

The extruder delivers long service life with low wear and minimal maintenance requirements. It also keeps resource consumption to a minimum and keeps scrap rates low. The optimised processing unit can easily be retrofitted to older SolEx (as well as UniEx) models, thanks to a compatible basic structure and drive unit.

The company will also showcase three pipe tools from its in-house toolmaking shop: a fast dimension change (FDC) pipe head that enables automatic pipe dimension changes during production; and two new spider PVC pipe heads – one mono-layer, and one three-layer. In the three-layer head, the middle layer of the pipe continues to be guided by a mandrel holder geometry, while the geometry of the outer layer has been revised. Another benefit of the new geometry is its excellent flushing behaviour – a key feature for PVC pipes with a foamed middle layer, highly filled compact pipes, or pipes with a regrind middle layer.

At K2019, both new spider pipe heads will be presented alongside compatible extruders. The mono spider head will be flange-mounted on a ConEx NG 65 conical twin-screw extruder. Alongside, a ConEx NG 54 will be available to view on the TwinEx 93-34 R parallel twin-screw extruder, showing the spider NG 160- 3 in a space-saving layout.

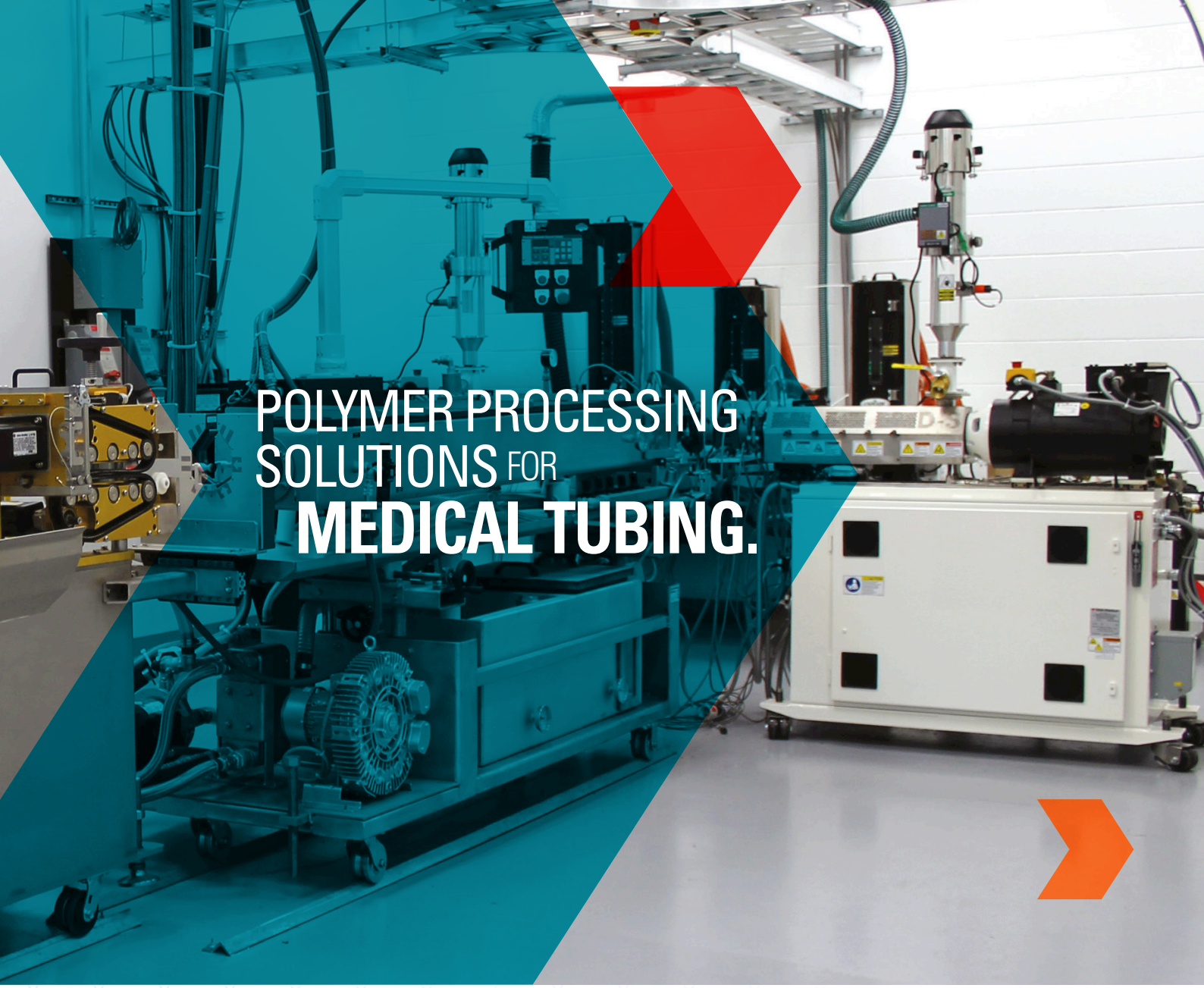
In addition, the company will show its new DTA 160 direct cutting machine – which uses no hydraulics, and works faster than competing systems.

› **www.battenfeld-cincinnati.com**

Cold Jet will present its new dry ice blaster, which promises to improve the way in which metal components such as screws are cleaned.

"The PCS 60 is the highest performing dry ice blaster available, and features many technological advancements that are firsts in our industry," said Gene Cooke, president and CEO of Cold Jet. The PCS 60 continues Cold Jet's tradition of leading the way and guiding our industry forward."

It features Cold Jet's patented Particle Control System (PCS), which cuts dry ice into diamond shaped particles in the exact dimensions chosen by the operator (3mm to 0.3mm – and 28 sizes in between). This gives users a greater degree of versatility in cleaning applications. With the PCS, a plastics processor can use one machine to clean many types of surfaces, such as the surface of tools, deburring and deflashing, and screws. Previously, a facility would need multiple machines with different



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Right: ColdJet's PCS 60 dry ice blaster promises to improve the way in which metal components such as screws are cleaned

aggression level capabilities to clean each, he said.

The machine is also easy to use: with a 7in LCD colour screen and digital controls, it provides an intuitive display that allows the user to easily view and adjust blasting parameters and machine settings. It also features programmable and password-protected application recipes, allowing users to set and save parameters such as blast pressure, particle size and feed rate. This increases efficiency and ensures the right settings for each application. A plastics processor can save one application recipe for one tool and another application recipe for a different tool, for instance. This prevents user error and ensures the right parameters are used for each unique application.

The company claims that the machine cleans more effectively and requires less dry ice and air pressure than competing machines. An optimised design, including a 'straight through' air system and redesigned SureFlow feeding system, minimises air pressure loss and dry ice sublimation within the machine. This allows the user to maximise air supply yield and reduce dry ice waste.

The model is also IoT-enabled via Cold Jet Connect – which provides remote monitoring and diagnostics while allowing users to collect and manage data and use tools for optimum performance and productivity. It can also be combined with a Cold Jet dry ice production unit and a robot for continuous and fully automated blasting.

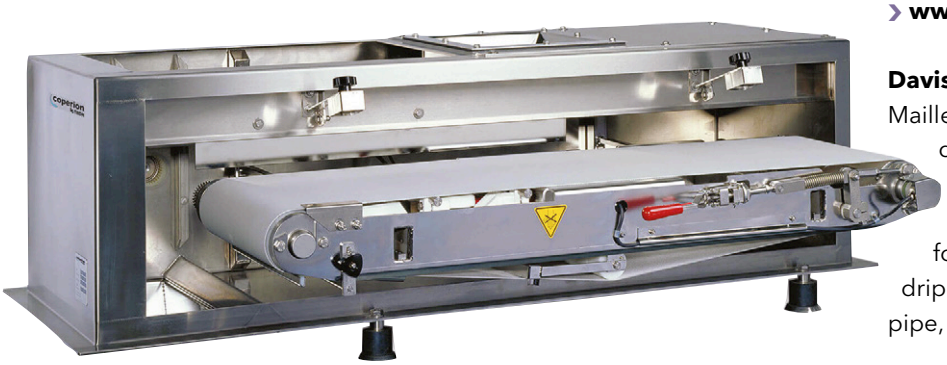
› **www.coldjet.com**

Coperion K-Tron will exhibit a variety of plastics processing technologies at K2019.

The show is the European premiere for its redesigned K3 vibratory feeder line – and its V200 model will be shown as part of a running system.

The K3-ML-D5-V200 vibratory feeder will be shown in action as part of a recirculating system – with automatic refill provided by a P-series vacuum receiver and a compact vacuum pump. Vibratory feeders are ideal for feeding recycled material or flakes as well as for the addition of glass fibre in compounding processes. They are nearly maintenance-free, as there is no wear on the mechanical parts. P-series vacuum receivers can be used to convey a wide range of bulk materials – in conveying only applications such as hopper loading, as well as loss-in-weigh feeder refill applications. The receivers are made of stainless steel, and their features include steep cone angles – to ensure efficient discharge – and band clamps for quick disassembly.

Below: Coperion K-Tron's SWB-300 weigh belt feeder promises high accuracy and efficient process control



Also on display, the company's SWB-300 weigh belt feeder is a comparatively simply constructed, reliable gravimetric feeder for high accuracy and efficient process control. Weigh belt feeders of this type can feed large volumes of bulk materials with various flow properties and are well suited for, among other things, processing recyclates.

Another materials handling solution is Fluidlift Ecoblue, a pneumatic conveying process for plastic pellets that increases efficiency and minimises degradation. In contrast to conventional designs, it reduces abrasion – which cuts the generation of dust or strands to maintain product quality and reduce waste accumulation. It also enables plastics manufacturers to lower costs and increase throughputs, thanks to low energy consumption.

› **www.coperion.com**

Davis-Standard and its subsidiaries – including Maillefer – will showcase a range of extrusion and converting technologies at K2019.

In pipe and profile, it will show a range of solutions and manufacturing configurations for automotive fuel and vapour tubes, micro-drip irrigation laterals, heating and plumbing pipe, blown fibre micro-duct, medical tubes,

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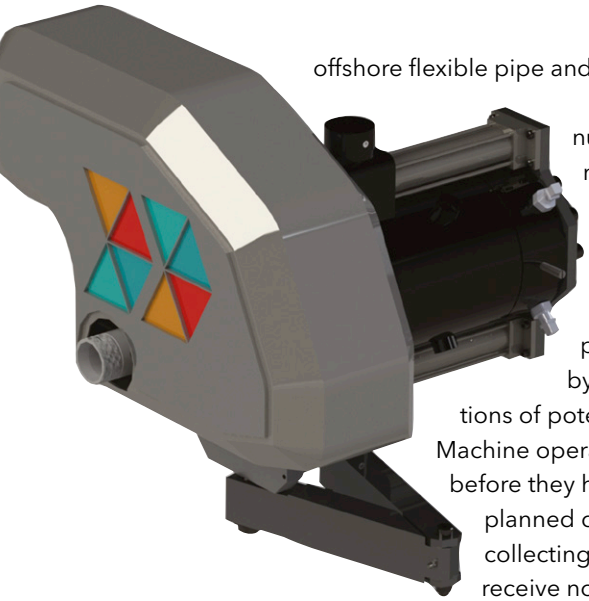

Above: The 3000A crosshead from Davis-Standard reduces scrap and allows faster start-up times when making silicone extrusions

offshore flexible pipe and custom pipe and tubing.

It will also show a number of control and maintenance products, including its DS Activ-Check. This helps processors take advantage of real-time predictive maintenance, by providing early notifications of potential machine failure. Machine operators are alerted to issues before they happen, reducing unplanned downtime while also collecting operating data. Users receive notifications via e-mail or text, and continuous monitoring of production machine status is available on smart devices and remote PCs. Key parameters monitored include extruder reducer, lubrication system, motor characteristics, the drive power unit, barrel heating and cooling.

Its benefits will be demonstrated on a profile line using Microsoft Windows 10 on an Epic III control system.

At the same time, Maillefer's Bluebox shows an Industry 4.0 data strategy developed for high-speed acquisition and storage from all levels. It will exhibit an implementation of a smart factory, where data from many different exhibits – including the stand itself – are correlated into informative dashboards. The real-time exhibit provides visitors with insight on how Industry 4.0 applies to their particular manufacturing environments.

A series of Maillefer components – including its MXC extruders and ECH extrusion heads – will also be on show.

There will also be equipment for making medical and automotive products from elastomers. This includes silicone technology for medical grade silicone tubes, wound drains and catheters, as well as equipment for manufacturing hydraulic and automotive hoses and automotive seals. One example is the 3000A crosshead, which reduces scrap and allows faster start-up times. It offers features such as a tapered mandrel and engineered flow paths to ensure consistent flow through all speed ranges, as well as a thrust bearing on pin adjustment to adjust wall thickness without interruption.

"The show is always a tremendous opportunity to connect with our global customer base," said Jim Murphy, president and CEO of Davis-Standard. "Our exhibit will highlight a cross-section of technology. We will also share progress on our product lines and continual efforts to improve customer service responsiveness."

› **www.davis-standard.com**
› **www.maillefer.net**

FarragTech of Austria says it has continued to refine the design of its compressed air resin dryer (Card) – and will show a number of variants at K2019.

The dryer, first developed in the 1990s, relied on a new method of drying.

"In extrusion blow moulding, it was standard for a long time to vent the dry blower air at the end of each cycle," said Rainer Farrag, founder of the company. "As a result, a lot of unused air – and energy – was lost, which I found was a pity. The idea struck me to use this air for resin drying."

Using compressed air from an upstream process to dry resins made it possible to dehumidify material with minimal extra energy – and no moving parts. It proved a cost-effective, reliable alternative to adsorption drying.

Although the basic design is the same, improve-

AMI will launch new data subscription services and demonstrate a suite of interactive tools to support online analysis of critical market information at K2019.

"Our new data subscription service provides a comprehensive view of the plastic processing universe through any browser," said Richard Walker, head of market intelligence at AMI. "All our clients need is internet access. This is the first important step in the development of our data services."

The launch is the latest stage in the development of the company's market intelligence reports and data services. These include AMI's database of global plastics processors – which has been assembled over 30 years, and includes verified information for more than 20,000 named production sites.

"The demand for plastics continues to rise but there is increased uncertainty as the circular economy becomes a primary issue affecting the industry. It is our intention for AMI's data subscription package to offer a suite of commercially valuable information including detailed end use application tonnage data with historic, current and future forecasts of polymer, providing our clients with the tools to easily identify opportunities associated with the circular economy in a visually effective way," he said.

With advanced mapping capabilities and online access, a number of AMI's larger clients are already using the new web-based Search and Analysis tool. Options are also available for smaller clients, who may require more targeted access to data.

› **www.ami.international**

Right: Farrag will show its Card E/S, Card M and Card L/XL bulk materials dryers at K2019

ments continue to be made: better process integration, modern controls – such as the Sleep mode – and the reduction of the amount of air after reaching a particular temperature in the upper range of the drying hopper all help to reduce energy consumption further. The heat recovery from the air compressor has meanwhile led to resin drying which can mostly dispense with additionally supplied energy.

At K2019, the company will show its Card E/S, Card M and Card L/XL bulk materials dryers. These variants can, among other things, be combined with systems for condensation water protection and for internal mould cooling. This way, they make the whole process more efficient, says the company.

"It has to be assumed that resin drying using compressed air will become the standard in the plastics industry in the years to come," said Farrag.

› **www.farragtech.com**

Graham Engineering will showcase live demonstrations of a range of its extrusion systems – equipped with its Navigator control system – to make end products including medical tubing and sheet.

Real-time graphical display is a feature of the Navigator control system, said the company. High visual correlation between the touchscreen and machine function ensures an intuitive user experience for ease of use and rapid learning, it added. Control is delivered via hardware that is designed to withstand harsh industrial conditions such as vibration, electrical interference, high temperature, and humidity.

Below: American Kuhne will run a medical tubing line at K2019, including XC300 Navigator control

"Navigator uses an industrial PC with a Windows platform to enable intuitive, integrated extrusion process control," said David Schroeder, CEO of Graham.

Originally developed for Graham's extrusion blow moulding systems – and later adapted for Welex sheet extrusion lines – Navigator controls are now available for American Kuhne extrusion systems such as those for medical tubing, profiles and wire and cable. There are three levels of functionality: XC100 for stand-alone extruders; XC200 for one or more extruders in simultaneous operation; and XC300 for integrated production lines with the extruder and components such as a puller, water bath, or winder.

During the show, **American Kuhne** will run a tri-layer tubing line, comprising three compact modular extruders and the XC300 Navigator control with an integrated TwinCat Scope View data-acquisition system. It will also showcase other medical extrusion systems, including Ultra MD and compact modular extruders.

› **www.grahamengineering.com**
› **www.americankuhne.com**

KraussMaffei says that all extrusion machinery – no matter its age – can be given a 'digital retrofit' to make it 'fit for Industry 4.0'.

The company's Digital & Service Solutions (DSS) business unit will showcase a retrofitted machine at this year's K2019 show.

"As of now, various bundles enable the networking and use of data for all machine generations and makes in the area of injection moulding," said the company. "Soon, extrusion technology will also be integrated into the common data ecosystem."

Industry 4.0 describes the way in which machinery can become more interconnected with its environment. For instance, fitting a variety of sensors to the machine – and instantly sharing the information from them – allows operators and managers to improve performance.

With its retrofit program, KraussMaffei says it creates the technical prerequisite for connectivity– across processes, generations and, later, even across manufacturers.

"Wherever data arises, it also needs to be stored," said the company. "This can take place

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entirely in the cloud – via a gateway computer – or near-network, by means of Edge computing."

Advantages include quality improvement, production control, and greater efficiency – thanks to the reduction of maintenance, energy, material and personnel costs.

"In the future, businesses will be competitive only if they have a networked system of production," said KraussMaffei.

KraussMaffei already offers tools such as the DataXplorer, which stores up to 500 signals per second as continuous curves, to reveal details about the production process. These signals can originate from sources such as the machine itself, from the tooling or from peripherals. DataXplorer opens the door to status and process monitoring for extrusion, said the company.

Because some companies do not want to get involved with data analysis, DSS offers the option to outsource specific analysis knowledge. Using the available information, experts can help to boost process optimisation, generate customer-specific reports and provide data-driven guidance in order to make better decisions.

At K2019, the company will also highlight its pultrusion expertise – for making products such as long, thin window profiles in fibre-reinforced materials. Fibres in pultruded profiles are aligned with the direction of load, resulting in products that are specially optimised regarding material and weight.

"Pultrusion is the most cost-effective way of producing composites, and the obstacles for investing in systems and moulds are low," said Philipp Zimmermann, head of composites at KraussMaffei.

Its iPul system, with mould, metering machine and accessories, is capable of production speeds of up to 3 m/min. Recently, it acquired UK-based Pultrex – which also makes pultrusion profiles.

"The experience of Pultrex adds to our system expertise," said Zimmermann. "We now provide the complete value chain from a single supplier and are pursuing the common goal of advancing standardised systems engineering for pultrusion."

At the show, the company will display new pultruded components for the construction and automotive industries.

› **www.kraussmaffei.com**

Below: DataXplorer is now available for all types of KraussMaffei machinery, including extruders

Maag will show its entire portfolio at K for the first time – incorporating virgin polymer production, compounding, extrusion, mechanical end-of-life recycling, and industrial pump applications. This includes products from its subsidiaries including Reduction Engineering Scheer and Ettlinger.

The Ettlinger product range now offers high-performance filters for post-consumer recycling as well as solution packages downstream of the extruder, said the company.

"Our global distribution network provides customers with the technology that best meets their commercial and technical needs," said Alaaddin Aydin, vice president of Maag Germany. "Multiple solution options are usually available depending on requirements. Our many centres of excellence offer the engineering expertise to combine global know-how in custom systems."

Maag's portfolio extends from small machines and systems for throughputs up to 100 kg/h to machine and plant components capable of handling more than 100 t/h (including centrifugal dryers, polymer pumps and custom solutions in industrial applications).

› **www.maag.com**

Maguire will showcase its vacuum resin dryer, which it says uses a fraction of the energy of a desiccant dryer. The dryer, which has been renamed Ultra (it was formerly called VBD), can drastically reduce energy bills, says the company.

"While the energy needed to heat polymer to its required temperature is roughly the same for both vacuum and desiccant dryers, the Ultra dryer uses much less energy in the next stage – when the heated resin is actually dried," said Frank Kavanagh, vice president of marketing and sales at Maguire.

He cites a typical example for a process running at 220lbs (100kg) per hour, for 6,000 hours per year. An average desiccant dryer might run at 60 Watts per pound of material, versus the Ultra, which consumes 19 Watts per pound. While each system uses around 15W to heat the material from ambient temperature, the energy used to dry is very different: the desiccant dryer would use another 45W, while the Ultra uses just 4W – around 10 times less. ›

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Right: Maguire says that its Ultra vacuum resin dryer can drastically reduce energy bills

For an average US price of $0.12/kW, the annual energy bill for the desiccant dryer is $7,128, and $570 for the Ultra.

"Over the average lifespan of a dryer, that equates to $65,580," said Kavanagh. Using load cells in the dryer – on the vacuum hopper and retention hoppers – allows the touchscreen controls of the dryer to control the process in a way not seen with desiccant dryers, he said.

"The use of data provided by the load cells allows the dryer to achieve many functions automatically, such as automatic start-ups, automatic stops, and making cleaning and materials changes extremely rapid," he said.

Ultra dryers are available with throughputs of 150, 300, 600, and 1,000 lbs/hr. (68, 136, 272, and 454 kg/hr).

› **www.maguire.com**

US-based **Milacron** will display a wide range of its machinery technologies. While many are focused on injection moulding, the company also has expertise in extrusion.

Its main extrusion focus at K2019 is its aftermarket offerings – including gearbox rebuilds, single and twin screw manufacture, retrofits, and rebuilds. At the same time, it can decrease lead times for its nitrided and long-wear tungsten carbide clad barrels.

Improvements to its machinery offerings include the next generation Mosaic machine control – with more processing power and memory, and larger screen size.

The company is also continuing to develop new die head technologies for making PO, PP and PVC pipes, and medical products.

› **www.milacron.com**

Molecor will present its latest developments and technology for making oriented PVC (PVC-O) pipes and fittings.

The technology allows the manufacture of PVC-O pipes and fittings with a significant energy saving as well as with a great efficiency in the use of resources, says the company.

Molecor will also present its latest product development, C-PVC-O pipes, which are suitable for transporting fluids at high temperatures or in hot environments.

The development of C-PVC-O is the result of Molecor's research and has been possible thanks to collaboration with Lubrizol, with the raw material TemRite 88703. To develop C-PVC-O, the M-OR-P-1640 model was adapted to work on a higher range of temperatures than usual. Tests showed that the resultant material had better mechanical properties, superior even to those specified in the standard.

C-PVC-O becomes another option in the pipe sector with the possibility of being applied in civil works when working in environments with high temperatures.

› **www.molecor.com**

Motan will focus on a range of materials handling technologies at K2019.

Its Spectroplus synchronous dosing and mixing unit was developed for extrusion and compounding and will replace its previous Graviplus range. With a modular design, it is suitable for a large range of different materials – from powders, granulates and regrinds to liquids and flakes. Additionally, the synchronous dosing unit can be augmented with the Spetroflex dosing modules, which are also available in gravimetric and volumetric versions.

Spectroplus is controlled with the new Spectronet control, which can control both volumetric and gravimetric dosing modules, as well as external dosing units.

Meanwhile, its Metroflow gravimetric material loaders offer precise vacuum conveying – such as to move material from a silo to a drying bin, or to the procesing machine. With their precise weighing technology, they are particularly suited for monitoring material consumption in real time, which means that the units are ready for use in an Industry 4.0 environment.

Right: Motan will show a range of its materials handling technologies, including its Metroflow gravimetric material loaders

Also, its new Luxor CA A compressed air dryer, with optimised control and integrated ETAplus technology, is designed for small to medium material throughputs. The dryer operates at temperatures of 30-180°C. It can be installed directly on top of the processing machine or on a mobile frame. The dryer is available in four sizes with bin volumes of 8, 15, 30 and 60 litres. ›

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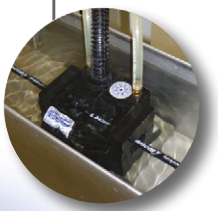

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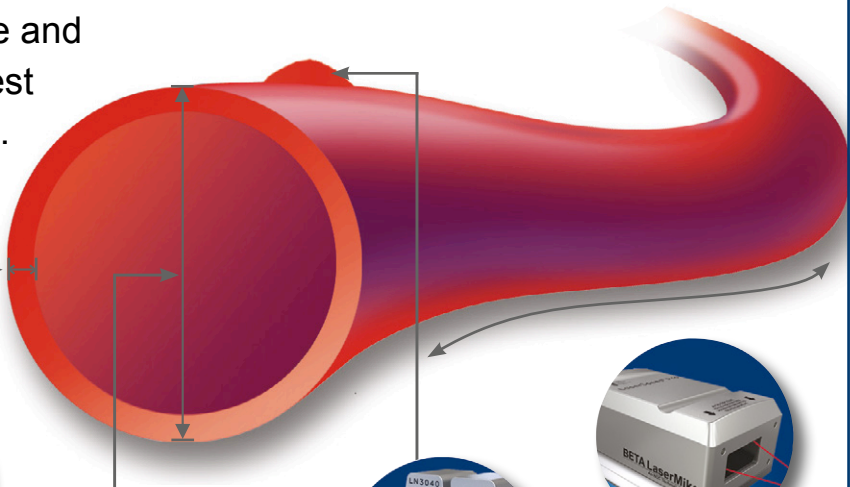

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Rigth: Plasmec says its Combimix-HC mixers are aimed at technical mixing applications in the field of PVC or WPC dry blend production

The company has also reworked and expanded its Metro range of individual material loaders. The new Metro G (for granulate) model, for large material throughputs, is available in 60, 100 and 150 litre capacities. Metro R (for regrind) is designed for processing recyclate, and is available in the same three sizes, as is the Metro F (for processing flakes). As a non-free-flowing material, flakes are prone to bridge-building, so this model is equipped with an extra-large outlet flap.

The Metro SG loaders offer an affordable range for standard applications, and are quick and easy to install. The Metrovac SG conveying station – with conveying control, blower and central dust filter – can supply up to eight material loaders and four purging valves. At the same time, the new Metronet SG provides the matching control, from which eight material loaders and one stand-by blower can be managed via a colour touchscreen display.

› **www.motan-colortronic.com**

Plasmec, which specialises in plastic mixing machinery, is to show a range of its technologies at K2019.

Combimix-HC mixers are aimed at technical mixing applications in the field of PVC or WPC dry blend production. Versions span from 200/800 to 2500/8500 litres capacity. A high output can be achieved thanks to the optimised design of the high-speed TRM mixer, and the high-efficiency HEC cooler type mixer.

Plasmec will also show a TRR-1500/FV container mixer, which complies with the Atex Directives. It is suitable for mixing additives with potential explosion risk and can be installed in classified areas. It is an alternative to conventional turbo-mixers for masterbatch, pigments and technical polymers when production conditions require a high degree of versatility and a wide range of different recipes to be mixed with the same machine, says the company.

› **www.plasmec.it**

Right: ProTec will launch its new Somos RDF flexible modular drying system at K2019

ProTec Polymer Processing will launch a new flexible modular drying system at K2019.

The Somos RDF modular resin drying system, for flexible stationary use without a central dry air generator, consists of autonomous units with their own Industry 4.0-capable controllers. Depending on requirements and desired throughput, the modules can be combined into a variable overall system with central visualisation and control.

Components are available with capacities of 50-400 litres, with each individually controllable. When interconnected, they can be controlled using a common operator control unit. As standard, they offer drying temperatures of 60-140°C, while high-temperature variants for up to 180°C are also available. Each module has an integrated air generator, which rules out complete failure – as may occur with a centrally supplied drying system.

Installation requires little space and effort as the modules are compact and do not require extensive supply and return air piping. The system also saves energy because only the components that are needed are operated. If requirements change, modules can be added or removed.

The modules can store up to 200 formulations. They have their own dry air generators and also provide several energy-saving systems: drying air volume is adapted to throughput, while regeneration cycles are controlled on the basis of the actual water content of the pellets, for instance.

› **www.sp-protec.com**

Schwing Technologies – based just 30km from Dusseldorf – will showcase its new vacuum pyrolysis system. The company, which celebrates its 50th anniversary this year, says that the Vacuclean Compact can be used to clean a variety of small tools and machine parts, with a maximum load of 50kg.

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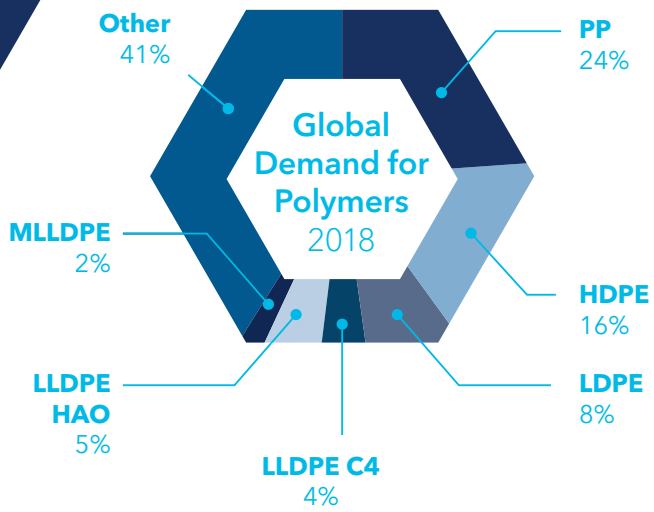

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Above: Schwing's Vacuclean Compact can clean small tools and machine parts such as screw elements and spinnerets

appreciate, for cleaning screw elements, spinnerets, spin packs, pelletising discs and screen changers," said Thomas Schwing, managing director.

The machine is energy-efficient and environmentally friendly, and operates without gas fuel, says the company. It removes all plastic residues from production tools – while still protecting the material – which helps to reduce machine downtime and extend the service life of the cleaned parts, says the company.

› **www.schwing-technologies.com**

Sikora is offering free material testing to K2019 visitors, using its Purity Concept V – an inspection and analysis system that combines the advantages of a light table with automated analysis.

Plastic pellets are placed on a sample tray and moved through an inspection area. Within seconds, the material is inspected by a colour camera. A projector optically marks all contaminated pellets directly on the sample tray. By evaluating the images, contamination – such as black specks as small as 50 microns on the surface of transparent, translucent and coloured material – automatically detected, visualised and statistically evaluated.

Sikora offers to inspect and analyse up to three free granulate samples (up to around 100g each). The results can either be discussed directly at the show or sent confidentially.

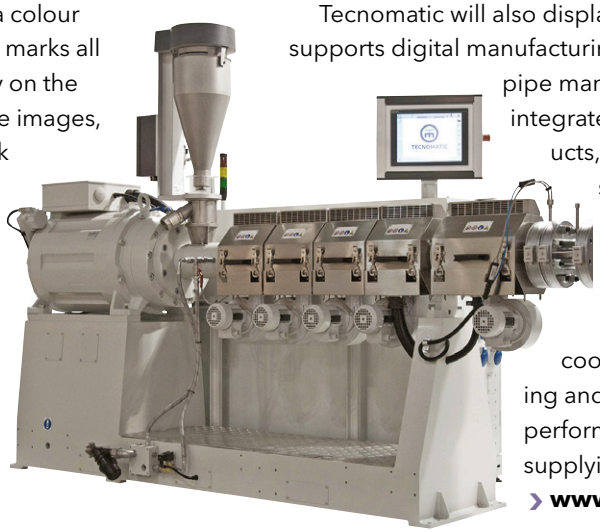
› **www.sikora.net**

At K2019, **Tecnomatic** of Italy will exhibit one extruder and two die-heads. It will also show how the latest Industry 4.0 software be used in extrusion plants.

Zephyr is the highest performing extruder in Tecnomatic's product range, offering high output at lower melt temperatures. It also helps pipe producers reduce energy consumption. Innovations on the extruder include new spiral grooved bush, screw and motors.

In addition to the extruder, the company will display a multi-layer die head and a coating die head from its Venus series. The Venus Multi F3 250 can produce PP-R pipes up to 250mm in three layers, with pipe air cooling, while the Venus Coat 400 can coat various kinds of non-weldable materials.

Tecnomatic will also display a system that supports digital manufacturing – providing plastic pipe manufacturers with an integrated portfolio of products, solutions, industrial software and automation technologies.



Right: Zephyr is the highest performing extruder in Tecnomatic's product range

"Industry 4.0 plays an increasingly important role in coordinating, synchronising and analysing machinery performance, as well as supplying critical data," it said.

› **www.tecnomaticsrl.net**

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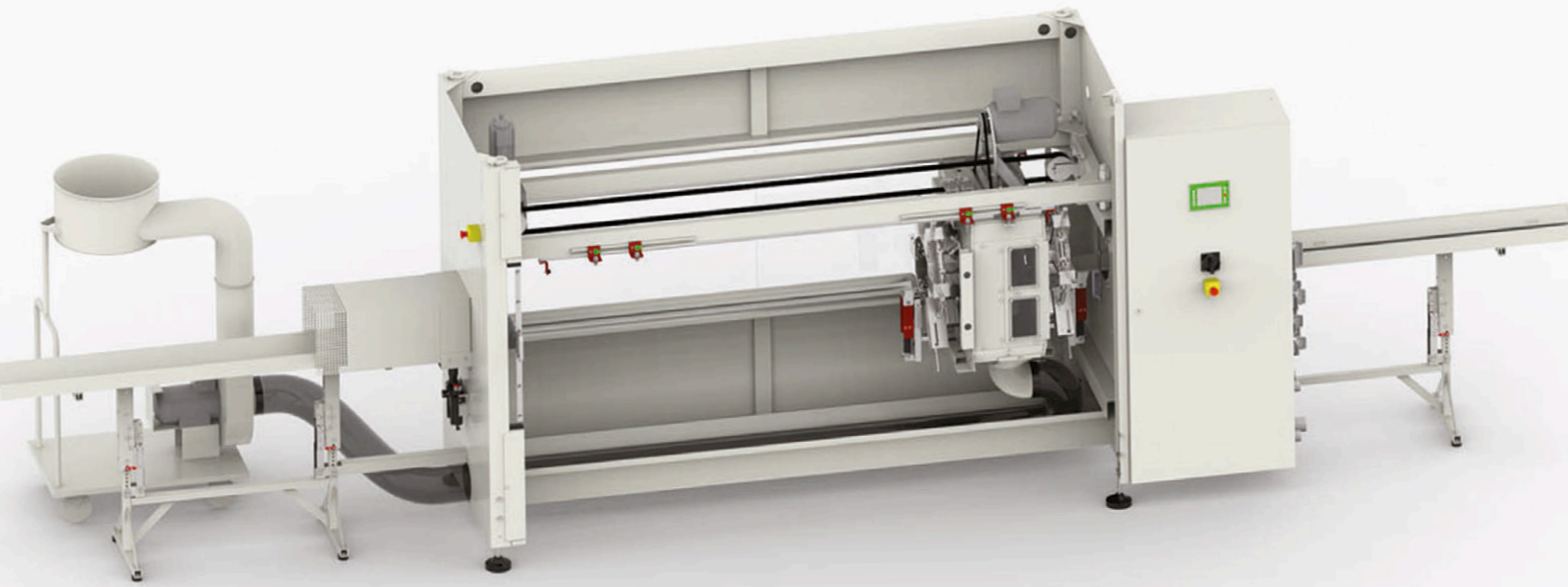

Downstream technologies help turn newly made pipe and profile into a product that can be shipped more quickly to customers

Keeping control, making the cut

Processes such as cutting, cooling and measuring help to ensure that extruded pipe and profile is ready for delivery as soon as possible – and in exactly the right form. Between them, downstream products ensure product quality and accuracy.

At this year's K2019, **Battenfeld-Cincinnati** will unveil its new DTA 160 direct cutting machine. With a new cutting unit, both polyolefin and PVC pipes can be cut accurately to length quickly, precisely and cleanly. A highlight of the swarfless unit is that it uses no hydraulics.

The saw carriage is very light, weighing around 40% of a conventional system. It must follow the pipe in line with the process requirements so as not to interfere with or interrupt the continuous production flow. The reduced weight improves the dynamics and enables short pipe lengths to be cut at greater extrusion speeds. The time required for acceleration and deceleration is significantly reduced.

"The greater mobility of the cutting unit is advantageous for short lengths of 50cm or less in particular," said Henning Stieglitz, CTO of BC Extrusion Holding in Bad Oeynhausen, Germany.

The cutting tools are powered by linear actuators. The advantages of this include a reduced number of components – and less maintenance – as well as increased precision and flexibility. The cutting tools rotate around the pipe during the cutting process. Because of this, the tool only needs to be long enough to cut through the wall thickness of the pipe, regardless of its diameter. This contributes to the unit's compact design. Quick-action fasteners and centring aids enable cutting blades to be exchanged easily. A wide variety of blade shapes can be used, including triangular and rounded blades to match cut performance to specific customer needs: for instance, a chamfer mill can be incorporated, as it is often needed for PVC pipes.

Multiple, evenly distributed pneumatic clamping jaws grip the pipe simultaneously, ensuring a clean cut thanks to their stable guidance. The small distance between the cutting position and the clamp prevents the pipe from being deformed, further enhancing the quality of the cutting surface. This makes it easier when the pipe is installed, for example, with sleeves, and enables extremely precise pipe-to-pipe connections. Special bearing materials synchronise the clamping jaws to improve the service life of individual components. ›

Main image: Battenfeld-Cincinnati's DTA 160 direct cutting machine uses no hydraulics, and claims to work faster than competing systems

Inner coating for small products

Germany's **Institute for Plastics Processing** (IKV) – part of RWTH Aachen University – will exhibit a range of its technologies during K2019.

As well as showcasing projects in injection moulding and additive manufacturing, IKV's team of plasma scientists will show a modular, scalable plasma unit that they have developed. It can be used to coat the inside of small hollow articles, such as medical syringes and ampoules, says the team.

Possible uses include increasing the barrier effect against gases and aromas, reducing friction or improving chemical resistance.

At the show, the scientists will demonstrate the automatic coating of plastic syringes, including the handling of specimens. Visitors will be able to compare the friction-reducing effect on coated syringes with that of uncoated ones. IKV scientists will be on hand to demonstrate the machines in operation and explain the processes.

The DTA 160 can be installed as an individual component or as part of a new overall system, and can also be retrofitted to existing pipe extrusion systems. One major pipe manufacturer has already incorporated a prototype of the new cutting unit into its day-to-day production activities.

High cut rates

UK-based **Gillard** will exhibit its new extrusion servo rotary cutter at K2019.

The Servo-Torq Plus extrusion cutter is designed for plastics, rubbers and many non-polymeric materials. It combines Lenze brushless AC servo motors with a digital multi-axis control system to activate the rotating knife blade. Gillard says very high cut rates are possible, with precise cut length accuracy. At the same time, Siemens widescreen touch panels allow easy operator control of the machine.

The cutter is available with maximum diameter cutting capacities of up to 150mm. All types of plastic and rubber extruded material can be cut with the machine.

Integral twin-belt Accra-Feed caterpillar infeeder/puller machines are provided to match every cutter model. These feature direct drive AC motors and planetary gearboxes, which improve speed control at high extrusion speeds.

The machine has a high level of connectivity: ProfiNet allows networking with the rest of the extrusion line, while remote service is available via the Internet using the built-in VPN router.

Right: Gillard will show its Servo-Torq cutter at K2019

Dimension measurement

Zumbach of Switzerland will showcase a range of its technologies that measure pipe and tube dimensions quickly and accurately.

Its Wallmaster is a based on ultrasonics, while its Rayex system uses X-rays to measure wall thickness, eccentricity, diameter and ovality. The optimal technology can be selected for every application and specific requirement, it said.

In addition of gaining control over the production process and product quality, full data acquisition and production transparency helps customers as they move towards Industry 4.0 implementation, the company added.

Other devices such as its Odac laser diameter gauges, KW lump-neckdown detectors and non-contact length measurement systems further improve process control, and provide full transparency of the production process – including for complex multi-layer products.

The Odac laser diameter gauge can make up to 9000 calibrated measurements per second. A permanent, precise diameter and ovality measurement in combination with flaw detection – all in one unit – makes it ideal for tube and hose extrusion lines.

Tailored to the application, a selection of 1-, 2- or 3-axis Odac laser diameter gauges are available. These can be supplied in combination with powerful Usys display and control systems, which offer statistics, process control and data archiving.

At the same time, its Profilemaster systems offer full cross-section measurement of plastic and rubber pipe

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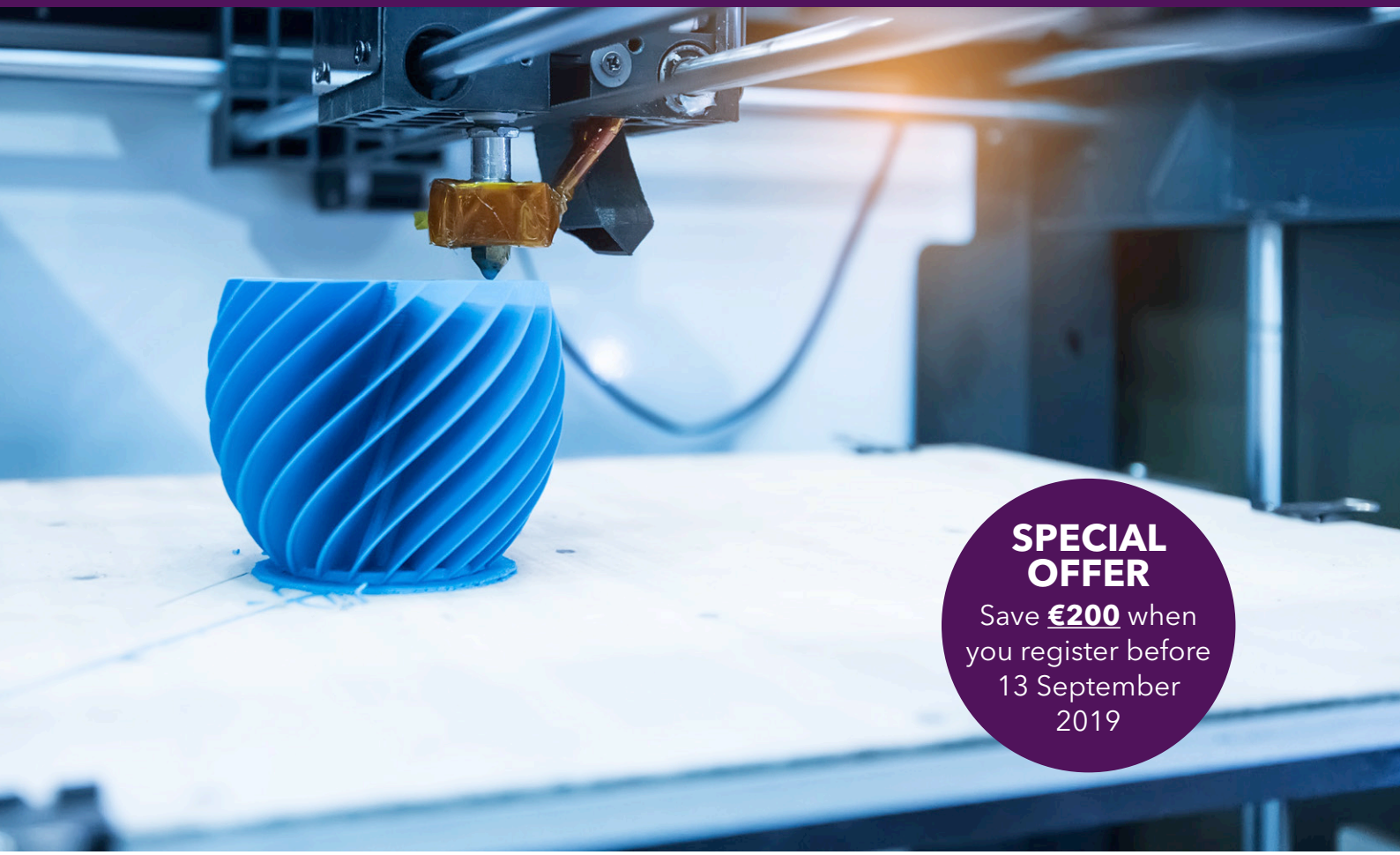

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Above: Zumbach will show a range of its pipe and tube measurement technologies

and profiles directly in the production line. All relevant dimensions such as diameter, width, height, angle and radii are permanently measured plus statistics and process information recorded for traceability reasons.

Finally, its OPC UA allows easy, transparent data management: the universal communication protocol is commony used for industrial automation.

Zumbach says it is the protocol of choice for Industry 4.0 integration and data exchange, with relevant systems and process control software solutions.

Close control

Beta LaserMike, part of NDC, will display its complete plastic pipe and tube measurement and control system with gauges in place – from the extruder through to the puller station. The integrated system enables manufacturers to improve product quality, increase productivity, boost process reliability and realise material savings, says the company.

The end-to-end system includes the AccuScan 6000, which it says is the industry's only four-axis diameter and ovality gauge for measuring products up to 50mm. It provides comprehensive measurement coverage around the circumference of the product to deliver benefits such as high single-scan accuracy, ovality accuracy and flaw detection accuracy.

The AccuScan 5000 Series two-axis diameter and ovality gauge will also be on display. Both models work at 2,400 scans per second per axis.

Its UltraScan Pro ultrasonic gauge provides fast, precise measurements of product wall thickness and concentricity. Manufacturing processes benefit from high-speed tolerance checking, multi-layer measurements (up to four layers), enhanced Ethernet

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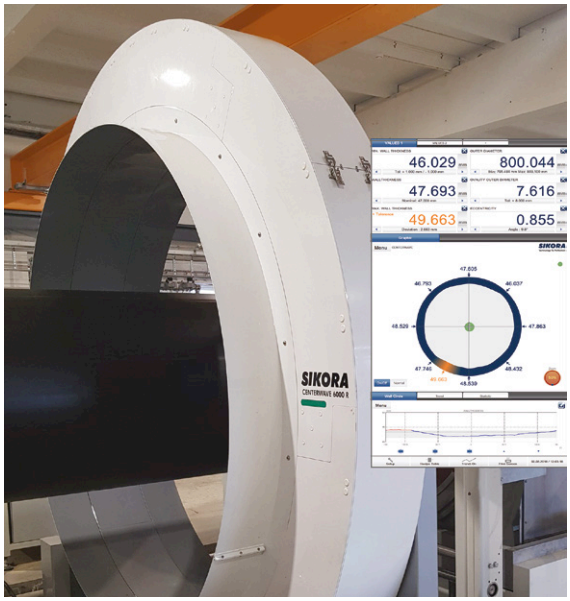

Right: Sikora's Centrewave 6000 uses millimetre wave technology to measure the dimensions of large pipes

connectivity via built-in web server and other advances. UltraScan's patented 'Snap' technology, with full-automatic setup and calibration, allows manufacturers to make fast process adjustments to avoid scrap and ensure quality results.

Also on display is the latest LaserSpeed Pro non-contact gauge for measuring the length and speed of products. LaserSpeed Pro delivers high accuracy, making it an ideal replacement for encoders, says the company.

The LN3015/LN3040 lump and neck-down detectors quickly and reliably spot product flaws before they become costly production problems. Fast-sensing and processing technology instantly detects sudden changes in the product diameter (up to 40mm) to catch the smallest of flaws.

Pipe dimension measurement

Sikora will use K2019 to showcase its Centrewave 6000/1600 for the first time.

The model, which measures the dimensions of hoses and tubes up to 1,600mm in diameter, is based on millimetre wave technology. It measures continuously over 360 degrees of the circumference of the pipe's wall thickness, diameter, ovality, inner profile and sagging.

"The Centrewave 6000 does not only impress because of its dimensions, but foremost due to its benefits resulting from the technology for the extrusion process," said Christian Schalich, head of sales for hose and tube at Sikora.

Nominal dimensions are quickly reached, start-up scrap is avoided, and processes are optimally controlled, said the company. Furthermore, the system does not require any coupling media, as it measures precisely and independently to external influences – such as temperature or plastics material – and does not require calibration.

"The device also automatically determines the exact refractive index," said Schalich.

It defines the intensity and the speed at which radiation travels through the material, which helps to measure accuracy. Manual input of modifications of the production conditions is not required, says Sikora.

PP belling machine

Sica will launch its Everbell4 200EN – a new PP pipe belling machine – at K2019.

The company says it represents a new concept in multi-socketing machines. It processes up to four pipes at the time with only two ovens – which reduces energy consumption by around 40% – and one forming station.

The machine has already been tested on an extrusion line at a customer's site for more than a month. It is compact – being just 233cm wide – which is 89cm narrower than its previous model and much narrower than competitor machines.

It can process 1200 sockets/hour with PP-H pipes, in diameters of 32, 40 and 50mm, and 1.8mm wall thickness. Speed is not influenced by the simultaneous processing of different pipe lengths.

In terms of precision, a patented system assures permanent socket profile for pipes of 32-200mm diameter. At the same time, using electrical control boosts both accuracy and speed – and banishes the need for hydraulics.

With pipepmoving arms electrically actuated, the speed of the arms changes automatically based on the diameter of pipe processed – without operator intervention. Another point is that the machine does not require many hours of experimentation to determine the first recipe for new sockets. The operator inputs the dimensional measurement of the socket and a PLC automatically calculates the process parameters and initiates the first recipe.

The machine is flexible enough to handle many different pipe diameters with the same arms: 32-40-50, 63-75, 90-110, 125-160 and 200 mm diameter.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.battenfeld-cincinnati.com**
- **www.gillardcutting.com**
- **www.zumbach.com**
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- **www.sikora.net**
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Vienna / 2019

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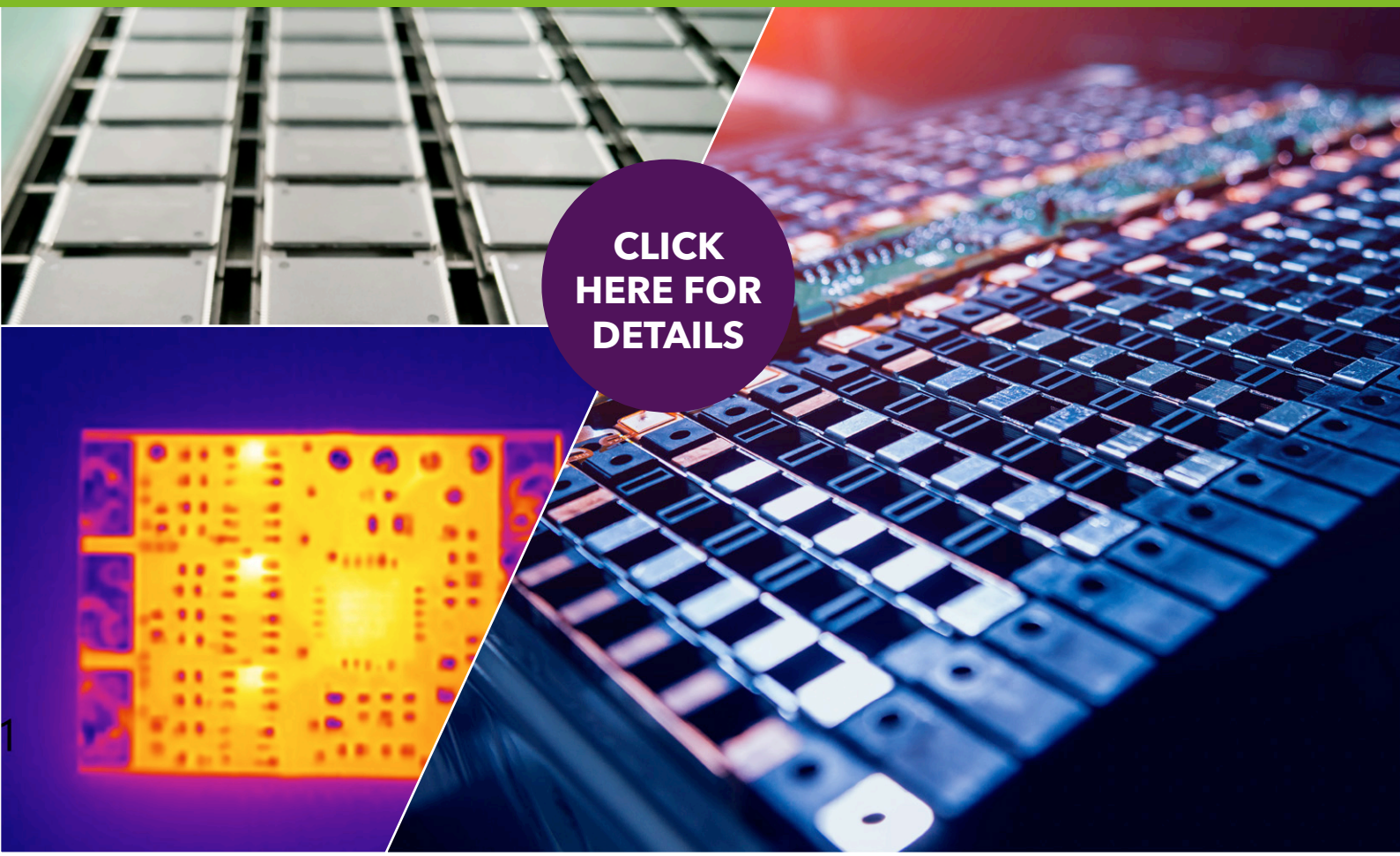

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AMI's Polymer Foam conference takes place in Hamburg in November, bringing together leading specialists to explore the challenges and benefits of foaming technology

PHOTO: SHUTTERSTOCK

Exploring opportunities for foamed polymers

Foamed polymers offer a whole raft of potential benefits, ranging from weight, material and energy savings to improved performance and cost effectiveness. But maximising the gains means understanding and successfully implementing the very best technologies. AMI's seventh European Polymer Foam conference brings together key technical experts and decision makers from end-users, foam manufacturers, testing companies and universities, as well as leading materials and technology providers, to discuss and explore the latest innovations and end-use applications involving polymer foam.

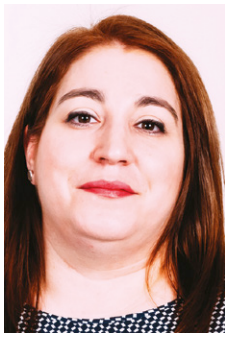
Taking place in Hamburg, Germany, on 26-27 November, the Polymer Foam conference will explore new opportunities for polymer foams in end-use markets, will examine regulatory developments and how they may impact on the use of foamed materials and blowing agents, and will identify end-use requirements, innovative production techniques and new material combinations. Covering all foaming solutions, a key attraction of this well-established event is the opportunity it provides attendees to find out more about their own business sector as well as learning from ideas being successfully applied in other foaming areas. This article previews the event and takes a look at the line-up of expert speakers.

Aerospace ideas

Polymer Foam will be opened by **Ingo Roth**, who is responsible for Research & Technology Cabin and Cargo Interior and Materials at **Airbus** in Germany. He will explain how foam is being used to reduce weight and increase functional integration in aerospace applications. He will be followed by **Norbert Hessenberger**, Head of Innovation & Development at **Greiner Aerospace** in Austria, who will detail some innovative foam solutions for aircraft interior and seating applications.

The focus will then turn to processing innovations. **Yuxiao Zhang**, Research Associate at the **Institute for Plastics Processing (IKV)** at **RWTH Aachen University** in Germany, will take a detailed look at available foam injection moulding processes for packaging applications. Then

Main image: The newest foam production and development innovations will be discussed at AMI's seventh European Polymer Foam conference in Hamburg in November



Expert speakers at the seventh European Polymer Foam conference include (from left) Cellmat Technologies Manager New Products and R&D Dr Cristina Saiz-Arroyo, University of Toronto Professor Chul B Park, and Tramaco Technical Sales Manager Dr Thomas Mergenhagen

Dr Cristina Saiz-Arroyo, Manager New Products and R&D at **Cellmat Technologies** in Spain, will examine how foaming mechanisms can be controlled to successfully optimise the production of advanced polymeric foam structures. And **Prof Dr Volker Altstädt**, Professor at the **University Bayreuth** in Germany, will explore some high-performance flame-retardant foams based on thermoplastic PET and thermoset epoxy resins.

Nano innovation

A full session has been allocated to the topic of nano-fibrillated materials. **Han Goossens**, Chief Scientist, Technology Management & New Offerings, and **Sunamita Anunciacao**, Specifications Specialist, at **SABIC** in the Netherlands will kick off the discussion with a joint presentation identifying new possibilities for PET foaming using nano-fibrillated masterbatches. Then **Prof Chul B Park**, Professor at the **University of Toronto** in Canada, will follow on with details of an investigation into foamability of impact modified polypropylene using nano-fibrillated EPDM rubber.

The final session on the first day will give attendees the opportunity to find out about technical and regulatory developments impacting on chemical foaming agents. **Dr Thomas Mergenhagen**, Technical Sales Manager/Quality Manager at **Tramaco** in Germany, will review the basics and highlight some new developments in chemical foaming agents, including some key regulatory changes within the EU. Then **Dr Theresa Wassmer**, Technical Sales Manager Polymers at **Chemische Fabrik Budenheim** in Germany, will focus on the sustainablilty theme by exploring innovations in eco-friendly, endothermic foaming agents for thermoplastics.

Progress in PU

The second day of the conference will open with a look at the polyurethane foam industry. **Dr Aleksander Prociak**, Prof of CUT, Deputy Manager of Department of Chemistry and Technology of Polymers at the **Cracow University of Technology** in Poland, will present some new research on bio-based PU foams for thermal insulating applications. His presentation will also look at the effects of selected bio-components in this application. Next up is **Dr Guillaume Francois**, Scientific Software Developer at **Transvalor** in France, who will explain how in situ industrial PU foaming and filling can be modelled using numerical simulation. And **Dr Jan-Pleun Lens**, Vice President Research and Applications at **FRX Polymers** in the US, will speak about graphite-free and halogen-free flame-retardant flexible PU foams for automotive applications.

The final session of the conference is focused on extrusion processing. **Robert Breuer**, Research Associate at the **Institute for Plastics Processing (IKV)** in Germany, will look at the production of polypropylene foam sheet using blowing agent mixtures based on CO_2. And **Hilmar Heithorst**, Product Management CoC Flat Products at **Kraussmaffei Technologies** in Germany, will explore some of the newest extrusion technologies for PET foams.

About Polymer Foam EU 2019

Polymer Foam EU takes place at the Maritim Hotel in Hamburg, Germany, on 26-27 November 2019. The event brings together expert speakers from foam end users, manufacturers, testing companies and universities, as well as materials and technology providers. Over its previous six editions, the conference has established itself as the place to learn about foam market opportunities, end use requirements, regulatory developments, novel production techniques, and innovative material combinations.

Aside from the formal programme, the informal lunches and refreshment breaks and the complimentary cocktail reception at the end of the first day provide plenty of opportunity for discussion and networking. To find out more, visit the Polymer Foam **conference website** or contact Conference Organiser Katie Edwards. Tel: +44 (0)117 314 8111; Email: **katie.edwards@ami.international**

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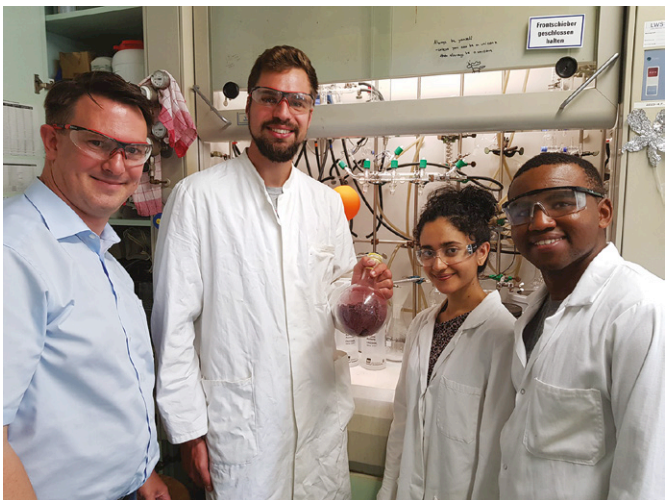
UV FILTERS

In a nutshell: researchers find new source for organic UV absorbers

An international research team has used cashew nut shell liquid (CNSL) as the basis for new types of organic UV filter, which can be used as a plastics additive.

The cashew nut shells are left over from the production of cashew nuts, so are a waste product.

The researchers, from Johannes Gutenberg University Mainz (JGU) in Germany, the University of the Witwatersrand in Johannesburg in South Africa and the University of Dar-es-Salaam in Tanzania, say the CNSL acts as a substitute for petroleum in the synthesis of the filter.



UV radiation is a typical cause of damage to paints, coatings and plastics. A typical way to protect against this is to add UV filters to the formulation. These can either be mineral pigments such as titanium dioxide or organic compounds.

Currently, both classes of UV filters are under fire for different reasons, say the researchers – with some organic filters being toxic to aquatic life. At the same time, most organic filters are produced from petroleum.

The researchers, led by Till Opatz of JGU and Charles de Koning from Johannesburg, used CNSL as a renewable starting material for the production of new UV filters. CNSL is produced in large quantity during the production of the nuts and cannot be used as food or feed., so there is no competition between its use as a chemical raw material and the production of foodstuff.

Using CNSL can be regarded as an example of xylochemistry – in which woody biomass serves as the carbon source for chemical synthesis.

The research was published in a recent edition of the European Journal of Organic Chemistry.

› **www.uni-mainz.de**

ADDITIVES

Clay synergist FRs cover multiple materials

Tolsa has extended its Adins range of flame-retardant (FR) additives for PP, PVC, rubber polymer systems, and silicones, and will highlight them at K2019.

The new clay synergists reduce smoke production and improve heat release in PP, PVC, and rubber polymer systems, in addition to the existing FR additives used in other polymers.

"Our unique FR technology continues to evolve and we see continuing growth for clay synergists in a wide range of systems that require the highest standards of flame retardancy," said Antonio Esteban, technical manager for special additives at Tolsa. "Our materials are highly versatile and can be fine-tuned to meet the high-performance needs of formulators and end users."

The expanded product line includes a new grade that uses titanium dioxide to improve the performance of intumescent systems for PP and coatings. It further stabilises the char in intumescent systems (at dosages of 1-2%), improving the flame-retardant efficiency. In intumescent systems, Adins clay decreases and delays the peak of the heat release rate and acts as a smoke suppressor. It can improve cost efficiency of formulations with intumescent flame retardants.

Key end-use applications include transportation, pipe, coatings, and wire and cable.

Tolsa has also introduced Adins Clay Sil1, which is used in silicones and PVC formulations, delivering reduced heat release and smoke suppression. It is an effective alternative to antimony trioxide (ATO), thus easing environmental concerns.

The company is also looking to translate its FR technology to other polymer matrices including nylon, polycarbonate, and thermosets.

■ The next issue of PPE will include extensive coverage of new materials at K2019.

› **www.tolsa.com**

RECYCLING

Separator technology protects recycling and processing equipment

Bunting Europe will showcase its expertise in magnetic separators and metal detectors for the recycling and plastics industries at K2019.

In virgin plastic manufacturing processes, metal damages processing equipment and the quality of the end-product. Recycled plastic commonly has both ferrous and non-ferrous metal contamination, and removal is vital to enable the reuse of the waste material, says the company.

Bunting's portfolio includes a wide range of magnetic separators and metal detectors to detect and remove metals.

Its FF and HF drawer filter magnets are the most commonly used magnetic separators in the plastics sector. Visitors will see both standard and manual-clean (MSC) designs, which all use high strength neodymium iron boron (rare earth) magnets.

In operation, plastic beads or shredded plastic waste falls through the drawer filter under gravity, while ferrous metal contamination is attracted to the surface of the magnets.

The company will display its new FF350 drawer filter magnet in Europe for the first time. The FF350 enables processing material at higher temperatures.

High heat is damaging to standard rare earth magnets and the new design maintains magnetic strength at temperatures up to 350F (175°C). There are also changes to the housing, window and access fixings to provide trouble-free operation at these temperatures.

The company will also display the plate magnet (with and without tapered step) and grate magnets (round and square).

"Our experience in solving metal contamination issues in the plastics sector is second to none," said Simon Ayling, managing director of Bunting Europe. "Without removing metal from waste, the recycling of plastic is simply not possible."

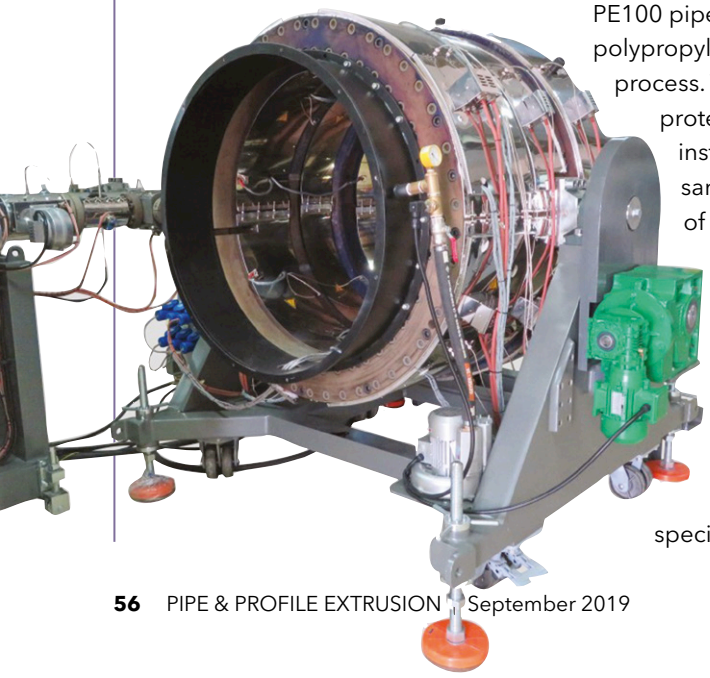
■ The next issue of PPE will include extensive coverage of recycling machinery.

› **www.buntingeurope.com**

PIPE COATING

Large die head for coating PO pipe

Conextru of Austria says it has supplied its largest cross head for polyolefin pipe coating.



Coating polyethylene (PE) pressure pipes is a significant trend, says the company. It involves covering the PE100 pipe with an additional polypropylene (PP) layer, via a coating process. This 1-3mm PP layer protects the pipe when it is installed in a trench without sand, which reduces the cost of installation.

The PO 1000 CR pipe heads that make the pipes are 400-1000mm in diameter, and have a maximum throughput of 250 kg/h. The distribution system is a helical spiral of 36 channels, which is specially designed for low output and low volume.

PP and PE do weld together, so the grip or adhesive force is by shrinking the PP to the PE pipe. Different process parameters can influence this grip – with PE pipe temperature being the most important.

The whole coating equipment has a range of 400-1000mm, and has an electrical box as an interface for all power cables and thermocouples. A C 45 30 extruder, with maximum output of 250 kg/h PE and 200 kg/h of PP, includes a barrier screw and ABB PLC control.

A second extruder (C 30 25), with maximum output of 5 kg/h provides colour stripe material.

› **www.conextru.eu**

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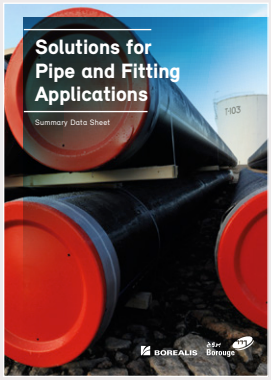
BOREALIS: PIPE POLYMERS



Borealis has been a key supplier to the pipe industry for more than 50 years. This six-page brochure details its full range of PE and PP pipe resins for production of pipes and fittings for a wide variety of infrastructure applications.

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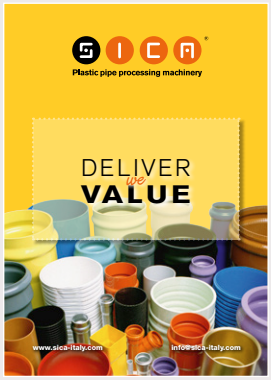
SICA: PIPE PROCESSING



This brochure from Sica covers the company's full range of performance pipe finishing equipment including its novel TRS-W cutting and chamfering, Unibell electric belling and robotised packaging machines.

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HEXPOL: DRYFLEX TPE

The Dryflex family of TPEs from Hexpol TPE add soft touch appeal, function performance and product safety features in a range of consumer, automotive, industrial and packaging applications. Find out more in this brochure.

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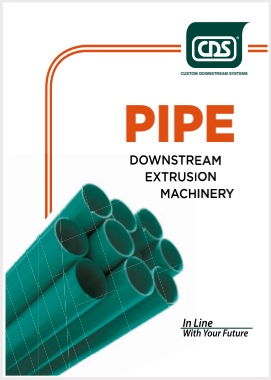
CDS: PIPE PRODUCTION



This 12-page brochure details the main features of CDS' pipe capabilities, including vacuum tanks, spray tanks, haul-offs, swarfless cutters, planetary saws and pipe collection equipment.

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UNICOR: PIPE CORRUGATION

This brand new 48-page brochure from Unicor provides detailed insight into the design, production, applications and advantages of corrugated pipes. It includes specification data on the company's wide range of pipe corrugation equipment.

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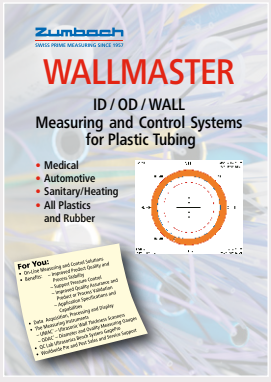
ZUMBACH: MEASUREMENT CONTROL



This eight-page brochure details the main features of Zumbach's Wallmaster measurement and control system for improving product quality, process stability and data capture in plastic tube and pipe extrusion applications.

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Learn more about AMI's upcoming conferences

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POLYMER TESTING & ANALYSIS

The 4th edition of the Polymer Testing & Analysis conference, taking place on 18-19 September 2019 in Düsseldorf, Germany, will gather together laboratory staff, researchers and R&D professionals who develop, test and analyse new polymer materials.

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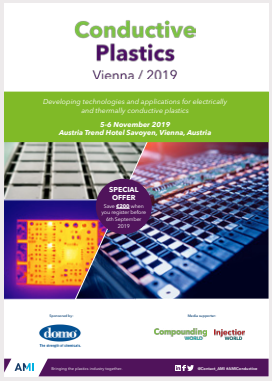
CONDUCTIVE PLASTICS 2019



AMI's Conductive Plastics conference takes place for the fourth time in Europe on 5-6 November 2019. It is the place to learn about formulation, processing and application of both electrically and thermally conductive thermoplastics. The event takes place in Vienna.

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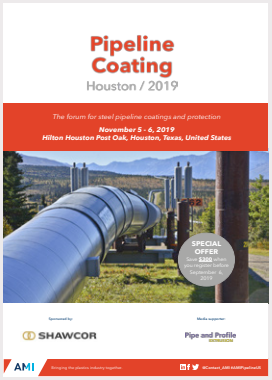
PIPELINE COATING HOUSTON 2019



AMI's fourth Pipeline Coating Houston conference takes place on 5-6 November 2019. It will bring together North American pipeline operators, contractors, pipe coaters, researchers and specifiers to discuss the latest sector trends and technologies.

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POLYOLEFIN ADDITIVES 2019

Taking place in Vienna in Austria on 12-14 November, attendees at Polyolefin Additives will learn more about the latest additive technology trends in the polyolefin resins market, including vital steps to implementing the circular economy.

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PROFILES

Taking place in Cologne in Germany on 12-13 November 2019, AMI's Profiles conference brings together the entire industry value chain to discuss the latest developments in construction standards, materials and production technologies.

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POLYMER FOAM 2019

The seventh Polymer Foam conference will be held in Hamburg in Germany on 26-27 November, bringing together an international audience to learn more about the latest chemical, physical and particle foaming technologies.

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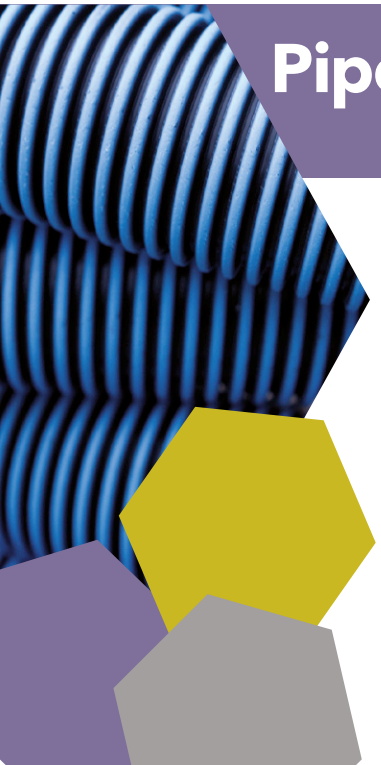
Inter Primo

Head office:	Copenhagen, Denmark
CEO:	Claus Tønnesen
Founded:	1959
Ownership:	Private
Turnover (2018):	Around €150 million
Employees:	Around 1,100
Profile:	Founded in 1959, Inter Primo has concentrated on plastics extrusion since the very beginning. While it began by extruding window and door profiles, it has since expanded to include products for the medical industry, transportation, building, offshore, energy, white goods, power and lighting.
Product lines:	Inter Primo produces both standard and custom products for a range of industries. Its standard products for the construction industry include drop profiles, sliding strips, bumpers, side seals and roof profiles, while its customised products include gaskets, window and door profiles, interior and exterior products (such as sill profiles) and industrial doors. It also offers standard and custom profiles for a number of other industries – such as customised busbars, covers and insulators for lighting articles. In addition to extrusion, it offers a range of support services, including design and tooling.
Factory locations:	The company has 15 plants in nine different countries. These are located in Denmark, Finaland, Germany, Norway, Poland, Russia, Sweden and China. Inter Primo recently acquired Netherlands-based Essentra Extrusion – which runs 75 extrusion lines, employs around 200 people and has an annual turnover of around €37 million.

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



Pipe and Profile EXTRUSION FORTHCOMING FEATURES

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

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PVC-O pipe
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Materials handling equipment
K2019 show issue

November/December 2019
Cross-linked polyethylene (PEX)
WPCs • Extruder wear protection
Multi-layer pipe extrusion
K2019 show preview

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

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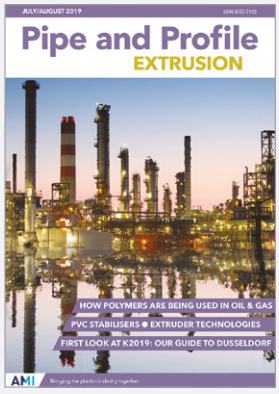

Pipe and Profile
July/August 2019
The July-August edition of Pipe and Profile Extrusion looks at how polymer pipes are being used in the offshore oil and gas sector. Other features cover extruder innovations to be shown at K2019 and developments in PVC additives.

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Pipe and Profile
June 2019
The June issue of Pipe and Profile Extrusion includes features that cover infrastructure pipes, profile die control, pipe corrugators and pipe weld assessment. Plus it has a review of the Plastics Extrusion World Expo in Cleveland, US, in May.

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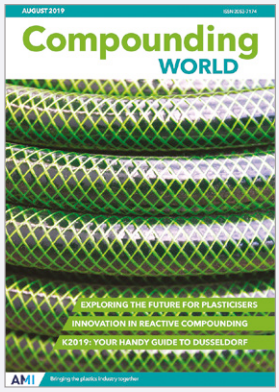

Compounding World
August 2019
The August edition of Compounding World looks at the latest technical and regulatory developments in PVC plasticisers. Other technologies in this month's spotlight include reactive compounding, wear resistant machine parts and WPCs.

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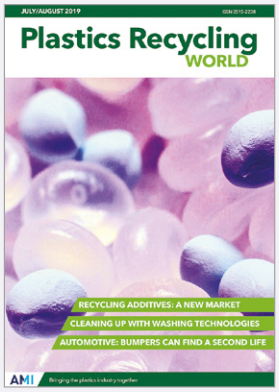

Plastics Recycling World
July/August 2019
The July/August edition of Plastics Recycling World takes a detailed look at the growing range of additives available to plastics recyclers. It also explores new developments in washing equipment and reviews a major US car bumper recycling project.

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Injection World
July/August 2019
The July-August issue of Injection World looks at technology enabling injection moulders to use more recyclate. Plus features on packaging and masterbatch and analysis of tethered caps regulation.

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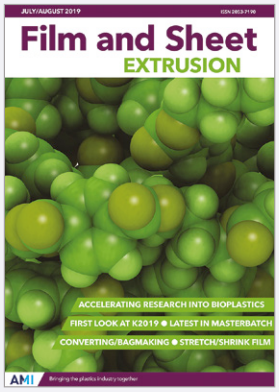

Film and Sheet
July/August 2019
The July-August edition of Film and Sheet Extrusion looks at the accelerating research into bioplastics applications, plus stretch and shrink film, masterbatches, bag-making machinery and a Visitor Guide to K2019.

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	25-28 November	Plastivision Arabia, Sharjah	www.plastivision.ae
	27-29 November	Plastics & Rubber Vietnam	www.plasticsvietnam.com
2020	**13-16 January**	Saudi Plastics & Petrochem, Riyadh	www.saudipp.com
	16-20 January	Plastivision India, Mumbai, India	www.plastivision.org
	21-23 January	Swiss Plastics, Lucerne, Switzerland	www.swissplastics-expo.ch
	28-31 January	Interplastica, Moscow, Russia	www.interplastica.de
	9-11 March	Plast Alger, Algiers, Algeria	www.plastalger.com
	11-13 March	Expo Plasticos, Guadalajara, Mexico	www.expoplasticos.com.mx
	3-4 June	Plastics Extrusion World Expo Europe, Essen, Germany	www.eu.extrusion-expo.com/
	8-11 June	Argenplas, Buenos Aires, Argentina	www.argenplas.com.ar
	21-25 September	Colombiaplast, Bogota, Colombia	www.colombiaplast.org
	13-17 October	Fakuma, Friedrichshafen, Germany	www.fakuma-messe.de

AMI CONFERENCES

10-12 September 2019	Masterbatch, Vienna, Austria
18-19 September 2019	Polymer Testing & Analysis, Dusseldorf, Germany
5-6 November 2019	Medical Tubing, Minneapolis, USA
12-13 November 2019	Profiles, Cologne, Germany
12-14 November 2019	Polyolefin Additives, Vienna, Austria
4-5 December 2019	Oil & Gas Non-Metallics, London, UK
24-25 March 2020	PVC Formulation, Cleveland, USA
2-3 June 2020	Profiles, Cleveland, USA
2-3 June 2020	Oil & Gas Polymer Engineering, Houston, USA
17-18 June 2020	Medical Tubing, Berlin, Germany

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

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