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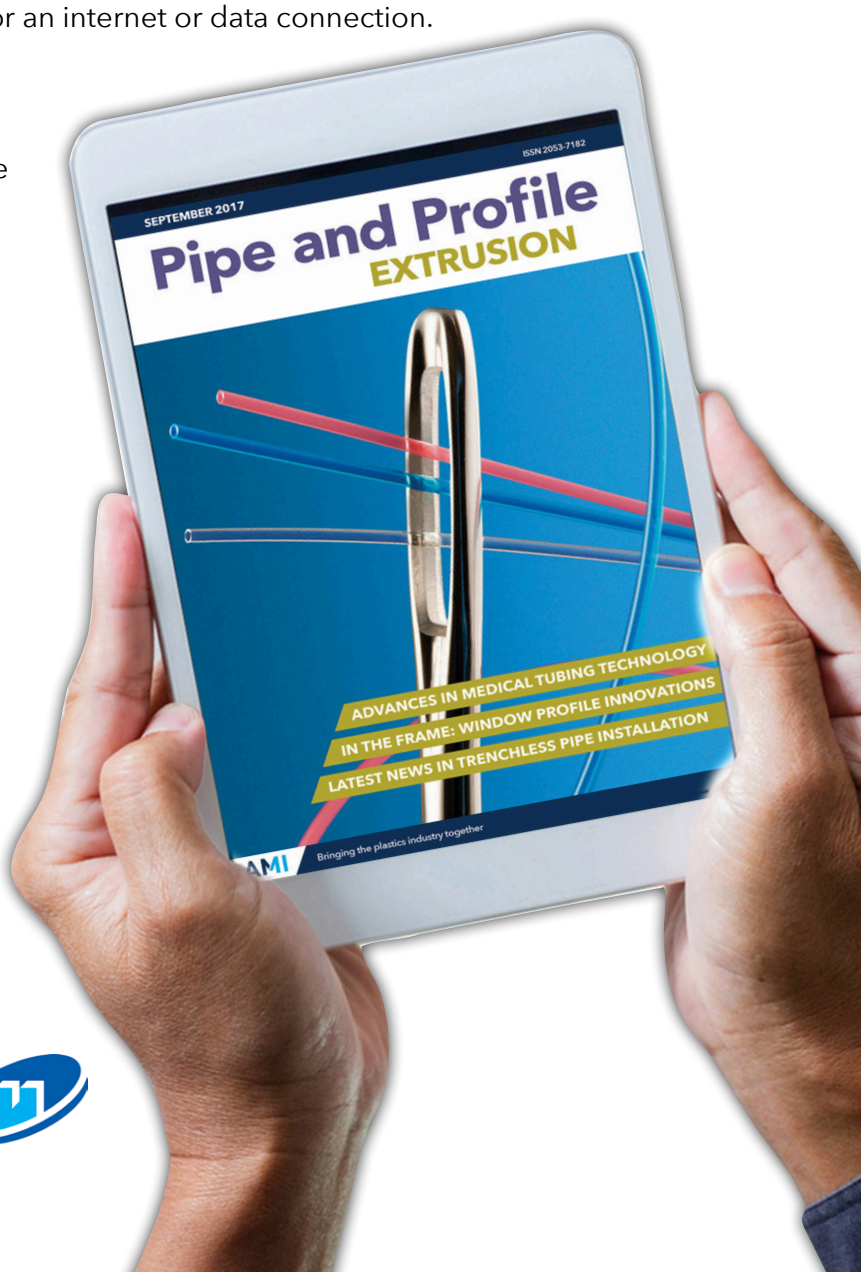

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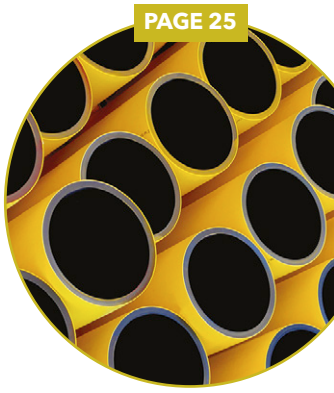
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Deceuninck sales dip as profits grows

Deceuninck, the Belgian profile extruder, has reported a rise in profits in 2018 – despite a reduction in sales.

Full-year sales fell nearly 2% to around €674 million ($US767m), as solid growth in North America and emerging markets was offset by lower volumes in Turkey. Sales in Europe remained stable.

Adjusted EBITDA for the period, however, was more than €72m ($US82m), a growth of more than 6%, which the company ascribed to operational efficiencies resulting from process improvements and investments in equipment and infrastructure.

Francis Van Eeckhout, CEO of Deceunink, said: "2018 was a good year for Deceuninck with adjusted EBITDA increasing to its highest level in a decade.

› **www.deceuninck.com**

Uponor reports modest boost in 2018 results

Uponor, the major pipe manufacturer, showed moderate sales and profit growth for 2018.

Net sales for the year reached nearly €1.2bn (US$1.36bn), a growth of just over 2%. Comparable operating profit – after removing items such as the sale of the company's North American infrastructure pipe business – was just over €99m (US$113m), also a shade over 2% higher than in 2017.

Uponor said that currency fluctuations dragged results down – and without them, full-year growth would have been move than 7%. The negative effect was mainly due to the US and Canadian dollars, Swedish Krone and Russian Rouble, it said.

Sales increased in the European building solutions segment, but "operational challenges" at its plant in Virsbo, Sweden – and increased raw material costs – pushed down profitability, said the company.

In North America, net sales increased but were hampered by start-up costs from the company's new facility in Hutchinson.

"In addition, the segment suffered from increasing raw material costs and freight rates throughout the first half of the year, and the second half of the year was not enough to compensate this completely," said Jyri Luomakoski, president and CEO of Uponor.

The company is to end operations in Asia in 2019 and will focus on its core businesses in Europe and North America.

This year, Uponor says it expects net sales and profit to equal those for 2018 – to fill the gap left by divestments.

› **www.uponor.com**

Weak Q3 for pipemaker ADS

US-based ADS had a weak third quarter but expects to finish the year on target.

Sales in the quarter fell 0.8% to around US$318m, while profits dipped by 50% to nearly US$17m. However, year-to-date sales and profits were both ahead, it said.

Scott Barbour, president and CEO of ADS, said: "We are on track to meet our financial guidance for the year, despite unseasonably wet weather shifting sales volumes from Q3 to Q4."

› **www.ads-pipe.com**

PA12 plant planned for 2021

Evonik says that its planned polyamide 12 (PA12) production plant is scheduled to begin operations in the first half of 2021.

The €400 million (US$455m) project, Evonik's largest investment in Germany to date, is expected to increase the company's overall capacity for PA12 by more than 50%. Other facilities to make the polymer and its precursors will be built at the Marl Chemical Park and will supplement existing PA12 production.

The company says that PA12 is in demand from areas including automotive production and oil and gas pipelines.

"This investment supports our concentration on speciality chemicals," said Claus Rettig, head of Evonik's resource efficiency segment. "Products made from PA12 are usually energy-efficient: they are durable and require less maintenance than steel components – such as in gas pipelines – and contribute to lightweight construction, such as in automotive design."

› **www.evonik.com**

Right: Evonik says PA12 is in demand from industries including automotive and oil & gas

Trex posts sales and profits growth in 2018

US-based plastic decking manufacturer Trex posted increased sales and profits in 2018.

On the back of a strong final quarter, the company reported full-year sales of US$684 million – a 21% year-on-year increase. This includes a US$6m one-off charge in the third quarter related to expanding product stocking positions.

Sales in its residential products division grew 13% to US$613mn, while its commercial products contributed another US$71m. Overall profit for the company was US$135m, a 41% year-on-year increase.

Sales in the final quarter reached US$140m (a 15% increase), yielding a profit of US$25m (a rise of 38%).

"Fourth quarter results benefited from double digit-revenue growth in both residential and commercial products," said James Cline, CEO of Trex. "Thanks to our advantages in the identification, procurement and usage of recycled raw materials and increased capacity utilisation, we offset increased fourth quarter start-up expenses associated with the roll-out of the newly-engineered Trex Enhance product line."

For the first quarter of this year, Trex expects net sales of US$176m – a 3% rise on the equivalent period in 2018. Combined with the Q4 2018 sales, this is an 8% growth over the same period one year previously.

"Q4 and Q1 are historically more heavily weighted to distribution load-in," said Cline.

› **www.trex.com**

Recyclate quality concerns

Most European plastics converters (76%) believe that improved collection and sorting of plastic waste would be the most suitable way to increase the quality of recycled plastic materials, according to the second EuPC survey. They also said that they saw investments in better recycling technologies by recyclers (53%) and better design for recycling (29%) as important measures.

A third survey will take place this year, says EuPC.

› **www.pceu.eu**

KM buys pultrusion specialist

KraussMaffei has strengthened its competence in profile manufacturing machinery by acquiring UK-based specialist Pultrex.

Pultrex is a leading provider of pultrusion, pullwinding and filament winding systems. It also makes pultruded profiles for customers in industries including construction, transport and wind power.

Colin Leek, managing director of Pultrex, said: "The range of use of pultruded profiles is extremely diverse and continues to grow."

Nicolas Beyl of KraussMaffei added: "With Pultrex, we are complementing our system competence and now offer the entire value chain from a single supplier."

› **www.kraussmaffei.com**

› **https://pultrex.com**

Left: PPI's guide provides information on safe handling of HDPE conduit

Safe handling of PE conduit

US-based trade association the Plastics Pipe Institute (PPI) has published a guide to handling high-density polyethylene (HDPE) conduit.

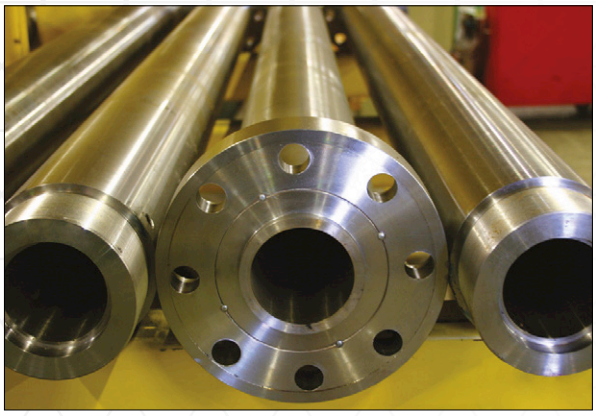
Available free on PPI's website, the guide provides information about the safe handling of reels and coils of HDPE conduit and duct – including the potential risks of cutting open such reels and coils. Certain installation considerations are also addressed from the perspective of worker safety.

HDPE conduit (or PE conduit) is used to house and protect electrical power and communications cables in typical applications such as power utilities and telecommunications. Benefits include availability in long lengths without joints, high strength, flexibility, reliability and installation toughness.

"PE conduit has been used safely in thousands of applications," said Lance MacNevin, director of engineering for PPI's power and communications division. "Still, there are precautions that should be adhered to when handling and transporting any PE product."

Topics covered in the guide include: unloading PE conduit in free-standing reels; releasing the outside wrap of reels or coils; avoiding entanglement of conduit on reels or coils; and safety when cutting conduit to length.

› **www.plasticpipe.org**



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Trelleborg takes over pipes JV

Trelleborg has taken full ownership of the North American plastic pipes joint venture that it runs with Max Seal.

In the operation, which has run since 2014, the two firms have developed and manufactured polymer-based sealing systems together. The JV includes a manufacturing facility in Tijuana, Mexico, which produces watertight seals for a variety of plastic and double corrugated wall pipe systems for water and wastewater.

In early February, Trelleborg acquired the remaining 49% of the shares of Max Seal. Its 130 employees now become part of the Americas organisation of Trelleborg's seals and profiles operation.

"I am delighted we have purchased the outstanding equity of the joint venture," said Magnus Andersson, head of Trelleborg's seals and profiles operation.

› **www.trelleborg.com**

Pipe division 'drives organic growth' at GF

Georg Fischer's piping systems division posted strong results last year, acting as the "main pillar of organic growth" behind the parent company's expansion.

The company as a whole posted sales of nearly CHF4.6bn (US$4.6bn) in 2018, which was 10% higher than the previous year. At the same time, profits rose by 9%.

The piping systems division boosted sales by more than 8%, to exceed CHF1.8bn (US$1.8bn), while profitability (EBITDA) rose to CHF269m (US$269m) – a growth of almost 10%.

Organic growth in the division was 8%. The main growth contributors were Europe and North America, while growth in China was "muted" due to ongoing trade disputes, said the company. The division now accounts for almost half of GF's total sales.

The piping systems division plans to launch a number of new products – including a new line of digital valves – while the company is also developing promising market segments, such as the cooling of data centres.

Looking ahead, macro-economic conditions have become more uncertain and volatile recently, said the company.

"Chances are, however, intact – barring unforeseen circumstances – to pursue our positive development," it said.

Yves Serra, CEO, retires in April and will be replaced by the company's current CFO Andreas Müller.

› **www.georgfischer.com**

Ending 2018 on a sales high

Deliveries of primary plastics machinery in North America increased in the final quarter of 2018 – but full-year figures appear no higher than they were in 2017.

Preliminary figures from the Plastics Industry Association's Committee on Equipment Statistics (CES) reveal Q4 increases in both extrusion and injection moulding equipment: total deliveries for the quarter reached nearly US$377 million – an 8% rise compared to the preceding quarter.

Compared to the equivalent quarter in 2017, single-screw extruders were up by 34% and twin-screw extruders by 52%.

While CES did not release full-year sales, previous quarterly results show a total of around US$1.392bn – a shade ahead of estimated 2017 figures of US$1.385bn.

CES also conducts a quarterly survey of machinery suppliers regarding market conditions and expectation. For the coming quarter, 75% of respondents expect conditions to improve or hold steady; over the next 12 months, 67% expect the market to be steady-to-better.

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Join the party at the Rock and Roll Hall of Fame in Cleveland

Cleveland's iconic Rock and Roll Hall of Fame will be the venue for a major networking party for the plastics industry on the evening of May 8, 2019. The event will be open to visitors and exhibitors from the plastics extrusion, recycling and compounding tradeshows, which are being held at the nearby Huntington Convention Center on May 8-9.

Admission to the Plastics Recycling World Expo, Plastics Extrusion World Expo and the Compounding World Expo plus their associated conferences is free-of-charge if you **register in advance**. Advance tickets for the networking party cost just $20 (less than a standard ticket), and they include exclusive access to all of the Rock and Roll Hall of Fame exhibits, plus a drink and some nibbles – **details here**. The party will run from 7:00PM to 11:00PM.

"This fantastic venue will provide a great place for attendees to relax and network after a busy first day at the exhibitions, which will feature more than 230 exhibitors and over 120 speakers across five free-to-attend conference theatres," said Rita Andrews, head of exhibitions at AMI, the organiser of the events.

Located on the shore of Lake Erie in downtown Cleveland, the Rock and Roll Hall of Fame is a short walk from the Huntington Convention Center and neighbouring hotels. Housed in an eye-catching structure designed by I. M. Pei, it boasts an extensive collection of popular music artefacts spread over six floors. Multi-media exhibits map out the history of rock music and the people who created it.

The breadth and depth of the display is hugely impressive, covering everything from the birth of rock and roll through to current pop stars and everything in between. Fans of rock, pop, blues, country, folk, gospel, soul, funk, R&B, heavy metal, punk, new wave or hip hop will all find plenty to enjoy among the thousands of objects on display.

For example, the attractions include Jimi Hendrix's Stratocaster guitar, David Bowie's iconic outfits, Keith Moon's platform shoes, John Lennon's Sgt Pepper suit, Run DMC's Adidas sneakers, and the awning from legendary New York venue CBGB.

The Hall of Fame also features exhibits on cities that have had a major impact on the development of rock and roll, including Memphis, Detroit, London, Liverpool, San Francisco, Los Angeles, New York, and Seattle. There are also displays focusing on the influential local music scenes in Cleveland, Akron and beyond.

For those who have been lucky enough to visit the attraction before, there is always something new to see including recent acquisitions and constantly evolving temporary exhibits. This year there are displays honouring the 2019 inductees to the Hall of Fame, which are The Cure, Def Leppard, Janet Jackson, Stevie Nicks, Radiohead, Roxy Music and The Zombies. Another new addition will be an interactive display featuring rock-themed pinball machines to play on.

The party is being sponsored by Technical Process & Engineering (TPEI) and Entek, and is supported by AMI's magazines – *Plastics Recycling World*, *Compounding World*, *Film and Sheet Extrusion* and *Pipe and Profile Extrusion*.

For more information on the Rock and Roll Hall of Fame party and to register for the three industry tradeshows and their five focused conference theatres for free, please visit: **www.plasticsrecyclingworldexpo.com/na/**

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Baerlocher invests $30m in India

Baerlocher is to invest $30m at its production site at Dewas in Madhya Pradesh in India. The move will double PVC stabiliser production there by 2021 and expand capacity for metal stearates.

The Dewas plant, which Baerlocher acquired from National Peroxide in 1999, is already the largest PVC stabiliser production operation in India. The company said this latest investment confirms its commitment to the country's buoyant plastics industry and will enable customer conversion to calcium-based technology.

Baerlocher said the first phase of the project, which includes a new warehouse and an increase in its lead and calcium-based stabiliser production capacity, is in the final phase of construction and will be commissioned by mid-2019. 10 hectares of land adjacent to the current plant has been acquired for the next phase of the project.

"With the demand for PVC in India growing annually by 7-8%, driven by growth in agricultural and infrastructure sectors, this investment shows our commitment to our customers and supports the country's 'Make in India' programme," said Jayen Modi, Managing Director of Baerlocher India.

"With our new capacity in 2019, we will remain as a reliable supplier of non-dusting lead stabilisers and liquid mixed metal stabilisers with room to grow further in these sectors. However, a range of exciting new product forms for calcium-based systems will be available to our customers for the first time in mid-2019," he said.

PHOTO: BAERLOCHER

The Indian plant produces liquid and non-dusting metal stabilisers

› **www.baerlocher.com**

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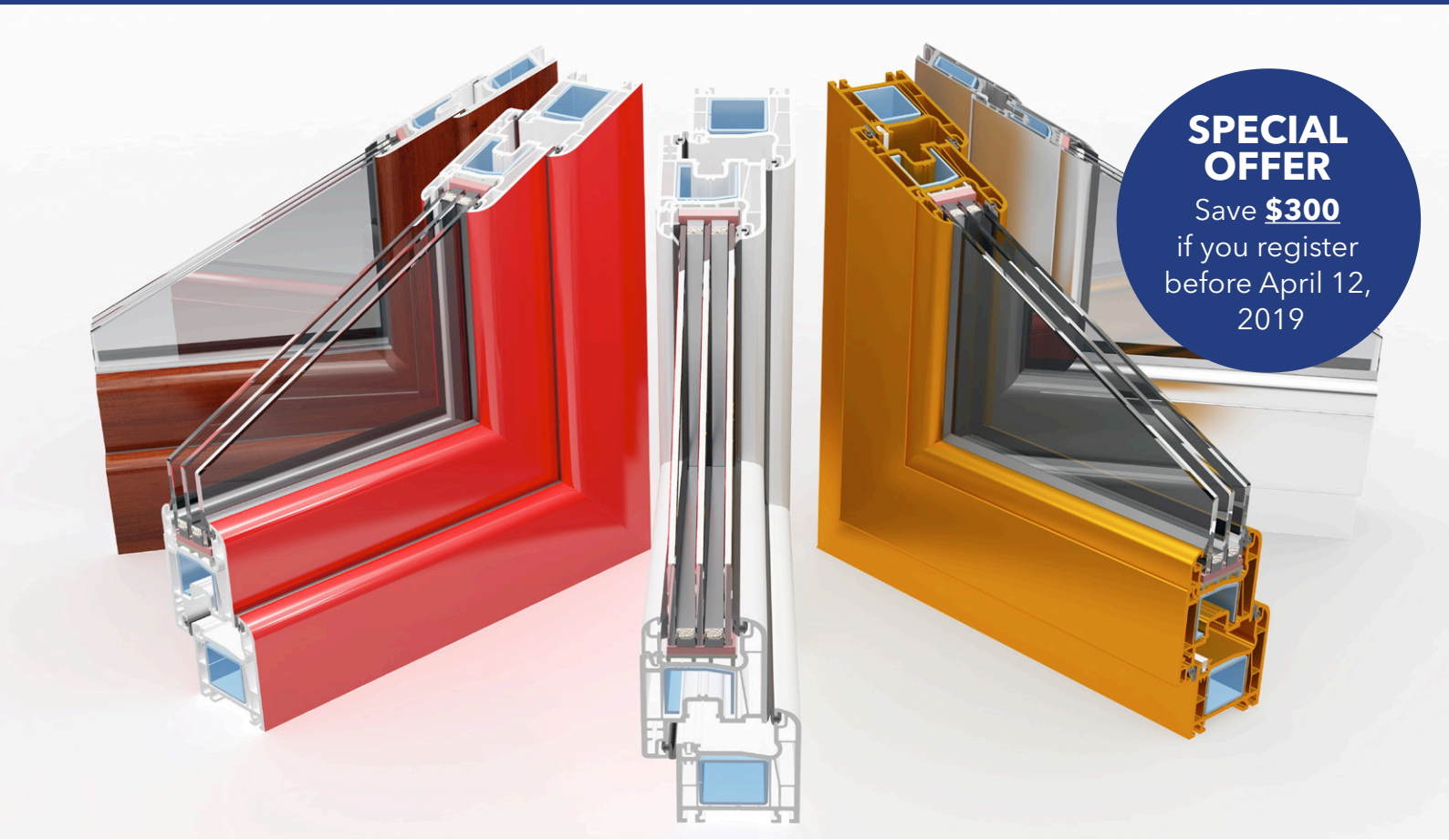

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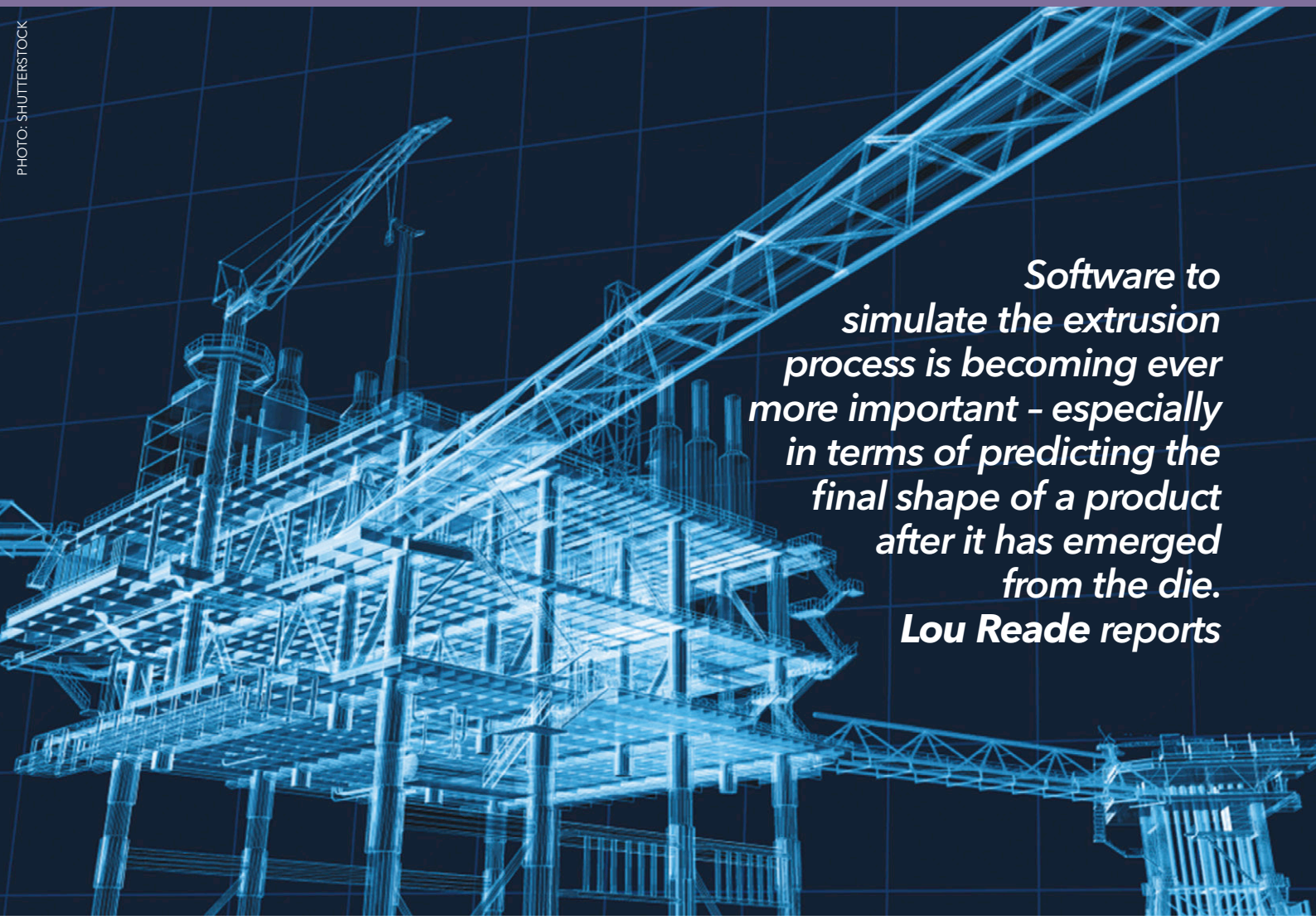


PHOTO: SHUTTERSTOCK

Software to simulate the extrusion process is becoming ever more important – especially in terms of predicting the final shape of a product after it has emerged from the die. Lou Reade reports

Simulation gets under the surface of extruded products

Computer simulation is common across the manufacturing industry, yet it relatively unused within plastic extrusion. However, a growing number of products – in addition to ongoing fundamental research projects – can help pipe and profile extruders to maximise the quality of their products.

US-based **Plastic Flow**, for instance, says that the latest version of its PolyXtrue software can simulate both extrudate cooling and corresponding shrinkage at the same time. Ordinarily, two separate software packages are needed to simulate the flow inside the die and to predict extrudate cooling, it says.

The new version includes the effect of shrinkage due to extrudate cooling as well as the effect of non-uniform exit velocity to predict the extrudate distortion and the shape of the final extruded product.

For accurate analysis of extrudate cooling, shrinkage, and distortion, the new version starts by treating the polymer as a melt near the die exit, but then transforms the analysis to treat the extrudate as a solid at lower temperatures away from the exit. This unified fluid-solid analysis of extrudate gives high accuracy in the predicted temperature and distortion of the extrudate. The algorithm for the post-die analysis has been revamped to simulate this coupled fluid-solid system while improving the computational speed of the software, says the company. Flow in the calibrator – as well as in the post-calibrator region – is also included in the analysis.

The new version continues to run as an add-in inside SolidWorks and Inventor. The OptiXtrue software allows automatic optimisation of extrusion dies by parameterising the critical die dimensions in either of the two geometric modelling software

Main image: Modelling software helps the oil and gas industry predict the effects of ageing on polymer and composite pipes – which are increasingly replacing steel

packages. Many other important features from previous versions of PolyXtrue – such as accurate prediction of layer structure in the final product, and accelerated computation speed using a computer's Graphics Processing Unit (GPU) – have been improved in the new version.

The graphical user interface (GUI) of the software has been updated with new features that make it more effective and more user friendly. Some new features of the PolyXtrue GUI include:

Generating the geometry of the flow channel in the die from the die plate geometry;

Splitting flow channel geometry into multiple volumes, to allow local refinement of the finite element mesh for an accurate simulation;

Generating profile step dies from a series of profile drawings in DWG or DXF format;

Saving and restoring up to four camera views (viewing angle/zoom) to allow comparison of results from multiple simulations;

A new graphing module that plots and compares multiple curves on the same graph, including those from previous simulations. It also allows curve names in the graph legend – include gridlines in the graph – to be changed;

Improved troubleshooter dialogue for viewing and analysing geometry and mesh errors; and,

Accurate control of cut-plane location to show transition points between die plates and die cavity, as well as making it easier to position the cut plane at the die exit.

The latest release of PolyXtrue is also available as a 'Pay Per Execution' (PPX) version.

Tested on profile dies

Last year Mahesh Gupta, managing director of the company, used an early version of the enhanced software to predict extrudate distortion for three different profile dies. The analysis included the effect of both non-uniform exit velocity and cooling shrinkage on distortion.

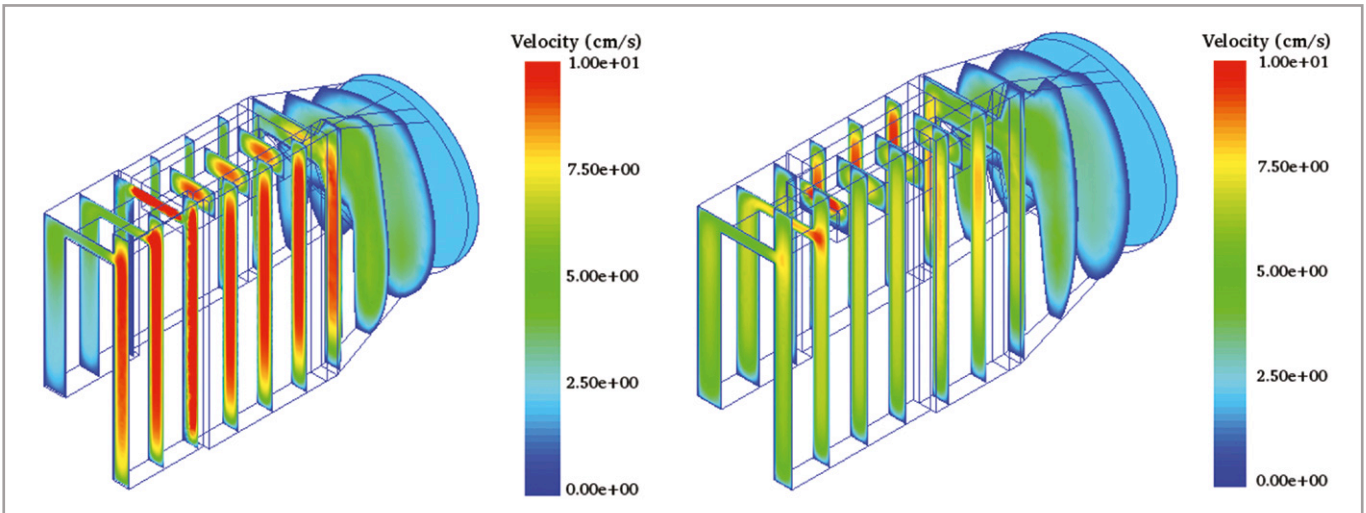
As an extruded polymer exits a die, the shape of the profile can change significantly. There are two elements to this distortion: shape change, due to non-uniform velocity at the die exit; and a reduction in cross-section, due to cooling shrinkage at room temperature. After the polymer leaves the die, the thickness and length of the profile will tend to increase at locations with larger velocity and decrease at lower velocity locations. This non-uniform velocity can cause significant distortion in profile shape.

In work prior to this, Gupta had only included the effect of non-uniform exit velocity to predict the distortion. In the later research, the effect of cooling shrinkage was included, to predict the shrinkage of many different extrudate profiles, he said.

An amorphous polymer (ABS) was used for all profiles. Effect of temperature on the mechanical properties (elastic modulus, Poisson's ratio, and thermal expansion coefficient) of ABS was captured in the simulation.

Flow inside the die was simulated using a number of equations. The existing commercial version of PolyXtrue solved only five of them – which are flow and heat equations – but the enhanced version also solved five thermo-mechanical equations. The extended version was used in the study – and is included in the latest commercial release.

This enhanced version of PolyXtrue includes extrudate shrinkage analysis capabilities, and was used to predict the shrinkage for three different dies – a circular channel, a square channel, and a profile die.



PolyXtrue helped to improve velocity distribution between the initial (left) and new (right) die designs

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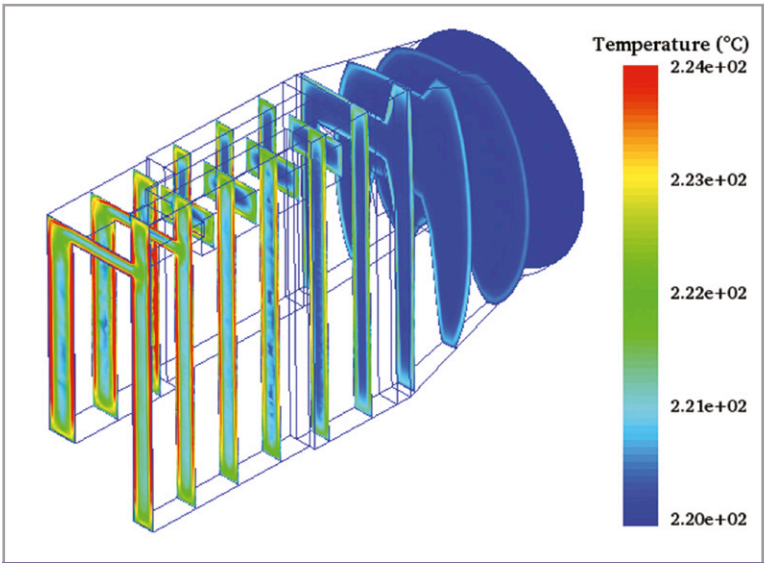

The optimised die showed an improved temperature profile after simulation with PolyXtrue

Results for the circular and the square channels were very similar, so Gupta only presented results for the square channel during last year's Antec. However, it was important to simulate the extrudate shrinkage for a circular channel in order to validate the newly developed extrudate shrinkage code in the software. For the circular channel, the predicted shrinkage matched the corresponding theoretical values.

Because the exit velocity of the optimised die is quite uniform, distortion is smaller than that for the original die.

In conclusion, said Gupta, thermo-mechanical analysis allowed accurate prediction of the cooling shrinkage of extrudate after the polymer exited the die.

"Even though non-uniformity in the exit velocity has the maximum effect on extrudate distortion, cooling shrinkage further increases the distortion after the die exit," he said.

Open source code

At last year's Profiles conference – organised by **AMI** – João Miguel Nóbrega, assistant professor at the **University of Minho** in Portugal, told delegates how his team has used open source computational codes in the design of profile forming tools.

He said that Open Foam (standing for Open source Field Operation and Manipulation) has been used in conjunction with techniques such as multi-physics systems and several pre-compiled solvers – which handle everything from compressible and incompressible flow, combustion, heat transfer and viscoelasticity.

The die design procedure progresses through a series of simulation phases – including geometry generation (using Free CAD), creation of boundary sub-groups (with Salome), mesh generation (using Snappy Hex Mesh) and modelling (using Open Foam). Then, it is assessed for balanced flow distribution. If it is not balanced, either the boundary conditions or geometry are modified.

In one example, the technique was used to assess the production of a polycarbonate swimming pool cover – including testing the effect of non-uniform temperature distribution. This split the die into different temperature zones, which were adjusted in order to ensure the correct shape of the final part.

Future work in profile extrusion dies is expected to look at predicting extrusion die swell, and develop a number of automated design procedures, he said.

Offshore use

Simulation is not restricted to the production of extruded parts. At AMI's recent Oil & Gas conference, Ramin Moslemian, principal scientist at **DNV GL** in Norway, told delegates how modelling software is used to predict the lifetime of polymer and composite pipes in the oil and gas industry.

While the industry has historically relied on steel pipe, problems of corrosion and heavy weight has led it to use alternative materials such as polymers and composites – which are not in danger of corroding but may go through different types of ageing processes. For instance, polymers may undergo environmental ageing through leaching of additives or chemical degradation, as well as through temperature effects. Typical problems include failures in PVDF or nylon liners, or PE liner collapse in rehabilitated pipes.

"For composites, ageing is more complex due to the possibility of ageing in matrix, fibres and their interface," he said.

The various mechanisms behind failure can be modelled in order to determine the likely effect of each on pipe life and performance. However, using only experimental data offers "limited possibilities" and is both costly and time consuming, he said.

"Models which are based on the physical understanding of various degradation mechanisms can enhance our understanding while reducing the risk and cost of utilising polymers and composites in the oil and gas industry," said Moslemian. "Such models can be enhanced if they are implemented in a probabilistic framework which uses innovative methodologies including data analytics and machine learning."

This kind of 'digital framework' uses experimental data, finite element modelling and 'expert belief' – in combination with machine learning algorithms – to build an accurate prediction of

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Right: Fraunhofer IGD says shifting simulation calculation from the CPU to the graphics processor has helped it develop new software that carries out design and simulation in parallel

behaviour, he said.

In the longer term, this work will be used to create a 'digital twin' of polymer and composite parts, which can be used in their design, qualification and integrity management, he said.

Parallel simulation

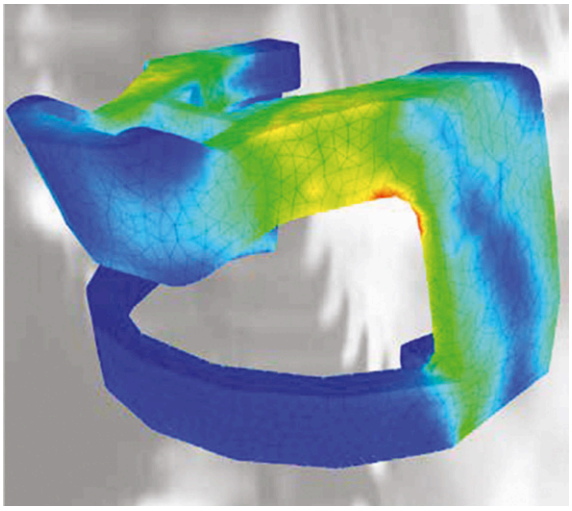
The **Fraunhofer Institute for Computer Graphics Research** (IGD) has developed new software that carry out two separate tasks in parallel: computer-aided design of a component and the simulation of its stability. Previously, designers needed different tools to do this, comprising geometric modelling, simulation, and analysis – usually on different machines. This required data models to be manually converted between the tools.

Daniel Weber, who leads the 'Interactive Simulation' group at Fraunhofer IGD, speaks of a trend-setting evolution of construction work towards a more direct, intuitive working style. This naturally leads to better results, not only in terms of the required development time but also the quality of the design.

The core of the new technology is an efficient equation solver for structural mechanics, as it shifts the simulation calculation from the CPU to the graphics processor – which has massively parallel calculation potential. The software was developed for commercially available graphics cards with CUDA architectures.

"While a CPU has only four to eight cores, up to 5,000 cores are available on the graphics card," said Weber.

Since the computational time is much faster than standard simulations, the designer sees results in



near-real time – and can immediately identify room for improvement and optimise the design quickly. In tests, Fraunhofer IGD said that commercial software needed 36 seconds to generate a model with more than 300,000 finite elements, while its solution needed 0.5 seconds of pure computation time – for a total time of 3.5 seconds with initialisation.

"Depending on how we look at it, our simulation solution is 10 to 70 times faster than the comparison software," said Weber.

Fraunhofer IGD is looking to attract licensees – such as design engineers in large companies, and manufacturers of relevant software.

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AMI's 11th PVC Formulation conference takes place in Cologne in April, providing a meeting point for the European PVC industry. We preview the event

PHOTO: SHUTTERSTOCK

Formulating ideas for PVC

Main image: PVC Formulation 2019 will explore market, regulatory and technology developments affecting the PVC industry

PVC may be one of the longest established polymers but it is also one of the most versatile, with material and technological innovations ensuring that it continues to adapt to changes in regulation and new performance demands. AMI's 11th PVC Formulation conference, which takes place in Cologne in Germany on 1-3 April 2019, will once again provide the forum to learn more about the latest market, material and technological developments impacting the European flexible and rigid PVC industry.

PVC Formulation 2019 brings together industry-elite speakers from across the entire supply chain with the aim of identifying opportunities and overcoming obstacles in the international PVC industry. The two-day agenda includes developments in plasticisers, innovation in additives, strategies for cost-reduction and performance improvement, as well as an update on PVC industry regulation and the latest sustainability initiatives. This article takes a more detailed look at the speaker line-up and topics.

PVC Formulation 2019 will be opened by **Thomas Hülsmann**, Managing Director at industry association **AGPU** in Germany, who will look at the latest market trends and key applications with a focus on plastics strategy and current status of regulations. He will also share the results of the German 2019 PVC survey and look at the achievements of the vinyl industry in the context of markets, political debate and regulation. He will be followed by **Yves Heroes**, Director Market Intelligence at **Kem One** in France, who will discuss the impact of the current trade wars on the supply and price development of PVC resin as part of a rounded market overview.

The conference will then move on to discuss plasticisers. **Perry Walters**, Technical Manager at **European Plasticisers** (part of CEFIC) in Belgium, will give an overview on the safe and sustainable use of the wide range of plasticisers which are available on the market today, touching also on regulatory developments. Then **Megan Kravec**, Business Development Manager at **Valtris Specialty Chemicals** in the US, will present a detailed examination of the properties of a novel low-volatile cyclohexanoate fast-fusing plasticiser. **Matheus Oliveira Loyola de Souza**, Technical PVC Engineer at **Unipar** in Brazil, will provide a performance comparison between phthalate and non-phthalate plasticisers in PVC applications. And the final presentation in the session will be given by **Anders Magnusson**, Technical Market Development Manager at **Perstorp** in Sweden, who will discuss the sustainability, performance and safety characteristics of polyolester plasticisers. ›

Moving on to resin and additive innovations, the next session of the conference will be opened by **Dr Bernhard Pelzl**, Head of Group R&D at **Chemson Polymer-Additive** in Austria, who will examine some of the newest trends in highly-filled PVC compounds. Then **Wouter Devriese**, Global Manager Technical Service TempRite Engineered Polymers at **Lubrizol Advanced Materials** in Belgium, will explain how addition of CPVC resin to PVC formulations can enhance material performance. And **Tony Gaukroger**, Director at **Colourtone Masterbatch** in the UK, will detail how infrared reflective colours can be used to extend the service life of PVC building products.

Jurgen Hartmann, Managing Director **at Add-Chem Germany**, will review how CPE can be applied as a cost-effective impact modifier for high-quality PVC formulations. **Dr Bernard Cora**, TS&D Director at **Dow France**, will compare different impact modifier types for outdoor rigid PVC formulations. And an insight into developments in bio-based lubricants for rigid PVC extrusion applications will be delivered by **Dr Christian Mueller**, Global Technical Market Manager Green Polymer Additives at **Emery Oleochemicals** in Germany.

The second day of PVC Formulation 2019 will be opened by **Dr Timo Seibel**, Head of Group Product Development at **Chemson** in Germany, who will look into the future with an analysis of the potential for PVC in additive manufacturing (3D printing) applications. Then **Dr Andreas Winter**, Senior Technical Service/Senior Account Manager and **Dr Michael Fischer**, Technical Service, Account Manager at **Vinnolit** in Germany, will present an overview of copolymer systems. And **Jean-Christophe Lepers**, Technical Marketing Development Specialty Vinyls at **Innovyn** in Belgium, will speak about vinyl resins to meet future automotive sealing requirements.

The focus will then turn to flame retardancy. **Dr Yann Bourgeois**, Product Manager at **Huber Engineered Materials** in the US, will explore the potential of molybdates in improving flame and smoke properties in PVC and explain how that fits into the context of new regulations. Then **Ian Yates**, Business Development Manager UltraCarb at **LKAB Minerals** in Germany, will review the latest developments in application of huntite-hydromagnesite in flame retardant formulations.





Expert speakers at PVC Formulation 2019 include (clockwise from left) KemOne Director of Market Intelligence Yves Heroes, European Plasticisers Technical Manager Perry Walters, Innovyn Technical Marketing Development Specialty Vinyls Jean-Christophe Lepers, BASF Vice President Regulatory Affairs/Advocacy Industrial Petrochemicals Europe Dr Rainer Otter, and Vinylplus Technical and Environmental Affairs Senior Manager Dr Vincent Stone

The final session of the conference will address legislation and sustainability issues. It will open with an examination of the new 3R challenge for the chemical industry – Research, Rebuttal and Regulations. This will be given by **Dr Rainer Otter**, Vice President Regulatory Affairs/Advocacy Industrial Petrochemicals Europe at **BASF** in Germany. He will be followed by **Dr Vincent Stone**, Technical and Environmental Affairs Senior Manager at **Vinylplus** in Belgium, who will discuss the voluntary commitments of the European PVC industry in the context of the EU circular economy. And the conference will be brought to a close by **Jan Mervart**, REACH Specialist R&D at **Deza** in the Czech Republic, who will detail the DEHP authorisation and restriction process from a manufacturer's perspective.

About PVC Formulation Europe 2019

Running in Cologne in Germany on 1-3 April 2019, AMI's 11th PVC Formulation conference once again provides a meeting, learning and networking point for the entire PVC industry supply chain. Expert speakers will come together to identify key global market trends influencing the PVC supply chain and to explore developments in resins, plasticisers and additives for production of PVC compounds.

Aside from its formal presentations, this international conference includes a mini-exhibition while informal breaks throughout the two-day event allow attendees to exchange ideas and develop new business contacts. Further networking opportunities are available at the optional informal conference dinner.

To learn more about PVC Formulation 2019, to book your place, or to find out about sponsorship or exhibition opportunities, visit the **conference website** or contact Conference Organiser Rebecca Weir. Tel: +44 (0)117 314 8111; Email: **Rebecca.weir@ami.international**

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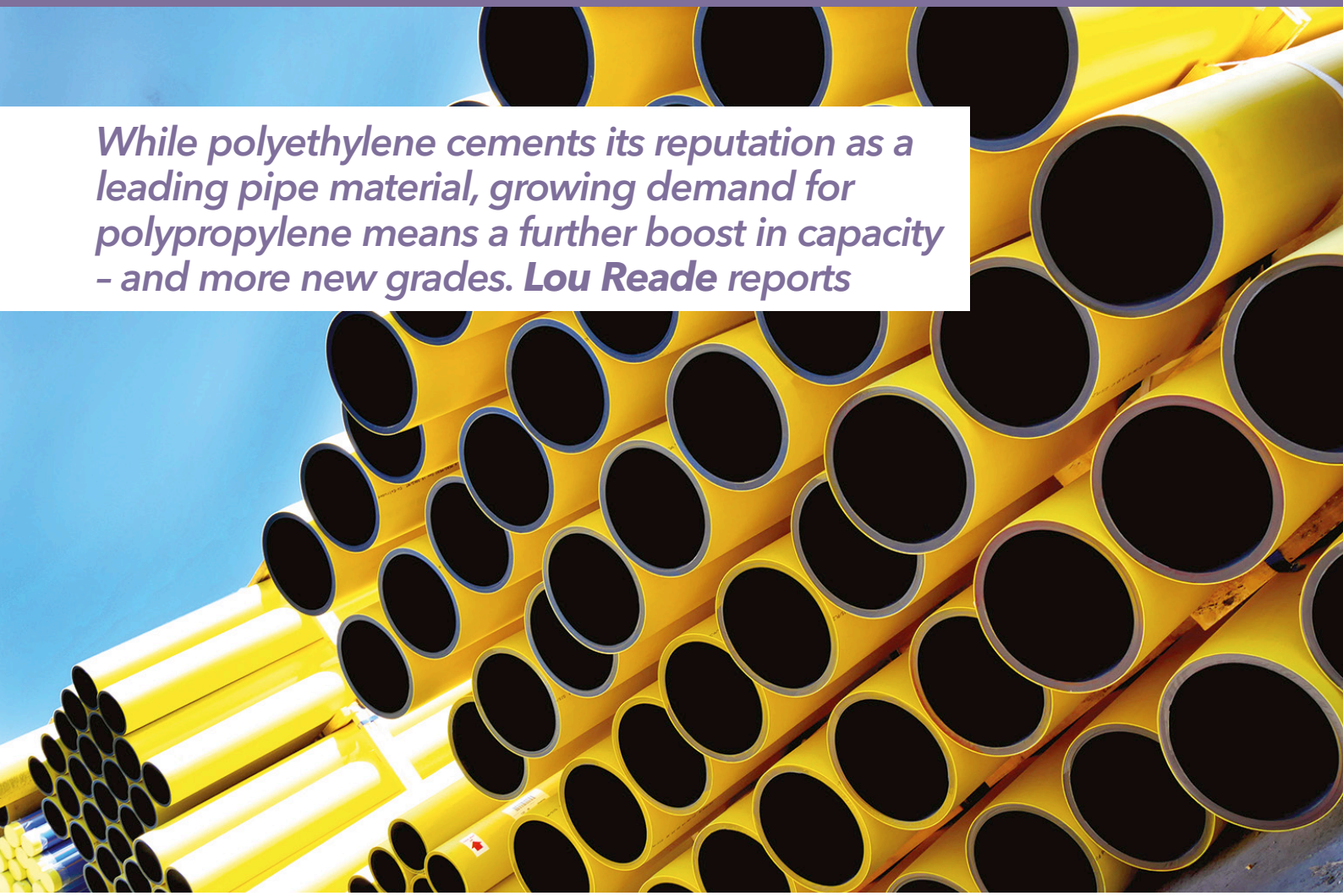


While polyethylene cements its reputation as a leading pipe material, growing demand for polypropylene means a further boost in capacity – and more new grades. ***Lou Reade*** *reports*

Polyolefins making their mark in pipe applications

Polypropylene (PP) pipe is an established product in Europe, but less well known in North America – though this has recently begun to change. In response, the US-based **Plastics Pipe Institute** (PPI) has created a new industry technical committee to support the growing use of PP pipe.

Its Polypropylene Pressure Pipe Steering Committee (P4 SC) – part of the Building and Construction Division (BCD) – will focus entirely on two types of PP pressure pipe: polypropylene random copolymer (PP-R), and polypropylene random copolymer with modified crystallinity and temperature resistance (PP-RCT). Both types of pipe are approved for potable hot and cold water plumbing systems, hydronic heating and cooling systems, and other applications.

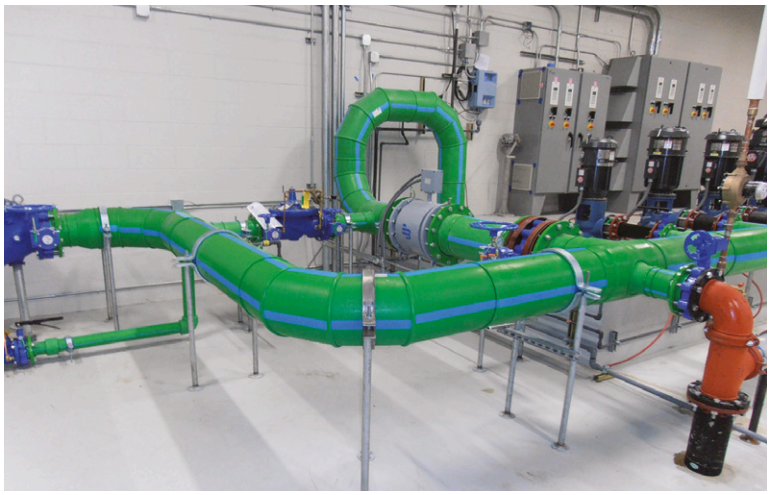
"PP pressure pipes are relatively new in North America, and PPI can help grow this market in a technically correct and responsible manner," said Tony Radoszewski, president of PPI.

PPI says the new committee fits well with BCD's focus on plastic pressure pipe and tubing systems used in buildings and on building premises for applications such as plumbing, water service, fire protection, hydronic heating and cooling, snow and ice melting and ground source geothermal piping systems.

Lance MacNevin, BCD's director of engineering, said: "Our first activity was to publish a new PPI webpage dedicated to PP-R and PP-RCT piping systems, which contains technical information, lists of advantages and applications, plus links to PPI member firms that produce PP-R and PP-RCT systems."

MacNevin says that the new committee will engage in a wide range of activities, including: supporting industry efforts to update and harmonise product standards ASTM F2389 and CSA

Main image: HY100 gas pipe from Radius Systems combines a yellow PE80 outer with a black PE100 inner layer



Above: PPI has created a new technical committee to support the growing use of PP pipe in North America

B137.11; coordinating and publishing research on proper uses of PP systems for plumbing and hydronic applications; developing online calculators for design of PP piping systems; and creating educational content about PP materials.

PPI's first publication related to PP-R pressure pipe is PPI TN-57, which provides information on proper integration of copper tubing and components with random copolymerised polypropylene (PP-R) piping materials for plumbing applications.

"This document is a great example of the kind of educational content the P4 SC and PPI can generate to help the industry as a whole," said MacNevin.

Gas supply

Radius Systems says that its new high performance HY100 gas pipe provided a modern, durable solution for low- and medium-pressure gas networks and pipeline rehabilitation schemes.

HY100 is part of a wide range of solutions from Radius. Specifically designed for gas distribution, it is a robust, co-extruded solid wall pipe with a yellow PE80 outer – for pipe identification and application recognition – and a black PE100 inner. The use of high performance PE100 material enables Radius to offer an SDR21 pipe with increased gas-carrying capacity and a maximum operating pressure of 2 bar. The polyethylene material used for the pipe manufacture provides maximum corrosion resistance and long service lifetime – and is compatible with conventional electrofusion and butt-fusion jointing techniques.

Pipes are manufactured in diameters of 250-450mm within Radius' ISO 9001:2015 certified manufacturing facilities, and are approved to appropriate UK gas industry specifications. The HY100 pipe is also compatible with approved electrofusion and spigot fittings, says the company.

"We have engaged with our customers to develop a cost-effective range of solid wall pipes that combine the strength of PE100 with the yellow colour identification of PE80," said Mark Hunter, product support and marketing manage. "The pipe range is fully approved to the UK gas industry specification to meet our customers' requirements."

European expansion

Meanwhile, **Borealis** is to increase its PP production in Europe by adding 80,000 tonnes/year capacity at its Kallo plant in Belgium. The extra material is expected to come onstream by mid-2020.

At the same time, the company has approved the start of the Front End Engineering and Design (Feed) phase to expand its PP plant in Beringen in Belgium. The final investment decision on this expansion (of up to 300,000 tonnes/year) is due to happen by the end of this year, with start-up expected in mid-2022.

This project would include an upgrade of the current process technology to the proprietary Borstar platform.

These capacity increases aim to take advantage of the extra propylene supply coming from the new PDH (propane dehydrogenation) plant in Kallo. Feedstock will flow to Beringen via an underground pipeline network.

"This PP capacity increase will be another significant European investment aimed at serving our European customer base," said Alfred Stern, CEO of Borealis. "In Europe, polypropylene supply is not keeping up with increasing demand. With the market tightening and continuous application expansion for PP materials, additional investment is needed to support the growth of our customers."

Certified circular

SABIC has produced its first polymers – polyethylene (PE) and polypropylene (PP) – using a feedstock from mixed plastic waste.

It says that these 'certified circular polymers' introduce pyrolysis oil from plastic waste into the company's Geleen production site in The Netherlands. The pyrolysis oil, called Tacoil – and produced by UK-based **Plastic Energy** – is derived from the recycling of low quality, mixed plastic waste that would otherwise be landfilled or incinerated.

The project is currently at the market foundation stage, with the first monthly volumes of PE and PP now available. The company estimates that full-scale commercial production will begin in 2021.

"Certified circular polymers are a disruptive innovation and the market foundation stage is a critical phase in their development," said Frank Kuijpers, general manager for corporate sustainability at the company. "It will act as a bridge

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Right: Jeroen Castelijn (left), general manager of SABIC's Geleen site and Frank Kuijpers, general manager for corporate sustainability, at the plant that has begun producing 'certified circular polymers' in the Netherlands

moving from a linear economy to a circular one and enable the value chain to become familiar with the products and consider how they can best be implemented in their own markets."

The polymers are certified through the International Sustainability and Carbon Certification plus (ISCC+) scheme that certifies circular content and standards across the value chain from source to end product. The certification works on a "mass balance system", meaning that for each tonne of circular feedstock fed into the cracker and substituting fossil-based feedstock, a tonne of the output can be classified as circular.

Pipe launches

SABIC is, of course, still producing many traditional polyolefins – including five pipe grades that it showed at last year's NPE exhibition in the USA.

The grades are: HDPE P6006NA for high-pressure industrial pipe; Vestolen A Rely 5933RD, a high-density polyethylene (HDPE) product for chlorinated potable water; HDPE P4200RT and Supeer P8200RT for domestic pipe applications, including under-floor heating; and LLDPE P438J for drip irrigation pipes.

For industrial pressure pipe used to transport water and gas, new HDPE P6006NA combines high stress crack resistance properties with long-term hydrostatic strength. It is made using multi-modal polyethylene (PE) resins and is designed for high-pressure applications according to the US PE 4710 rating.

For underground infrastructure applications, its Vestolen A Rely 5933RD can deliver a longer useful life, especially for potable water distribution pipe requiring improved resistance to chlorinated disinfectants. This HDPE grade is a PE100 classified solution. It delivers higher resistance to slow crack growth than standard PE100 grades, for potential use in trenchless installation techniques.

The company also showed two solutions for domestic pipe, which can be used for under-floor heating systems and mono and multilayer pipe systems for plumbing and heating. The grades are designed to meet all the requirements of DIN 16833/ISO 24033 for PE-RT Type II. HDPE P4200RT provides high stress crack resistance, long-term hydrostatic strength and high heat stability. It features high melt viscosity for extrusion of pipes with a wide range of diameters, from larger and thicker to smaller with thin walls.

At the same time, Supeer P8200RT, boosts pipe

Stadium supply

PP pipe maker **Aquatherm** is playing its part in the 2022 Word Cup in Qatar – having already installed its products in three football stadiums there.

The Khalifa International Stadium in Doha has already been renovated, for instance: it offers space for 40,000 spectators and has been fitted with Aquatherm Green Pipe – in dimensions of 20-250mm in diameter – for drinking water supply and public facilities.

Around 50km north, in Al Khor, Aquatherm Green Pipe of 20-355mm has been installed at the Al Bayt stadium, while in Doha's Ras Abu Aboud stadium, the entire drinking water supply is supplied by Aquatherm pipes.

A fourth facility, the Lusail Iconic Stadium, will be equipped with Aquatherm Blue Pipe for refrigeration, as well as additions of its Green Pipe.

Volker Köhler, sales area manager for Africa and the Middle East, said of the construction site: "I am very satisfied with the results so far and am convinced that the 2022 World Cup will be a very special event."

flexibility while maintaining pressure resistance, making it grade suitable for flexible pipe systems with fewer fittings or connectors – ensuring faster installation. It also provides long-term hydrostatic strength, good surface finish and high processability.

Finally, its LLDPE P438J – for thin-wall components used in drip irrigation, such as laterals, tapes and sub-mains – can help its customers enter the agriculture and aquaculture sectors. The grade, which incorporates additives, avoids the need to blend multiple materials. The grade combines stiffness, toughness and high melt strength, and has good flow properties.

Irrigation innovation

Meanwhile, 'Green Plastic' – the polyethylene produced by **Braskem** from sugarcane – is now being used to make irrigation pipes.

At last year's International Irrigation Fair 2018, Italian manufacturer Irritec showed its new line of Multibar tubes for use in tree and orchard crops, vineyards and orchards nurseries. The products are made with Braskem's sustainably derived material.

"This is a pioneering project in agriculture, as it marks the entry of this material into the irrigation segment," said Pedro Moldenhauer de Lima, commercial manager at Braskem.

The material resin, made from sugarcane, has the same physical characteristics as conventional PE. One of its main differentials is the capacity to capture 3.09 tonnes of CO2 per tonne produced, which reduces greenhouse gas emission into the atmosphere. In addition, it is recyclable.

Luiz Carlos Fernandes, managing director of Irritec, says the company chose to use Green Plastic in its Multibar line because it is the one with the highest added value – as well as having the longest shelf life and so is most appropriate to be made with sustainable material.

"Irritec's mission is the continuous search for innovative materials and solutions that guarantee the creation of increasingly efficient products for agriculture, with the lowest environmental impact," he said.

Crossing the ocean

Agru recently opened its new XXL pipe production facility in Charleston, South Carolina in the USA – and has since been working on huge project: making pipe lengths over 500m – with outside diameters (ODs) up to 2.83m – for the seawater intake of a cooling circuit for a power plant situated in the Middle East.

The company says this is the first time that a fully pressure-resistant polyethylene (PE) pipe with an OD of more than 2.5 m has been towed on the sea. Albert Lueghamer, head of application technology and senior sales manager at Agru in Austria, said it was the biggest volume of large-diameter pipes sold in Agru's history. Because of the length of the pipes and their large diameter, the order had to be fulfilled at the XXL facility.

A real challenge was to transport the 0.5km long pipes. Tugboats transport the them across the Atlantic and Indian Ocean to the destination – a journey of more than 25,000km. Several refuelling stops were needed – on a sea route where pirates operate, and has a tow time of more than 130 days.

In early December 2018, the first ship arrived in South Africa to refuel. The pipes were inspected to check for damage after crossing the Atlantic – though there was nothing to worry about. While being towed, the ship also has two accompanying 'shuttles', made by Agru, that emit radar beams and carry position lights to warn other ships about the length of the cargo.

Other recent polyethyene pipe applications in which Agru has been involved include: a €15m (US$17m) project by French company SIBA to build a reservoir that incorporates HDPE Agruline pipes of 500mm OD; and what is being billed the world's highest indoor waterfall at Changi Airport in Singapore – a 40m high structure that uses more than 2,400m of Agruline HDPE pipe with ODs of 110mm that were joined together by both butt-welding and electro-socket welding.

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Below: Agru's XXL pipe production facility in the USA recently produced 500m pipe lengths – which were then towed by ship to a power plant in the Middle East

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Technology advances boost medical tubing

Visitors to the MD&M West show in the USA found a variety of new materials at their disposal – while delegates at a recent medical conference learnt more about machinery used to make tubing

Medical tubing may all look similar, but the huge diversity in applications – from IV drips to catheters – means that a range of materials and production technologies are needed to ensure that the product has the correct dimensions and properties. A number of new technologies – particularly materials – were recently seen at the MD&M West exhibition in Anaheim, USA, while innovative production and testing technologies were presented at a recent medical conference in the USA.

DEHP-free

Teknor Apex showcased a new range of medical-grade PVC compounds at MD&M West, which were made without DEHP or other ortho-phthalate plasticisers.

Its Apex PVC and Flexalloy PVC elastomer compounds are available in 10 series, each with Shore A hardness from 50 to 90 (for Apex grades) and 40 to 80 (for Flexalloy grades). All the compounds can be ETO-, gamma- and E-beam-sterilised and exhibit good colour hold, says the company.

Extrusion grades are suitable for use in respiratory, blood transport and delivery, catheter, enteral feeding and many other types of tubing applications. The new compounds offer several alternatives to DEHP and other ortho-phthalate plasticisers, including:

- TOTM – a trimellitate with the lowest extractability from the PVC matrix and highest resistance to crazing or stress cracking when in contact with polycarbonate or ABS, as well as good toxicology results;
- ATBC (Acetyl Tributyl Citrate), derived from citric acid rather than petroleum sources, exhibits processing behaviour almost identical to that of DEHP, with excellent toxicology; and,
- TOTM/DOTP and ATBC/DOTP – plasticisers based on proprietary blending technologies to give formulations that are more cost-effective than 100% TOTM or ATBC, while provides equivalent or superior processing, says the company.

"This portfolio of 'off-the-shelf' medical PVC compounds help customers reduce their time-to-market while having multiple options for replacing conventional phthalate plasticisers," said Derek Laffey, medical industry manager for the vinyl division of Teknor Apex.

The products are supplied with a full complement of physical property, biocompatibility and regulatory test data, and are pre-compliant with global standards.

Catheter partnership

Conair teamed up with multiple partners at the show to produce a 1.4mm FEP (Neoflon) catheter

Main image: Multiple partners teamed up to produce a 1.4mm FEP catheter tube at MD&M West earlier this year

Right: Tekni-Plex has expanded silicone tubing capability by adding a new extrusion line at its Suzhou facility in China

tube – showing the combination of extrusion, sizing/cooling, gauging, cutting, drying, conveying and quality control needed to make it.

The tube is made of clear FEP delivered by the primary 0.75in **Davis-Standard** extruder. A second 0.75in extruder delivers white FEP filled with 8% barium sulphate for X-ray opacity. The resin streams are combined in a cross-head coextrusion die supplied by **Guill Tool & Engineering** so that the barium-filled material forms three stripes that are fully embedded in the wall of the tubing. The stripes are visible under X-rays, enabling physicians and surgeons to see how the tube is positioned within the patient.

Resins were supplied by **Daikin** and **PolyOne Colorant Chromatics**.

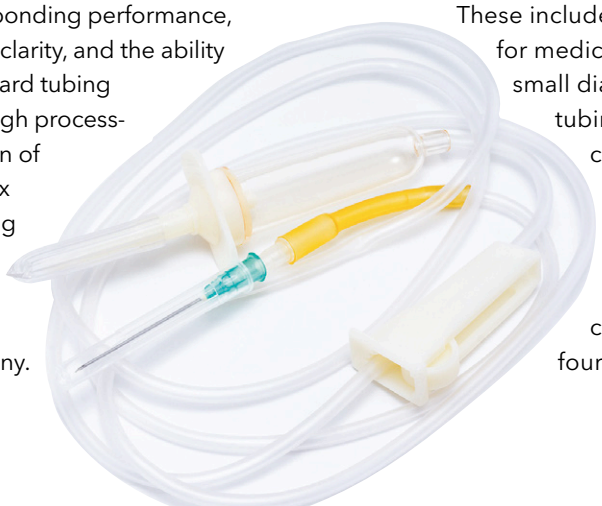
The extruders were surrounded by Conair upstream and downstream equipment and **Zumbach** monitoring systems. After exiting the die, the tube enters a Conair MedVac vacuum-sizing/cooling tank. The vacuum creates pressure inside the tube that stabilises dimensions and prevents cooling water drooling out of the tank's feed opening and affecting the surface finish of the tube. A Zumbach ultrasonic gauge inside the tank monitors wall thickness, while a three-axis OD laser gauge downstream from the tank provides closed-loop dimensional control, allowing concentricity adjustments.

Several other pieces of Conair downstream equipment – including a MedLine servo-driven puller/cutter, MicroWheel MW1-0.2 dryer and Thermolator temperature control unit – were also used on the line.

Combined advantage

Ineos Styrolution introduced its new Styroflex 4G80, a styrene thermoplastic elastomer (S-TPE) that combines transparency, elasticity and high processability – making it suitable for extrusion applications.

The material is aimed at various medical tubing applications – ranging from traditional IV sets to more complex multi-layer tubing structures. Key properties include: high bonding performance, good kink resistance and clarity, and the ability to be processed on standard tubing extrusion equipment at high processing rates. This combination of properties makes Styroflex 4G80 applicable for tubing applications that have historically been developed with other materials, says the company.



Right: Styroflex 4G80's combination of transparency, elasticity and processability makes it suitable for medical extrusion

Alexander Silvestre, global director for healthcare, said: "Styroflex 4G80 has been developed with some of our partners to ensure a market need was properly met. It was designed to meet the demanding needs for medical tubing, but also cater to the desires for some medical OEMs looking for an alternate solution."

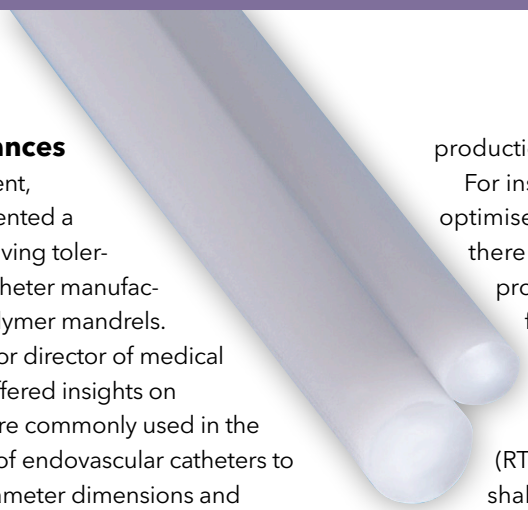
Silicone boost

Natvar, a subsidiary of **Tekni-Plex**, highlighted its silicone tubing capability, which has recently expanded after the addition of a new extrusion line at its Suzhou manufacturing facility in China – boosting capacity and allowing the production of smaller sized tubes.

The new line is producing smaller sized tubing – down to 0.2mm inside diameter, 0.1mm wall thickness and tolerances as low as +/- 0.03mm – for medical pump applications, including peristaltic and patient-controlled analgesia (PCA) pumps.

"Supplying tight tolerances in silicone tubing from our China facility will be of interest to pump manufacturers who assemble their medical devices in the region and have had challenges sourcing quality tubing," said Bob Donohue, general manager of Natvar.

The China facility also makes medical tubing in other materials including PVC, thermoplastic urethanes (TPU) and thermoplastic elastomers. These include large diameter tubes for medical equipment down to small diameter micro-extruded tubing for endovascular catheter applications. These micro-extruded tubes can be produced with walls as thin as 0.076mm (0.003in) and coextruded with up to four layers.



Left: Dunn Industries extrudes an acetal rod that is used to maintain the inner wall dimensions of catheters

Better tolerances

At the same event, Tekni-Plex presented a paper on improving tolerance during catheter manufacturing using polymer mandrels. Dan Lazas, senior director of medical components, offered insights on mandrels that are commonly used in the manufacturing of endovascular catheters to retain inside diameter dimensions and tolerances. Topics covered during the presentation included mandrel application, selection and design for manufacturability.

The use of polymer mandrels has proliferated in recent years, he said, due to the increase in cardiovascular and neurovascular guide catheter innovations and demand for thin wall, tight tolerance designs – with the most common application for polymer mandrels being the production of braid-reinforced catheter shafts. Polymer mandrels are also used to produce thin wall tubing with tight tolerances that cannot otherwise be produced using free-extrusion.

Dunn Industries, another Tekni-Plex subsidiary, highlighted its range of acetal catheter core mandrels. Dunn's proprietary process precision-extrudes a solid acetal rod, which is supplied on continuous spools for ease-of-use during catheter processing operations. The cores maintain inside wall dimensions during initial extrusion of the inner polymer layer, application of the reinforcing fibre layer and extrusion or 'jacketing' of the outer layer.

Small scale

At the **AMI** Medical tubing conference – held in October last year in Boston, USA – Jason Baird, senior process engineer at **Davis-Standard**, told delegates of some of the challenges behind very low throughput (VLT) extrusion, which is typically applied in the production of micro-tubing.

While macrobore medical tubing typically sees throughput rates of 800 ft/min and tolerances of 0.003-0.005in, microbore tubing throughputs are generally below 100 ft/min with tolerances down to 0.0005in. While the former focuses on speed, the latter focuses on quality. Macrobore tubing has outputs measure in hundreds of kg or lbs per hour – while microbore tubing is made at 'fractions' of kg or lbs per hour.

Production cannot simply be 'scaled down', he said, as smaller extruders present practical problems – including feeding issues and structural integrity problems. Instead, components such as screws must be correctly designed for this new production scale, he said.

For instance, the screw design should be optimised for a particular resin. In terms of sizing, there should be excellent die flow distribution, proper (but not excess) drawdown, and room for controllability.

Key goals in the extrusion operations are to get a homogeneous melt, consistent throughput and low residence time (RT), he said. Some ways to reduce RT include shallow, narrow channels, and using a shorter extruder.

Tube testing

At the same event, Elizabeth Kidd, custom applications scientist at US-based **BTG Labs**, told delegates how using water contact angle measurements can be used to validate surface modification of polymer tubing.

The contact angle indicates the shape of a droplet of fluid on a surface, which is a measure of its 'wettability'. This kind of testing is a way of evaluating catheter surfaces, for instance, to detect the presence of coatings (which could be there due to contamination), or to monitor whether a surface treatment process has been successful.

The test can be done using a gauge that produces a result within 2 seconds, she said. The test is also non-destructive. BTG routinely uses the test to evaluate the level of plasma treatment on polymer catheters, or to monitor cleanliness.

In one case, a customer was concerned about an extruded catheter showing a strange surface phenomenon with ageing: the surface energy appeared to increase with out-time, while adhesion strength was reduced. At the same time, wiping with solvent decreased the surface energy.

BTG analysed the surface using contact angle analysis and ATR-FTIR – revealing that the surface was contaminated with unreacted monomer.

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Pipe and Profile Extrusion magazine will be hosting a focused conference theatre at the free-to-attend Plastics Extrusion Wold Expo in Cleveland, Ohio, in May. We preview the programme

Pipe & Profile Extrusion conference details confirmed

Main image: Conference theatres proved very popular at AMI's first free-to-attend Expos, which took place in Essen, Germany last year

The conference programme for the *Pipe and Profile Extrusion* theatre at the Plastics Extrusion World Expo has just been published. It is free to attend the conference sessions and the tradeshow, which take place on 8-9 May 2019 at the Huntington Convention Center in downtown Cleveland, Ohio. Register for your free ticket **here**.

The Plastics Extrusion World Expo is taking place alongside the Compounding World Expo and the Plastics Recycling World Expo – your free ticket covers all three events. More than 230 companies have already booked booths at the focused tradeshows. There will be five free-to-attend conference theatres, including the one hosted by *Pipe and Profile Extrusion* magazine, and they will feature a total of 120+ speakers, 15 business debates, and nine training seminars.

The keynote address on the first day in the *Pipe and Profile Extrusion* theatre will be given by Richard Krock, VP for regulatory and technical affairs at **The Vinyl Institute**. He will provide a valuable update on the US vinyl industry. TThe opening keynote on the second day, examining technologies for expanding the use of plastics in pipe systems, will be given by Sarah Patterson, technical director at **The Plastics Pipe Institute**.

There will be four industry debates across the two days, focusing on the future for plastics profiles, medical tubing, plastic pipes and wood-plastics composites (WPCs). These will be hosted by Lou Reade, the editor of *Pipe and Profile Extrusion* magazine. The panellists include influential representatives from companies such as **CertainTeed**, **Deceuninck**, **Dura-Line**, **Eldon James**, **Envirolastech**, **North American Decking Association**, **Raumedic**, **Spectrum Plastics** and **WL Plastics**. For more information about the debates and the line-up of speakers, see **this article** in last month's magazine.

A special training seminar on the afternoon of 8 May will focus on product stewardship and regulatory compliance for extruders, compounders and recyclers. It will be given by Bernie Henn, supplier development manager at **Verisk 3E**.

A series of technical presentations throughout the two-day programme will provide useful ideas for optimising extrusion lines and operations. For

example, there will be a topical presentation on intelligent industrial automation. This will look at how to use your process data to solve quality, downtime and production problems. It will be given by Willem Sundblad, founder & CEO at **Oden Technologies**.

A couple of the technical papers will focus on vinyl extrusion. One looking specifically at C-PVC processing will be given by Gianmarco Palladino, sales and technical manager at **Bausano**, the Italian manufacturer of extrusion lines for pipe, tubing and profile production. The other vinyl extrusion talk will be delivered by Michael Batton, overseas sales director at **Entex**, the German manufacturer of planetary roller extruders. He will look at how these special machines can be used for the direct extrusion of PVC.

Dan Barlow of **Integrated Control Technologies** will give a presentation on the second day of the Plastics Extrusion World Expo providing a guide to upgrading extrusion lines. In particular, he will cover best practices and methods for achieving a successful upgrade.

Another of the technical presentations at the event will look at optimizing mixing technology for high quality formulations. This will be delivered by Jeremy O'Brien, sales manager with **Greiner Extrusions US**, a leading supplier of extrusion lines and tooling for profile production, which has its headquarters in Austria.

The full conference programme including timings can be downloaded **here**. It covers both the Pipe and Profile Extrusion theatre and the Film and Sheet Extrusion theatre.

The free ticket for the Plastics Extrusion World Expo also provides free admission to **Compounding World Expo** and its two conference theatres. These will feature speakers from companies such as Westlake Compounds, Mexichem Specialty Compounds, Aurora Plastics, Champlain Cable, Southwire, Prysmian, TPC Wire & Cable, Farrel, Coperion, Entek, RTP, A. Schulman, Techmer PM, Americhem, Clariant, Primex Plastics, Chroma, CPM Extrusion, KraussMaffei, Milliken, Wacker, Sikora, Buss, Konica Minolta, Case Western Reserve University, SI Group and many more. Download the full Compounding World Expo programme **here**.

There will also a free conference theatre in the adjacent **Plastics Recycling World Expo**. This has a packed programme with speakers from HP, Lavergne Groupe, Ravago, Terracycle, Winpak, Phoenix Technologies, Bühler, Association of Plastics Recyclers, Amcor, Erema, Cumberland/ACS, Starlinger, American Cutting Edge, Britas, Vecoplan, BYK and many more. Download the full Plastics Recycling World Expo programme **here**.

The three Expos will feature more than 230 exhibitors from around the world including a wide range of suppliers of extruders, auxiliary equipment, raw materials, additives, and related products and services. They will include Davis-Standard, KraussMaffei, Greiner Extrusion, Reifenhäuser, Bausano, Union Officine Maccaniche, FB Balzanelli, Labtech Engineering, Dr Collin, CW Brabender Instruments, Sikora, Netzsch Instruments, Konica Minolta, NFM, Coperion, Nordson, Maag, PSI Polymer Systems, Parkinson Technologies, Advanced Blending Solutions, Maguire, Syncro, Plastics Systems, Azo, Zeppelin, National Bulk Equipment, Apex Engineering, Farrel Pomini, Plasmec, Mixaco, B&P Littleford, Promixon, United Feed Screws, Erema, Cumberland, Starlinger, Vecoplan, Pallmann, Herbold USA, Clariant, PolyOne, Brenntag, Modern Dispersions, Chemours, Cabot, Omya, Struktol, Ferro, Lubrizol, Wacker, Orion, Superior Graphite, Unipetrol, Aditya Birla, Heritage Plastics, BYK and many more.

The limited number of remaining booths are being filled on a daily basis. To find out more about exhibiting at any of the expos, visit **https://www.ami.international/exhibitions**.

Rita Andrews, head of exhibitions at AMI said: "The Cleveland exhibitions will provide visitors with a great opportunity to learn about the latest products, find new suppliers, and negotiate deals. In addition, the conference sessions will provide the perfect place to discover innovative technologies and industry best practices".

To book your free ticket, which is valid for both days of the event, visit: **ami.ltd/Register-AMI-Expos**

Speakers at the event include (clockwise from top left): Bernie Henn of Verisk 3E; Dan Barlow of ITC; Gianmarco Paladino of Bausano; Jeremy O'Brien of Greiner Extrusions US; Richard Krock of the Vinyl Institute; Willem Sunglad of Oden Technologies; Sarah Patterson of the Plastics Pipe Institute; and Michael Batton of Entex

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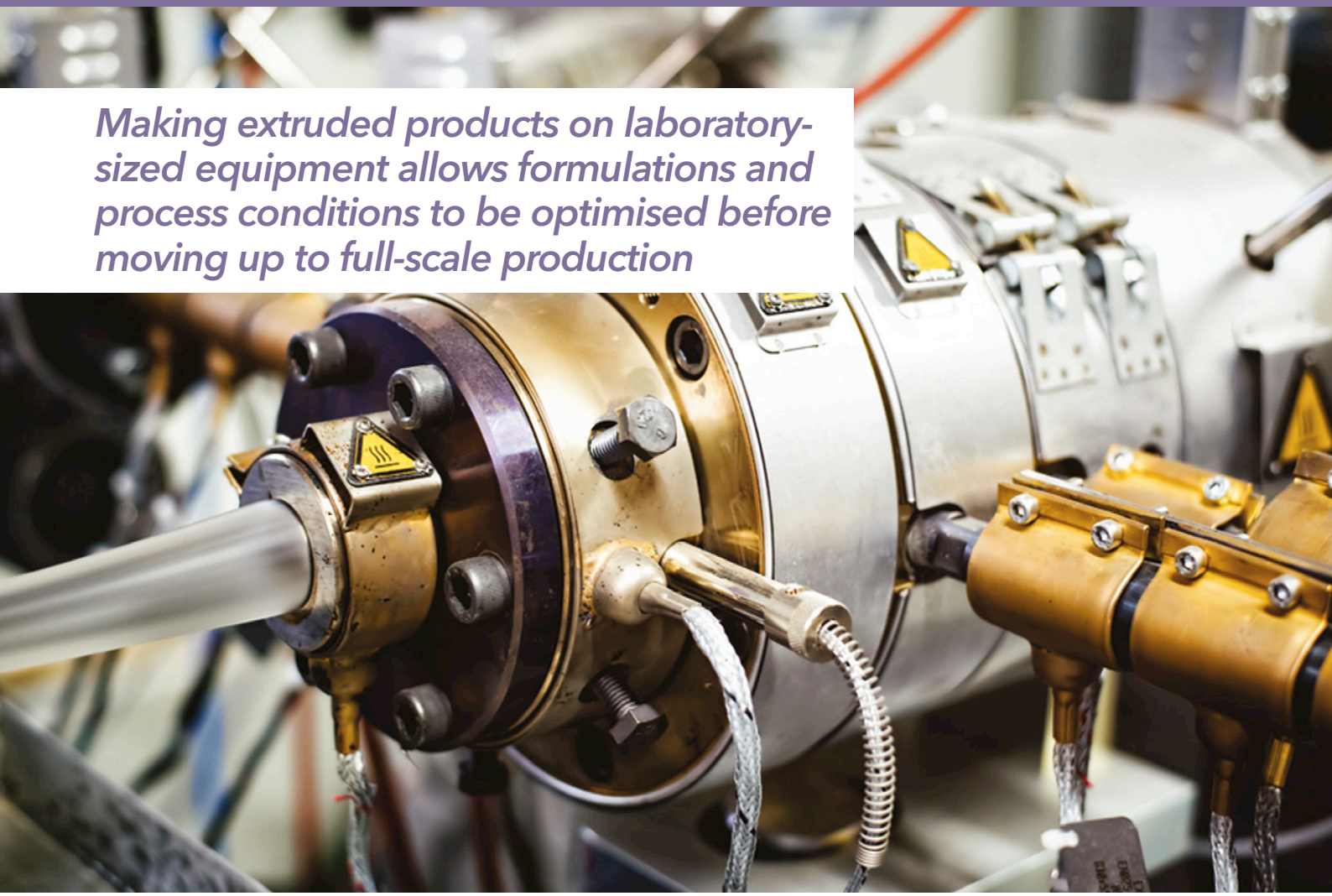


Lab extruders: providing proof of product quality

Laboratory facilities at extrusion companies are most often used to test formulations and process conditions on a small scale, before they are ramped up to full-scale production.

Davis-Standard, for instance, has extended the lab capabilities at its technical centre in Pawcatuck, USA – offering trials for its Helibar groove feed extruder and DS Activ-Check control system for continuous extruder monitoring.

"These technologies are proven in the field and we're pleased to offer experimentation in our technical centre," said John Christiano, vice president of extrusion technology at Davis-Standard.

Helibar is suitable for use with profile and sheet extrusion processes, while Activ-Check is suitable for the majority of the company's extruders, it says.

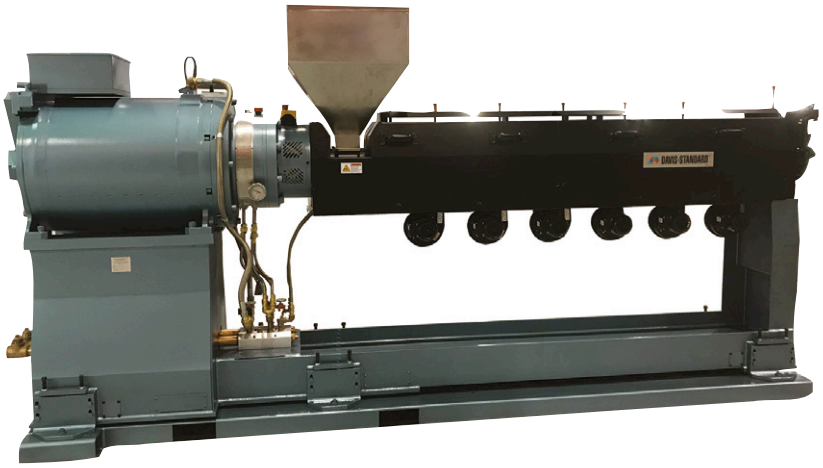
Davis-Standard says the Helibar is a "next generation" groove feed extruder. Helical grooves inside the barrel run along the entire barrel bore. This can increase extruder output rates while improving energy efficiency and reducing barrel and screw wear. Other advantages include: lower start-up costs; shorter residence time; and the ability to process higher levels of regrind. This is especially beneficial for high-profile applications where speed, melt quality and efficiency are paramount, said Christiano.

The new extruder in the lab will be 65mm, with a 36:1 L/D.

The DS Activ-Check system will be mounted on a 4.5in (114mm) extruder. Using a continuous monitoring platform, it boosts preventative and predictive maintenance. Operators can monitor key mechanical and electrical components of the extruder and gearbox and receive early notification of potential component failure to prevent unscheduled downtime.

John Clemens, director of extrusion controls,

Main image: Formulations and process conditions are often tested at laboratory scale before moving to full-scale production



Above: Davis-Standard's Helibar groove feed extruder is suitable for use with both profile and sheet extrusion processes

said: "The capability to monitor extrusion line variables such as mechanical and electrical system conditions is essential in order to bring products to market faster."

Testing contaminants

Israel-based drip irrigation pipe producer **Netafim** recently used a lab extruder as part of a test method to determine solid contaminants in recycled polyethylene (PE) – which is commonly used to make the pipe products.

"Our production process takes place at very high speed and can only tolerate very clean and uniform recycled PE," said Rami Margalit, recycled materials manager at the company.

One problem when using recycled material was having holes in the pipe wall, which is typically caused by a solid contaminant in the melt stream. Because of this, it knew it had to determine the number and size of contaminant particles.

The company devised a simple test: the material was passed through a lab extruder – equipped with a filter screen – and the residue was examined under a microscope.

"As simple as this method was, we were surprised to find that the recyclers were not using it," he said.

Contaminants included those from recycled agricultural film – such as sand and wood particles – and from post-industrial waste, such as paper and aluminium foil.

"There were also some contaminants create in the recycling process, such as small pieces of metal," he said.

Overall, despite the simplicity of the test, it takes some time to build the expertise to take full advantage of it, he said.

On the market

Last year, **Brabender** set up its Marketplace, a platform to buy and sell used laboratory equipment – from an "inexpensive, durable laboratory measuring device" to "a used, premium quality piece of equipment".

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

The Marketplace is accommodated within Brabender's website.

In-house testing

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

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

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

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

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

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

CLICK ON THE LINKS FOR MORE INFORMATION:

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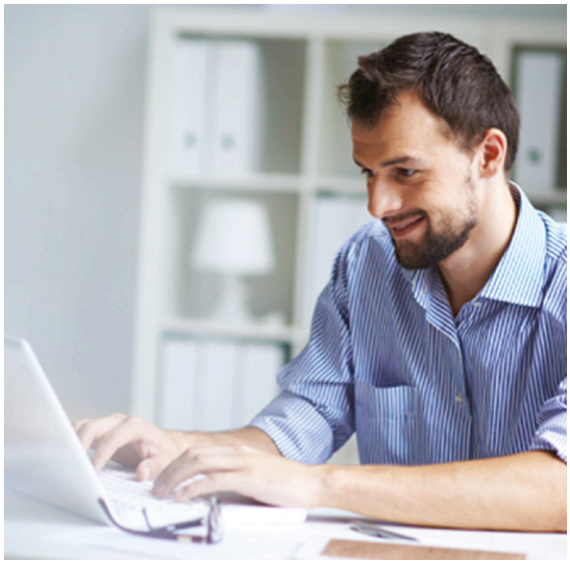

Right: Brabender set up its Marketplace as a platform to buy and sell used laboratory equipment

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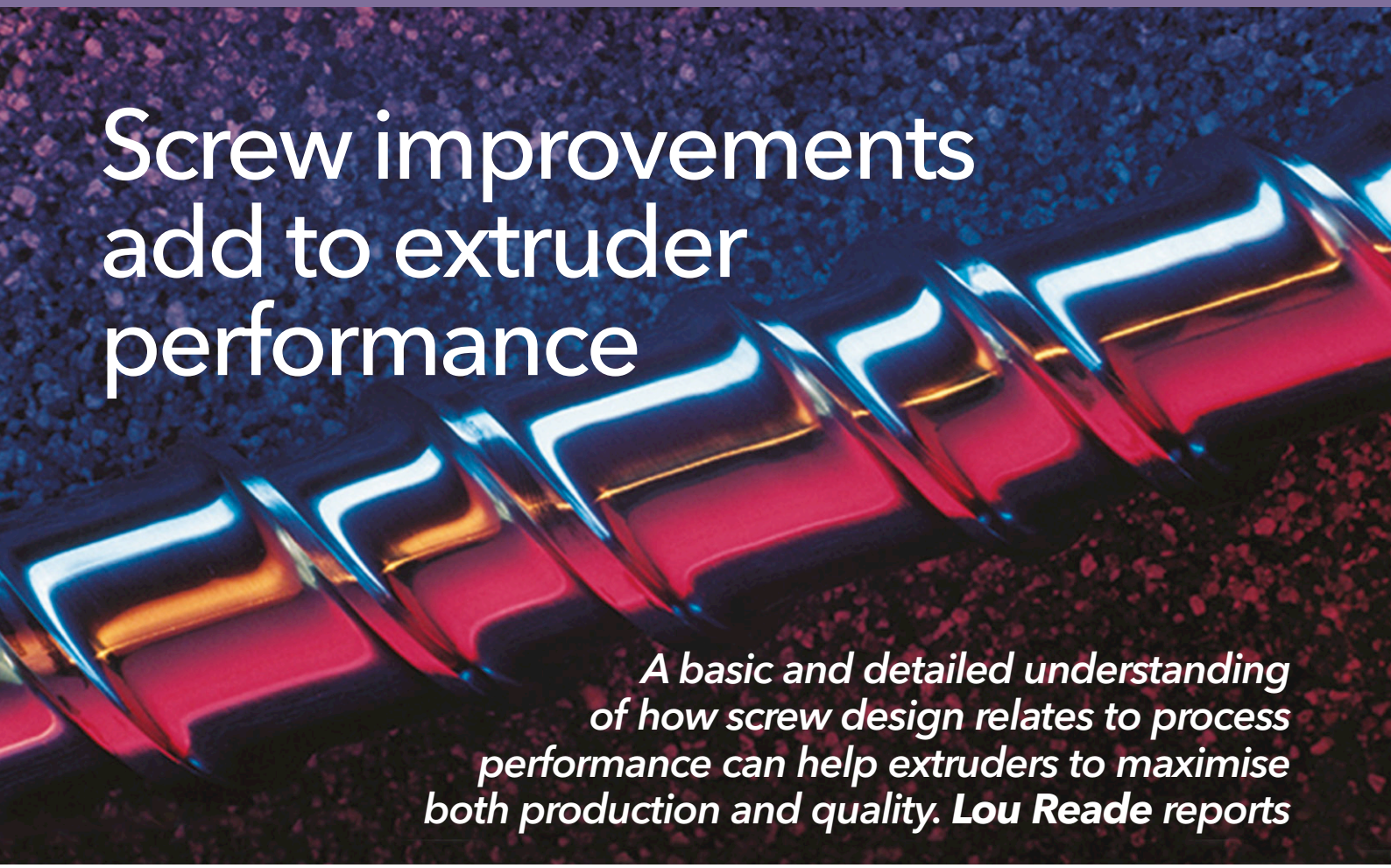
Screw improvements add to extruder performance



A basic and detailed understanding of how screw design relates to process performance can help extruders to maximise both production and quality. Lou Reade reports

Screw design is critical to extruder performance – and replacing old screws with new ones can lead to big improvements in extrusion performance.

One North American hose manufacturer recently replaced the feedscrews on four of its **Davis-Standard** extruders – and saw throughput improve by more than one-third.

Swan Products, which makes water hoses for consumer and industrial markets, installed the new screws at one of its plants in Canada. From order to installation, the project took about two and half months, saving the company time and money by providing a cost-efficient means to increase productivity.

"We were able to replace feedscrews on older machines and improve throughput by over 33%," said Jose Rossi, director of manufacturing in North America for Swan Products. "Davis-Standard's lab facility in Pawcatuck enabled us to prove design concepts alongside feedscrew engineers with hands-on experience."

The new high-throughput designs included one 2.5in (50mm) and three 4.5in (114mm) feedscrews. Using Davis-Standard's lab was very useful, as Swan needed capabilities to process both PVC and TPV resins. During the trial, several designs were tested to determine the best options for outputs and stability specific to Swan's process requirements.

According to Davis-Standard, its lab facility was key to the solution.

"We have analytical capabilities at the lab that enable us to see what's going on inside the extruder as we test different feedscrews," said Jason Baird, the senior process engineer at Davis-Standard who conducted Swan's trial. "When you improve output rates, you also need to confirm stability to achieve uniform product."

Major stores

Because Swan supplies to major stores, quality and consistency are essential. The tests verified both outputs and stability while also evaluating every aspect of performance from melt temperature to torque, says Baird.

"This gave Swan the validation they needed to achieve immediate results," he said.

To further support growth in feedscrew manufacturing, Davis-Standard recently installed a fourth CNC machining centre at its lab facility in Pawcatuck, Connecticut. The US$2 million investment will further boost production efficiency and increase feedscrew production by over 25%, it says.

The new centre is a Weingartner Pickup 700 Whirler, which can machine feedscrew sizes comprising 80% of Davis-Standard's screw volume. This includes feedscrews from 1.5in (38mm) to 6in (152mm) in diameter and in lengths up to 207in (5,200mm).

Main image: Replacing feedscrews on four machines helped Swan Products increase hose throughput

Thai growth

Nordson, through its Xaloy brand, is also expanding capacity by adding capabilities at its Chonburi facility in Thailand – where it has boosted production capacity and added new machinery.

"As the Asian hub for our Xaloy business, our Chonburi facility provides rapid response and technical support for our customers in the region," said HK Teong, vice president in charge of the Nordson Polymer Processing Systems (PPS) product line in Asia.

Since acquiring Xaloy in 2012, Nordson has invested in advanced systems for manufacturing its products – including both screws and barrels – at Chonburi and other Xaloy facilities in the USA and Germany. The investment at Chonburi has involved replacing older machines with new systems, which has allowed "a significant expansion of manufacturing capacity and capability".

In addition, Nordson has expanded Xaloy operations in Europe itself – naming **Protec Scandinavia** to be its representative in Norway and Sweden for the Xaloy range of plasticising system components. Protec, based in Mjøndalen in Norway, will provide sales, support service, and spare parts for Xaloy extrusion (and injection moulding) screws, barrels and front end components.

Model behaviour

Researchers at the **University of Massachusetts Lowell** have investigated and modelled the plastication behaviour in general purpose and barrier screw designs – in an attempt to better understand the interaction between machine design, material properties and processing conditions.

"We are specifically interested in understanding the polymers' states as a function of position and time within the extrusion screws during plastication," said the authors in a paper published in *Polymers* (doi:10.3390/polym10080823).

The researchers ran extrusion tests on the screws, in parallel with process simulation. They found that an effect called vortical fountain flow had a significant effect on plastication.

"We believe that the developed coiled sheet morphology could be predicted and exploited to achieve improved dispersion or create micro or nanostructured morphologies within the screw channel," said the researchers. "However, higher fidelity material constitutive and processing models are needed to guide researchers and practicing engineers to improve processing capabilities and fully exploit the potential of the processed polymeric systems and composites."

For now, they said, variances in temperature, flow rate and pressure will continue to affect most polymer processing applications, but extruder operators can:

- Minimise the temperature variation between the solids bed and the melt pool by supplying heated polymer feedstock;
- Increase the time for heat conduction to the solids bed with reduced screw speeds; and,
- Incorporate additional mixing sections within screw designs.

Superior mixing

Josef Dobrowsky, managing director of Austrian extrusion specialist Conextru, says dynamic mixer screws could improve polymer melt quality – for lower power consumption – if they were used in standard extruders.

"Dynamic mixing is an established technology but not very well known – so rarely used," he said. "This technology is recommended even with ready-coloured materials."

Users could overcome problems of inefficient mixing and inhomogeneity when adding elements such as colour, carbon black or filler master batches – or any other kind of additives, he says.

Overall, the result is better dispersion and homogeneity of the melt regarding particle distribution and temperature, he says – adding that he has seen results from replacing a standard mixing tip with dynamic mixers of the same length but with 3D active screw flights.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.davis-standard.com**
- **www.nordson.com**
- **www.protecscandinavia.com**
- **www.uml.edu**
- **www.conextru.eu**

Below: Davis-Standard expects its new machining centre to boost feedscrew production by over 25%

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FILM AND SHEET EXTRUSION: THEATER 1 - DAY 1

9:30 - 10:00 **KEYNOTE: Exploring opportunities in high barrier packaging**
Charmaine Russell, Business Manager - Conferences, AMI

10:15 - 11:00 **INDUSTRY DEBATE: The future for plastics packaging**
Salvatore Pellingra, Vice President Global Application and Innovation Development, PROAMPAC • Rodney Weaver, Market Development Manager, SEALED AIR • Steve Sargeant, General Manager of Technology, FLEX FILMS

11:10 - 11:30 **Coextrusion technology: A critical tool for product development**
Olivier Catherine, Technical Director, CLOEREN

11:40 - 12:00 **Adding value in extrusion - continuous production of thermoplastic honeycomb panels**
Tomasz Czarneck, Chief Operating Offi cer, ECONCORE

12:10 - 12:30 **Title to be confirmed**
Peter Greenlimb, Owner, CHEMAGINEERING

1:15 - 2:00 **INDUSTRY DEBATE: The future for agricultural films**
Ralf Dujardin, Vice President Marketing & Innovation, IMAFLEX • Roger Tambay, Director, FILMORGANIC • Ramon Parellada, Director, GRUPO POLYTEC

2:10 - 2:30 **Global megatrends affecting flexible packaging and how to adapt**
Steve DeSpain, Vice President, REIFENHAUSER

2:40 - 3:00 **Contaminant migration considerations for recycled PET in food contact applications**
Sushant Jain, Senior Scientist - Applications & Technology, PROCESSING TECHNOLOGIES INTERNATIONAL (PTI)

3:15 - 4:00 **TRAINING SEMINAR: Food contact material compliance**
Kevin C. Kenny, Chief Operating Officer, DECERNIS

4:10 - 4:30 **Cost justification of a blown film extrusion line retrofit**
Carl Gillig, President, SYNCRO

FILM AND SHEET EXTRUSION: THEATER 1 - DAY 2

9:30 - 10:00 **KEYNOTE: Analysing global trends in film**
Andrew Reynolds, Director, ADVANCE BIDCO (owner of AMI)

10:15 - 11:00 **INDUSTRY DEBATE: Women in plastics: empowering industry change**
Lauren Hickey, Director of Marketing and Product Management, AMERICHEM • Meli Laurance, Regional Commercial Industry Manager Plastics, BASF COLORS AND EFFECTS • Candace Sanders, Assistant Plant Manager, GENOVA PRODUCTS • Molly Bridger, Group Director of Marketing, SIMONA AMERICA GROUP • Jennifer Profitt, Plant Manager, ASSOCIATED MATERIALS

11:10 - 11:30 **Adiabatic fluid coolers: replacing traditional cooling towers**
Tom Stone, Aquatech USA - National Sales Manager, UNIVERSAL DYNAMICS

11:40 - 12:00 **Machinery solutions for sustainability in flexible packaging films**
Maurilio Millefanti, Technical Sales Manager, MACCHI

1:15 - 2:00 **INDUSTRY DEBATE: The future for stretch & shrink films**
Sunil Daga, President, WRAPTITE • Luke Venechuk, Senior Packaging Engineer, HIGHLIGHT INDUSTRIES • John Cook, Technical Director, ATLANTIC PACKAGING • Ludovic Capt, Director Innovation, Business Development BALCAN PLASTICS

2:10 - 2:30 **Instrumenting your extruder for the industrial internet of things, IIoT, with a focus on predictive and preventative maintenance**
John Christiano, Vice President - Technology, DAVIS STANDARD

2:40 - 3:00 **Title to be confirmed**
Miriam Olivi, International Sales Director, FRIGOSYSTEM

3:15 - 4:00 **Finally, the truth: Learn the facts about plastics & the environment**
Chris DeArmitt, President, PHANTOM PLASTICS

4:10 - 4:30 **Exploring blown film technology for packaging applications and agricultural industries**
Carlo Pattini, Product Manager Blown Film Lines, LUIGI BANDERA

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Speakers over the two days include representatives from:

Sealed Air Re-imagine™ · FILMORGANIC We Deliver on Performance and Precision · ProAmpac · WRAP TITE "Your Source For Packaging, Shipping & Safety Supplies" · IMAFLEX inc. Committed to Excellence · FLEX

Information correct at time of publishing. Speaker line up and titles subject to change .

PLASTICS EXTRUSION WORLD EXPO

MAY 8 - 9, 2019
HUNTINGTON CONVENTION CENTER, CLEVELAND, OHIO, USA
Focused conference programs on film, sheet, pipe, profile and tubing extrusion

PIPE AND PROFILE EXTRUSION: THEATER 2 - DAY 1

9:30 - 10:00 **KEYNOTE: Update on US vinyl industry**
Richard Krock, Vice President Regulatory and Technical Affairs, THE VINYL INSTITUTE

10:15 - 11:00 **INDUSTRY DEBATE: The future for plastic profiles**
Paul Adams, Director of Materials R&D, DECEUNINCK • George Walrath, Senior Scientist, CERTAINTEED • Keith Scutter, Owner, RESOURCE PLASTICS

11:10 - 11:30 **Intelligent industrial automation: Using your process data to solve quality, downtime, and production problems**
Willem Sundblad, Founder & CEO, ODEN TECHNOLOGIES

11:40 - 12:00 **Solutions in dark color outdoor architectural applications**
Kristin Meyers, Sr. Industry Manager - Extrusion, POLYONE

1:15 - 2:00 **INDUSTRY DEBATE: The future for medical tubing**
William Coulson, Vice President, ELDON JAMES • Pradnya Parulekar, Global Business Development, RAUMEDIC • Steve Maxson, Vice President of Sales - Vascular Technologies, SPECTRUM PLASTICS GROUP

2:10 - 2:30 **Understanding C-PVC processing**
Gianmarco Palladino, Sales and Technical Manager in Plastic Extrusion Process, BAUSANO

3:15 - 4:00 **TRAINING SEMINAR: Modernizing product stewardship for extruded, compounded, or recycled plastics**
Bernie Henn, Supplier Development Manager, VERISK 3E

4:10 - 4:30 **Exploring planetary roller extruders and their application areas in PVC direct extrusion**
Michael Batton, Overseas Sales Director, ENTEX

PIPE AND PROFILE EXTRUSION: THEATER 2 - DAY 2

9:30 - 10:00 **KEYNOTE: Technologies expanding the use of plastics in pipe systems**
Sarah Patterson, Technical Director, PLASTICS PIPE INSTITUTE

10:15 - 11:00 **INDUSTRY DEBATE: The future for plastic pipes**
David Fink, Senior Vice President, WL PLASTICS • • Tony Radoszewski, President, PLASTICS PIPE INSTITUTE • Arturo Valencia, Director of Research & Development/Engineering, DURA-LINE

11:10 - 11:30 **A guide to extruder upgrades: best practices and methods for achieving a successful upgrade**
Dan Barlow, President, INTEGRATED CONTROL TECH

1:15 - 2:00 **INDUSTRY DEBATE: The future for wood-plastic composites**
Paul Schmitt, Founder, ENVIROLASTECH • Matt Breyer, President, NORTH AMERICAN DECKING ASSOCIATION

2:10 - 2:30 **How transparent C-PVC fittings can clear up installation issues before they occur**
Senior Representative, SEKISUI

2:40 - 3:00 **High performance glass flake additives: no more performance trade-offs between strength and dimensional stability**
Liz Gershon, N.A. Business Manager, DREYTEK

4:10 - 4:30 **Optimizing mixing technology for high quality formulations in extrusion**
Jeremy O'Brien, Sales Manager, GREINER EXTRUSION US

REGISTER FOR FREE NOW!

Speakers over the two days include representatives from:

WL PLASTICS The Ideal Piping Solution · deceuninck · CertainTeed SAINT-GOBAIN · Eldon James · RAUMEDIC Lifeline to Health · ENVIROLASTECH

Information correct at time of publishing. Speaker line up and titles subject to change .

PLASTICS EXTRUSION WORLD EXPO

MAY 8 - 9, 2019
HUNTINGTON CONVENTION CENTER, CLEVELAND, OHIO, USA
Focused conference programs on film, sheet, pipe, profile and tubing extrusion

TYPES OF PRESENTATIONS

Business Debates

Business debates will run for 45 minutes and feature influential industry leaders discussing strategic issues facing the global extrusion market. They will be focused on specific sectors of the industry including: plastics packaging; profiles; agricultural films; medical tubing; stretch and shrink films; wood-plastic composites; and plastic pipes.

Training Seminars

Practical training seminars will be delivered by experts on topics including food contact legislation and regulatory compliance.

Industry Presentations

There will also be more than 20 presentations covering the latest technology developments and industry trends. Topics being covered include market outlooks; barrier packaging; co-extrusion technologies; flexible packaging; control and instrumentation; advances in blown film extrusion; retrofit economics; PVC trends; opportunities for plastics pipes; internet of things; mixing technologies; direct extrusion; and many more.

LOCATION AND VENUE

The Plastics Extrusion World Expo, will be held at the Huntington Convention Center in Cleveland, Ohio, USA. This state-of-the-art exhibition facility is located right in the heart of Cleveland's revitalized downtown boasting plentiful parking, free public transport and surrounded by an excellent selection of hotels.

LAST EXHIBITION STANDS AVAILABLE

The two-day event will provide a cost-effective and time-efficient way to promote your company, and its products and services to a large international audience focused on your core markets.

A range of shell-scheme and space-only stands are on offer from 100 to 400 sqft, along with a special exhibition package including furniture to make exhibiting at the Plastics Extrusion World Expo 2019 as simple and as cost-effective as possible.

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Networking Party Rock & Roll Hall of Fame

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ROCK AND ROLL HALL OF FAME

From the ground up, the Rock Hall delivers a legendary music experience like no other. Feel like a rock and roll music inductee and be one of the first to see the Class of 2019 exhibit, showcasing iconic items representing this years' inductees; The Cure, Def Leppard, Janet Jackson, Stevie Nicks, Radiohead, Roxy Music and The Zombies.

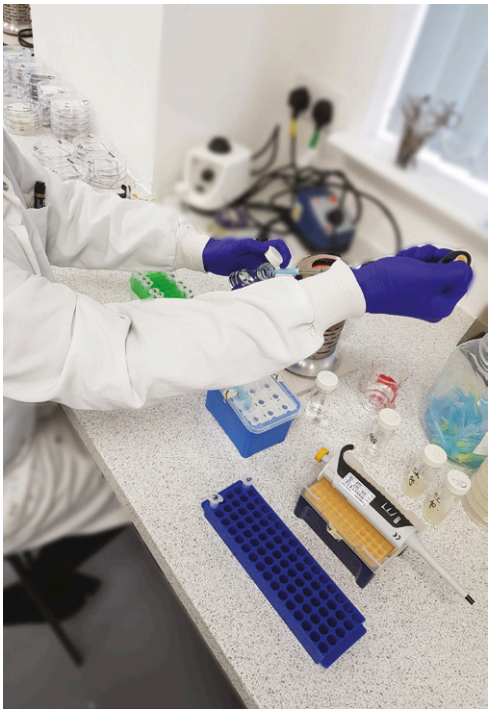
The party ticket is $20 per person and will give you full access to this iconic venue with drinks and nibbles. Doors open at 7pm.

Click here to find out more

*Tickets are available to registered attendees of the exhibitions only.

ANTIMICROBIALS

Investment helps boost anti-microbial capacity



UK-based BioCote, which develops antimicrobial additives, has invested more than £600,000 (US$782,000) to improve its manufacturing facility in Coventry.

The move will enable the company to meet rising demand for its additives, which are integrated into products – such as plastic pipe – to make them easier to keep hygienically clean and less likely to cause cross-contamination.

The expansion includes larger headquarters, which houses its customer support team, and a laboratory to test and certify the antimicrobial properties of its customers' products. The facility also includes a sterile packing area and warehouse.

Sean Reid, managing director of BioCote, said: "Our knowledge of microbiology, materials chemistry and global biocidal regulations has kept us at the forefront of the industry – and an increasing number of companies are now incorporating our antimicrobial additives into plastics and polymers."

Biocote saw a 15% increase in revenue last year.

› **www.biocote.com**

ADDITIVES

New grades of carbon black aimed at high pressure pipe

Orion Engineered Carbons has developed new grades of carbon black for use in pipe applications.

Its Printex Zeta A Beads are designed for use in PE 100 and PE 4710 pipe for gas and water distribution. The high chemical purity, a very low sulphur level, and physical cleanliness help to minimise taste and odour effects.

Low compound moisture absorption and high microscopic dispersion performance ensure a smooth, defect-free pipe, while the product also provides high UV protection for long-term stability, says the company.

"We are always fine-tuning our offerings to respond to the evolving requirements of a broad range of polymeric applications and to improve finished-product performance," said Joey LeBlanc, marketing manager for polymers in the Americas.

At the same time, it says that its XPB 633 Beads can be used in many conductive plastic compounds and applications – including extruded conductive pipes and profiles. The product is suitable for use in co-polymers, nylon, polyolefins and many other polymer types. The universally conductive blacks are specifically geared for thermoplastics requiring conductivity and anti-static properties.

"They provide better conductivity at lower concentration than most conductive blacks," said LeBlanc.

› **www.orioncarbons.com**

ELASTOMERS

Pipe seal lifetime of 800 years

Trelleborg says that an independent 'stress relaxation' test has determined that the average performance lifetime of some of its pipe sealing compounds is more than 800 years.

Elastocon, which tests stress relaxation in elastomers, found that Trelleborg's elastomeric compounds remain within the acceptable 50% relaxation threshold for longer than rival solutions.

Its compounds recorded an estimated average service lifetime of 841 years – far beyond the 97 years of four rival systems that were tested, it said.

› **www.trelleborg.com**

› **www.elastocon.se**

MEASUREMENT

Measuring systems now available with OPC protocol

LaserLinc says it has introduced a series of ultrasonic measurement systems – for diameter, ovality, eccentricity and flaw detection – with OPC UA & DA communication.

All of the company's in-process and off-line measurement and control systems are now available with the OPC industrial communications protocol, including the latest platform/operating system independent Universal Architecture (OPC-UA) standard.

As well as data, users can access and modify configuration from any OPC-DA or OPC-UA compliant device or software, directly or remotely, without additional hardware or software.

LaserLinc has introduced OPC client functions to simplify commissioning of systems and save money. Most OPC-UA compliant products, including sensors and PLCs, only offer server functions, and so require a third-party gateway to bridge them: with its OPC Client, LaserLinc says its Total Vu HMI can drive communication directly.

"This is a better way to capture and move data, especially from different systems," said said Jeff Kohler, CEO of LaserLinc. "The cost savings and ability to directly access and modify data is a game changer."

All the company's systems can be upgraded to OPC [UA or DA]. With the remote support tools provided with its systems, upgrades can be performed over the Internet by LaserLinc's team of applications engineers, said the company.

OPC-UA ensures that measurement systems are compatible with Manufacturing 4.0 and IIoT, says LaserLinc.

› **www.laserlinc.com**

ANCILLARIES

Indian ancillary expansion

Motan-Colortronic's subsidiary in India has moved to larger premises in Chennai – allowing it to triple local production and storage space and boost its portfolio.

"Now, we not only cover the increasing demand for high quality peripheral units and systems, but also provide shorter delivery times," said Srikanth Padmanabhan, managing director of the subsidiary. "With the new products we can now also serve additional segments such as extrusion and compounding."

At the opening, the firm showed products including a Metrovac SG blower station.

› **www.motan-colortronic.com**

JOINING

Plenty of pipework for hotel expansion

Pipe joining was an unseen contributor to the recent expansion of the Seminole Hard Rock Hotel & Casino in Florida.

The expansion, which includes a guitar-shaped hotel tower, included piping installation for the casino's heated and chilled water systems.

Installer Kirlin needed to build and fit a piping system to connect a central chiller plant to all the casino's outlying buildings. After originally considering carbon steel, it chose Aquatherm PP-R pipe, which was much lighter than metal pipe, so allowed much faster and easier installation.

To overcome another challenge – fusing 24in diameter pipe in tight spaces – the company invested in a prototype butt fusion machine from McElroy. After field testing on this project and others, the prototype became the Acrobat 630 featuring the QuikFit carriage.

For smaller pipe, Kirlin used two Acrobat 250 models, which butt fuse up to 8in pipe. For socket fusion, it used hand tools and leased several McElroy Spider 125s.

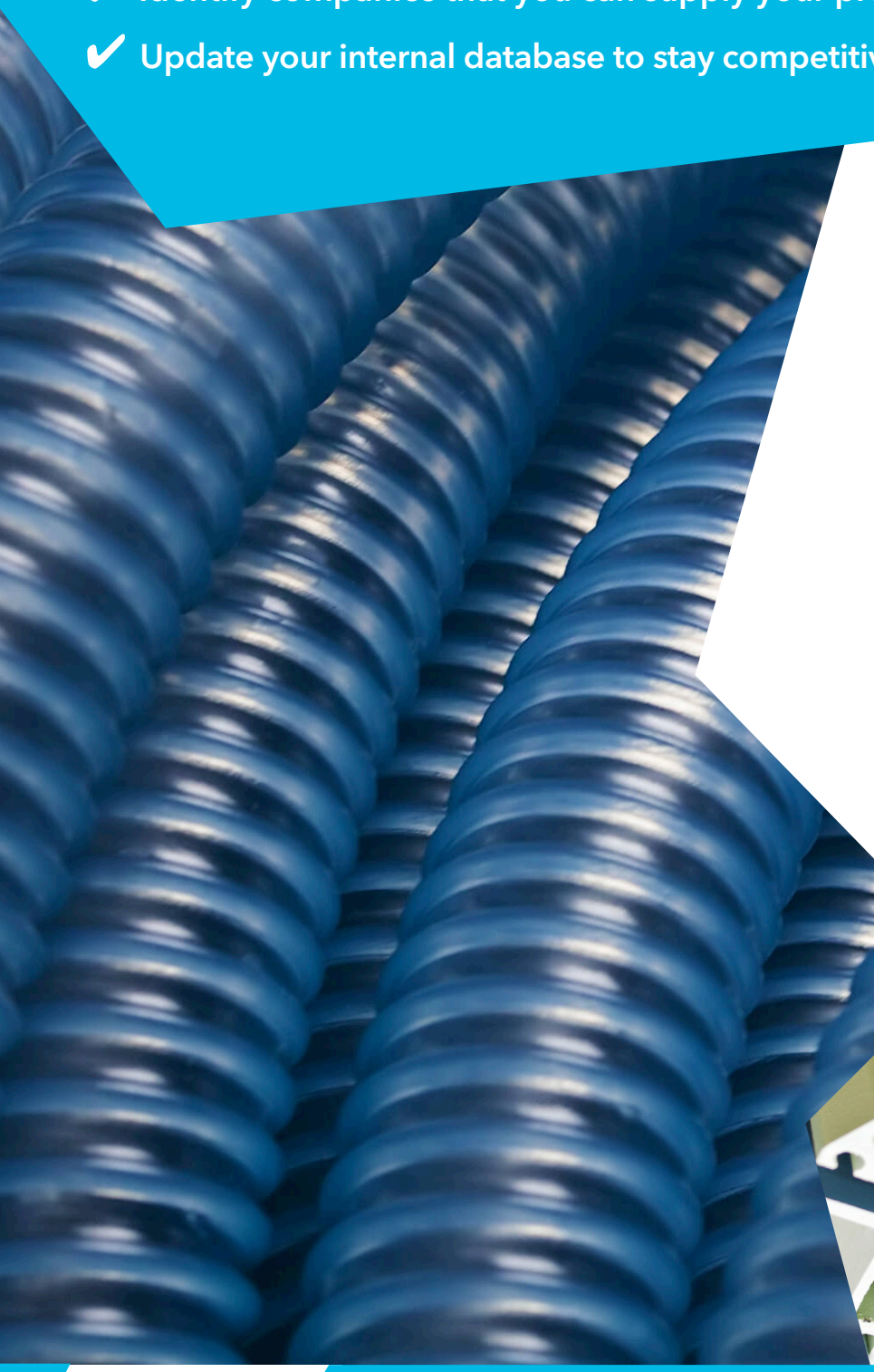
In all, the project used about 7 miles of Aquatherm Blue Pipe in various sizes, and about 3,000 ft of Green Pipe SDR 11 and SDR 7.4 MF for the domestic water mains in the casino expansion.

› **www.mcelroy.com**

› **www.aquatherm.com**

Thermoplastics Profile, Tube and Hose Extruder in Europe databases

- ✔ Research the trends and key players
- ✔ Identify companies that you can supply your products to
- ✔ Update your internal database to stay competitive



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

Make sure you are updated on this niche market for 2019!

Get sample Excel data **HERE**

AMI

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Download these new product brochures

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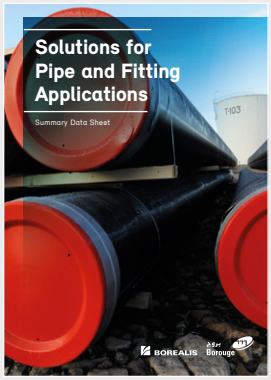
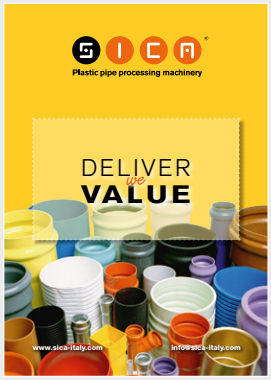
BOREALIS: PIPE POLYMERS



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.

❯ CLICK HERE TO DOWNLOAD

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.

❯ CLICK HERE TO DOWNLOAD

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.

❯ CLICK HERE TO DOWNLOAD

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.

❯ CLICK HERE TO DOWNLOAD

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.

❯ CLICK HERE TO DOWNLOAD

DAVIS-STANDARD: PIPE & PROFILE

Davis-Standard supplies a wide range of extruders and extrusion systems for pipe, profile and tubing applications, including medical tubing. This four page brochure details the range of equipment available and key performance benefits.

❯ CLICK HERE TO DOWNLOAD

If you would like your brochure to be included on this page, please contact Claire Bishop claire.bishop@ami.international. Tel: +44 (0)1732 682948

Learn more about AMI's upcoming conferences

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

POLYMERS FOR OIL AND GAS ENGINEERING

AMI holds its first Polymers for Oil and Gas Engineering conference on 27-28 March 2019 in Kuala Lumpur, Malaysia, where experts will examine specification, selection, performance and lifetime prediction of oil and gas polymers.

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PVC FORMULATION EUROPE

Taking place in Cologne in Germany on 1-3 April, PVC Formulation will discuss global market trends in the PVC industry and explore the latest developments in rigid and flexible PVC materials, plasticisers, additives and compounding.

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FIRE RETARDANTS IN PLASTICS 2019

The ninth edition of AMI's Fire Retardants in Plastics conference will take place on 2-3 April 2019 in Pittsburgh, PA, USA, providing a meeting and learning point for all in the North American flame retardants industry.

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POLYMERS IN BUILDING INSULATION

The second edition of AMI's Polymers in Building Insulation will take place on 9-10 April 2019 in Dusseldorf, Germany. The event will focus on the key trends, challenges and opportunities in construction insulation materials.

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PLASTIC PIPES IN INFRASTRUCTURE 2019

Taking place in Dusseldorf in Germany on 9-10 April 2019, AMI's Plastic Pipes in Infrastructure conference is the meeting place for pipe specifiers, installers, end users, resin suppliers, additive producers and equipment makers.

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PERFORMANCE POLYPROPYLENE 2019

The second AMI Performance Poly-propylene conference will be held in Cologne in Germany on 14-15 March 2019. The event will attract a global audience to discuss the latest developments in high performance PP compounds.

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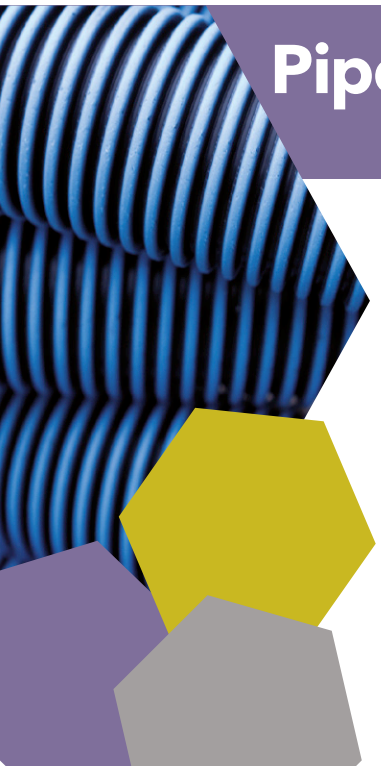
To see our full line-up of more than 50 plastics industry events over the next 12 months, please visit www.ami.international/events

Ding Zing Advanced Materials

Head office:	Kaohsiung, Taiwan
Chairman:	Hsun-Tai Lin
Founded:	1981
Ownership:	Public (listed on Taipei Exchange)
Employees:	More than 700
Turnover (2017):	Around TW$2.3bn (US$74m)
Profile:	Ding Zing Advanced Materials is a leading extruder of thermoplastic polyurethane (TPU) based in Taiwan. As well as making tubing products (such as air hoses and hydration tubes) and profiles, it is a leading producer of TPU film and injection moulded seals.
Product lines:	The company's market leading tubing product is its Perfloa range of air hoses and hydration tubes, which are available in a number of variants: its Hydration range of tubing is available in a range of sizes and colours and is soft, odourless and free of plasticisers, says the company. There are also Braided hoses, with high tensile strength and abrasion resistance, a Recoil range (suitable for applications such as air tools), and Straight hoses. In addition, the company offers a range of belts – with different cross-sections – with high rebound resilience and high chemical resistance.
Factory location:	The company operates around 60 extrusion lines – with plans to install more capacity – at a 1 million sq ft production plant in Kaohsiung, Taiwan. In addition to existing branch offices in Taichung (Taiwan), Vietnam, China and the Netherlands, Ding Zing recently opened an 80,000 sq ft warehouse near its USA offices in Secaucus, New Jersey.

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:

April 2019
Control & Instrumentation
PE100+ • Standards & Testing
Materials recovery & granulators
Plastics Extrusion World Expo preview

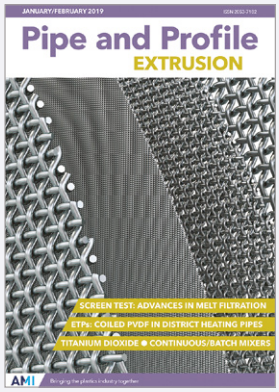
May 2018
Pipe die developments
PVC recycling
Focus on pressure pipes
Chinaplas 2019 review

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

For information on advertising in these issues, please contact:
Claire Bishop: claire.bishop@ami.international Tel: +44 (0)1732 682948
Levent Tounjer: levent.tounjer@ami.international Tel: +44 (0)117 314 8183

Keep informed: read our latest editions

AMI publishes five process-specific FREE plastics industry magazines. Simply click on the cover below to read each magazine. Or download the issue in the relevant Apple or Android app



Pipe and Profile
January/February 2019
The January/February edition of Pipe and Profile Extrusion features a study on the feasibility of using coiled PVDF for slipline rehabilitation of district network heating pipes. Plus features on titanium dioxide, melt filtration and mixer technology.

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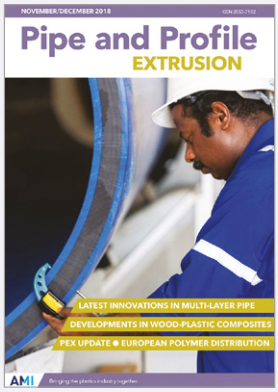

Pipe and Profile
November/December 2018
The November/December edition of Pipe and Profile Extrusion features the latest multilayer pipe dies which can make products more flexibly and efficiently. Plus features on PEX and wood-plastic composites.

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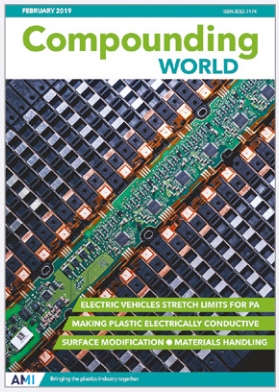

Compounding World
February 2019
The February issue of Compounding World looks at the use of polyamide materials in the developing market for electric vehicles. The features also focus on Improving wear and reducing friction, electrically conductive compounds and materials handling solutions.

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Plastics Recycling World
January/February 2019
The January/February 2019 edition of Plastics Recycling World looks at barriers to recycling flexible packaging and how they can be overcome. Plus, this edition reviews IV enhancement options for PET and the latest pelletising developments.

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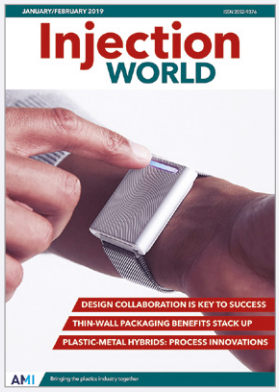

Injection World
January/February 2019
The January/February edition of Injection World magazine examines the role of designers and material producers in successful product developments. It also reviews innovations in polymer-metal hybrids and thin wall packaging.

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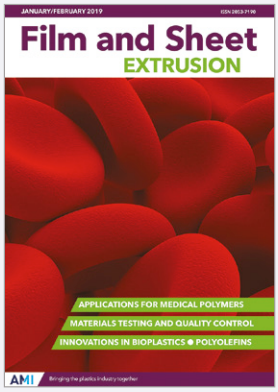

Film and Sheet
January/February 2019
The January/February 2019 edition of Film and Sheet Extrusion magazine looks at some of the latest innovations in medical plastics. Plus an update on bioplastics and the latest innovations in polymer analysis and polyolefin resins.

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Take out your own FREE subscriptions to any of the magazines. Click on the logos below to simply register on-line.

Compounding WORLD
Film and Sheet EXTRUSION
Pipe and Profile EXTRUSION
Injection WORLD
Plastics Recycling WORLD

GLOBAL EXHIBITION GUIDE

2019	**28 February - 4 March**	Indiaplast, Delhi	www.indiaplast.org
	12-14 March	JEC World, Paris, France	www.jeccomposites.com
	12-16 March	Koplas, Seoul, South Korea	www.koplas.com
	19-21 March	EU Coatings Show, Nuremberg, Germany	www.european-coatings-show.com
	25-29 March	Plástico Brasil, São Paulo, Brazil	www.plasticobrasil.com.br
	8-12 April	Feiplastic, Sao Paulo, Brazil	www.feiplastic.com.br
	8-9 May	Extrusion Expo, Cleveland, USA	www.extrusion-expo.com
	21-24 May	Chinaplas, Guangzhou, China	www.chinaplasonline.com
	21-24 May	Moulding Expo, Stuttgart, Germany	www.moulding-expo.com
	18-21 September	T-Plas/Tiprex, Bangkok, Thailand	www.tplas.com
	16-23 October	K2019, Dusseldorf, Germany	www.k-online.com
	25-28 November	Plastivision Arabia, Sharjah	www.plastivision.ae
	27-29 November	Plastics & Rubber Vietnam	www.plasticsvietnam.com
2020	**16-20 January**	Plastivision India, Mumbai, India	www.plastivision.org
	21-23 January	Swiss Plastics, Lucerne, Switzerland	www.swissplastics-expo.ch
	13-17 October	Fakuma, Friedrichshafen, Germany	www.fakuma-messe.de

AMI CONFERENCES

27-28 March 2019	Polymers for Oil & Gas Engineering, Kuala Lumpur
1-3 April 2019	PVC Formulation, Cologne, Germany
9-10 April 2019	Plastic Pipes in Infrastructure, Dusseldorf, Germany
4-5 June 2019	Profiles, Pittsburgh, USA
4-5 June 2019	Oil & Gas Polymer Engineering, Houston, USA
25-26 June 2019	Medical Tubing, Berlin, Germany

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

www.ami.international

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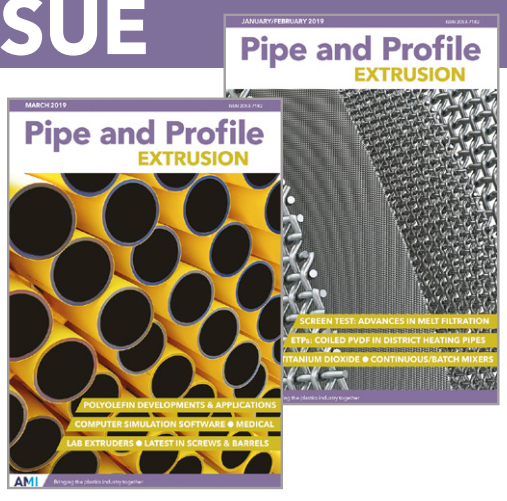

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