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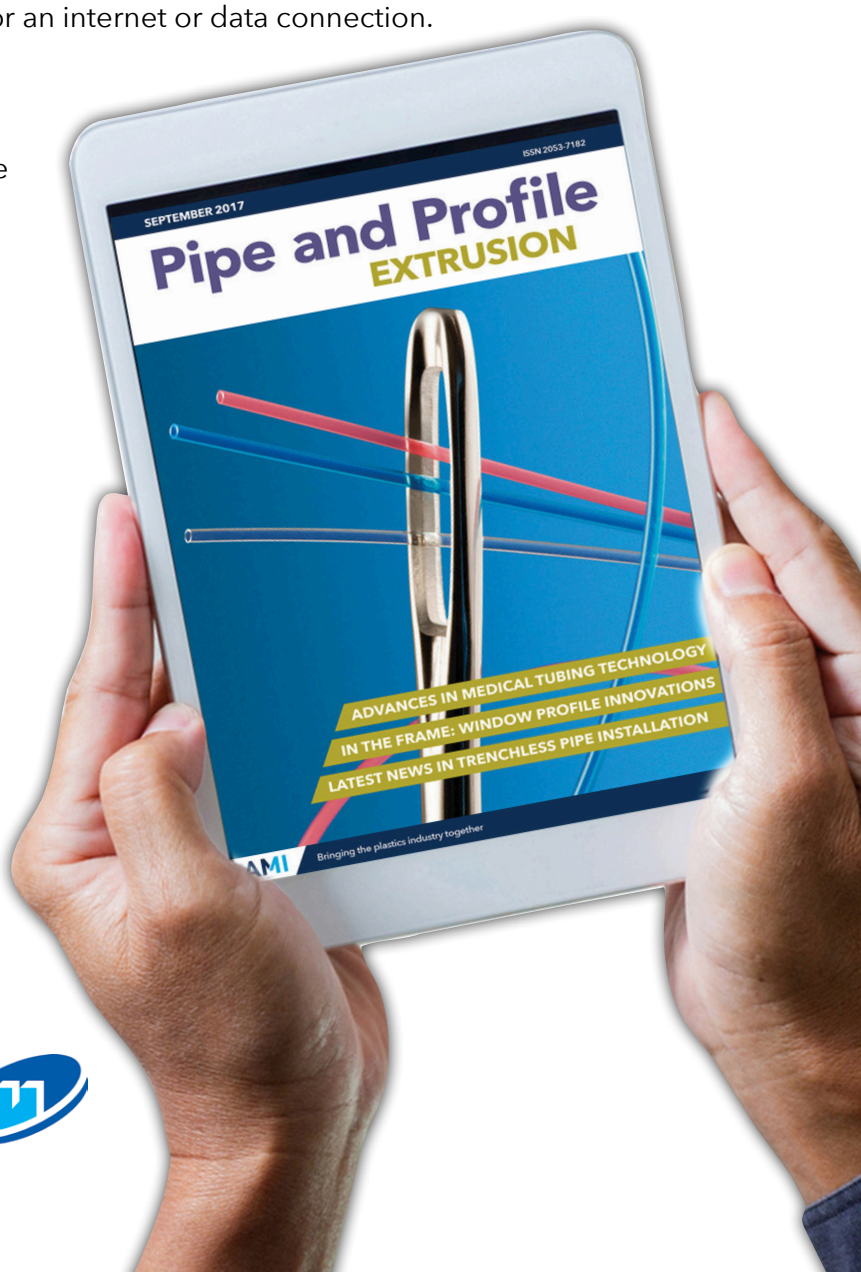

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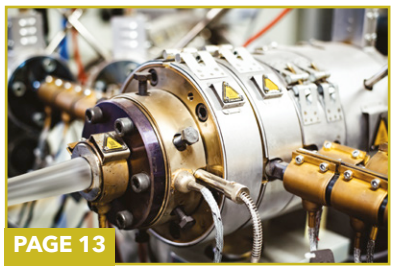
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AMI
Third Floor, One Brunswick Square,
Bristol, BS2 8PE, United Kingdom
Tel:+44 (0)117 924 9442
Fax:+44 (0)117 311 1534
www.ami.international
www.twitter.com/plasticsworld
Registered in England No: 2140318

EDITORIAL

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

Editor: Lou Reade
lou@pipeandprofile.com

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

ADVERTISING

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

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

Sales manager (China): Jenny Zhou
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Simona breaks €400m sales barrier for first time in 2018

German extrusion specialist Simona has announced record sales and profits for 2018.

Last year, the company expanded sales by 6% to €418 million (US$466m), driven mainly by strong growth in North America – where revenue expanded nearly 21% to exceed €114m (US$127m). In Europe, it saw more modest growth of less than 2%, to take sales past €273m (US$304m).

Germany, Switzerland and Austria saw solid growth, but sales in Western Europe were affected by sluggish business in France and Italy, it said. Revenue from Eastern Europe was slightly higher. Business in Asia remained stable despite economic slowdown in China, with sales constant at around €30m (US$33m).

Simona CEO Moyses is to step down later this year

Pre-tax profits at the group rose by 31% to €32m (US$36m).

A strong fourth quarter helped Simona meet growth targets in its Pipes and Fittings division. Here, sales rose almost 5% to more than €84m (US$94m). The key growth drivers included a positive global performance in industrial products and solid sales relating to infrastructure applications in Germany and Eastern Europe.

"Initiated in 2017, efforts to reposition the division are now bearing fruit," said the company.

Despite weaker economic conditions, Simona has set a revenue target of €435-450m for 2019 – a growth of at least 9%. In the first quarter of 2019, it has already grown sales by 12%, to €111m (US$124m), though profitability declined slightly.

The company is also searching for a new leader, as CEO Wolfgang Moyses has announced he will leave Simona by October 2019.

› **www.simona.de**

Trelleborg opens new US plant

Trelleborg has inaugurated a new combined manufacturing plant in the USA – which brings three previous manufacturing sites together.

The plant, in Aurora, Ohio, occupies more than 150,000 sq ft and houses seven plastic extrusion lines and 10 for rubber and silicon, plus other equipment.

The plant will employ around 165 people and be the headquarters of Trelleborg's sealing profiles business division in the Americas, says the company.

› **www.trelleborg.com**

Egeplast begins UK pipe production with partner

Egeplast of Germany is to start manufacturing polyethylene pipe in the UK, through its distributor Westwood Pipelines.

Westwood, based in Doncaster, says it will now be able to offer more flexibility and improved lead-times on a broad range of Egeplast products – including PE pressure pipe in coils and SLA barrier pipe.

Westwood says its fabrication and fittings solutions with Egeplast pipe will bring a strong partnership to supply the utility, civil, construction and infrastructure sectors.

"The introduction of UK production will contribute to a reduction of our carbon footprint, secure jobs in the local area and reduce potential risks in the event of potential transport issues arising from the Brexit process," said Egeplast.

Egeplast will begin manufacturing its pipes in the UK through distributor Westwood Pipelines

In addition, Westwood Pipelines is a distributor of Georg Fischer's Elgef Plus range of electrofusion fittings in the UK.

› **www.egeplast.de**

› **www.westpipes.com**

Trex expands its film recycling programme

US decking specialist Trex is looking to expand its plastic film collection and recycling programme.

The company has branded the long-standing scheme NexTrex, and is looking to expand the 32,000 stores from which it currently collects waste plastic film.

Through the programme, Trex compensates partners for collecting recycled plastic material. After collection, the plastic material is sent to local distribution centres, then sorted and shipped to Trex's two North American manufacturing facilities.

"NexTrex is an integral component of our sourcing efforts, and we're thrilled by the growing interest and participation by retailers across the country," said Dave Heglas, senior director of material management at Trex. "Through NexTrex, we collected more than 130m lbs of recycled plastic from retailers in 2018."

Cline: "We are committed to making our products as eco-friendly as possible"

Trex provides participants with recycling bins and a list of qualifying recyclable materials, which include everyday items such as grocery bags, overwraps, newspaper sleeves and bubble wrap.

■ Trex has been named the 'greenest' decking at the Green Builder Media's 2019 Reader's Choice Awards – for the ninth year in succession.

The company says it received nearly three times as many votes as its closest competitor.

"Sustainability is in the DNA of Trex," said Jim Cline, chairman and CEO. "From the beginning, we have been committed to making our products and processes as eco-friendly as possible."

› **www.trex.com**

US extruder shifts its ownership

Employees at Custom Profile, a Michigan, US-based manufacturer of extruded plastic products, have bought the company from the private equity firm that was its majority owner.

In partnership with investment firm Mosaic Capital Partners, the employees have bought all of Custom Profile's equity from Blackford Capital. Terms of the deal have not been disclosed.

Custom Profile's leadership team, including CEO John Boeschenstein, will stay at the company.

"This new partnership with Mosaic is an excellent opportunity for us to access the capital necessary to grow, while sharing the benefit of that growth with our employees," he said. "We look forward to working with Mosaic to continue growing the value of our business for our employee-owners."

Custom Profile has production facilities are in Walker, Grand Rapids and Juarez, Mexico.

› **www.custom-profile.com**

Profits dip at Mexichem in Q1

Mexican chemicals giant Mexichem – which also includes extrusion companies like Wavin in its portfolio – announced a 39% drop in net profits in the first quarter of the year.

Profit was nearly US$48m for the period, compared with nearly US$79m for the corresponding period in 2018. Total sales for the quarter were US$1.77 billion – a 1% on Q1 in 2018.

Daniel Martínez-Valle, CEO of Mexichem, said he was encouraged by the momentum that certain businesses – including Building & Infrastructure – were bringing.

› **www.mexichem.com**

Chinaplas 2019 is held in Guangzhou this year, and organiser Adsale expects it to host around 180,000 visitors. The show, which runs from 21-24 May, is held at the China Import and Export Complex in Pazhou, Guangzhou. Around 3,500 exhibitors are expected to fill more than 250,000 sq m of exhibition space. Visitors from more than 150 countries and regions are expected to attend, said Adsale.

■ Our Chinaplas **preview** begins on page 25.

› **www.chinaplasonline.com**

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European Court upholds decision to allow DEHP in recycled PVC

The European Commission has won a court case at the European Court of Justice, regarding the use of 'legacy additives' in recycled PVC.

Many phthalates – including DEHP – have been restricted by the European Chemicals Agency (ECHA). In 2016, the Commission backed a recommendation by ECHA to grant a four-year authorisation for uses of DEHP in recycled PVC by three PVC recycling companies – VinyLoop Ferrera, Stena Recycling and Plastic Planet.

ClientEarth, an environmental NGO, challenged this decision at the European Court of Justice. However, in a decision on 4 April 2019, the court backed the Commission's stance.

ClientEarth says that it may appeal the ruling, saying that the court's decision was contrary to Reach's main objective of ensuring high level of protection for health and the environment.

"We regret that the EU makes it so hard for NGOs to go to court to protect people and the environment," ClientEarth lawyer Alice Bernard told *Chemical Watch*.

The Commission originally gave the three companies permission to use recycled PVC – which contained DEHP – in two ways: to formulate recycled PVC and dry-blends; and in industrial use of recycled soft PVC in various processes, including extrusion.

The issue of legacy additives affects other PVC products – notably rigid products like pipes and profiles that historically used lead and cadmium stabilisers. Both substances have since been phased out in Europe – but will still be present in the PVC recyclate that is commonly incorporated into window profiles.

Brigitte Dero, general manager of VinylPlus, said of legacy additives: "The committees of ECHA concluded in favour of allowing – for 15 years – the recycling of PVC waste containing lead up to concentrations which should allow most recycling to go on – because the conditions applied ensure that the risk is controlled."

■ Our feature on PVC recycling begins on page 31.

› **www.echa.europa.eu**

› **www.clientearth.org**

Plastics industry bodies put their points to Congress

Opening federally funded infrastructure projects to include thermoplastic pipe can help cut plastic waste, the Plastics Pipe Institute (PPI) has told members of the US Congress.

"Fair and open competition of qualified products is the gateway to not only reducing costs, but also to increasing the productive use of plastic waste," said Radoszewski, president of PPI. "When companies know they have new markets to pursue – in this case plastics pipe manufacturers being including in the bid process – they are comfortable funding new technologies, such as how to use more recycled plastic in their products."

Webster (right) learnt from Radoszewski how plastic bottles can be turned into long-lasting pipe

PPI and four other bodies spoke with members of Congress including Daniel Webster, a member of the House Committee on Transportation and Infrastructure.

"He was pleased to learn that scrap plastic bottles can become long-life plastic pipe," said Radoszewski.

› **www.plasticpipe.org**

Landmark year for Reiku

Reiku of Germany – which makes extruded tubing for cable protection – has celebrated 50 years in business.

The firm, founded in 1969, began by making zip-on plastic sheathing products. Now, its portfolio stretches to more than 8,000 items: last year, it says it processed more than 400 tonnes of plastics into nearly 2,400km of tubing.

"We create the best possible conditions for preventing damage to the cable," said co-manager Peter Sailer.

› **www.reiku.de**

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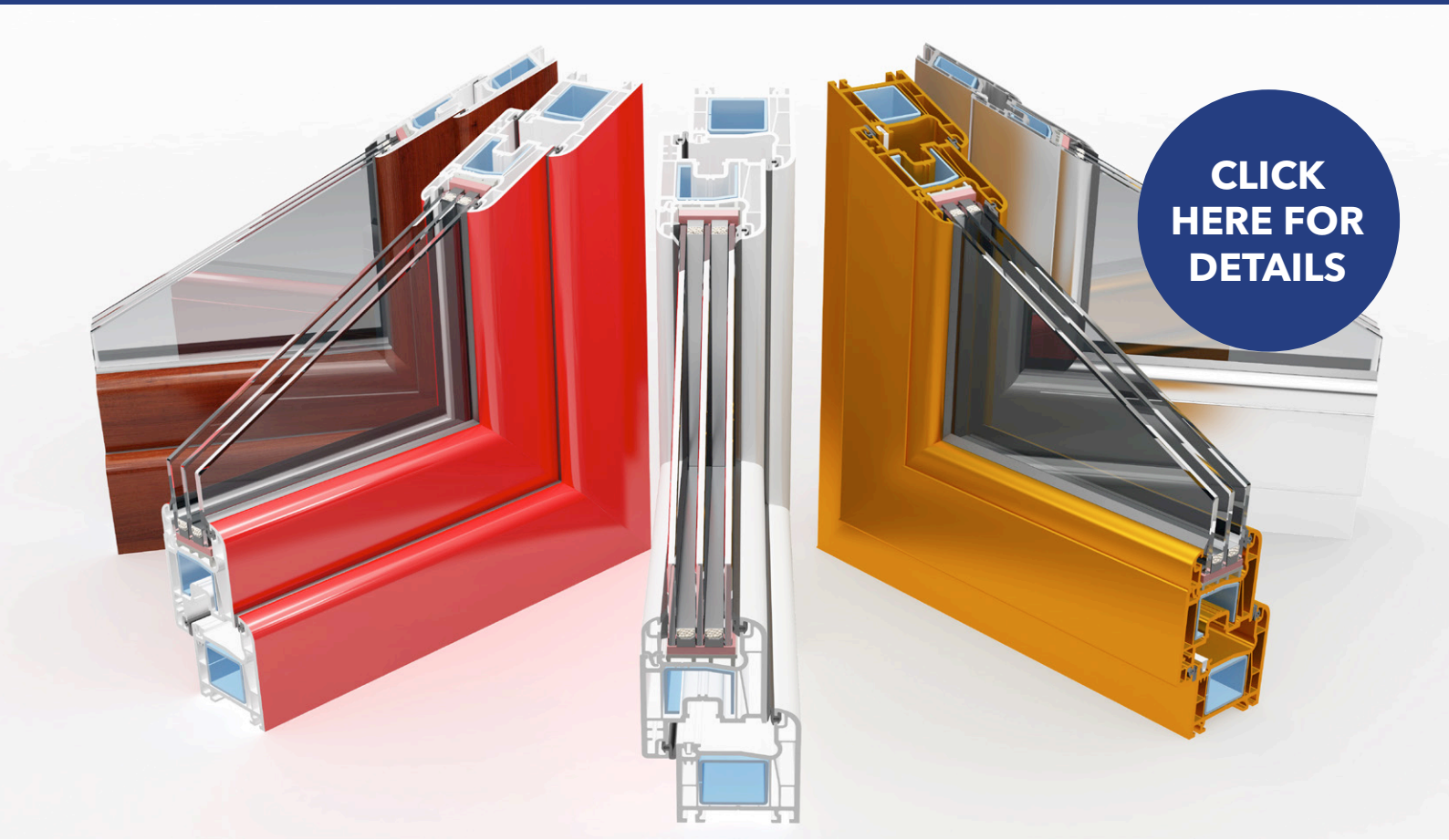

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Over 2000 register for US expos

More than 2000 people have registered to attend the expos focused on plastics extrusion, recycling and compounding in Cleveland, Ohio on 8-9 May.

The Plastics Extrusion World Expo, Plastics Recycling World Expo and Compounding World Expo will feature more than 260 exhibitors and five conference theatres with over 130 speakers across the two-day event.

Free tickets for the exhibitions and conferences are available by registering in advance **HERE**.

"Bookings are still coming in fast and we expect this to be the biggest dedicated plastics industry event in the USA this year," said Nikola Whyman, senior marketing manager at AMI, the organiser of the exhibitions and conferences.

The US expos follow AMI's highly successful events in Germany

The companies registering to attend include a wide range of plastics extruders, recyclers and compounders.

In addition, the event's large selection of exhibitors and high-level conference sessions are attracting interest from OEMs and end-users.

Representatives from the following companies are among the 2000+ people that have registered to attend: Abbott, Amcor, Ampacet, Associated Materials, Avery Dennison, Azek Building Products, Bemis, Berry Global, Bixby, Colgate-Palmolive, Dell, Envision Plastics, Ford Motor Company, Genova Products, HP, Lavergne, LyondellBasell, NAPCO, Nestle, PolyOne, Primex Plastics, Renolit, Reynolds, Royal Building Products, Southwire, Taghleef, Tarkett, TE Connectivity, Tekni-Plex, Teknor Apex, Trex, Veka, Whirlpool and many more.

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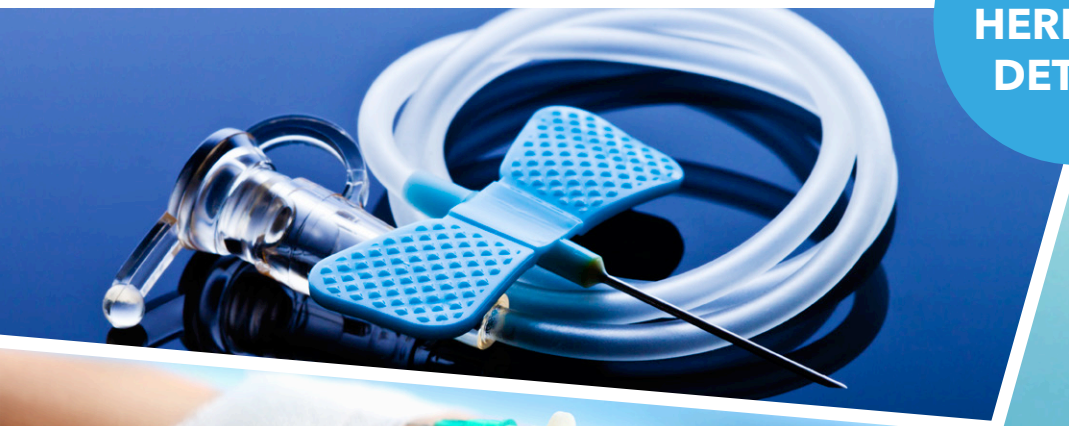

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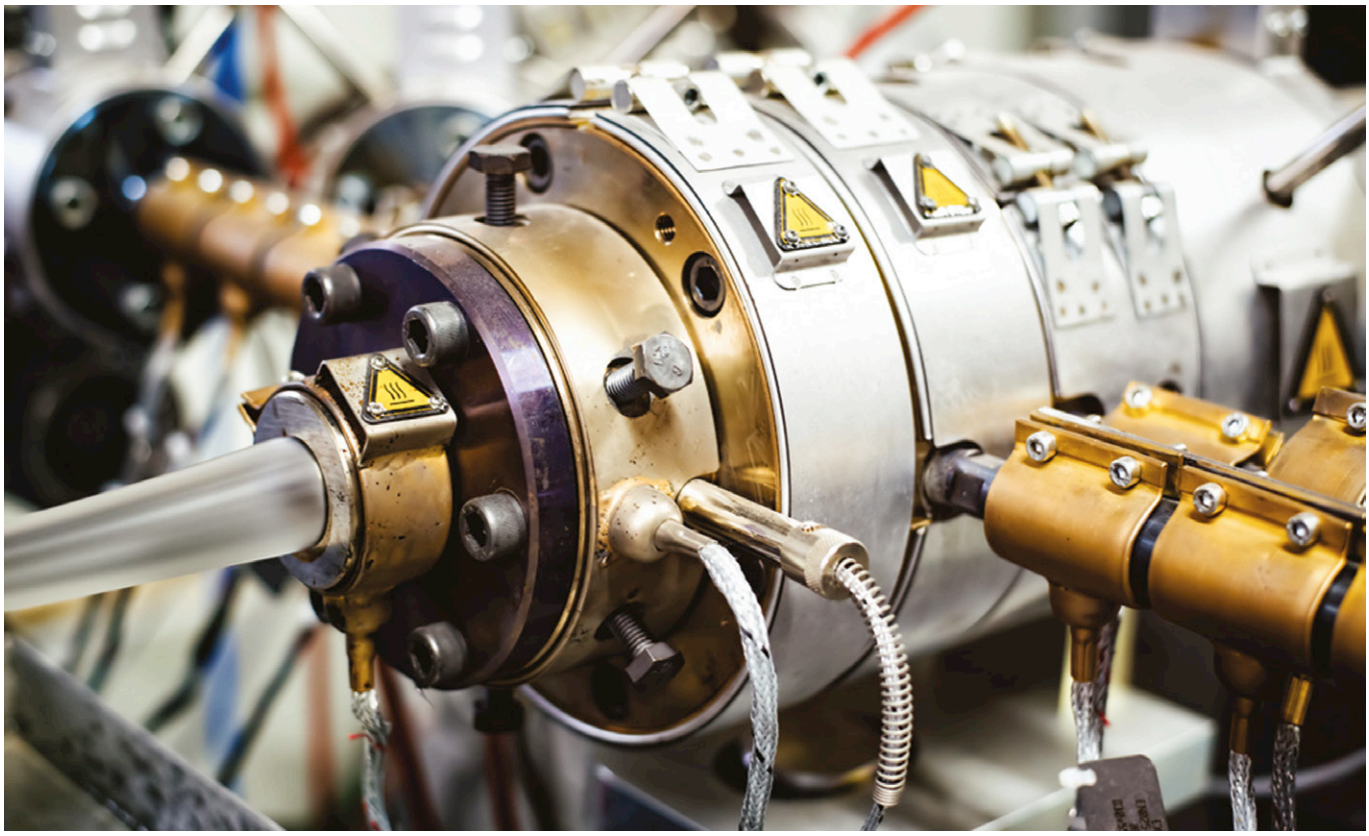


Project planning required for proper pipe die design

Before designing a pipe die head, it is imperative to have a clear concept of the whole project – including the product to be made, material to be used and associated equipment used in the production, says Sushil Kainth

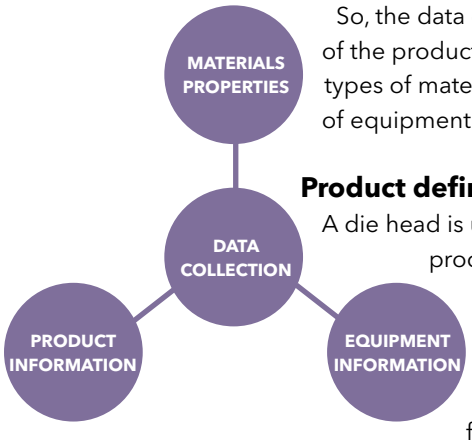
The design of a die head is always a part of a complete project. This project can be a new factory, new production line, new product on an existing line, or just the replacement of an existing die head. Whatever the extent of involvement it may have, the stages of planning a new head from design to a smooth running of production are the same. In many cases, the die designer is part of the team responsible for the complete project, whose job it is to collect all the necessary data concerning the project from start to end.

Data collection

Before starting the design of a die head, it is important to have a clear concept of the project – including the aims and limitations of the product, the material to be used, and the associated equipment. Getting this information can be difficult if one does not know which information is needed and where to get it from. Design engineers are not always the decision makers, so it is important for them to compile a list of questions in the form of a project brief to collect all the necessary information concerning these questions:

- What will be made with the die (in terms of product or products)?
- What materials or polymers will be used in manufacturing?
- What equipment will be used (such as extruder and downstream equipment)?

Main image: Pipe dies are critical in the production of all types of plastic pipe



Above: Several sources of information are needed when designing a pipe die

So, the data collection is an investigation of the product or the range of products, types of materials to be used, and the type of equipment and its capabilities.

Product definition

A die head is usually made for a specific product or range of similar products, such as pipes, tubes or profiles, which should be defined at this stage. A die head designed for large diameter pipes for water or gas applications cannot be used for profiles, for instance. Usually, die heads made for monolayer pipes and tubes are made in-line with the extruder and the downstream equipment. Multilayer pipes and tubes heads can be a combination of in-line and feed at an angle, and in some cases just crossheads – where all extruders are situated at left, right, top, and bottom of the crosshead.

The exception to this rule occurs in prototype products, where die heads made for other applications are adopted to produce limited samples of different products. For instance, crossheads for cable covering have been used to make tubes, with limited product quality and production efficiency.

Clear product definition will determine the orientation of the die head, the type, and the size of the head. The size of the head is determined from the range of products to be manufactured on the production equipment. So, to proceed with the design of the die head, the product is defined as pipe, tube, wire coating and so on.

Production range

Once the end product has been agreed, the next stage is to define the range of products that can be made from the die head. For instance, a head designed to make 100mm diameter pipes can be used for pipes of 50-125mm diameter. So, the product range for the given die head is defined as Ø 50-125mm pipes. The same die head cannot be used to make 10mm tubes or 200mm pipes without sacrificing some of its qualities – such as the material residence time in the die head, shear rate, shear stress, pressure drop and compression angles between the pin and die.

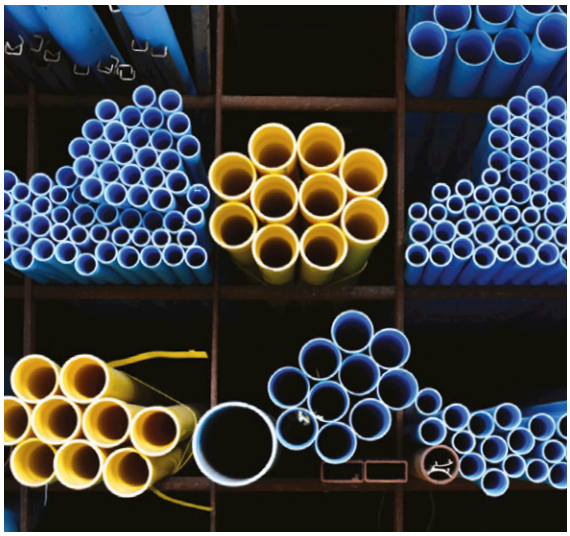
If a head designed for Ø 100mm pipes is used to make Ø 10mm tubes, the first problem will be that there is too much material stagnant in the head – resulting in long residence time, low shear rate, high shear stress in the tooling region and high pressure in the head due to the small annulus area at the tip of the die. Long residence time and low shear rate can cause melt degradation in the head. For low heat stability materials like PVC, the degraded material can start gassing, causing environmental hazards and even damaging the die head. High shear stress in the tooling region will cause melt fracture, resulting in shark skin effect on the product. High pressure in the head will cause the leakage of the melt and, in some cases, will damage the head. For these reasons, it is important to define the product range for which the head is to be designed.

There are a number of design considerations for choosing the product range, such as the geometry of the die head, the melt flow characteristics, the plant capacity, and the economical manufacturing of the die head and tooling. The designer has to make judgements on all these issues to determine a good balance between the influencing factors. These judgements are either based on fundamental calculations or simulation of the flow characteristics.

Wall thickness

Along with the product range – which refers to minimum and maximum diameters – the wall thicknesses of the components are also needed, especially in the case of tubes and pipes. This information is necessary for calculations of material output, line speed, draw down ratios, and die geometry. In the case of special tubes like medical tubes, microtubes for fibre optics and fibre optics ducting, there will be particular industry standards to follow – some of which may be written by certain standards institutes and others may be agreed between the manufacturers and the customers on local, national, and international levels.

In the water and gas industries these standards are defined by the water boards and gas boards in each country. Water and gas pipes are normally



Right: A single die head will be designed to produce a limited range of diameters and wall thicknesses

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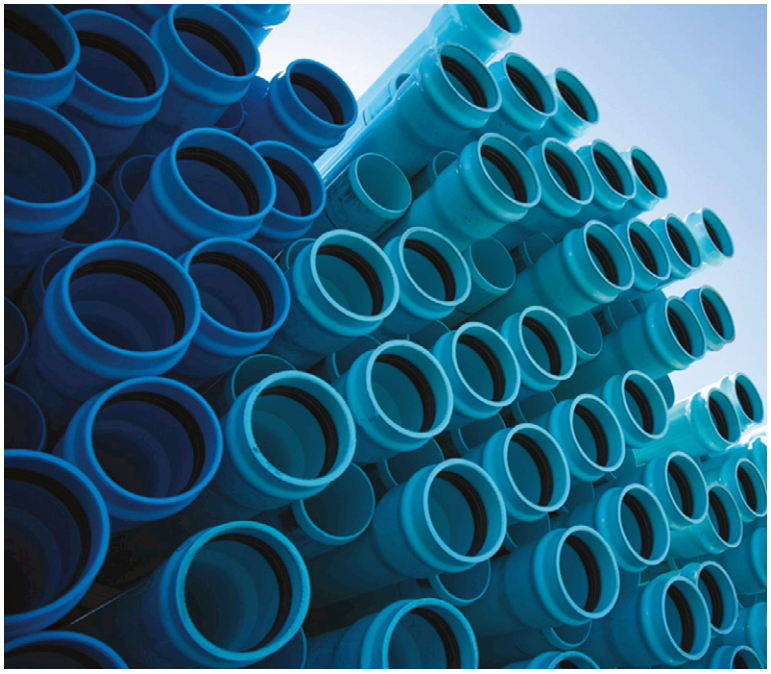

Above: Die heads that process easily degradable materials, such as PVC, should be kept as simple as possible

referred to using the Standard Diameter Ratio (SDR), which is the ratio of nominal outside diameter to minimum wall thickness. For instance, a 11 SDR for a 110 mm diameter pipe would give a wall thickness of 10mm. Two commonly used SDRs in the water industry are 11 and 17.

Material information

The second important part of the data collection or project brief is the material information. It is wrongly assumed that a die head can process any number of materials. For example, die heads for easily degradable materials should be kept as simple as possible, while for polyolefins they require a long relaxation area after the spider to knit the weld lines created by the spider legs. There are times when the weld lines cannot be eliminated to acceptable standards with this type of die head. In this case, different types of distributors in the die head are considered.

It is usually a good practice to design the die head for as many materials as possible, but there are limitations due to the rheological and thermodynamic properties of the materials. A single layer product may be made from a number of materials for specific applications using the same die head. Multilayer products, however, have different combinations of specific materials and so may re- quire different die heads for each set of materials.

Basic information about materials is classified as PVC, LDPE, HDPE, polypropylene, polyamide, polystyrene, etc. Within each class of material, there are several different grades with varying properties, which can have a significant influence on the design of the die head.

Among the material properties there are physical properties dealing with specific gravity, water absorption, and dielectric strength, normally given in the material manufacturers' literature along with mechanical properties such as tensile strength, elongation, tensile yield, compression strength, flexural strength, various moduli, and hardness. Some processing properties such as melting temperature, processing temperature range, compression ratio, and linear shrinkage are also specified. Thermal properties like the coefficient of linear thermal expansion, deflection temperature, and thermal conductivity can also be obtained from the material manufacturers' literature.

Beside these, there are various chemical properties that are considered at the product design stage. It is for the product designer to take into account all these properties to ensure that the product will perform for the purpose it will be manufactured. The product designer may determine the suitable properties either from the manufacturers' literature or in some cases with direct involvement of the material manufacturers or their suppliers. Usually, material manufacturers are large multinational companies with huge research and development facilities, and they are continuously developing new materials for specific applications.

Die designers are more interested in the rheological and thermodynamic properties of the materials for the calculations or simulation of the flow of melt through the die and its effect. Both rheological and thermodynamic properties are linked to each other.

Rheology data

Rheology is the scientific study of fluid flow; the critical study of elasticity, viscosity, and plasticity, which is of particular importance for polymer processing and solid/fluid mixtures.

The critical study of elasticity relates to Hooke's law, describing the behaviour of an elastic solid with applied shear stress and resulting in deformation of the solid. The critical study of viscosity is derived from Newton's law, describing the behaviour of a linear viscous fluid with applied shear stress and resulting in deformation of the fluid.

Since the behaviour of polymeric materials falls within these two limits, as they are solid at room temperature and fluid at melt temperatures, to fully understand the behaviour of the flow of materials one needs a very good education in physics and mathematics.

Most die designers, even being engineers, may find it hard to understand the mathematics involved – but this can be unnecessary as many

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computer simulation programs exist save time at a moderate cost.

It suffices to say that the rheology data normally required for calculations and simulation is related to the shear viscosity η, which is defined as follows:

$\eta = \tau/\gamma$	where: τ = shear stress γ = shear rate

The values of shear viscosity, shear rate, and shear stress at different temperatures are obtained from a piece of laboratory equipment called rheometer.

These days, many material suppliers publish this data on sites such as www.campusplastics.comor www.materialdatacenter.com

The necessary information is not always available on the Campus website, so the die designer should ask the customer to supply this information on the selected grades of the materials. The customer for whom the die is to be designed will be in a better position to get the data from the material manufacturers.

Typical information required for material flow calculations for a grade of LDPE (obtained from Campus) usually consists of three temperatures – and at each temperature there are 10 readings of shear rate versus shear viscosity. These values of shear rate and viscosity are normally apparent values as obtained from the rheometer. The true values are obtained by applying the correction for non-Newtonian behaviour of the melt. The designer should ask the supplier of the data if it contains true values or apparent values. Many laboratories can supply both values and many simulation programs accept data in both forms. On the other hand, die designer who can perform the flow calculations will be aware of these differences anyway.

Thermodynamic properties

In the calculations of heat transfer in the extrusion dies, extruder, or downstream equipment (calibration, cooling tanks, etc.), or to determine the cooling and heating capacities of the equipment, thermodynamic properties are required. The thermodynamic properties of the melt that are needed are:

1. Melt density [kg/m^3]
2. Specific heat capacity [J/kg/°C]
3. Thermal conductivity [W/m/°C]

Similar properties of the materials in the solid state are also required:

Melting temperature [°C]
Freezing temperature [°C]
Solid density [kg/m^3]
Specific heat capacity [J/kg/°C]
Thermal conductivity [W/m/°C]
Specific heat of fusion [kJ/kg]

In some cases, these properties are listed in the material manufacturers' literature or can be supplied on request. Some of the material suppliers have these listed on the Campus website.

Typical thermodynamic properties for the solids and melts of a grade of LDPE are given in Tables 1 and 2.

Equipment information

Information about the equipment to which the die will be fitted or matched in capacity and capability will be needed. This equipment can include an extruder, calibrator, cooling bath, haul-off, cutter and winder.

The information required about the ***extruder*** includes:

- Size – including diameter of screw, L/D ratio, compression ratio – which will give the designer an idea of extruder capacity;
- Type of extruder – single or twin screw;
- Output in kg/hr;
- Number of heating zones and spare connections;
- Flange drawing and clamping arrangement; and,
- Breaker plate drawing

Table 1: Typical thermodynamic properties of LDPE

Melting temperature	Freezing temperature	Density	Specific heat capacity	Thermal conductivity	Specific heat of fusion
110.0°C	90.0°C	920.0 kg/m^3	2300 J/kg/°C	0.280 W/m/°C	130.0 kJ/kg

Table 2: Typical thermodynamic properties of LDPE melts

Density	Specific heat capacity	Thermal conductivity
750.0 kg/m^3	2300 J/kg/°C	0.240 W/m/°C

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Table 3: Design brief, of the type given to customer by die designer

1 Product	Tube, pipe, etc
2 Product range	Minimum diameter and maximum diameter of the product, or diameters of all products in the range
3 Wall thickness of each product	
4 Material (or materials, if more than one)	Manufacturers' names and grade names if known
5 Rheology data	Readings of shear rates [s^{-1}] vs. shear viscosities [Pa·s] at three or more temperatures
6 Thermodynamic data * Density of each material * Specific heat capacity * Thermal conductivity	 [kg/m^3] [J/kg/°C] [W/m/°C]
7 Extruder details *Type of extruder *Screw diameter *Extruder output *Flange details *Breaker plate dimensions	 Single or twin screw [mm] [kg/h] Drawing Drawing
8 Calibrator	
9 Cooling bath *Dimensions *Type: vacuum, spray, etc. *Temperature	 L × W × D
10 Haul-off *Make *Length *Belt width *Speed min/max	 If applicable
11 Cutter *Make *Length *Speed min/max	 If applicable
12 Winder *Make *Diameter *Speed min/max	 If applicable

Information about the ***calibrator*** is only needed if it is an existing calibrator. In many cases, the calibrator is also designed with the die to suit the required product size and output.

The length, width, and depth of the ***cooling bath*** give the designer some idea of the limitations on cooling capacity of the line. Sometimes the cooling capacity of the bath can limit the output capacity of the die head.

Information about the ***haul-off*** is only needed for the maximum and minimum size of the product. Normally it is assumed that the haul-off will be suitable.

The ***cutter*** does not normally affect the die design and is only required in the case of special products. At the same time, the size or capacity of the ***winder*** does not affect the die design – but can limit the plant capacity.

Summary: design brief

A design brief in a table form as shown in Table 3 should be given to the customer by the die designer. This includes all necessary information so that it is clear to the customer what is expected from the die in terms of its performance. Should there be some differences of opinion, these can be discussed at this stage or an agreement can be reached – either to design the die to suit the equipment, or to upgrade equipment to meet the anticipated output requirements.

■ This article is taken from Sushil Kaint's book *Die design for extrusion of plastic tubes and pipes*, which is published by Carl Hanser Verlag. Copies of the book can be ordered from this **link**.

Other chapters of the book cover: basic die design; designing a simple die; simulating melt flow; spiral dies; monolayer dies for pipes and tubes of various sizes; coextrusion pipe dies (including three-layer dies); and materials for extrusion dies.

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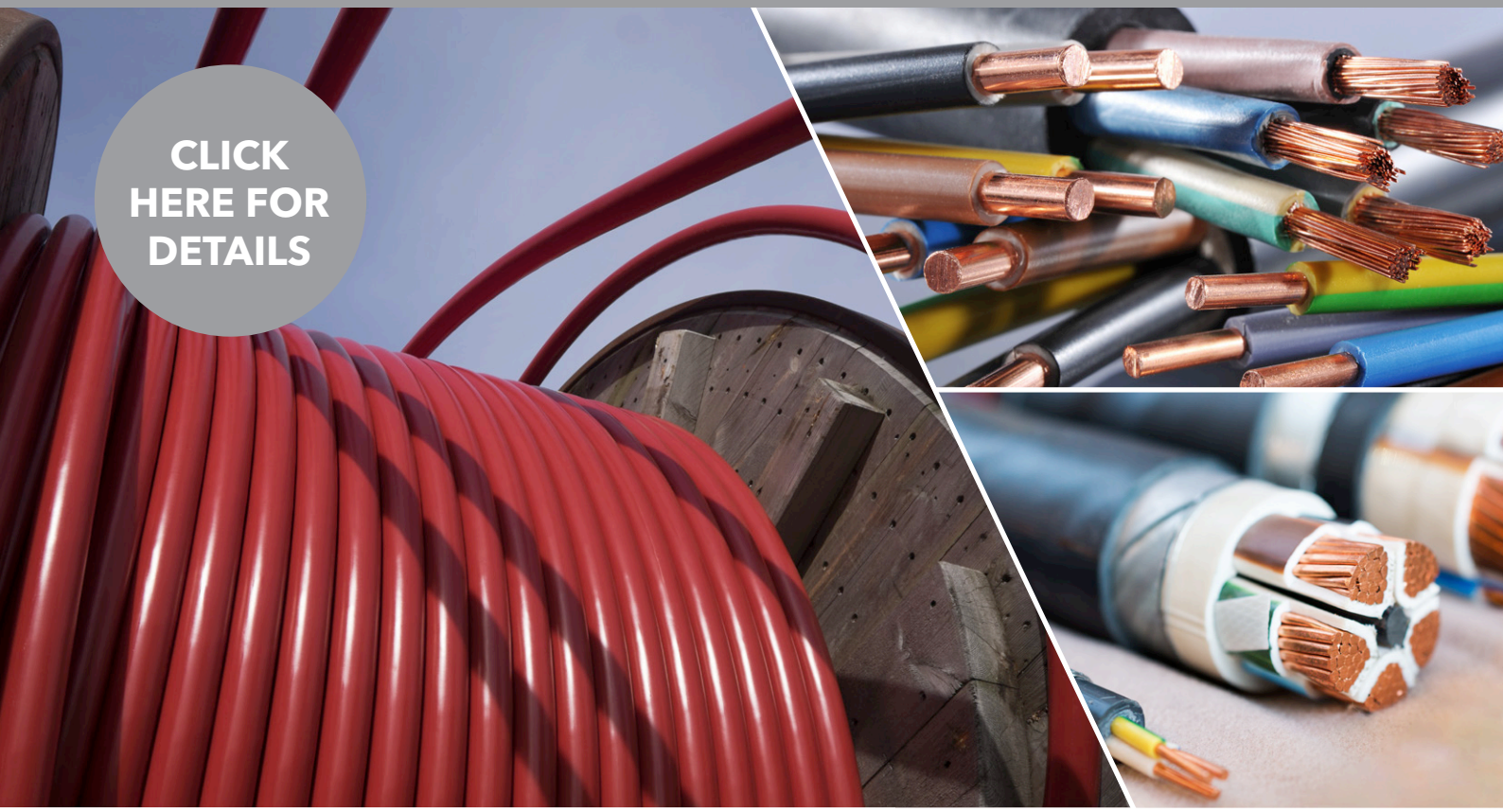

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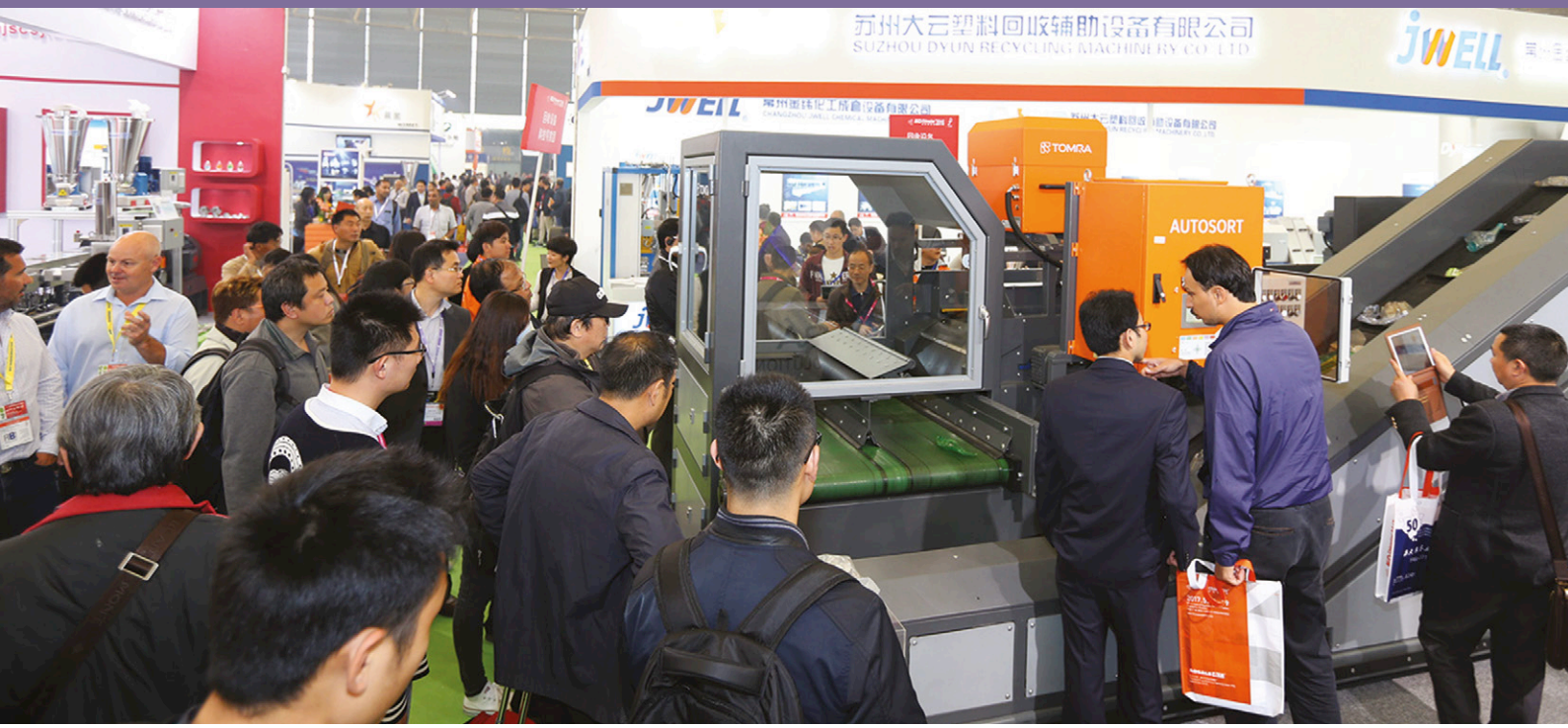


Chinaplas returns to Guangzhou

Chinaplas returns to Guangzhou this year, and here we preview the show with a focus on features of interest to pipe and profile extruders

Chinaplas returns to Guangzhou this year and is expected to host around 180,000 visitors. The show, which runs from 21-24 May, is held at the China Import and Export Complex in Pazhou, Guangzhou. Around 3,500 exhibitors are expected to fill more than 250,000 sq m of exhibition space.

Many of its traditional features will return. One is an increasing focus on sustainability – and in this respect it will upgrade its Recycling Technology Zone and promote it to "a prime position" at this year's event.

The show's organiser, Adsale, says that the local market has changed since China banned the import of waste plastics in 2017.

"In the past, the waste processing and recycling industry relied heavily on imports – lacking a complete recycling chain – while recycling rate and proportion of large-scale recycling are both low," it said. "With the implementation of the ban, it is bound to intensify the shortage of raw materials, and the recycling system of renewable resources is in urgent need of change."

And China's ongoing productivity – and growth in plastics production – will mean a necessary improvement in recycling.

"It is predicted that by 2025, China will produce nearly a quarter of the world's total urban solid waste," it said. "And we know that by improving the recycling rate of waste plastics, the development of a circular economy can be greatly promoted."

Other areas of interest to pipe and profile extruders include: Medical Plastics Connect, which promotes medical-grade chemical raw materials and equipment; Tech Talk, which covers 11 major themes including precision extrusion and 'green building solutions'; Design X Innovation; and, Industry 4.0 Factory of the Future. In this final feature, there will be two themed areas – 'Manufacturing Intelligence Control Room' and 'Smart Factory' – to demonstrate implementable intelligent solutions. Visitors can view 15 simulation scenarios – from production, management and supply chain, including shift handover, KPI monitoring at multiple production sites and material traceability.

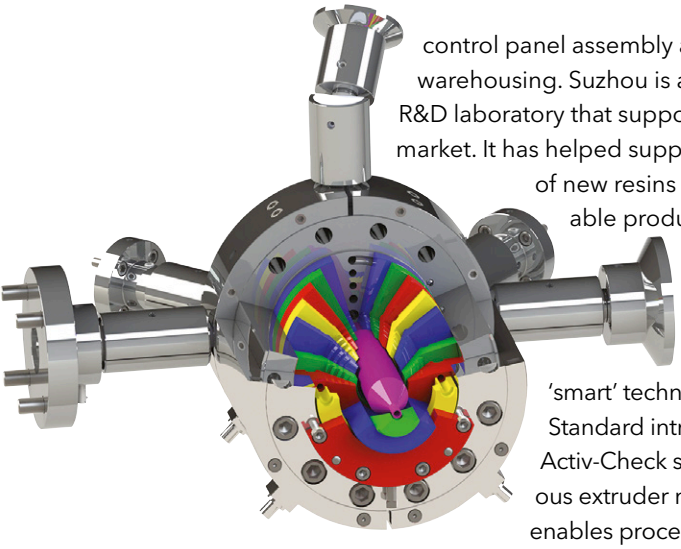
For all these extra features, the main reason for visiting the show will always be the exhibition space – and many external exhibitors will again be at Chinaplas.

Main image: The Recycling Technology Zone will be promoted to a prime position at this year's event

Suzhou expansion

Davis-Standard will promote several aspects of its equipment innovation at Chinaplas – along with its regional growth.

The company is expanding its Suzhou location this year. An additional 35,000 sq ft (3,251 sq m) facility near its existing shop in Suzhou will house



Above: Guill's redesigned Series 800 extrusion tooling produces multi-layer pipes and tubes

control panel assembly and provide extra warehousing. Suzhou is also home to an R&D laboratory that supports Asia's medical market. It has helped support development of new resins and biodegradable products.

In addition – in response to increased demand for 'smart' technology – Davis-Standard introduced the DS Activ-Check system for continuous extruder monitoring. It enables processors to take advantage of real-time preventative maintenance by providing early notifications of potential extruder failures. Machine operators are alerted to issues before they happen, preventing unnecessary downtime while also collecting valuable data. Key parameters monitored include extruder reducer, lubrication system, motor characteristics, the drive power unit, barrel heating and cooling.

The company will exhibit alongside its subsidiaries including Maillefer – which it acquired in 2017, allowing it to expand its pipe and tube equipment offering with new facilities in Finland and Switzerland.

Multi-layer tooling

US-based **Guill Tool & Engineering** will introduce the latest generation of its Series 800, the 2-to-6 layer extrusion tooling designed to produce high quality, material-efficient 1/8in to 6in OD tubing for automotive, medical, appliance and industrial applications.

The redesigned series produces smooth extrusion and layer definition of fluoropolymers and other materials for multi-layer, multi-lumen medical tubing, as well as fuel line constructions, multi-layer PEX pipe and drip irrigation applications. The design further allows thin layer combinations of polymers and adhesives to .02mm or less. Guill offers its extensive line of crossheads and inline tubing dies in fixed and adjustable centre, for single or co-extrusion applications. The tooling is designed to process all compounds, and features the company's Seal Right System, which combines with its patented Feather Touch Concentricity adjustment to eliminate polymer leaking.

Guill also offers its unique spiral flow distribution system. Guill says all its tooling is produced with rigorous computer simulation of the flow channels using Computational Fluid Dynamics (CFD) programs, resulting in optimum uniform flow with no weld lines.

Drying control

Drying will be a key focus for **Moretto** at Chinaplas – where it will display its Moisture Meter Manager. This device gives an in-line reading of the moisture content of polymer granules, and manages and controls the drying process to ensure product certification and energy savings.

It uses an MM Crown sensor to measure the moisture of the granule when it enters the hopper. This allows the system to accurately predict the drying process that the dryer must handle. The dried material exiting the hopper is further analysed by the MM Box sensor, which accurately analyses the water content in the polymer (from 15 to 3000ppm, with a temperature range of 20-180°C). Using the range between initial and final moisture levels allows the device to manage the dryer's working conditions and maximise process performances within strict energy limitations.

Moretto will also showcase some 'mini dryer' systems. Its X Comb range is frequently used in the medical sector to dry small quantities of material (with hourly production of 1-20kg). It features powerful turbocompressors, zeolite technology, a dew point equalizer (to -60°C) and the OTX hopper. Maximum efficiency and auto calibration are strategic factors for optimal transport of plastic materials, it says.

It will also show its Exa, a flexible conveying system that can manage up to six Kasko receivers, including powerful suction units with side channels, and a cyclone filter suitable for the transport of large quantities of granules or dusty regrinds. The system is connected with Moretto's Mowis supervising system and is manageable by portable devices, Master K key pad and Master 300 touch view. The Exa system can guarantee high control, performance and flexibility in case of expansion of the system, says Moretto. ›

Right: Moretto's Moisture Meter Manager analyses the moisture content of polymer granules and manages and controls the drying process

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Right: Coperion K-Tron's Bulk Solids Pump (BSP) feeder allows gentle feeding of free-flowing granular materials

Feeding solutions

Coperion K-Tron will showcase a variety of equipment at Chinaplas, including a number of feeding solutions.

Its K2-ML-D5-T35/S60 Quick Change (QC) feeder features the ActiFlow bulk solids activator and Electronic Pressure Compensation (EPC) in combination with a 2400 Series vacuum receiver for refill. The T35/S60 QC is designed for applications requiring quick changeover of materials and convenience of fast cleaning. It allows for the removal of the entire feeding module with screws in place for replacement with a second unit. The removed feeding module can then be transported to a cleaning facility for further disassembly, cleaning and preparation for another material. Twin and single screw feeding modules are available. Single screw feeding units handle free flowing powders, granules, pellets and other non-flooding materials, while twin screw units are ideal for floodable powders and more difficult, sticky or hard-to-flow materials.

The ActiFlow smart bulk solids activator offers an innovative way to prevent bridging and rat-holing of cohesive bulk materials in stainless steel hoppers without internal hopper agitation. It is a non-product contact device, consisting of a vibratory drive and intelligent control unit, designed to work with Coperion K-Tron's line of gravimetric loss-in-weight feeders. Together with a control unit, it continuously activates the material inside the hopper with an optimised frequency and amplitude, without exerting any mechanical force on the bulk material.

Also on display will be the company's K-ML-BSP-150-S Bulk Solids Pump (BSP) feeder, for gentle feeding of free flowing granular materials. The BSP feeder does not use the usual screws/augers, belts or vibratory trays to convey the material. Instead it uses positive displacement action to feed free flowing materials with high accuracy, offering uniform discharge, consistent volume and gentle handling. Material moves smoothly from storage hopper to discharge outlet through a 'product lock-up zone', achieving true linear mass flow. With no pockets or screws and only one moving part, the compact feeder is cleaned in seconds, making it ideal for applications with frequent material changes.

Pump quality

Maag will present a broad range of its products that help compounders and recyclers combine high productivity with high product quality.

From its range of gear pumps, Maag will present

the Extrex in X6 class design. As with all X6 versions, Maag has re-engineered and redesigned all the components, from the shafts through to the bearings and seals, and optimised the interaction of the components. Specially developed gear teeth with low compression allow high pressures to be achieved with low shear rates. The result is a further increase in achievable product quality, volumetric efficiency, as well as production consistency and safety.

In addition, it will show an ERF350 melt filter from its subsidiary Ettlinger. The ERF350 reliably filters plastic melts with impurities and separates out foreign materials. It can handle impurity levels up to 18 % with very low melt losses. Designed for high efficiency, it achieves a maximum throughput of 3,800 kg/h, depending on the type of melt and degree of impurities as well as the selected filtration rating. It is suitable for typical polyolefins and polystyrenes, as well as technical plastics such as styrene copolymers, TPEs and TPUs.

Filter simulation

Seebach of Germany will exhibit its flow simulation capability for non-Newtonian fluids – such as plastic melts.

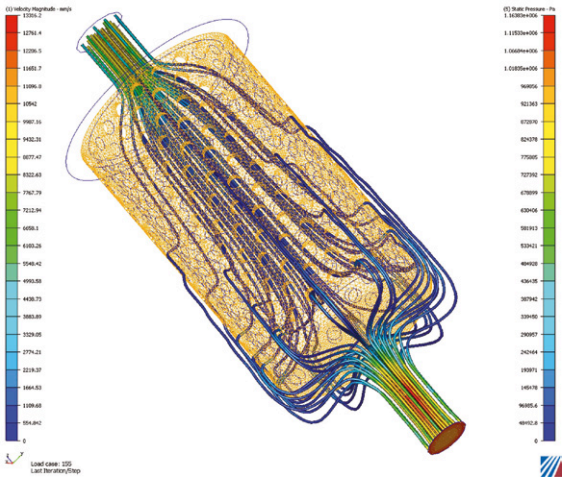
Flow simulation is increasingly used to identify the root cause of filtration problems, and to develop filtration solutions for custom applications. Seebach's approach relies on its extensive experience in the filtration of non-Newtonian fluids – which change their viscosity with applied shear. Using simulation, it can optimise existing systems or design new systems for specific applications.

It can provide the following data – expressed in graphic form:

- Expected start pressure loss;
- Velocity profile within the filter;
- Shear stress and viscosity profiles; and,
- Temperature gradient (for temperature-dependent simulation).

To perform a simulation, Seebach requires the following data: drawings (preferred 3D models) of the existing filtration system; information on flow rate, temperature conditions and desired filtration rating; and fluid data (including density, viscosity curves and temperature transition coefficient).

Depending on the quality of the existing data, a simulation can be completed in 1-3 days.



Right: Seebach uses flow simulation to develop filtration solutions for custom applications

Rubber processing

Uth of Germany will present its latest products for rubber and silicone extrusion – including straining systems, its Roll-Ex gear pump technology and new systems like the TRP Reworker and Polymer Dosing systems.

With a focus on its gear pump technology for rubber extrusion, Uth will present its solutions for applications requiring a high level of availability, cost-efficiency and material-saving. The market demands cost-effective products of the highest quality, says Uth.

With throughputs up to 10,000 kg/h, Uth's Roll-Ex gear pump extruder systems have set the benchmark for fine mesh straining of rubber compounds, it says. Using either the compact two-roll feeder (TRF) or a conical twin screw feeder (DSE), the modular design of Roll-Ex enables the integration of the strainer in each specific line design.

Because of the flexible and compact design, a seamless integration into existing lines is also possible, it says.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.chinaplasonline.com**
- **www.guill.com**
- **www.davis-standard.com**
- **www.moretto.com**
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Chinaplas 2019 – Key Information

Dates: May 21-24, 2019 **Opening Hours:** 09:30-17:30 (until 16:00 on final day)
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PHOTO: EUROCELL

PVC industry stands by its recycling record

Europe's PVC sector has made huge progress in recycling since 2000, and companies are continuing their commitment – though legacy additives remain a regulatory problem. By ***David Eldridge***

In a time of increased public, political and regulatory pressure on plastics waste, the success of PVC recycling in Europe shows what can be achieved by focused plastics recycling programmes.

From a standing start, the first PVC industry Voluntary Commitment, Vinyl 2010, reached a level of 260,000 tonnes of recycled PVC in 2010, when it was superseded by **VinylPlus**, the second programme which achieved a level of nearly 640,000 tonnes in 2017. Yet, such achievements can go unnoticed by politicians caught up in a storm of condemnation, as the case has been with plastics waste recently. One of the features of the EU's Strategy for Plastics last year was a call for voluntary pledges from stakeholders to boost the uptake of recycled plastics. The response from VinylPlus was to ratchet up its existing goal of recycling 800,000 tonnes of PVC waste by 2020 to a new commitment to recycle 900,000 tonnes per year by 2025, and beyond that, 1m tonnes per year by 2030.

The VinylPlus programme is communicated in an annual Progress Report, through its Sustainability Forum and, of course, through direct contact with its members in the PVC industry, and with European Commission officials and wider stakeholders.

Louder voice

VinylPlus is also attempting to make its voice heard online through political news websites to communicate what the programme has achieved and the ongoing initiatives it is a part of. In a sponsored article published on the Politico news site, Brigitte Dero, general manager at VinylPlus, wrote: "We have been following the evolving EU debate on plastics with keen interest. The vote by MEPs in Strasbourg on single-use plastics is the latest chapter in what is likely to be a long story, and we are also playing our part in it. The Parliament report stated that: 'Joint and coordinated actions by all stakeholders across the entire value chain, including consumers, are necessary in order to succeed and achieve an outcome that is advantageous for the economy, the environment, the climate and health.' We could not agree more." ›

Main image: Around 300,000 tonnes of PVC window profiles were recycled in Europe in 2017, says VinylPlus

Right: Recycling of PVC windows at Askren Manor, near Schweinfurt, Germany

How likely is PVC to come under renewed attack from legislators due to the current alarm about waste plastics, particularly in the marine environment? Dero said: "Waste plastics in the marine litter (and land) environment is a challenge for all plastics, and not specifically for PVC. As PVC is essentially used in long life applications such as building and construction, the issue is rather less acute for PVC than for plastics whose main market is packaging. PVC producers are however taking the matter seriously, among others by signing up to the 'Operation Clean Sweep' [initiative to prevent polymer pellet, flake and powder loss]."

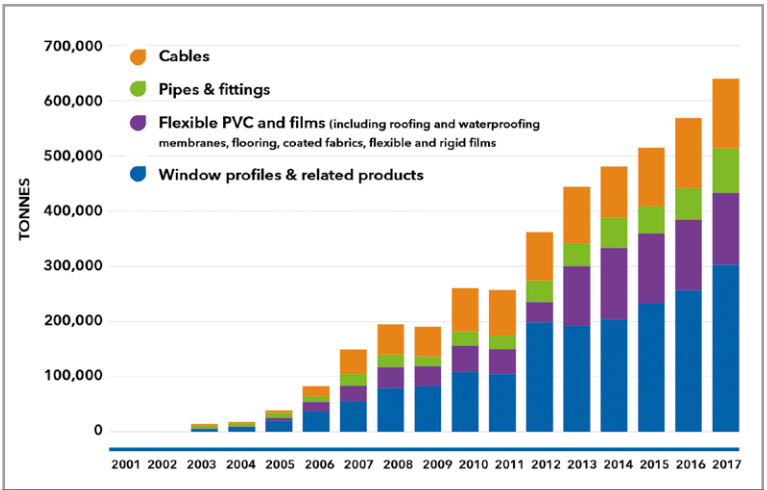
Detailed picture

The VinylPlus Progress Report presents a detailed picture of achievements. A breakdown of the 639,648 tonnes recycled in 2017 shows the contributions from schemes run by EuPC sector groups and sectoral associations, and by the industry-wide Recovinyl scheme, which target recycling of vinyls from window profiles, pipes and fittings, cables, rigid and flexible films, flooring and coated fabrics.

Figures for 2018, which are due to be released this month, will be reported in the next issue of the magazine.

"The amounts of recycled PVC continue to grow year after year, which shows that both the about 150 PVC recyclers and the many converters using recycled PVC, especially in the pipes and profiles sector, are making good progress. We have already recycled 4.2 million tonnes of PVC since 2000, and our recycling has risen steadily over the years," said Dero.

But the commitment of VinylPlus goes further than the headline recycling figures. She said: "We encourage investment in the recycling sector and collection systems, so we can do more to close the loop. We promote pioneering innovation in the use, production and re-use of PVC, including RecoMed, an award-winning scheme to recycle selected PVC medical devices, and a project on the re-use of PVC building products in urban agriculture in Denmark."



PVC recycled within the Vinyl 2010 and VinylPlus frameworks
Source: VinylPlus

Medical scheme

RecoMed is a UK project run by the **British Plastics Federation** and **Axion Consulting** to collect and recycle uncontaminated PVC medical products from hospitals. From its launch in 2014 to 2017, RecoMed collected and recycled 5,556 kg of PVC waste (including 3,000 kg just in 2017), equal to 177,910 sets of oxygen masks and tubing.

PVC medical products are a relatively new target area for recycling, but even in an established area like window profiles the potential for recycling continues to expand. The Hybrid Project, launched by **EPPA** (European PVC Window Profile and Related Building Products Association) in 2016, aims to classify the recyclability of PVC hybrid profiles. "It assessed that while post-industrial hybrid waste is easily recognised, it is often quite complex to identify hybrid materials in post-consumer waste. The project will continue in 2018 with a focus on post-consumer waste, to determine how to facilitate the identification and design of hybrid PVC profiles," said VinylPlus in its Progress Report.

Germany's **Rewindo** scheme for collecting and recycling used PVC windows and doors is responsible for some large-scale projects in the country. One of the largest recent projects has been at Askren Manor, west of Schweinfurt, where a former US army settlement is being demolished in order for the site to be redeveloped. At the 28-hectare site, there are 34 three-storey residential blocks and 13 semi-detached houses, which yield approximately 2,500 PVC windows for collection. These used windows are being recycled by Dekura at its plant in Höxter and the recycled PVC is used again in window manufacture. ❯

Legacy concerns

A major issue for PVC recycling is legacy additives: the presence in PVC recyclate of additives such as stabilisers based on heavy metals. VinylPlus co-ordinated programmes in which the PVC industry phased out cadmium and lead stabilisers, but they remain in the waste PVC that enters the recycling stream. This has led to a clash between the EU's circular economy goals and the management of restricted substances under the Reach directive and administered by the European Chemical Agency (ECHA). The ECHA proposed a threshold of 0.1% lead content for articles not containing recycled PVC, and for some construction applications there would be a 15-year derogation with a higher limit of lead content for articles using PVC recyclate. VinylPlus submitted comments and information to ECHA, including the results of independent studies into safe levels of lead stabilisers in rigid PVC. The ECHA's Committees for Risk Assessment and Socio-Economic Analysis (SEAC) assessed the information from all stakeholders and held a public consultation on the SEAC draft opinion earlier this year.

VinylPlus provided our sister magazine *Plastics Recycling World* with an update on legacy additives and when there may be an official announcement. Brigitte Dero said: "The Committees of the European Chemical Agency concluded in favour of allowing for 15 years the recycling of PVC waste containing lead up to concentrations which should allow most recycling to go on, because the conditions applied ensure that the risk is controlled. The decision is now in the hands of the Commission, which will propose legislative measures. In view of the wider discussions regarding the interface between waste and product legislation, it is difficult to predict a precise timing."

VinylPlus has engaged **The Natural Step**, an NGO based in Sweden, as an external advisor on sustainability issues, including the issue of legacy additives. At the request of the VinylPlus Controlled-Loop Committee, The Natural Step conducted an analysis using the sustainability principles it has developed to evaluate the issue and "to consider the best current waste management option for rigid PVC articles when 'back casting' from full alignment with sustainability principles in the longer term".

In The Natural Step's subsequent report, *Legacy additives in rigid PVC and progress towards sustainability*, it said its analysis indicated that alternatives to recycling rigid PVC, such as landfilling and incineration, would breach sustainability principles. It said: "Our long-standing conclusion is that all PVC articles need to be optimised for and managed within a controlled-loop system in order to align with the principles of sustainability advocated by The Natural Step. A closer look at management options for rigid PVC waste from window profiles and pipes suggests that legacy additives are not likely to 'leak out' from recycled materials, and the reuse of this waste stream is preferable to the alternative disposal routes assessed." It added that "so long as safe handling and ongoing VinylPlus commitments to achieving controlled-loop management of PVC remain in place, it is likely that the concentration of legacy additives will continue to decline in the material flow as newer PVC formulations enter the recycling stream".

Commission strategy

The European Commission recognised the difficulty of legacy substances in its Plastics Strategy announced last year and dedicated a section to the issue in its announcement. It said: "The issue of legacy substances will continue to constitute a barrier to the circular economy and, therefore, we will take steps to develop a specific decision-making methodology to support decisions on the recyclability of waste containing substances of concern. This methodology will take into account the overall cost-benefit of recycling a material compared to its disposal (including incineration with energy recovery). We expect to finish this work by mid-2019."

The regulatory difficulty is highlighted by another part of the PVC legacy additives issue: phthalate plasticisers. Many phthalates have been restricted by ECHA, including DEHP, which has been widely used as a plasticiser in vinyl flooring but was restricted by ECHA. In 2016, the Commission backed a recommendation by ECHA to grant a four-year authorisation for uses of DEHP in recycled PVC by three PVC recycling companies. This was

Below: Legacy additives, such as stabilisers used in PVC pipes, are the subject of regulatory conflict

PHOTO: EMERY OLEOCHEMICALS

Above: Major PVC manufacturers, including Deceuninck (pictured), have PVC recycling operations

challenged by environmental NGO ClientEarth which took the Commission to the European Court of Justice over its decision. However, in a judgment on 4 April 2019, the Court backed the Commission's decision. ClientEarth says it may appeal.

The PVC industry has concerns that the regulatory conflict over legacy additives could hinder investment in PVC recycling. In June, the VinyLoop PVC recycling business in Ferrara, Italy was closed due to financial losses. VinyLoop, a 60/40 joint venture between Inovyn and Texyloop, used a proprietary solvent process for hard-to-recycle soft PVC items. A fall in demand for the special type of recycled PVC produced at the VinyLoop plant, driven by increasing product regulation, severely impacted the business, it said at the time of the closure. Francesco Tarantino, VinyLoop General Manager, said demand for its VinyLoop R-PVC had recently collapsed: "This has been driven primarily by tighter regulations relating to VinyLoop R-PVC that contains DEHP."

In October, the remaining VinyLoop plant assets and related land, service contracts and all current employees were transferred to Benvic Europe. Benvic intends to convert the assets for its business focussed on polymer compound production.

Hard to treat

This may be seen as a setback for PVC recycling in Europe, yet work continues on treating difficult-to-recycle PVC waste, for example at the Oreade-Suez plant in France where trial reprocessing is being scaled up. Companies in the large volume PVC markets also report continuing commitment to recycling. Major PVC extruder **Deceuninck** said in its 2017 annual report that it focused last year on improving post-sorting and pelletising technologies and investing in further automation at its recycling plant in Diksmuide, Belgium. Deceuninck recycled 12,000 tonnes of post-industrial and post-consumer rigid PVC waste in 2017, part of which the group reuses in added value products, such as new window profiles and thermal reinforcements.

Veka, another major PVC profiles extruder, is making a major investment in PVC recycling in the UK this year. It says it is spending more than £8m to convert a former metals recycling plant in Wellingborough into a PVC window recycling operation using post-industrial and post-consumer waste. The German company expects the plant to open this year and to be fully operational from spring 2019, with up to 50 jobs expected to be created. With the addition of the new UK plant to the two it operates in Germany and France, Veka will have combined capacity of more than 100,000 tpa of PVC window waste.

Simon Scholes, commercial director at Veka Recycling in the UK, said: "This will give us the ability to produce the highest quality polymer for use in a range of construction products, including brand new window and doorframe profiles. We will have the ability to promote and deliver PVC-U windows as truly sustainable at a time when plastic generally is under close scrutiny, and to make the most of what is a tremendous resource."

British window maker **Eurocell** is another group with a commitment to PVC recycling. Over the past six years, Eurocell has invested £5m in an expansion at its PVC recycling operation in Ilkeston, Derbyshire. In October, the company rebranded the operation from Merritt Plastics (which it acquired in 2009) to Eurocell Recycle. The plant has contributed heavily to the 61,500 tonnes of end-of-life PVC Eurocell has diverted from landfill over the last 10 years, said the group. Chris Coxon, head of marketing at Eurocell, said: "We have owned the facility for almost a decade as Merritt Plastics. The time has come to bring it under the Eurocell name and the rebrand allows us to raise awareness and expand further, venturing into different locations, whilst remaining consistent with our brand and messaging throughout. We look forward to our future as Eurocell Recycle and continuing to carry out positive work within our industry."

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.vinylplus.eu**
- **www.bpf.co.uk**
- **www.axiongroup.co.uk**
- **www.eppa-profiles.eu**
- **www.rewindo.de**
- **www.thenaturalstep.org**
- **www.deceuninck.com**
- **https://vekauk.com**
- **www.eurocell-recycle.co.uk**

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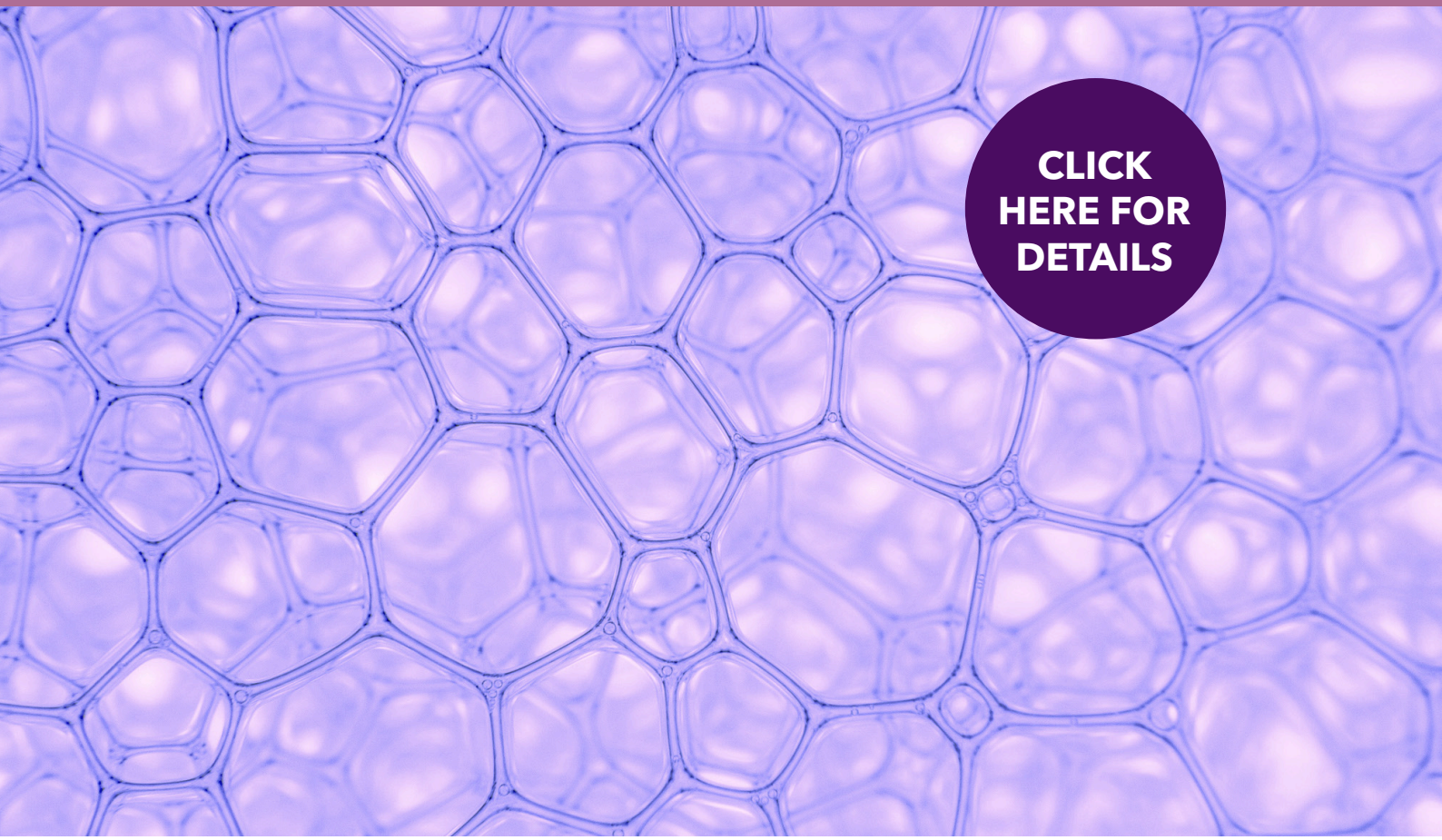

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Compounding WORLD

Putting on the pressure

A wide variety of materials can be used in pipes that transport fluids under pressure – including polyolefins, recycled materials and even a new form of PVC pipe. ***Lou Reade*** *reports*

Pressure pipe is designed to cope with high internal forces but must also be able to withstand other factors – such as the weather.

For this reason, **GPS UK** has developed Excel White, a pipe system for transporting water in above ground applications. While most PE pipes for water applications are buried underground, some applications – such as when it needs to cross rivers, or for hydro projects – that require pipe to be installed above ground. When exposed to sunlight, traditional black PE materials can expand, which affects performance, which is solved by making thicker-walled pipe.

Excel White is a co-extrusion of white and black PE100 to provide a white surface, that reflects sunlight and so absorbs less solar radiation. A lower surface temperature reduces thermal stress and expansion and allows a thinner pipe wall to be used, offering considerable cost savings.

The new pipe is available in sizes of 180-630mm in SDR11, SDR17, SDR21 and SDR26. Offering flexibility to contractors and installers, Excel White is offered in 6m and 12m straight lengths or 50m and 100m coils in 180mm. Additional sizes, SDRs and lengths are available subject to a minimum order value.

"We have launched Excel White is an improved solution for above ground applications, in terms of product performance and reduced costs," said Sophia Zhang, product manager at GPS UK. "Our technical team always works closely with customers on above ground projects to ensure the correct specification of pipe is designed to cater for the effect of sunlight."

Water for Gothenburg

High pressure SLA barrier pipe from **Egeplast** was recently installed into contaminated soil under the river Göta älv in Gothenburg, Sweden using the HDD method. The pipe supplies drinking water to the island of Hisingen. Building the pipeline involved creating an underpass over a total length of around 560m under the river. This was complex, because of complicated geological conditions with contaminated mud and a drilling at a depth of more than 30m.

SLA barrier pipe was chosen, with dimensions of 630 x 70.3mm SDR 9. It prevents any permeation by hazardous substances. The pipe has an inner layer of PE100-RC, outer protective layer of PEplus

Main image: Egeplast's SLA barrier pipe was recently installed into contaminated soil in Sweden using the HDD method

Above: Molecor has tested the effectiveness of creating oriented chlorinated PVC for pipes

and a metallic permeation barrier – which allows for permanent protection of sensitive media and their environment. In addition, its electrical properties provide optional pipeline detection and inspection for intactness before and after installation.

The pipes were connected via butt welding. Prior to insertion, the integrity of the pipe string to be inserted was examined by means of a puncture test using a high voltage tester. Once the test result was positive, insertion of the pipe string was initiated.

Recycle in pipe

Scientists at the **Institute of Physics of Materials** (IPM) in Brno in the Czech Republic have studied how recycled material might be used in multi-layer pipe – including pressure pipe. The work involved simulating crack propagation in several different configurations.

Recycling of polymer material for pipes has become an important issue: the European Plastic Pipes & Fittings Association (Teppfa) has committed to use 250,000 tonnes of recycled material by the year 2020, for instance – and EU initiatives will force more virgin material to be replaced by recycle. According to current regulations, recycling is not allowed at all for pressure piping systems.

"One way of applying recycled material possible to pressure pipe systems would be to use it in multi-layer pipes," said Pavel Hutar, deputy research group leader at IPM, in a paper at last year's PPXIX conference. "Co-extruded multilayer pipes – with an inner layer of recycled material – can have similar durability to conventional pipes."

The team used linear elastic fracture mechanics to estimate the lifetime of multi-layer pipes containing both virgin and recycled PE, considering several possibilities of crack propagation. Crack growth rate was measured using a cracked round bar (CRB) test for several material grades (including recycle). At the same time, a finite element model (FEM) of the multi-layer pipe was created to calculate stress intensity factors for elliptical cracks propagating through the pipe wall.

One test showed that, if a pressure pipe were made only of recycled material, its performance would be insufficient – and had lower calculated lifetimes than PE100 or PE100-RC pipes.

However, in a second test – on multi-layer pipe in which the crack propagates in the inner layer made of virgin PE – showed that recycled PE in a multi-layer structure did not significantly lower lifetime, which was only slightly below that of 'all virgin' pipe.

Slow crack propagation through recycled material is much faster than it is through virgin materials, so crack initiation in the middle (recycled) layer was also investigated – and found to have lower quality. Changing the thickness of this layer did not significantly influence the estimated lifetime.

High pressure transportation for big pipe

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.

Orientation of C-PVC

At the same event, **Molecor** of Spain – which makes PVC-O pipe – explained how it has applied its molecular orientation technology to chlorinated PVC (C-PVC).

"We want to achieve a product with all the advantages of PVC-O but with greater temperature resistance," said Ignacio Muñoz, CEO of Molecor.

Some of its underlying aims included: checking whether orientation of C-PVC was actually possible; analysing the properties of any materials produced; and, evaluating the economics of making C-PVC-O products.

To analyse the properties of C-PVC-O pipe, Molecor adapted one of its existing orientation machines to work at higher temperatures. The main changes had to be made in the orientation stage. Temperature was increased, in steps of 5°C, until the ideal temperature for orientation was obtained. Other parameters such as pressure and expansion speed were also adjusted. After fixing these, a set of pipes was made under standard conditions and tested according to the ISO 16422 Standard for PVC-O pipes.

Two stress-strain tests were done on the preform and on the final oriented pipe. Both results were above standard PVC-U and its oriented couple. It seemed to match well with the test requirements for CPVC and PVC-U for stress test (50 vs 48 MPa), where a higher stress value is expected for PVC-O.

In an axial sample test, oriented C-PVC-O showed a pipe stress of 54.78MPa, and a pipe strain of 94.6%. These results are in line with those of PVC-O. From a requirement of 50MPa for standard CPVC-O there is an increase of properties, said Molecor. Strain also showed a behaviour in line with the orientation of PVC-U, as it is less than in standard CPVC – usually exceeding 100%, said Molecor.

The corresponding values for a hoop sample test were: stress, 94.8MPa; and strain, 28.6%. The stress value for CPVC-O is quite similar to that obtained for PVC-O. Taking into account that the preform value is a little higher for CPVC, it seems that orientation effect is less than the one in PVC-U.

"Another significant consideration is how much the strain value is reduced in C-PVC after orientation," said Muñoz.

Molecor says it has shown that orientation can boost the mechanical properties of standard C-PVC, in a similar way PVC-U. This could be done by adapting existing mould-based lines.

"Applying orientation to C-PVC could find massive use in the civil works when working in hot environments," said Muñoz.

Left: Qenos says its online 'benefit calculator' helps users make the most of its new PE100 HSCR piping

Calculated benefits

Qenos has developed an online 'benefit calculator', which it says can help users make the most of its new PE100 HSCR piping – based on inputs such as nominal diameter, maximum allowable operating pressure and installation technique.

The company says that its high stress-crack resistance Alkadyne HCR193B is Australia's first pipe resin classified as PE100 HSCR – according to PIPA POP016. It could enable designs with pipes of lower wall thickness – provided the mechanical strength of the pipe is sufficient to withstand the forces working on the pipe during installation and service life.

The calculator compares the 'fit for purpose-risk based' design – using PE100 HSCR – with the 'deemed to comply' design that uses conventional PE100. It then translates this into pipeline Design Charts that quantify key benefits – such as increased hydraulic capacity, reduced material consumption, and lower carbon footprint.

"Our calculator provides pipeline design engineers with a rapid insight into the quantitative benefits that Alkadyne HCR193B can deliver over conventional PE100 resins in trenchless pipeline installations," said Jeroen Wassenaar, pipe market segment manager at Qenos.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.gpsuk.com**
- **www.egeplast.de**
- **www.ipm.cz**
- **www.molecor.com**
- **www.qenos.com**
- **www.agru.at**

With pressure being exerted on the plastics supply chain to recycle more plastics and add value to reclaimed materials, we preview AMI's second Plastics Recycling Technology conference taking place in Düsseldorf in June

Key plastics recycling stakeholders share insights

After the hugely successful launch event in 2017, *Plastics Recycling Technology* returns in 2019 and examines the latest technologies for increasing the volume of plastics being recycled. It also explores ways to improve the quality of reclaimed materials so that they can be used in higher value applications. This two-day event takes place on 18-19 June 2019 in Düsseldorf, a city which has always been a centre of innovation and progress.

Experts at *Plastics Recycling Technology* will provide an analysis of the European recycling market, innovations driving the recyclability of packaging and will discuss strategies to optimise plastics recycling lines. In addition, the conference covers the circular economy and relevant regulations, the growing importance of additives and delves into developments in chemical recycling, including case studies of exciting new applications across these various topics.

The opening session kicks-off with **Lizzy Carroll**, Research Analyst at **AMI,** who analyses trends in the European plastics recycling market with a closer look at the key findings of her new AMI study. **Mike Baxter**, External Affairs Director at **RPC-BPI Group** in the UK, then discusses the impact new EU regulations on plastic packaging will have on the European plastic recycling industry. A study on the use of recyclates by European plastics converting companies is presented by **Alexandre Dangis**, Managing Director of **EUPC** in Belgium.

Innovations

The next session takes a closer look at what is happening with regards to packaging and **Gian De Belder**, Packaging Technologist from **P&G** in Belgium, showcases the standardisation of tracer/watermark-based sorting technologies for plastic packaging. This is followed by a talk focusing on recycling technology for plastics in packaging material given by **Mikael Hamskog**, Recycling Spe-

cialist at **Tetra Pak** in Sweden. The third paper of the session is presented by **Dana Mosora**, Founder of **Dana Mosora Consulting** and a consultant for the European Ceflex consortium, based in Switzerland, who will provide insights from Ceflex.

The conference's third session opens with **Gerold Breuer**, Head of Marketing & Business Development from **Erema Group** in Austria, who discusses the next level of plastics recycling and its contribution to the circular economy. A technology presentation on innovative granulator designs to maximize profits in scrap recovery is given by **Marco Bellotti**, Sales & Marketing at **CMG** in Italy. **Jürgen Morosz**, Sales Manager at **MAS** in Austria, then explores recycling and compounding in one step and delves into tailor-made plastic compounds. After the refreshment break **Carl Pöpel**, Head of Product Management Compounding at **Kraussmaffei Berstorff** in Germany, closes the session with a paper on innovative extrusion and injection moulding applications.

The fourth and final session of the day features **Bernhard Gabauer**, Head of Segment Plastics, Business Area Digital Technologies from **Bühler** in the UK, talking about the crucial role of optical sorting in the plastic recycling industry. The last paper of the day is given by **Jürgen Schoenherr**, CEO of the **Zittau Institute for Technology Development, Peat and Natural Material Processing Research (ITN)** in Germany, who focuses on developments in "thermo-sensitive sorting" of mixed plastics.

To round off the first day, a networking drinks reception will be held in the exhibition room.

Value propositions

Day two of *Plastics Recycling Technology* 2019 is opened by **Kim Ragaert** from **Ghent University** in Belgium and **Mark-Olof Dirksen**, Project Leader Technology & Function Creation at **Philips** in the Netherlands, who give a joint presentation on their work in turning WEEE plastics into high-quality EEE products. A paper on a new innovative process for recycling end-of-life PMMA wastes is then given by **Jean-Luc Dubois**, Scientific Director, Catalysis,

Speakers at the conference include (from left to right) Gian De Belder from P&G, Mike Baxter from RPC-BPI, Mark-Olof Dirksen from Philips and Lizzy Carroll from AMI

Processes, Renewables and Recycling at **Arkema** in France. **Henning Albers**, Director of Institute for the **Hochschule Bremen (HSB) - City University of Applied Sciences** in Germany, discusses a new conceptual approach to implement recycling options for reinforced plastics in rotor blade systems.

Tarquin Crouch, Technical Services and Market Development Manager at **Imerplast** in the UK, begins the second session of the day with a look at creating a value proposition through compatibilisation of mixed polyolefins. This is followed by **Rudolf Pfaendner**, Division Director, Plastics at **Fraunhofer Institute for Structural Durability and System Reliability LBF** in Germany, investigating a new generation of stabilisers for high quality recyclates. Enabling polymer modification with polar and no polar polyolefin chemistry is then explored by **Isabel Arroyo**, Senior Research Scientist at **Dow Chemical** in Spain.

After the lunch break, the session is continued by **Stefan Viering**, R&D Engineer, Project Leader UFGM / Metal Tracer at **LKAB Minerals** in Germany, who discusses how ultra-fine ground magnetite is the natural dopant for plastics recycling.

The final session of the conference looks at advances in chemical recycling and starts with **Outi Teräs**, R&D Program Manager, Recycled Feeds at **Neste Corporation** in Finland, discussing ideas in building a circular value chain for chemical recycling of plastics. Closing the conference is **Isabelle Ydens**, Technical & Marketing Manager, Business Development Renewable Feedstock Polymers Europe at **Total Refining & Chemicals** in Belgium, presenting a new path for polystyrene recycling.

Thermoplastics pipe extrusion in Europe 2018

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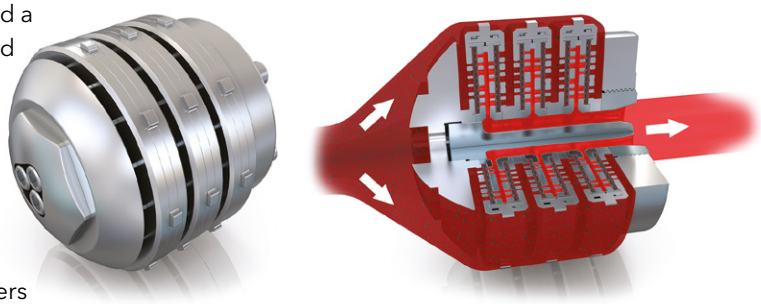
MELT FILTRATION

Efficient filter for piston-activated screenchangers



Nordson has developed a filter for piston-activated screen changers that enlarges the available filtration area without having to increase machine size.

FlexDisc enables processors and recyclers to achieve finer filtration, higher throughputs, longer filter service life, and reduced specific backflush volume. Nordson recommends it for increasing productivity and enhancing quality in a range of different applications.

The function of the hydraulic pistons is to insert screen cavities into the melt stream for filtration and to remove them for cleaning or replacement. In systems where FlexDiscs are used, each cavity contains a filter stack comprised of two to four FlexDiscs, depending on machine size. Each is equipped with two Nordson screen packs.

As a result, there is at least twice the filtration area available for each cavity than with conventional standard round screens, and around 25% more compared to the former FlexDisc version.

Screen changers that use Nordson's backflush technology include the BKG V-Type 3G and BKG HiCon™ K-SWE-4K-75/RS. Backflushing diverts contaminant from the melt stream. The higher efficiency of the new FlexDisc reduces the frequency of backflushing, says Nordson.

"The increased efficiency of the FlexDisc can enable the processor or recycler to save on investment cost by purchasing a smaller machine without sacrificing throughput," said Christian Schröder, global product manager at Nordson. "There are also significant operational savings possible with the reduction of specific backflush volume."

› **www.nordson.com**

AUTOMATION

Simulating plant and machinery

German automation and drive manufacturer Baumüller has developed a new program allowing users to begin performing simulation.

Its ProSimulation software allows virtual configuration and testing of automation systems and was seen for the first time at Hannover Messe recently.

The tool simplifies the virtual design, optimisation and commissioning of machines and plants. Depending on the level of experience, users can either quickly build their own simulations or applications thanks to the base library, or import existing software models thanks to the open interfaces, says the company.

› **www.baumueller.com**

PIPE EXTRUSION

Expanding extrusion output in Brazil

Duro, a leading pipe extruder based in Brazil, recently expanded water well lining production at its main production site in Goiania – with a new twin screw extruder from Battenfeld-Cincinnati.

Duro now has two extruders in the TwinEx series at its facility, which produce PVC pipe for water and sewage transport as well as water well linings for the Brazilian market.

The company has been running a TwinEx 93-34 parallel twin screw extruder since 2015 and had consistent performance with it according to Leonardo Brito Ferreira, owner of Duro.

"When we expanded our business, we decided to invest in another. The pipe quality is excellent, and we appreciate the level of local support we receive," he said.

Duro produces a wide range of building, sanitation, geo-duct (well-lining) and irrigation pipes as well as decorative lining.

› **www.battenfeld-cincinnati.com**

TESTING

Force testers are fast and effective

US-based Ametek STC has introduced its new Chatillon TCM series of motorised test machines.

The range consists of two force testers that offer fast, effective force testing up to 350 lbf (1500N) at an affordable price. The TCM100 is suitable for low capacity testing up to 100lbf (500N) while the TCM350 can test samples at a capacity of up to 350lbf (1500N).

Both force testers feature a standard crosshead travel of 406mm (16in) and are available in extended editions with a crosshead travel of 812mm (32in). A throat depth at a full 100mm (3.9in) enables the operator to perform force tests including tension, compression, bending, peeling, adhesion, insertion and extraction on samples up to 200mm (7.8in). This leaves the operator with a wide variety of testing options at a large working area while keeping a compact footprint.

A large LED display indicates travel speed and similar information so the operator can continuously monitor the test. TCM force testers feature haptic feedback, which reduces the time spent on test configuration as well as operator errors. The tactile buttons have no moving parts or membranes, meaning that durability – especially in production environments – is maximised.

Coupling the TCM force testers with digital Chatillon DF force gauges offers a load accuracy that exceeds 0.1% full scale as well as added benefits such as drive to limit. For fast and easy analysis, the Chatillon ForceTest software can be added to the solution enabling seamless serial data communication from the force tester to a computer, saving of test setups for faster workflow, live data view during tests and easy export of test results to CSV or PDF.

The Chatillon TCM series is the latest series of specialized force testers from Ametek STC and replaces its current Chatillon LTCM series of force testers.

› **www.ametektest.com**

CERTIFICATION

Tubing certified for food and drink use

Action Technology – a division of Tekni-Plex – says it has achieved National Sanitation Foundation (NSF) certification for its tubing product line.

It has met the requirements for NSF Standard 51 – Food Equipment Materials, and Standard 61 – Drinking Water System certification.

"NSF certification is the key to making sure that products meet strict public health standards," said Kevin Volden, sales manager of Action Technology. "Choosing a product certified by NSF lets you know the manufacturer complies with strict standards and procedures including extensive product testing, material analyses and unannounced plant inspections."

The company has received NSF-certification for polypropylene and polyethylene tubing in diameters ranging from .070 to .500in. Available stock colours include natural, black, red and blue. To support colour-coded installation or branding requirements, custom colours are also possible.

The company sells its tubing direct for a wide variety of applications including food, foodservice, water, sanitation and other market segments.

› **www.tekni-plex.com**

PIPE DIES

Crosshead offers fine adjustment

Guill Tool & Engineering has introduced a new single-point concentricity extrusion crosshead that uses micro-fine adjustment screws for precise concentricity adjustment.

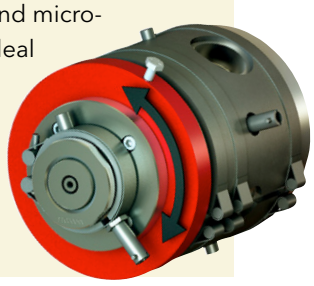
The precision of concentricity reaches 0.008in or finer per revolution. This single point concentricity adjustment is a unique innovation for the extrusion of thin-walled jacketing and precision ID/OD tubing, says Guill. One bolt controls 360° of adjustment.

Features of the single-point crosshead include a patented cam-lock deflector for quick changeovers, with a residence time of one minute at 0.5 lb/hr material flow, optimised usage with extruders measuring 0.5 and 0.75in and a max die ID of 0.250in.

The single-point crosshead also offers great flexibility to its users: it not only accepts both vacuum and micro-air accessories, but is ideal for pressure and sleeving applications.

Fluoropolymer designs are available upon request.

› **www.guill.com**



NEW from AMI Consulting

Polymeric Materials in the Global Cable Industry 2019

A qualitative and numerical appraisal of the global cables market, which provides:

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- Total consumption of polymeric material related to cable demand/use
- Top 10 manufacturers by region
- Top 5 manufacturers of leading countries

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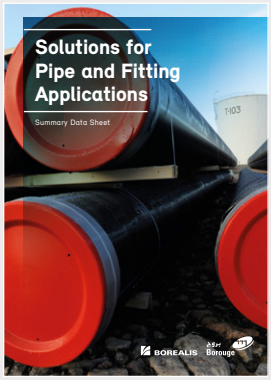
BOREALIS: PIPE POLYMERS



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

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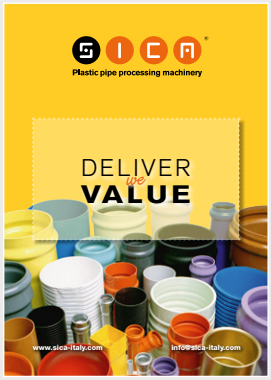
SICA: PIPE PROCESSING



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

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ZUMBACH: MEASUREMENT CONTROL

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

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HEXPOL: DRYFLEX TPE

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

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UNICOR: PIPE CORRUGATION

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

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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 brochure details the range of equipment available and key performance benefits.

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

Learn more about AMI's upcoming conferences

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

POLYMER SOURCING & DISTRIBUTION

The 14th edition of AMI's Polymer Sourcing & Distribution conference will be held on 13-15 May 2019 in Barcelona, Spain. The event attracts attendees from across the plastics supply chain, from polymer producers and traders to processors and brand owners.

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PROFILES USA

Profiles 2019 USA, AMI's 19th international conference on plastics in exterior building applications, takes place on 4-5 June in Pittsburgh, PA, US. It covers the latest market trends and polymer material and processing developments.

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OIL & GAS POLYMER ENGINEERING US

Taking place in Houston on 4-5 June 2019, AMI's fifth US conference for oil and gas operators, contractors, equipment manufacturers and researchers will provide detailed insight into the formulation, qualification and use of O&G polymer products.

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COMPOUNDING WORLD CONGRESS

The fourth Compounding World Congress takes place on 4-5 June 2019 in Cologne, Germany. This high level event covers the market trends, business developments, and technical innovations impacting on producers of technical compounds.

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PLASTICS RECYCLING TECHNOLOGY

AMI's second Plastics Recycling Technology conference takes place in Berlin in Germany on 18-19 June 2019, bringing together key players and industry experts to explore how technology will enable increased plastic recycling rates.

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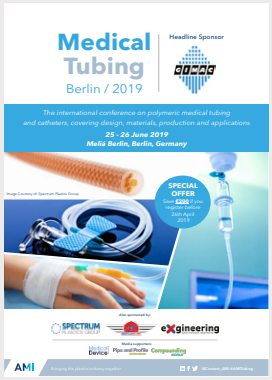
MEDICAL TUBING 2019



The vital role of polymers in the healthcare sector will be examined at AMI's third Medical Tubing conference in Berlin in Germany on 25-26 June 2019. Learn about the latest industry demands, regulations, materials and processing innovations.

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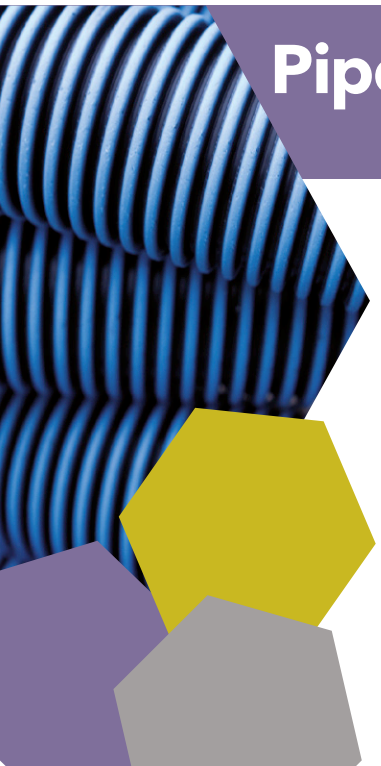
To see our full line-up of more than 50 plastics industry events over the next 12 months, please visit www.ami.international/events

Azek

Head office:	Skokie, Illinois, USA
CEO:	Jesse Singh
Founded:	1983
Ownership:	Private (backed by private equity)
Employees:	More than 1,000
Turnover (2018):	Around US$750m
Profile:	Azek, founded in 1983 at CPG International, turns recycled plastics into low-maintenance building products to replace wood and other traditional materials. It sells into the residential, commercial and industrial markets under a number of brand names, including Azek, TimberTech and Vycom.
Product lines:	Azek Building Products has two specific product lines. Its TimberTech line comprises capped polymer and composite decking, as well as railing, porch, lighting and paver products. At the same time, Azek Exteriors produces trim and moulding products.
Factory locations:	The company has made several acquisitions over the last year, including trimboard producer Versatex. It owns three manufacturing facilities in the USA – in Illinois, Pennsylvania and Ohio.
Latest news:	The company recently invested US$25m in a recycling plant at its TimberTech facility in Wilmington, Ohio facility. This will allow the company to recycle around 100m lbs (45,000 tonnes) of material per year by 2020. The plant will process scrap plastic such as milk bottles and plastic wrap, and turn it into products such as TimberTech Pro and Edge boards. Its long-term goal is to 95% recyclate in its decking.

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:

June 2019
Pipe corrugators
Profile dies • Pipe joining
Plastic Pipes in Infrastructure
Plastics Extrusion World 2019 review

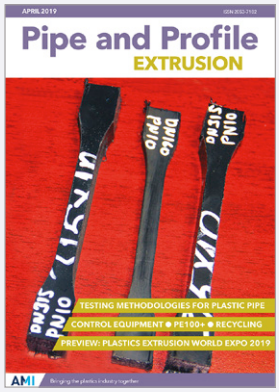
July/August 2019
PVC stabilisers
Oil & gas industry
Extruder technology
K2019 visitor guide

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
April 2019
The April edition of Pipe and Profile Extrusion magazine looks at developments in pipe testing and regulation. It also explores the latest innovations in process control and material recycling and highlights some new PE100 resin applications.

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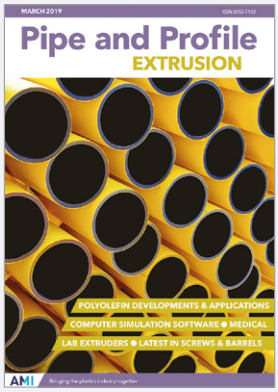

Pipe and Profile
March 2019
The March issue of Pipe and Profile Extrusion explores the growing use of PP in the pipe industry. It also takes a look at the latest developments in computer modelling, medical tubing technology, lab extruders and screw design.

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Compounding World
April 2019
Compounding World's April issue contains an extensive preview of AMI's Compounding World Expo in Cleveland in May, covering all the exhibitors at this key event. Plus features on thermally conductive compounds, PPS materials, processing aids and materials testing equipment.

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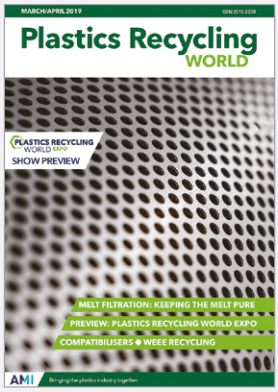

Plastics Recycling World
March/April 2019
The March/April edition of Plastics Recycling World examines the latest developments in melt filters and details innovations in WEEE recycling and polymer compatibiliaation. Plus, we preview next month's Plastics Recycling World Expo in the US.

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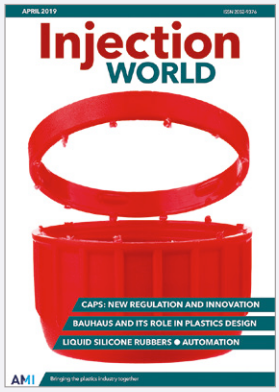

Injection World
April 2019
The April edition of Injection World looks at caps and closures and the drivers for innovation in the segment. Also included are features on LSR moulding and the role played by the Bauhaus in the history of plastics design.

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Film and Sheet
April 2019
The April issue of Film and Sheet Extrusion looks forward to the exhibitors at AMI's Plastics Extrusion World Expo in the US next month. Features in the magazine cover agricultural film, flat dies and slitter-rewinders.

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

GLOBAL EXHIBITION GUIDE

2019	**8-9 May**	Extrusion Expo, Cleveland, USA	www.extrusion-expo.com
	8-9 May	Plastteknik Nordic, Malmö, Sweden	www.easyfairs.com
	21-24 May	Chinaplas, Guangzhou, China	www.chinaplasonline.com
	21-24 May	Moulding Expo, Stuttgart, Germany	www.moulding-expo.com
	28-31 May	Plastpol 2019, Kielce, Poland	www.targikielce.pl
	19-22 June	Interplas Thailand, Bangkok	www.interplasthailand.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

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
5-6 November	Medical Tubing US, Minneapolis, USA
12-13 November	Profiles, Cologne, Germany
4-5 December	Oil & Gas Non-Metallics, London, UK

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

www.ami.international

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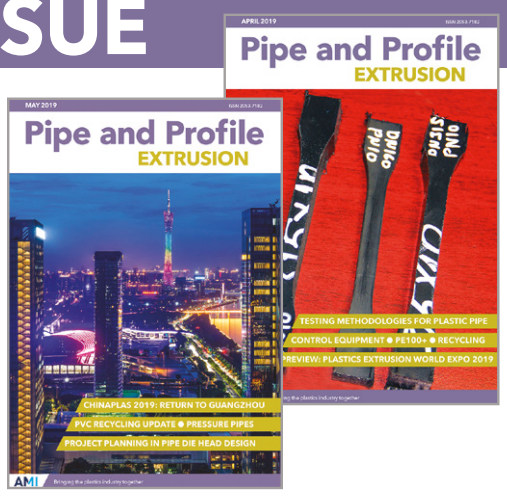

PLASTICS EXTRUSION WORLD EXPO

MAY 8 - 9, 2019

HUNTINGTON CONVENTION CENTER, CLEVELAND, OHIO, USA

Focused conference programs on film, sheet, pipe, profile and tubing extrusion

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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 Officer, ECONCORE

12:10 - 12:30 **The cost of extruder barrel cooling water corrosion & premature failures**
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

12:10 - 12:30 **New developments for PET replacement film**
Senior representative WINDMOELLER & HOELSCHER

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 **Cooling and thermoregulation: Increased productivity and energy effeciency**
Alessandro Grassi, Partner and Managing 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 .

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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, Owner, WALRATH CONSULTING SERVICES LLC • 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**
Yuya Sakamoto, Account Manager, Durastream CPVC Compounds, SEKISUI SPECIALTY CHEMICALS

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

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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.

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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.

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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.