OCTOBER 2022

ISSN 2053-7182

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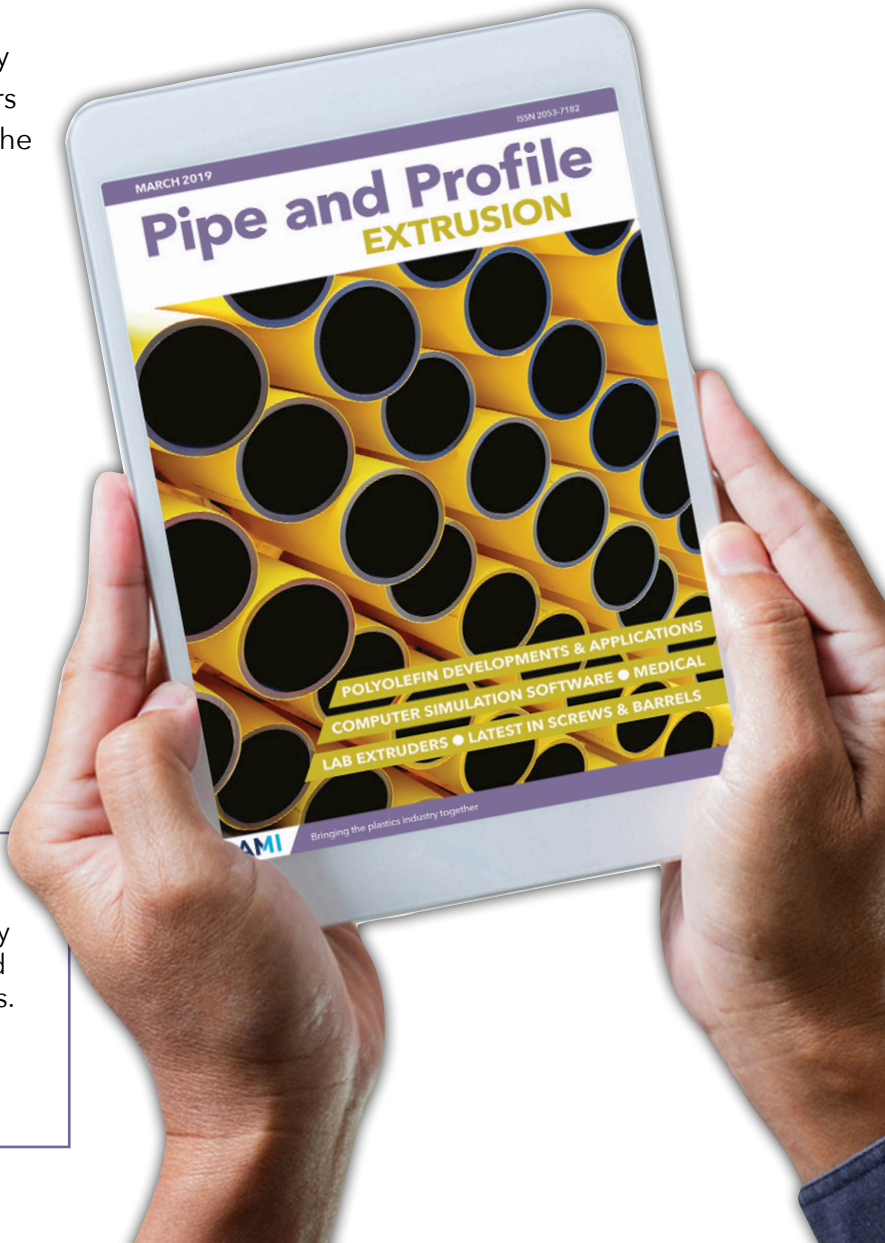

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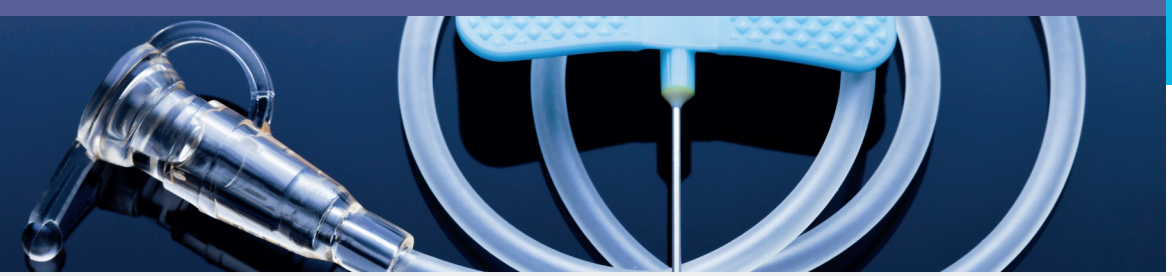

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Finland proposes €44 million fine on pipe manufacturers

The Finnish Competition and Consumer Authority (FCCA) has proposed penalty payments of €44 million (US$43m) against several manufacturers and wholesalers of plastic HVAC infrastructure pipeline products, for anti-competitive behaviour.

The FCCA says that the companies – Onninen, Dahl Suomi, Ahlsell, Uponor Infra (previously Uponor Suomi) and Pipelife Finland – "collaborated in directing business in these products to each other and hampered activities of companies outside their cooperation" between 2009 and 2016.

FCCA has made the recommendation to the Market Court in Finland, which will take the decision on the fines. It has proposed fines of around €4.8m for Pipelife Finland, and €13.5m for Uponor Infra and Uponor Suomi. The largest proposed fine of €16m, was for Onninen.

"Unlawful cooperation between these companies has softened competition and hampered the activities of competing companies," said Timo Mattila, deputy director general of the FCCA. "Companies must make their business decisions independently, and this has not been the case. This cooperation has been detrimental to customers due to the decrease in competition."

All the companies worked to prevent foreign operators from entering the Finnish market, while the wholesalers "refrained from selling significant amounts of competing products", said the FCCA.

The products include pipes and fittings used in applications such as pressure pipelines, sewage and drainage systems and cable protection pipelines. The companies accounted for around 70% of the wholesale and manufacturing market at the time, it added.

Uponor issued a statement denying the FCCA's claims.

"Uponor deems the claims to be without foundation," it said. "Uponor Infra and Uponor Suomi have not participated in actions violating competition law nor accepts such behaviour. We will now study the FCCA proposal and prepare its plea to the Market Court."

› **www.kkv.fi (FCCA)**
› **www.uponor.com**
› **www.kesko.fi**

Eurocell reports strong H1

UK-based window profiles manufacturer Eurocell has posted a set of positive results for the first half of this year.

First-half sales of £191 million (US$209m) were up 13% compared to the same period last year, and by 40% compared to the first half of 2019 (which was seen as a better comparison). Pre-tax profit for the period exceeded £15m (US$16m), a 7% improvement on the same period in 2021 (and 46% better than 2019).

"Demand has moderated from the unprecedented levels experienced in 2021," said Mark Kelly, CEO of Eurocell.

"It is pleasing to report that H1 sales volumes have kept pace with a strong comparative period – and have made progress compared to the equivalent period of 2019."

IMAGE: EUROCELL

Kelly: "Demand has moderated from the unprecedented levels experienced in 2021"

Profile production of around 27,000 tonnes was down 3% compared to that of H1 2021.

Overall Equipment Effectiveness rose from 68% in H1 2021 to 71% in H1 2022 – moving the company closer to its target of 75%. Revenue from profile sales rose by 17% – due to a good performance in new build – while sales from building plastics rose 11%.

In the period, the company's use of recyclate increased to 28% (around 8,300 tonnes), compared to 27% for the full year in 2021. Eurocell's medium-term ambition is to increase the proportion of recycled material used to 33%.

"We continue to trade in line with expectations and remain confident of delivering our medium-term ambitions for sales and margins," according to Kelly.

› **www.eurocell.co.uk**

Halloween costs cut with PVC

With Halloween on the way – but many people tightening their belts – a US TikTok user has found a way to decorate her house in frugal fashion, with a lot of help from PVC pipe.

TikTok user @merissalovan has created an 8ft-tall model of the grim reaper using a skull, black material, a small wheeled cart and a frame made from PVC pipe.

The grisly DIY project was reported in a recent issue of Dengarden magazine.

You can read the story and see a short video **here**.

WL Plastics to grow in Texas

US-based HDPE pipe manufacturer WL Plastics is looking to expand operations at its facility in Lubbock, Texas.

The company intends to build a second manufacturing facility at the Lubbock Rail Port, which could create up to 95 new jobs. Initial investment in the facility would be around US$40 million.

"The experience with our current manufacturing operation in Lubbock has been very positive," said Mark Wason, CEO of WL Plastics. "It has proven to be a stable source of skilled labour and an ideal location for the distribution of our products."

In 2018, the company invested US$17m to build the 50,000 sq ft plant, which produces pipe for the oil, gas and water markets.

› **www.wlplastics.com**

Vivasvaan to make pipe in UAE for two UK firms

United Arab Emirates-based pipe maker Vivasvaan Industrial is to produce pipes under licence for two UK-based manufacturers.

Last month, it signed an agreement with Marley Plumbing and Drainage UK, to manufacture its PVC push-fit soil and ABS waste range of piping products. They are used in residential and commercial construction, industrial and public utility applications. Marley has operated in the Gulf for around 40 years and is a subsidiary of Aliaxis.

"Vivasvaan has a strong presence in the region, and we are confident that this partnership will enable both companies to cater to the future needs of the construction industry," said Amedeo Macchiavello, VP for EMEA international business development at Aliaxis.

Vivasvaan, based in Khalifa Industrial Zone Abu Dhabi (KIZAD), is a subsidiary of Aquaplex Holding.

IMAGE: VIVASVAAN

Above: Vivasvaan has signed a manufacturing license agreement to produce PVC pipes for UK-based Marley

Ravi Hinduja, CEO of Vivasvaan, added: "This partnership with Marley is a testament to our continuous commitment to the construction supplies segment in the region."

In April of this year, Vivasvaan signed a similar manufacturing license agreement with Marshall-Tufflex – a UK-based producer of PVC conduit and cable management systems that also operates in the region. Under the agreement, Vivasvaan will produce Marshall-Tufflex black and white conduit and fittings between 20mm and 50mm, plus surface and flush-mounted boxes.

› **www.vivasvaan.com**
› **www.aliaxis-gulf.com**
› **www.marshall-tufflex.com**

Iplex wins water pipeline contract

IMAGE: IPLEX

Iplex Australia has secured a A$51 million (US$33m) contract to supply pipe for a major water project in Queensland.

The Haughton Pipeline project is expected to provide water security to the growing city of Townsville over the next 50 years. As part of the project's second stage, Iplex will supply more than 24km of 1.8m diameter glass reinforced polymer (GRP) pipe.

"Demand for the products we supply and manufacture – including those for the Haughton Pipeline – means we have significantly grown our Townsville operations," said Paul Lavelle, general manager of Iplex Australia.

In the first stage of the project, in 2018, Iplex won a contract to supply 36km of Flowtite GRP pipe. Funded by Townsville City Council and the Queensland Government, the overall project cost is estimated at A$274 million (US$177m).

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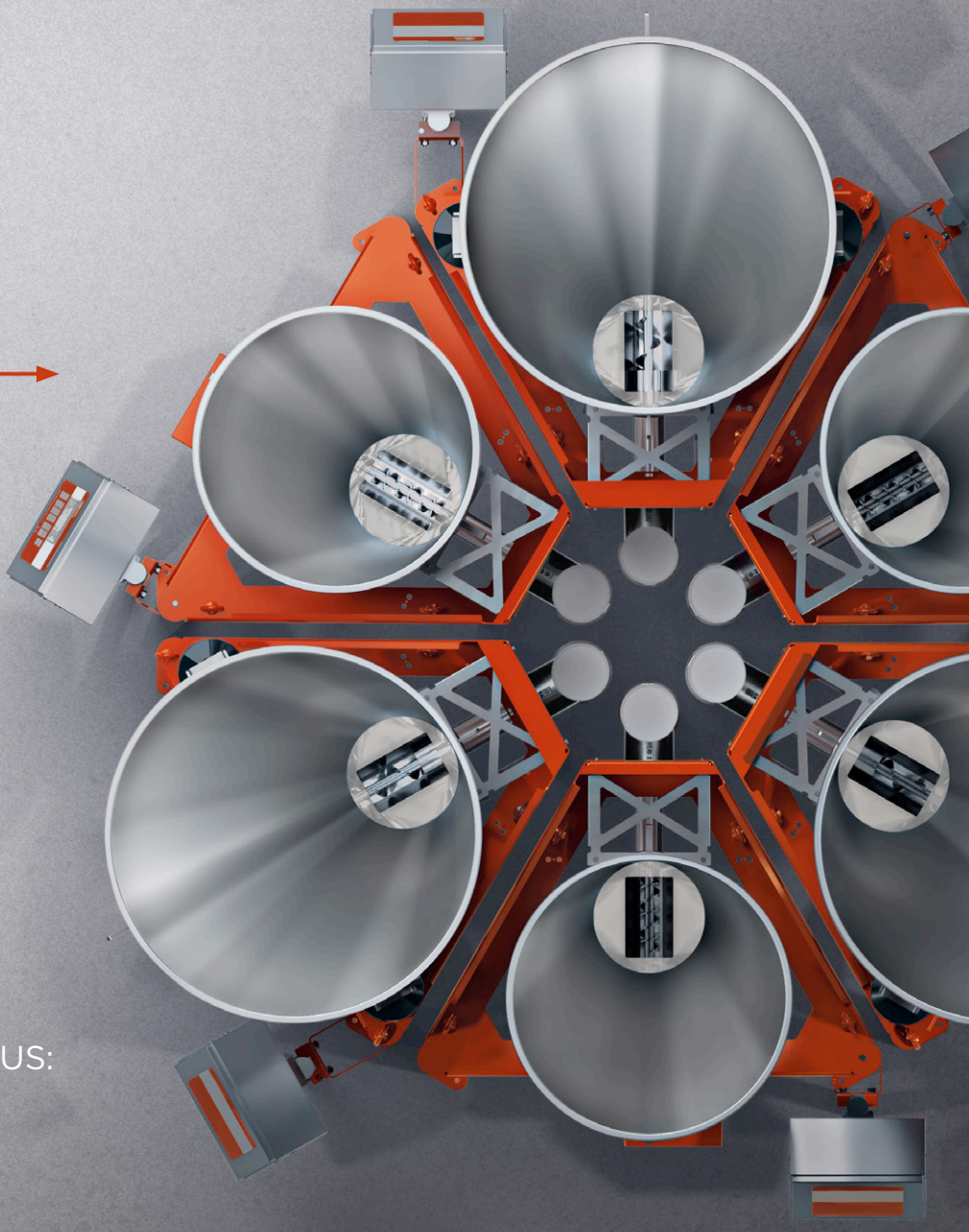

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Aliaxis boost in first half of year

Aliaxis, the Belgium-based manufacturer of pipes and fittings, has posted "record" sales and profits for the first half of the year.

The company reported sales of more than €2.2billion (US$2.1bn) for the period, an increase of more than 20% on the same period in 2021. At the same time, net profit rose nearly 27% to exceed €2141m (US$221m).

"In the first half of 2022, we reached record sales and [profits]," said Eric Olsen, CEO of Aliaxis. "Our teams showed their ability to adjust to changing market conditions."

In the Americas, revenue rose 24% and profitability was up 31%, despite "a tight labour market and inflationary environment". North America was driven by a strong housing market, a rise in infrastructure and irrigation investments. In Latin America, the growing building segment in Colombia and Costa Rica was partly offset by conditions in Chile.

Revenue in EMEA rose 8%, but profits fell due to increased raw material costs and inflation. In Europe, the building market slowed after Q2 2022. In Asia, revenues grew by 41% and profits by 3%.

Despite the strong results, it says the outlook for the second half of the year remains uncertain due to issues such as inflation and price volatility.

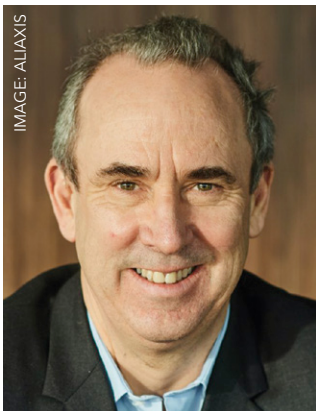


IMAGE: ALIAXIS

Olsen: "Our teams showed their ability to adjust to changing market conditions"

■ Aliaxis has invested €7 million (US$7m) to cut plastic construction and demolition waste in New Zealand. The project includes: investing in new plastic recycling facilities to sort, wash and shred PVC and HDPE; establishing a network of PVC and HDPE collection services; and carrying out joint research into minimising plastic construction waste. Aliaxis NZ will use the collected plastic to make PVC and HDPE pipe. The first facilities are expected to be operational by 2023, with all sites completed by 2027.

› **www.aliaxis.com**

Wavin buys Bow Plumbing

Pipe maker Wavin has acquired Bow Plumbing Group, a Canada-based manufacturer of pipes and fittings.

Wavin says the acquisition extends its presence in the North American residential and commercial construction market, which Bow supplies into.

"North America is experiencing increased demand for solutions that ensure urban resilience," said Sameer Bharadwaj, CEO of Wavin's parent company, Orbia. "This will provide us with local presence and know-how, expanded capacity and a strong customer base."

› **www.wavin.com**

Dura-Line expands conduit output

Conduit manufacturer Dura-Line is to build three new production facilities across North America, to meet growing demand for fibre-optic network infrastructure.

The company says that the fibre-optic cable market is expected to exceed US$19 billion by 2026. In addition, it says the US government's US$1 trillion infrastructure package includes US$65bn to extend broadband coverage.

The company will build two US facilities in Salt Lake City, Utah and a Canadian facility in Edmonton, Alberta. All three facilities are expected to be operational by mid-2023. In addition, the company overhauled its Gainesville, Texas plant earlier this year to raise production of its FuturePath conduit.

"These new facilities will enable us to scale our production of fit-for-purpose connectivity solutions," said Dale Wilson, vice president of sales and marketing for the US and Canada at Dura-Line. "We have worked with our customers to deliver what they not only today, but one, two, even three years from now."

› **www.duraline.com**

Pexco acquires PTFE specialist

Pexco, a US plastics extruder, has acquired Enflo a manufacturer of PTFE products.

"Enflo is well known for providing PTFE products that meet or exceed customer requirements across critical applications," said Sam Patel, CEO of Pexco. "This acquisition aligns with Pexco's strategic growth plan – as we continue to build high-performance polymer capabilities."

Enflo has a facility in Bristol, Connecticut, and a second in Grand Falls, Canada. It manufactures a range of PTFE shapes including moulded tubes and extruded rods and tubing – in standard and custom sizes.

Mark Lamoureaux, CEO of Enflo, added: "This will help us expand the geographic and industry reach of our PTFE solutions."

› **www.pexco.com**

KraussMaffei unlocks its new 97,000m² extrusion facility

Two years after construction began, KraussMaffei has been handed the key for its new extrusion production site at Laatzen, near Hanover in Germany.

The new 97,000m² plant offers space for up to 750 workplaces and will produce extrusion and compounding systems and recycling equipment. It has already commenced the move into the facility, which it aims to complete by the end of the year.

In addition to new offices and production buildings, a customer experience centre has been established along with an innovation centre allowing technical trials to be performed. The company says demanding and complex extrusion applications can also be tested on up to 26 lines under realistic conditions.

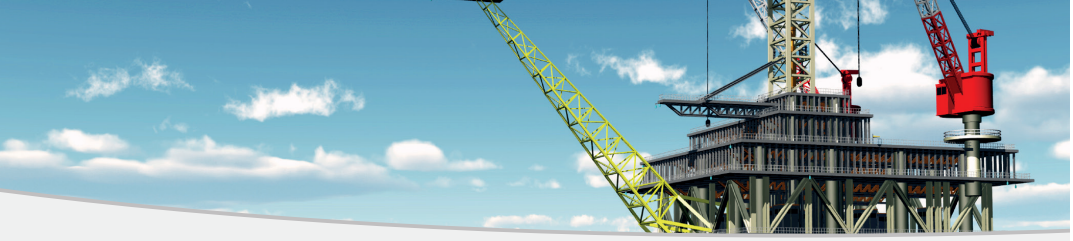
IMAGE: KRAUSSMAFFEI

Above: KraussMaffei accepts symbolic key to its new extrusion plant from project developer VGP

"In the new Laatzen plant, all extrusion technologies from pipe and profile extrusion through sheet and flat film extrusion to rubber and foam extrusion, as well as compounding and recycling technologies, are combined at a single location," said Dieter Thewes, CEO of KraussMaffei Extrusion.

Michael Ruf, CEO of KraussMaffei, added: "In our new extrusion and recycling technology centre, we are placing an even stronger focus on the circular economy."

› **www.kraussmaffei.com**



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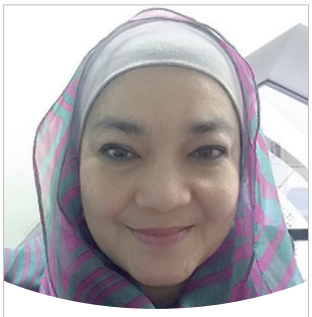

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Round numbers: latest in pipe inspection technology

IMAGE: INOEX

Innovations in pipe inspection include a way to assess corrugated pipe, a method to test burst pressures of 1500 bar and strain monitoring for HDPE pipe affected by earthquakes

Testing pipe – from assessing the precise dimensions of an extruded product, to measuring loads on a buried water main – is vital. A number of recent technologies and research projects are helping to extend product lifetime and raise quality.

Inoex has developed a new system – called Warp CP – for measuring corrugated pipe. It will be introduced at K2022.

It uses eight radar-based wall thickness sensors to measure a variety of structures in a pipe. These include outer and inner diameters, and the wall thicknesses of the bell, crest, liner and valley. The system is available for large corrugated pipes with diameters from 300mm.

The sensors scan the corrugated pipe continuously. Because the corrugated tube has different structures, it is necessary to assign the measurement data to the corresponding position on or in the pipe, says Inoex. This is done automatically by Warp-CP's algorithms.

Data is prepared for the user in in the form of different graphics and measurement data for each structure.

In addition, Inoex will showcase its Warp 100, an inline system for wall thickness and diameter measurement. It is available in three sizes and can be used for measurements in the diameter range from 60 to 630mm. Special optics allow the alignment of the radar wave to be focused on the centre of the pipe. Sensors are arranged so that measuring spots overlap – ensuring close-meshed coverage in the extrusion direction. Maximum line speed is up to 11.8 m/min.

Defect detection

Sikora diameter gauge heads – in the Laser 2000 and 6000 series – can be used to measure surface defects on cooled tube or pipe

Measuring pipe dimensions after the vacuum tank is an established part of inline control. However, assessing defects at the end of the extrusion line can help pipe manufacturers to avoid customer complaints.

A gauge head can be installed at the end of the line – in addition to existing wall thickness measurement devices, for instance – where the pipe is already crystallised. The diameter values of the cold measurement provide information about the shrinkage behaviour of the pipe. It also provides an additional ovality measurement.

The system also detects protruding defects. Combining it with an Ecocontrol 600 processor system enables values to be logged in detail at the end of the line.

Depending on customer needs, Sikora devices can measure between two and 12 measuring axes.

Main image: Warp CP from Inoex uses eight radar-based wall thickness sensors to assess corrugated pipe quality

IMAGE: SIKORA

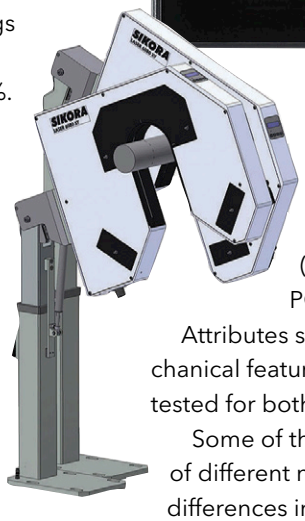
Right: Measurements from Sikora's gauge heads can be visualised on an Ecocontrol 600

The company has developed a tool for this, which calculates how many measuring axes are needed for 100 % surface detection. In a customer, meeting the calculation is done together to determine the best solution.

Pressure testing

At K2022, **Sciteq** of Denmark will introduce a new solution for airless pressure testing of pipes at pressures up to 1500 bar.

The system is used to determine the resistance to high internal pressures on pipes, fittings and other applications requiring high pressure testing, with an accuracy of 0.5%.



The company says it has developed a proportional valve that ensures that high pressures are maintained with high accuracy even at such high pressures. Static, burst and step testing of pipes and fittings can all be accommodated. This opens up testing of new ranges of reinforced pipes or other high-pressure products, says the company.

"It was a complex challenge to design a solution that can perform safe and precise tests at such a level of pressure," said Dennis Damborg, CEO of Sciteq. "We are introducing this system to the market because we have seen an increase in the demand for safe burst test, static and step test at high pressures."

Together with its Sigma software, the pressure test unit enables test laboratories to perform high pressure testing with precise pressure control and stable, linear pressure regulation. Sciteq will use K2022 to unveil updates to its Sigma software – which is used to control the test systems.

Small margins

There is also a large body of fundamental research on the testing and evaluation of pipe – as well as how it can be measured in extreme circumstances. Several were presented at last year's PPXX conference.

Enrico Boccaleri, associate professor at the **Università del Piemonte Orientale** in Italy, has tested and evaluated the effect of several nano-additives on PVC pipe performance.

The study was focused on industrial needs and involved seven PVC pipe producers in Italy. Two conventional rigid PVC formulations – for water distribution and sewage pipe – were modified with nanomaterials in variable amounts from 0.31 to 2.5 phr. The additives were chosen based on their commercial availability in industrial quantities. Materials were processed using pilot-scale machinery.

A range of nano-additives was used, including: 1D nanostructured materials (hydrotalcites); 2D nanostructured materials, such as multiwall carbon nanotubes (MWNTs); and 3D nanostructured POSS materials.

Attributes such as Vicat softening point, mechanical features (including load stress) were tested for both types of pipe.

Some of the results included: similar loadings of different nano-additives showed dramatic differences in final features – especially mechanical properties such as tensile strength, elongation and stiffness; POSS materials showed a strong effect in pressure pipe; and MWNTs had a strong effect on stiffness in sewage pipe.

"Nanostructured additives can dramatically change the properties of polymeric matrices with added quantities lower than 2.5 phr," he said. "The most striking improvements were seen in mechanical performances, with an enhancement in rigidity, tensile strength and elongation."

Recycled performance

In addition, researchers at the **Polymer Competence Center Leoben** in Austria have assessed the slow crack growth (SCG) resistance of reprocessed PVC.

The cyclic cracked round bar (CRB) test is a quick way of assessing SCG resistance of virgin, recycled and reprocessed PVC. Recycled PVC has shown similar SCG resistance to virgin grades.

"However, further research is needed to investigate the effects of impurities and plasticiser residues on SCG resistance," said Andreas Frank, senior researcher at PCCL. "The results demonstrate that repeated reprocessing – of up to 10 runs – creates no significant negative influence on the SCG resistance of PVC."

The team ran CRB tests on five virgin materials and six recyclates. The materials were used to

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IMAGE: SCITEQ

Above: Sciteq will introduce a new pipe testing solution and updated software at K2022

prepare a representative compound that is typically used to make PVC pipe. This led to two main conclusions: recycled PV grades showed comparable SCG resistance to virgin grades; and, even small amounts of plasticiser residue could have a significant impact on the SCG resistance.

One material saw a large deviation in SCG resistance – which may be due to the presence of plasticiser residues.

"Because no systematic studies are available in this context, further research on the effects of impurities and plasticiser residues on SCG resistance are recommended," said Frank.

Quake risk

Water pipes are typically buried underground and are subject to load from the weight of soil above them. However, more serious threats – such as earthquakes – also need to be accounted for.

US-based researchers have developed and tested a distributed strain monitoring system for HDPE water pipelines that cross an earthquake fault. HDPE is typically used in these applications because it can handle large deformations.

"Using HDPE increases the robustness of these pipelines but does not inform a utility about the actual deformed condition of a pipeline," said Peter Hubbard, a researcher in the department of civil and environmental engineering at the **University of California Berkeley**.

He is part of the team that developed a distributed monitoring system for HDPE pipelines. The system was designed to monitor two HDPE water pipelines that cross a strike-slip fault in California, USA. It is based on fibre-optic distributed strain sensing (DSS).

This kind of system can act as an 'early warning' system – allowing decisions such as reducing stress build-up in a pipeline that has been damaged due to fault slippage.

The East Bay Municipal Utility District plans to replace two steel water transmission pipelines – which cross an active fault – with two HDPE pipelines that are 22in and 36in in diameter. The new system is designed to provide strain data every 2cm along a 2km optical fibre, with a spatial resolution of 1m.

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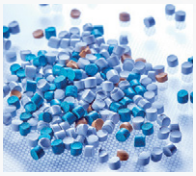


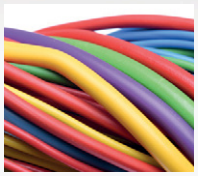


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K2022 Materials focus

IMAGE: MESSE DÜSSELDORF, CONSTANZE TILLMANN

In this issue, we focus on new materials – including a variety of resins and additives – that are being showcased at K2022. A key feature at this event is the use of recycled and recyclable materials. In addition, there are some more machinery launches that missed the deadline for the last issue.

Atlas Weathering Services Group (AWSG) has launched an advanced remote evaluation service. Its Virtual Inspection and Evaluation of Weathering (View) system will be demonstrated at K2022.

View is a virtual alternative that helps companies avoid the challenges and expense of an on-site visit. Now, clients can observe the effects of weathering on material specimens in real time from anywhere in the world. In addition, the convenience of View allows assessments to be made more frequently.

Using secure video conferencing software, a client interacts with an AWSG technician equipped with specialised, camera-enabled glasses to observe specimens in situ in high definition. They can then focus on specific areas of interest in detail – with magnification up to 60x using View's digital microscope.

Features of the service include: live on-line meetings or recorded video/audio; screen capture and whiteboard features to note specific areas of interest; and a digital microscope, for magnification of any specific surface defect.

View is available at three US locations, and will be expanded to European testing sites in the near future, says the company.

› **www.atlas-mts.com**

BASF says the theme for its K2022 presence will be the 'Plastics Journey', which it breaks down into the three key phases of Make, Use and Recycle.

"The Make phase is about improving how plastics are made, from product design to the choice of raw materials and the manufacturing process itself," said Martin Jung, president of performance materials. At K2022, the company will show how it can support customers in tracking and reducing product carbon footprint, such as the use of renewable or recycled feedstocks.

"In the Use phase of their lifecycle, plastics play out all their strengths: by improving energy efficiency through their light weight, by prolonging product lifecycles thanks to their robustness and peak performance, and by enabling more sustainable applications," he said. ›

Main image: Materials are a key part of the K show

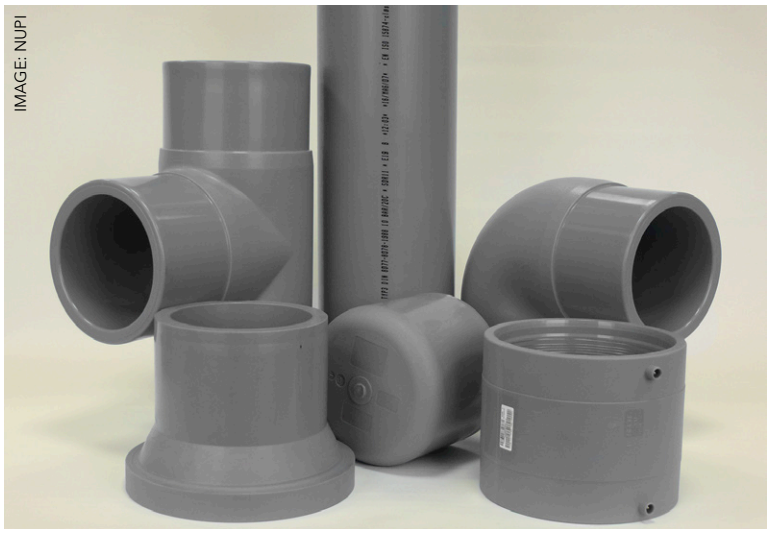


IMAGE: NUPI

Above: Nupi's Niron Beta PP-RCT pipe will be made using Borenewable materials from Borealis

The Recycle phase focuses on end-of-life.

"To achieve a circular economy, we need to get much better at the recycling of plastics to close the loop," Jung says. He cites the company's TrinamiX subsidiary, which is improving plastic sorting and identification using its mobile near-infrared (NIR) spectroscopy solutions, while its IrgaCycle range of additives improve mechanical recycling.

› **www.basf.com**

Benvic, which is known for its PVC compounds, is using K2022 to underline its expansion into making technical PVC and polyolefin compounds and ecological biopolymers.

"Benvic has had a quantum shift in its DNA in the past few years. We are therefore looking forward to sharing details of all our new materials and brands," said Eric Grange, product marketing manager.

The company's PVC products include the ProVinyl range, which targets applications in sectors as diverse as packaging, building, electrical and medical. ProVinyl grades include rigid, plasticised and recycled compounds with a focus on custom-made formulations for sustainable use.

Its second strand of materials is largely comprised of polyolefin-based polymer compounds for challenging applications. Marketed under the Xtended brand, the grades are grouped around PP compounded with specialty additives and fillers.

The company will also present its third strand of recycled and bio-based compounds. Benvic's French subsidiary Ereplast offers a number of solutions in recycled PVC.

› **www.benvic.com**

Borealis will showcase an application of its Borenewables range of materials, which are ISCC Plus-certified.

Italian pipe manufacturer Nupi has used polypropylene (PP) from the Bornewables range to make its Niron Beta PP-RCT pipe – which is used for domestic plumbing, heating and HVAC systems that are designed to perform under higher stress conditions and temperatures. The material offers the same performance as virgin PP.

Borealis says this helps Nupi be ready for the time when legislation will require the use of renewable materials in pipe production – and makes it the first pipe supplier in Italy to use this material.

"By using Bornewables PP for our new pipes, we are taking a major step forward in our efforts to reduce the carbon footprint of our products – and stay ahead of more stringent regulations by which the use of renewable feedstock may soon become mandatory for plastic pipes," said Roberta Brusi, quality director at Nupi.

The accreditation is based on a mass balance accounting process that allows Borealis and Nupi to prove and quantify the renewable content at each manufacturing step.

John Webster, global commercial director for infrastructure at Borealis, added: "The use of certified renewable polymers is an instrumental lever to accelerate the transition from a linear to a circular plastics economy."

› **www.borealisgroup.com**

DuPont has introduced its eCool technology, for extrusion of multi-layer cooling lines that are positioned inside and outside high-voltage battery packs in electric vehicles.

"Automotive cooling lines are critical to maintaining the performance of EV batteries," said Laurent Lefebvre, global marketing director for automotive at DuPont Mobility & Materials.

"They are an important target for sustainability improvement. With eCool, we offer a high-performance, flexible, more sustainable solution that is also cost competitive."

Electric vehicles can require up to three times the length of cooling lines found in traditional systems, says DuPont. For these large components, engineers must find a sustainable solution that will still hold up to cooling fluids.

The eCool technology is based on DuPont's Zytel LCPA Long Chain Polyamide grades co-extruded with thermoplastic olefin elastomer. This is an attractive alternative to existing – and heavier – options such as thick EPDM rubber hoses and other thermoplastic assemblies. The eCool solution removes weight and resists a wide range of EV cooling fluids. DuPont adds that eCool can reduce Global Warming Potential (GWP) of cooling tubes by over half compared to monolayer PA12 equivalents.

The technology can be made using extrusion and thermoforming. Benefits include: light weighting; sustainability; cost; and design freedom.

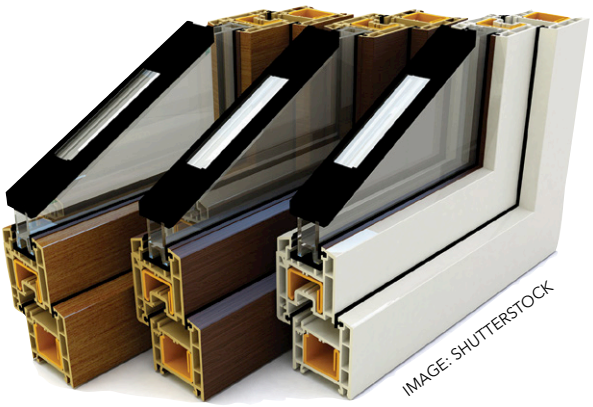
Production-level support is available at various DuPont application development centres. This includes CAE/FEA simulation, extrusion trials, support for post-processing, welding and testing for burst pressure, mechanical evaluation of properties and bend testing.

› **www.dupont.com**

HPF The Mineral Engineers, a division of Quarzwerke, will present developments in mineral additives for odour management in recycled compounds at K2022.

The company says that the use of high-quality plastic recyclates in new products is demanded when possible. However, contaminated post-consumer or post-industrial plastic waste is a challenge, as the required level of quality often cannot be achieved. The odour profile of recyclates, in particular, often causes dissatisfaction – with impurities or the recycling process itself causing unpleasant odours.

HPF has formulated a range of mineral-based odour absorbers. Olfatometric tests have shown that, when blended into a post-consumer PP recyclate at a level of 5% in a twin-screw extruder, the resulting compounds present an odour intensity significantly below the threshold set in the VDA 270 automotive standard.



Left: Ineos says its Luran S Eco B product uses up to 50% bio-attributed content

› **www.quarzwerke.com**

Ineos Styrolution says it has introduced its first sustainable grade of ASA – which will be presented at K2022. Its Luran S material is now available as Luran S Eco – with up to 50% bio-attributed content.

Luran S is for demanding use, especially in outdoor applications. Its UV resistance makes it a material of choice for applications such as window profiles.

Its longevity – thanks to its UV resistance – can be considered a first step towards being sustainable, says Ineos. However, it adds that 'true sustainability' is now coming with the material being based on bio-attributed content.

Options with up to 50% bio-attributed content are available. LCA calculations estimate that Luran S Eco B products will offer up to 58% carbon footprint reduction compared to fossil-based products, depending on the selected Luran S grade. The bio-attribution process is certified by ISCC Plus.

"To my knowledge, our Luran S Eco B products are the first bio-attributed ASA materials in the market," said Marcela Villegas, director of commercial product management for EMEA at Ineos Styrolution. "These products will help us and our customers to meet our respective sustainability targets."

› **www.ineos-styrolution.com**

Kraiburg TPE will present a broad portfolio of its materials at K2022.

One highlight will be a new proof of recyclability of selected TPS materials in the HDPE and PP streams.

"It has been assumed so far that TPS is not recyclable in the recycling stream," said the company. "Compatibility in the PP and HDPE stream with our products has now been demon-

strated and certified by Institute Cyclos-HTP."

It will also show its RC/UV range of materials, which has a proportion of post-industrial recycled materials ranging from 20% to 40%. This makes the materials suitable for the needs of automotive exterior applications such as weathering resistance. Existing components can now be replaced with alternatives made of recyclate-basesd TPE.

Universal PCR TPE is tailored to meet the needs of many consumer and industry applications and allows a portion of up to 41% post-consumer recyclate. Compounds are available in natural colour and grey – which can be dyed as needed. Mechanical properties are equivalent to those of standard solutions.

› **www.kraiburg-tpe.com**

KLK Oleo will show its sustainable polymer additives, including its Palmowax EBS and

Palmester range of external and internal plant-based fatty amide and fatty ester lubricants and slip agents, which can be used with many commodity and engineering resins. Palmowax EBS and Palmester 3976 are said to promote low surface friction and easy release in finished plastic parts produced by processes including calendaring and extrusion. Palmowax EBS is also useful in production of masterbatches, where it can act as a pigment dispersant as well as a processing aid that lubricates and homogenises other additives in the melt mixing system.

› **www.klkoleo.com**

Modern Dispersions, a producer of thermoplastic compounds and concentrates, will highlight its latest work with nanocarbons for masterbatches and compounds at K2022.

The company continues to carry out research and development with new grades of carbon black, graphite, and nanocarbons to improve thermoplastic compound properties such as colour, UV resistance, and electrical and thermal conductivity. Due to the lower filler loadings required with nanocarbons, better physical properties can be achieved with these types of compounds.

"We've had a lot of interest from OEMs and processors and our ongoing project sampling is promising," said Jan Kozma, vice president of sales and marketing at Modern Dispersions.

The company will also showcase other parts of its portfolio including black masterbatches, wood-poly-

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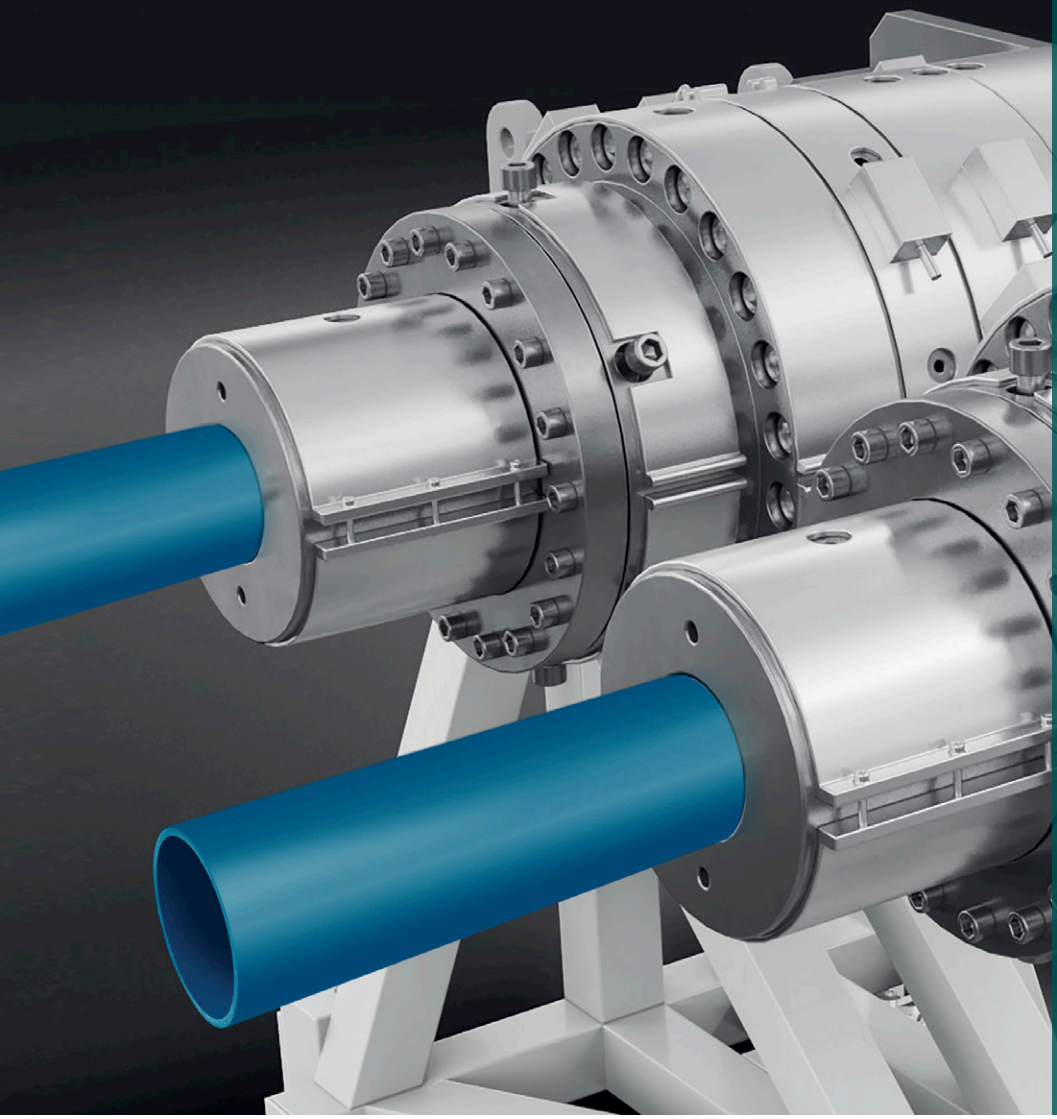

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IMAGE: SIMONA

Above: Simona will show a range of its piping innovations at K2022

mer composites (WPC), and colour concentrates. In WPCs, the company offers custom formulation with 40-50% loadings of PE-based WPC. These composites can be natural or custom-coloured.

› **www.moderndispersions.com**

OCS will demonstrate its PS25C pellet scanner at K2022, which can be used in a laboratory or online implementation for real-time inspection, measurement, evaluation and classification of granulates, recyclates and powders.

Using specific camera and lighting technology and high-performance hardware and software, the company says it can detect and classify gels, black specks or burn marks. It is particularly practical when used in an online application, where data can be transmitted directly to production and process control systems.

› **www.ocsgmbh.com**

Simona of Germany will showcase a broad range of its products and services at K2022.

From its infrastructure busines, it will show its PE 100 PSC RC-Line protective-jacket pipes with leakage monitoring.

The product range has been extended to include drinking water and wastewater piping systems with continuous leakage monitoring. These play an important role when used in water protection zones to safeguard against contamination from defective pipes. They are designed to comply with the quality standards and maximum safety mechanisms against pipe damage set out in statutory provisions.

The abbreviation PSC stands for Pipe System Control. As part of this system, detectors integrated into the pipe trigger a hazard notification in the event of damage. Thanks to this monitoring system, feed pumps can be switched off directly and any further discharge can be interrupted immediately. The sensor system can also determine the exact location of the defect – allowing for quick repair of the damage. In developing the PSC piping system, Simona has added a smart-tech solution to its product range for the safe discharge of wastewater through water protection.

Its Simona Stadpipe business, based in Norway, equips and installs land-based fish farms – including the design of piping systems. At K2022, it will present customised manifold systems for safe transport of fish, highlighting a range of specialist solutions developed with the help of its piping systems. Vacuum technology is used to pull the outlets out of the main pipe, allowing the execution of very smooth transitions within the manifold system. Manifolds can be produced in sizes up to 1,200mm in diameter.

› **www.simona.de**

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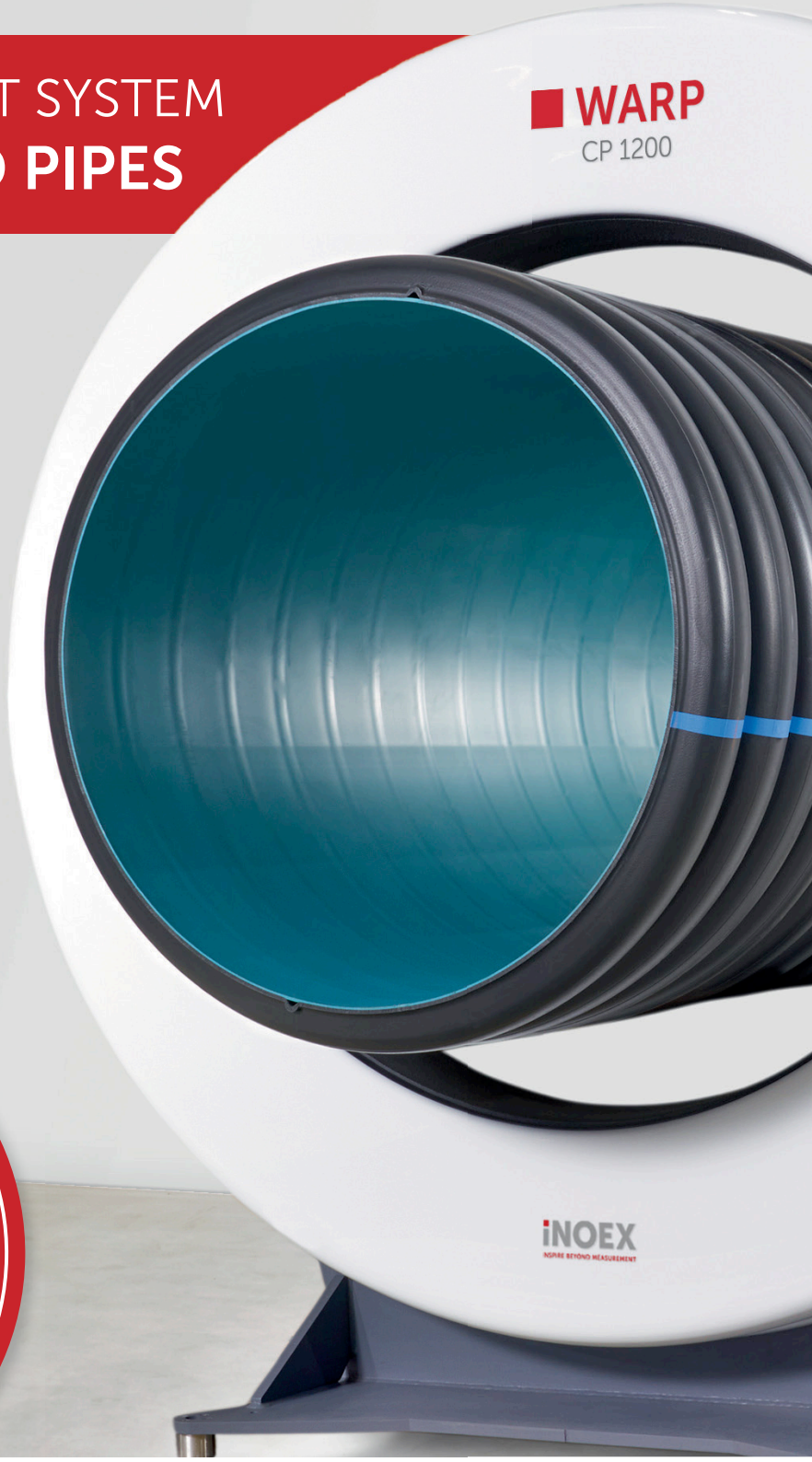

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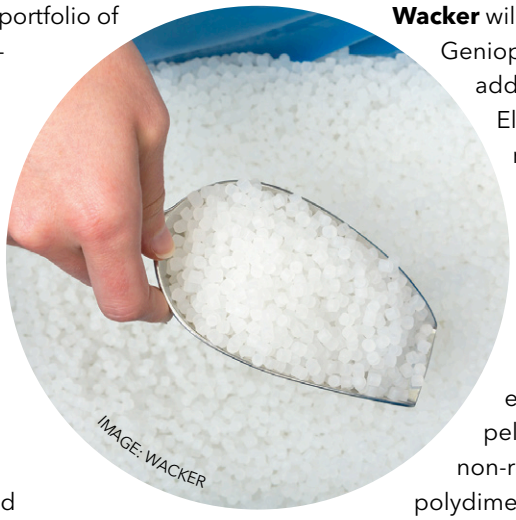
Right: Wacker's Genioplast PE50S08 masterbatch is said to improve processing of PE resins



Solvay has developed a new portfolio of UV-C stabilisers. These are designed for use in demanding hygiene applications, where polyolefin surfaces are treated with ultraviolet (UV) light in the UV-C spectrum (200-280nm) – to fight against COVID and hospital-acquired infections.

The company says that the new proprietary stabilisation technology is the first to address the risk of polyolefin degradation, discoloration and micro-crack formation – which is caused by frequent exposure to UV-C irradiation.

"Healthcare and other markets – such as aerospace and shared mobility – are increasingly using UV-C light to disinfect high-contact surfaces in an effort to combat pathogens," said Sophie Poelmans, global marketing manager for polymer additives at Solvay Materials. "Our new UV-C stabilisation technology helps end users achieve effective UV-C disinfection levels on surfaces made from polyolefins without compromising the performance of the material."

UV-C radiation can deactivate micro-organisms but can also lead to faster material degradation. Solvay's technology enables the use of UV-C light as an anti-microbial disinfectant on polyolefin surfaces, while protecting them against degradation. The technology is likely to find particular use in medical equipment used in operation and patient rooms.

› **www.solvay.com**

Wacker will present a new addition to its Genioplast line of performance additives as well as more Elastosil LSR products offering new application potential and sustainability benefits.

The Genioplast PE50S08 masterbatch is intended to improve the processing and surface finish of extruded PE resins, including compounded and recycled materials. The pelletised additive comprises a non-reactive, ultra-high-molecular polydimethylsiloxane in a low-density PE carrier. The silicone content of is 50%.

According to the company, PE50S08 is an effective processing aid that improves filler distribution in filled formulations and enhances the flow properties of the polymer melt. It claims this increases throughput and reduces the energy needed for compounding.

Where mixtures of different PE grades are compounded – as is the case in the processing of recycled polyethylene – it is said to ensure uniform mixing without major torque or temperature fluctuations. Wacker says that PE recycling is one of the new additive's key application areas.

Generally, Genioplast PE50S08 is used at addition levels of 1-3%. The product is said to be easy to feed with standard compounding set-ups and is readily incorporated into PE mixtures on a twin-screw extruder even when mineral fillers are added.

› **www.wacker.com**

K2022 Machinery focus

While we focused on machinery and ancillaries for pipe and profile extruders in our last issue, some information inevitably arrived after the publication deadline. Here, we focus on some more examples of relevant machinery that will be showcased at K2022.

Germany-based **Anybrid** has developed a mobile injection moulding process that can be used to overmould products such as profiles. It will be demonstrated at K2022.

The process, called Robin (for robotised injection moulding), effectively moves the injection moulding unit freely – rather than it being fixed in place.

One example of its use is to functionalise technical profiles inline during extrusion. Here, the machine moves to the profile dock, and along in the direction of the extrusion as the element is overmoulded.

In collaboration with Rehau, it has carried out several pilot tests recently. In one instance, the new technology was integrated directly into a production line in Rehau's technical centre.

Functional elements were applied to an extrusion profile at regular intervals. The challenge was to bring the parameters from extrusion and injection moulding together. Here, it was necessary to match the line speed of the profile with the injection moulding cycle – and the cooling time of the over-moulded element. If high productivity is needed, several Robin systems could be deployed simultaneously.

Tests with the pilot line made it possible to qualify several materials or material combinations. For example, good bonding strengths were achieved with several plastic including HDPE, ABS, TPE and PVC – either as mono-material systems or in various combinations. For this reason, a range of outdoor and indoor applications can be covered. Using mono-material systems allows a high level of recyclability, which is not possible with other joining processes such as adhesive bonding, says Anybrid.

› **www.anybrid.de**

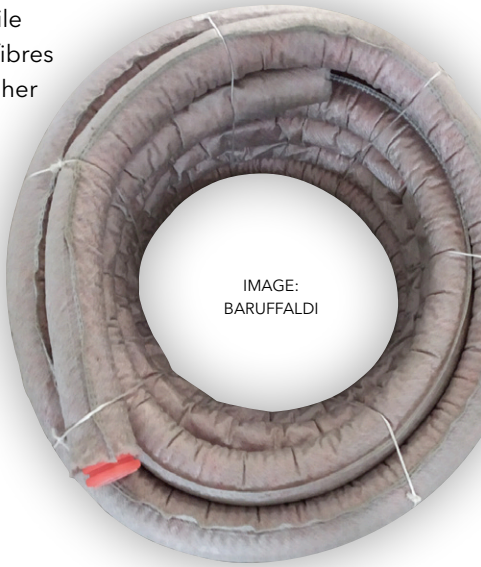
At K2022, **Baruffaldi** will unveil the redesign of its Dreno Covering machine – which covers perforated/slotted corrugated pipes with polypropylene (PP) geotextile.

The Dreno Covering is an automatic machine that can be used both in- and off-line. It can process both single-wall rigid and double-wall flexible pipes from 50 to 200mm diameter. The PP geotextile is wrapped around the pipe and welded continuously using an ultrasonic welding head. It is possible to place two coils of fabric – one for work and one in reserve – to avoid machine stops during automatic coil changeover. The variation in diameter from 50 to 200mm does not require additional equipment, but only a change in the width of the fabric coil.

The main advantage of using PP geotextile fabric rather than a sock is the ability to cover the pipe automatically – directly in the extrusion line. Other advantages of the PP geotextile include: it does not deform, and its fibres are dimensionally stable; it has a higher tear resistance; and, it has greater resistance to acids and bases – and thus higher durability.

During the redesign, attention was paid to the production speed – which now reaches 30 m/min – and to the dimensions of the machine. Overall dimensions have been reduced, by moving the electrical cabinet to the entry point of the pipe and by optimising the safety guards.

› **www.baruffaldi.eu**



Above: Baruffaldi has redesigned its Dreno Covering machine – which covers corrugated pipes with PP geotextile

At K2022, **Collin Lab & Pilot Solutions** will run a number of live demonstrations of extrusion equipment.

In pipe extrusion, this will include a medical tube line with a new VKT 3000 water bath.

The modular, 3,000mm water bath features optimised water circulation. It includes an optional pre-skinner, vacuum calibration, 2,000mm water cooling tank, drying module and heat exchanger. There is also a moveable base cabinet for a flexible extrusion die.

Modularity due to easy extension of the line by further water bath units – depending on the cooling section. Depending on the material and length of the water bath, for speeds of more than 200 m/min

› **www.collin-solutions.com**

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Prep time: latest in materials handling

Recent developments in materials handling include feeder and blender upgrades, updated software for dosing systems and carbon tracking for material logistics

Main image: Maguire says its new MGF+ range of feeders can raise flexibility and boost performance

Preparing granulate and other raw materials for the extrusion process can involve a range of processes – from drying and dosing to weighing and blending. Many suppliers are introducing new products in the lead-up to K2022.

Maguire, for instance, will unveil its new WSB-600 series blender at the show.

The new series of gravimetric blenders, for mid-range throughput applications, precisely dispenses up to 12 materials – including regrind, flake, wood flour and talc filler – and can be configured to dose up to six major ingredients.

The 600 series has a throughput range up to 2,500 lbs/hr. The WSB-600 adds another model to Maguire's line of weigh scale blenders, which already includes over 150 configurations.

Each ingredient hopper has a dispensing device designed for a material in a specific form. Like the larger units in the WSB family, the new blenders can be outfitted with up to six large-component slide gates for dispensing major ingredients, along with any combination of large corner valves (11,000 g/sec), 4in vertical valves (2,000 g/sec), 2in vertical valves (400 g/sec), auger feeders, and liquid colour pumps.

"By providing the same flexibility as larger units, the WSB-600 series blenders enable processors working in a smaller throughput range to meet growing demand for products that incorporate regrind and PCR along with virgin resin," said Frank Kavanagh, vice president of marketing and sales at Maguire.

In addition, Maguire will introduce a new line of feeders, providing complete application flexibility with added choices of gravimetric feeder. Its MGF+ models allow processers more flexibility and increased performance. They can be retrofitted with current Maguire equipment.

The MGF+ line includes up to four different-sized auger feeders on one mounting frame. This allows the flexibility to dispense multiple additives and materials within one frame and one controller. The centre hopper dispenses virgin material.

MGF+ 100L includes a virgin hopper that is on a pair of load cells, so that the material within this hopper is also being weighed and controlled by the same controller. It is ideally used for extrusion applications. MGF+ 100X takes the process control one step further by including an extrusion control package, where the extruder drive control is managed with the same touch screen controller as the hopper and the feeders.

Carbon tracking

At K-2022, **Altair** and **Motan** will demonstrate a carbon footprint tracker technology.

Evaluating carbon footprint is essentially an information problem. Plastics converters need

IMAGE: MOTAN

Above: Altair and Motan will showcase a carbon footprint tracker technology at K2022

relevant material data, as well as process parameters in order to monitor it. This is where the Motan-Altair demonstrator fits in. Altair provides – through a material database – the necessary data infrastructure and material information, while Motan interconnects the material logistics, including the machines involved for processing, compounding and grinding.

For each step, energy consumption is determined and recorded. This data is then fed back to the materials database so it can be analysed and visualised.

The database system is an individual version of Altair's Material Data Center, in which existing material data is complemented with carbon footprint properties and processing characteristics. By way of an interface to Motan's Material Data Gateway, it will supply Motan servers with processing data and – in return – live information about new and processed batches is returned.

This data is displayed and managed in a consolidated location to improve decision making – helping to improve both products and processes.

Kit upgrade

Brabender Technologie has upgraded a broad range of its gravimetric feeders

The company says that, with ever-smaller lots sizes and faster product changes, feeding equipment must be more versatile. It says that its 'Generation 2.0' equipment has taken these requirements into account, with a modular concept that allows easy disassembly and accessibility.

The principle has been put into action in its twin-screw DDSR20 2.0 feeder and single-screw DSR28 2.0 feeder.

The modular design allows the gearbox on both feeders to be easily changed and replaced.

"This flexibility enables the customer to switch between single and twin-screw versions," said Jürgen Knez, head of product development at Brabender.

The screw trough is located at the front end of the scale and can easily be removed. This has enhanced feeder accessibility – with end users benefiting from faster cleaning of components. Captive quarter-turn fasteners on the screw trough, hopper and lid help to speed up changeover time.

Seal replacement is also easier and faster, thanks to an easy screw trough removal – from the front of the feeder. A new seal can be inserted within five minutes. A new seal change indicator flags up when seals need to be change – at an early stage, which prevents gear and motor damage. In addition, Generation 2.0 units feature dust-tight vertical outlets made of transparent PETG. This is shatter-proof and the transparency allows the operator to perform visual checks of ingredient flow.

The feeders are available with an optional servo motor. This has the added benefit of a wider speed range, with full torque available at low rpm. The need to change screws and screw tubes can now be further reduced, which helps to minimise downtime. At low speeds, servo motors in high torque conditions still allow good speed control, said the company.

"The new design has enabled us to start offering customised, purpose-specific feeders that are more effective than before," said Knez."

Compact range

Moretto of Italy has developed a number of new or improved models in materials handling.

Its new Compact range of hopper loaders, containers and receivers claims to be 30% smaller than equivalent products. One example is its Kasko Compact single-phase hopper loader, which is equipped with a two-stage turbine and automatic filter cleaning as standard. Other key points include: quiet performance, soft start and a high efficiency discharge valve with gasket.

It has also restyled its three-phase VS Eco suction units to be more compact. The new range can work at a high load capacity and equipped with extra devices – such as vortex filter, bypass valve or cooling ring.

Efficient solution

Coperion K-Tron says that its preconfigured ProRate Plus feeders offer an efficient feeding solution. All three sizes of the feeder – small, medium, and large – will be on show at K2022.

The continuous gravimetric feeder line is an economical solution and offers a quick return on investment due to its good price-performance ratio and fast delivery times, says the company.

The feeder line's design allows a very compact, space-saving arrangement. The trapezoidal shape of

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Coperion K-Tron says its ProRate Plus continuous gravimetric feeder line has high efficiency

IMAGE: COPERION K-TRON

the ProRate Plus feeders allows up to six feeders to be grouped around an extruder inlet within a 1.5m radius. The three feeder models – Plus-S, Plus-M and Plus-L – cover a wide range of throughputs. They are capable of handling feed rates from 3.3 up to 4800 dm^3/h depending on the material. Theoretically, a feeding system with six ProRate Plus-L feeders can feed up to 28.8 m^3/h on a footprint of $7m^2$.

All feeders include P-SFT load cells, featuring reliable Smart Force Transducer weighing technology. They work under compression and provide accurate, reliable digital weight measurement under a range of operating conditions. The load cells supply a direct digital weighing signal. The onboard microcontroller ensures good repeatability and stability. P-SFT load cells have a high tolerance to vibration and electrical noise and feature built-in overload and underload protection.

In addition, its Smart Weigh Belt (SWB) feeder is used for continuous controlled gravimetric feeding of free-flowing or friable bulk materials. The SWB can be used for gravimetric batch feeding or continuous metering of bulk material flow. It features a primary weigh bridge and offers an optional secondary weigh bridge that provides continuous online auto tare, which reduces maintenance and frequency of calibration, and improves long-term stability. The SWB is available in 300, 600, 650, 800 and 1000mm belt widths. SWB-300 and SWB-600 are supplied as open or closed frame.

Software update

Movacolor has introduced a software update that further extends the ability of the MCTC touchscreen controller that is used to control its range of dosers.

Software version 2.13.0 – free of charge and

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Right: Conair's Moisture Minder provides real-time confirmation that a dryer has done its job

available in more than 20 languages – includes many new features including Italian translations, remote dosing and dosing stop accessory configuration and user interface improvements.

The MCTC controller plays an important role in the reliability and stability of the dosing process, says Movacolor. Features of the controller include fast calibration, storage of up to 1,000 recipes, EBM synchronization and sensor neck control.

IMAGE: CONAIR

The first version of the new software was introduced last year.

"Although we were able to fulfil many customer requests with the previous software version, we challenged ourselves to go further," said Gerhard Dersjant, managing director of Movacolor.

The software includes features such as: sensor neck integration, fast calibration options and a single shot test button for taking verification samples. It is also possible to contact support staff at Movacolor directly via remote control – which is a key factor in remote installation and support.

"This software allows us to temporarily take control of a machine that is thousands of kilometres away," said Dersjant.

Dryer check

Conair says that its Moisture Minder provides real-time confirmation that a dryer has done its job correctly.

The sensor detects residual moisture levels as low as 10 ppm in a broad range of polymers at throughput rates of 20 to 5000 lbs/hr. Installed at the outlet of a drying hopper, it suits new installations or can be retrofitted to existing systems.

The real-time monitor measures moisture continually. Set points can be configured so that an alert is issued when the specified level drifts outside prescribed limits. All readings are stored for historical trending, so that shifting conditions can be recognised. These records can also be used for process validation – confirming that parts were manufactured under acceptable conditions.

It is available in two models: the M5 unit detects moisture levels in the 10-1000 ppm range, while the M10 tracks moisture in a 300-3000-ppm band. Both sensors are electric, with no moving parts to maintain or change. Operation is passive, so there is no impact on production rates. Annual calibration and cleaning are the only regular maintenance chores.

The Moisture Minder can be used with Conair's Drying Monitor, which provides early indication that drying conditions are not right. Placed vertically in the drying hopper, the monitor probe measures temperature at multiple levels in the bed of material being dried. This detects anomalies that could result in unacceptable moisture levels in the resin when it leaves the hopper later.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.maguire.com**
- **www.altair.com**
- **www.motan.com**
- **www.brabender-technologie.com**
- **www.moretto.com**
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- **www.movacolor.com**
- **www.conairgroup.com**

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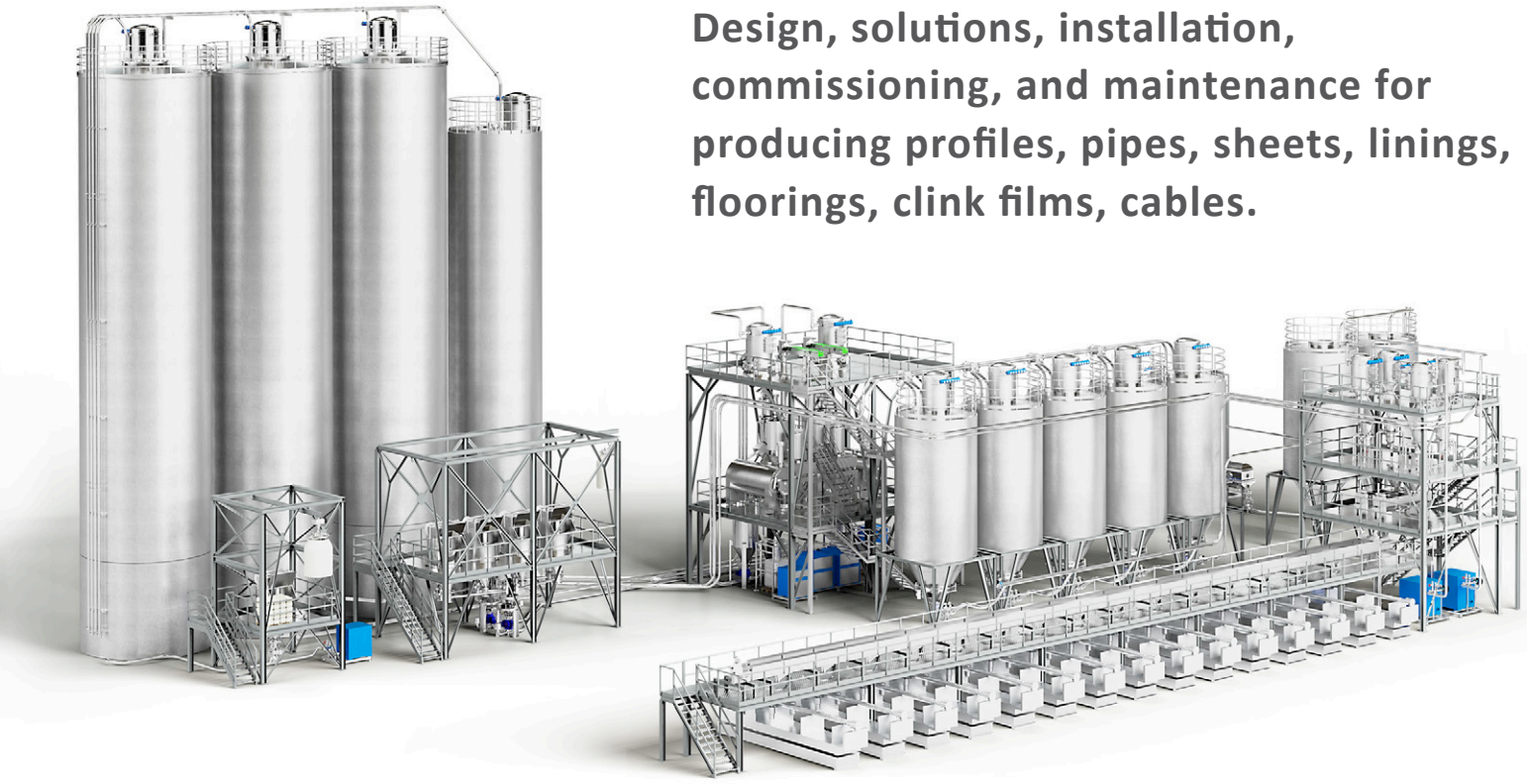

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US extrusion expo: industry insight and new technology

The latest Plastics Extrusion World Expo North America in November includes an exhibition of key technologies – plus a two-day conference programme of leading industry presenters

The North American edition of the Plastics Extrusion World Expo returns to Cleveland, Ohio in November, organised by AMI, publisher of *Pipe & Profile Extrusion* magazine. The free event – where you can find the latest products and solutions to improve your processes and future-proof your business all under one roof – features the largest concentration of plastics extrusion-related exhibits in the US. From manufacturers of extrusion machinery and equipment to industry-leading suppliers of materials, additives, and related services, you are certain to be able to find everything you need at the expo.

You will also be able to discover and debate the latest innovations and best practices in plastics extrusion in the dedicated conference theatre at Plastics Extrusion World Expo. The conference will feature two full days of technical presentations by leading experts in their fields.

Taking place at the Huntington Convention Centre in Cleveland on 9-10 November, this free-to-attend trade show is co-located with Compounding World Expo, Plastics Recycling World Expo, and Polymer Testing World Expo, giving ticket holders access to a total of four shows, more than 100 conference speakers, and more than 200 exhibitors from across the entire supply chain. The post-show report from the 2021 event showed a total attendance in excess of 3,000 people.

On the following pages, you can find out more about the exhibitors at the event, plus details on relevant speakers in the conference stream. Within the conference, the industry debate on the future of profile extrusion – held on the second day of the expo – is of particular relevance.

For more details on the exhibition, click **here**, and for more details on the conference, click **here**.

Main image: Conference sessions are a popular part of the Plastics Extrusion World Expo

Right: Bausano designs and produces a range of customised extrusion lines

IMAGE: BAUSANO

ABS Advanced Blending Solutions
Advanced Blending Solutions is a designer, supplier and manufacturer of material handling, blending, drying and controls for the plastics industry. With representatives throughout the country, ABS is a fast-growing company which says it is committed to providing the best products and services. All ABS products can be customised to meet customer needs.
› **https://adv-blend.com**

ALEMO
ALEMO is a global leader in the development and manufacture of extrusion lines and other converting machinery for foamed products. It supplies extrusion lines and other equipment to customers in almost every part of the world – including Europe, North & Latin America, Australia, India, Japan and Central Asia.
› **https://alemo.eu**

Anping Songjia Wire Mesh
Anping Songjia Wire Mesh is a professional manufacturer of extrusion screens located in Anping China. It weaves wire cloth in rolls with materials of stainless steel, plain steel, Monel and Hastelloy, and can process the wire cloth to various sizes of belt, circle screen, weld pack screen, aluminium bind pack screen and cylinder – all of which are widely used in the extruder for rubber and plastic processes.
› **www.chinameshfactory.com**

Bausano
Bausano extrusion lines are used for the production of profiles, pipes and medical tubes, WPC profiles and granules. Other than extruders, Bausano also provides a range of accessories for calibration, cooling, haul-off and cutting. It offers extrusion line personalisation consultancy, high production capacity and after-sales assistance.
› **www.bausano.com**

Bergen International
Bergen International is a leading manufacturer of chemical foaming agents. It focuses on providing plastic processors with standard and custom chemical foaming agent products under its Foamazol brand. These are available for many processes including structural foam moulding and a variety of extrusion processes.
› **www.bergeninternational.com**

Berlyn ECM
Berlyn ECM designs, engineers and manufactures plastic processing equipment. Its product line includes extruders, low bulk density feeders, screen changers (manual and hydraulic), continuous filters, dies, water baths, air strippers, diverter valves and screws and barrels. Berlyn equipment is used by many leading manufacturers of film and sheet, elastomers, pipe, profile, tubing and foam.
› **www.berlynecm.com**

Bryan Hauger Consulting
Bryan Hauger Consulting says its plastics experts, engineers and extruders can help with diverse projects. Its pipe team features experts in plastic pipe standards, polyethylene water pipes, pipe extrusion, oil & gas pipes, failure analysis, plumbing, heat fusion and thermoplastic welding. The film and packaging team features experts in plastic film design for blown film, resin selection, flexible packaging for food applications, and film markets.
› **www.bryanhaugerconsulting.com**

Busch Vacuum Solutions
Busch Vacuum Solutions has proven vacuum technology that is tailored to exact application requirements. From the production of the raw granulate or pellets to the manufacture of finished plastics parts, all the way to recycling, its product range provides the optimum vacuum generator for each application. Solutions range from individual vacuum pumps to fully customised systems and service plans.
› **www.buschvacuum.com**

CDS Custom Downstream Systems
For over 25 years, Custom Downstream Systems has been a North American leader of custom downstream plastic extrusion machines, delivering

turnkey systems for most polymer and rubber applications including pipes, profiles, tubes, custom products and medical devices. The founders envisaged a company that would set new standards for durable, reliable machines, delivering its expertise to the customer's exact specifications.
› **https://cdsmachines.com**

Combilift
Combilift, a global manufacturer of multi-directional forklifts, is a leader in long load handling solutions. The company exports to more than 85 countries and has more than 60,000 trucks in use worldwide. It says it can deliver a high level of customisation and adaptability and cater effectively to the diverse needs of individual customers – whether they are large or small.
› **https://combilift.com**

Compuplast
Compuplast provides advanced CAE tools and services to the plastics processing industry. Its products include the Virtual Extrusion Laboratory for extrusion equipment optimisation, T-SIM for thermoforming, B-SIM for blow moulding and Moldex3D for injection moulding.
› **www.compuplast.ca**

Davis-Standard
Davis-Standard is a leader in the design, development and distribution of extrusion and converting technology. Its systems encompass over 14 product lines to support manufacturing applications and customers within every major industry. This includes the agriculture, automotive, construction, healthcare, energy, electronics, food and beverage packaging, and retail sectors. All equipment is backed by robust aftermarket support, parts availability and customer service.
› **https://davis-standard.com**

IMAGE: DAVIS-STANDARD

IMAGE: COMBILIFT

Above: Combilift manufactures multi-directional forklifts and exports to more than 85 countries

Dynisco
Dynisco products and solutions provide indication and control for critical plastic process measurements including pressure, temperature and polymer rheology. Harnessing these parameters allows plastic processors to reduce lot-to-lot variations, reduce scrap, improve productivity and integrate recycled materials without sacrificing product quality. The company recently expanded its offering with the Dynisco Cloud Connect through Microsoft Azure. Dynisco has manufacturing locations in the US, Malaysia and China, and supports Europe and the Middle East through its sales, engineering and distribution centre in Heilbronn, Germany.
› **www.dynisco.com**

Enercon
Enercon says customers can improve adhesion with its complete line of surface treating solutions. Enercon's equipment for the converting and extruding industries includes corona, atmospheric plasma, flame and ozone treaters. Its surface treatment solutions are highly scalable with systems designed for the narrowest of lines up to 7m and beyond in width.
› **www.enerconind.com**

Ensign Equipment
Ensign engineers, manufactures and integrates bulk material handling equipment and automated systems that convey, mix, load, unload, weigh, feed and store dry bulk materials. The company designs equipment and systems that meet a customer's specific process requirements. Ensign has handled a wide range of applications including films, flakes, pellets, chips, fibres, granules, powders, and dissimilar materials of various types, densities, sizes and characteristics.
› **https://ensigneq.com**

Left: Davis-Standard is a leading supplier of extrusion technology

Extrusion Control & Supply
Extrusion Control & Supply (ECS) is a US supplier focused on the polymer extrusion MRO industry. Since 1997, it has provided supplies and support to over 1,000 polymer extrusion customers worldwide. With ongoing training, its staff offer support on the selection and application of its parts. ECS offers a complete line of parts and supplies and, with offices in three US time zones, can provide extended support hours and next-day shipping to accommodate last-minute orders. It also offers in-house breaker plate manufacturing, extruder screen stamping and cylinder welding, and a 'stock for need' programme.
› **https://extrusioncontrol.com**

FACTS
FACTS supplies integrated control system upgrades, drive systems, on-line measurement systems (for sheet, film and web), data collection and event logging. The FACTS Machinery Group designs and fabricates downstream extrusion equipment, including cooling tanks, vacuum sizing tanks, two-belt pullers and cut-to-length saws.
› **www.facts-inc.com**

FB Balzanelli USA
For over 25 years, FB Balzanelli has provided automatic and semi-automatic coilers of high quality. It says that its technology constantly evolves for a better return on investment. It also offers constant innovation to offer an ideal solution for specific needs in pipe coiling, packing and palletising. Product quality is customised and guaranteed to every detail, and customer care ensures correct and reliable operation of systems over a long period, it says.
› **www.fb-balzanelli.it**

Below: FB Balzanelli supplies automatic coilers for a variety of pipe sizes


IMAGE: BALZANELLI

Frigosystem - Go Trade North America
Frigosystem-Corema is focused on the design, manufacture and sale of industrial chillers and temperature controllers, with long experience in high accuracy systems. The variety of products can satisfy the demands of both large and small industry. Frigosystem can structure its offer with tailor-made plants and proposals, oriented to efficiency and energy saving. A focus on innovation, constant research in technologies and marketing, and the application of professional ethics support Frigosystem in its growth. In addition the company has a wide sales and service network.
› **www.frigosystem.it**

Gefran
With more than 50 years of experience, Gefran is a leader in the design and production of solutions for measuring, controlling, and driving industrial production processes. Its components are the result of research and cooperation with major research centres. Its areas of expertise include the design and production of sensors for measuring variables such as pressure, position, temperature, and force; and components and solutions for indication and control – meeting demands for optimisation of processes and intelligent management of energy consumption.
› **www.gefran.com**

Graham Engineering
A specialist in single-screw extrusion, Graham Engineering Corporation (GEC) has provided its technology in more than 70 countries across many forms of extrusion. Its capabilities comprise standard and custom solutions spanning sheet, single-screw extruders, feed screws, extrusion systems and specialised turnkey systems for automotive, industrial, construction, packaging, wire & cable, durable goods, graphics, and healthcare.
› **www.grahamengineering.com**

Greiner Extrusion US
Greiner Extrusion is a leading supplier of extrusion lines, tooling and systems for profile extrusion. Its core competence is process expertise in profile extrusion – development, design, manufacture and process optimisation of tooling and extrusion lines. The service portfolio ranges from formulation development to extrusion lines and from tooling to the engineering of complete production plants. At 11 locations in Europe, the US and Asia, complete solutions are provided for all profile manufacturer

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requirements worldwide. The company also has six technology centres and 15 permanently available extrusion lines worldwide.

› **www.greinerextrusion.com**

Greiner Extrusion supplies extrusion lines, tooling and systems for profile extrusion

IMAGE: GREINER EXTRUSION

Integrated Control Technologies

Integrated Control Technologies is an OEM that specialises in extruder drive and control upgrades. It says it has developed products that allow better manufacturing. The most recent series is the PDQ Series of products – which it says defines the true definition for standardisation.

› **www.integratedcontroltech.com**

Labtech Engineering

Labtech Engineering is a Thai manufacturer of laboratory-scale polymer processing equipment. It offers a range of single and twin-screw extruders, two-roll mills, mixers, hydraulic presses from 20 to 80 tonnes, filter testers, single- and multi-layer film blowing lines and film casting lines, and tube production lines. It has a large stock of spare parts that available for same-day shipping – allowing them to reach the customer within a few days. It has shipped over 5,000 of its machines to customers around the world. A recent factory expansion has given it a much-needed production increase.

› **www.labtechengineering.com**

LaserLinc

LaserLinc manufactures in-process and off-line non-contact measurement and visualisation systems for a multitude of high-value industries, especially wire, cable, fibre optics, medical, automotive and aerospace. The company enables accurate and reliable measurement of many dimensions and features, including inside and outside diameter, wall thickness, surface flaws and profile.

› **https://laserlinc.com**

Below: Labtech Engineering is a Thai manufacturer of lab-scale polymer processing equipment

IMAGE: LABTECH

Marvel Marking Products

Marvel Marking Products is a manufacturer of industrial marking devices and print room supplies. As it has evolved and grown over the years, so have its product lines. Marvel supplies a full line of glass marking equipment, print room supplies, contact printing and indenting products. Its team of craftsman produce consistent, efficient equipment which remains economical for each of its product markets.

› **www.marvelmarking.com**

NDC Technologies

NDC Technologies provides intelligent, connected measurement and process control solutions. It provides a range of plastic film and sheet, pipe, tube and profile gauging systems to help customers transform acquired process data into both knowledge and intelligence. This enables the customer to enhance production processes, increase productivity, boost process efficiencies and deliver higher quality products.

› **www.ndc.com**

NFM

NFM/Welding Engineers is a global OEM that produces plastic and rubber extrusion systems. NFM partners with customers to provide a wide portfolio. This ranges from custom-designed full turnkey extrusion systems to replacement parts and services for most OEM extrusion equipment and applications. Key technologies include: TEM series co-rotating twin extruders; WE series counter-rotating twin extruders; HSX single-screw (plastics); and HRX single-screw (rubber).

› **www.nfm.net**

Omipa

Omipa is a specialised manufacturer of complete extrusion and co-extrusion lines for the production of sheet, foil, film and hollow profiles in many different thermoplastics. It makes all components of the extrusion line in-house – starting from the

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Right: Pixargus systems are used for surface inspection and dimension measurement

design. This helps it to meet customer needs and requirements, following a customisation logic, up to installation of the finished line. Omipa pays particular attention to after-sales service, sending trained technicians to customers sites and offering a rapid, efficient spare parts service and on-line assistance.

› **www.omipa-extrusion.com**

Parkinson Technologies

Parkinson Technologies offers large-scale web handling, winding and plastics processing equipment for continuous web processing. Its product lines include Key Filters screen changers, Marshall & Williams orientation lines, Parkinson Winders surface and centre winders and Dusenbery Converting Systems slitter rewinders. It also offers customers the flexibility to conduct plastics sheet/film extrusion and orientation R&D and to produce commercially viable marketing samples.

› **www.parkinsontechnologies.com**

Paulson Training Programs

Paulson says its workforce training can improve quality, production, and profits. Clients can transform its personnel into confident, certified plastic processors using Paulson's revolutionary teaching approach from the 'Plastics Point of View',

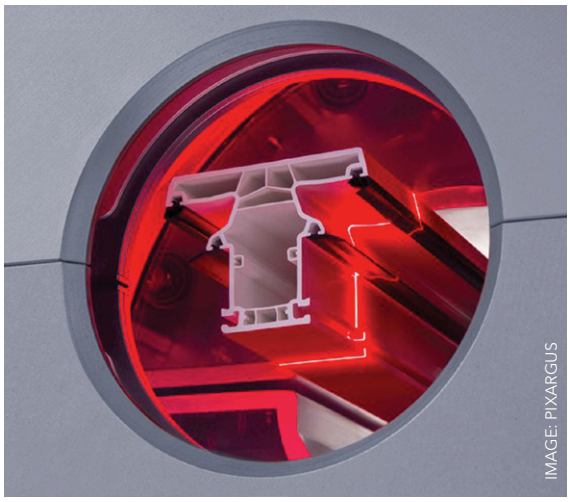

IMAGE: PIXARGUS

it says. The company helps plastics engineers, technicians and operators learn the fundamentals and advanced topics of moulding through intensive online courses, instructor-led seminars and machine simulation. Successful plastics companies have used Paulson for a range of flexible and proven training solutions.

› **www.paulsontraining.com**

Pixargus

Pixargus offers a range of turnkey inline systems for surface inspection and dimension measurement. Its

Experts speak at free conference

Visitors to this year's event can attend a free conference in the show's Plastics Extrusion World Expo theatre. Industry experts will make presentations on subjects as diverse as business intelligence, market opportunities and technology updates.

There will be three industry debates across the two days, focusing on the future for plastics flexible packaging, profile extrusion and polymers in flooring. It will include representatives from companies including **Jindal Films**, **Vitopel**, **Oben** and **Deceuninck**. Panellists for the debate on profiles include **George Walrath** of **Walrath Consulting Services**, and **Paul Adams**, materials engineering director of **Deceuninck**.

A number of technical presentations are of relevance to pipe and profile extruders. On day one, **John Facinelli** of **AdvanSix** will explain the best way to select nylon materials for demanding applications – including extruded profiles. **Brandy Herrmann**, senior business development engineer at **Sikora**, will explain how X-ray technology can help maintain quality of extruded pipe.

There are also presentations on energy efficiency (from **Custom Downstream Services**), control systems (from **Integrated Control Technologies**) and screen changers (from **Parkinson Technologies**).

One day two, **Rick Barnes** of **Paulson Training Programs** explains how an understanding of the science behind extrusion can boost profits.

Also on day two are papers on melt pressure measurement (from **ECS**), pressure sensing (by **Dynisco**) and raw material traceability (from **Advanced Blending Solutions**).

For more information about the Plastics Extrusion World Expo conference and the full line-up of speakers, **CLICK HERE**.

Speakers at the event include (from left): Paul Adams of Deceuninck; John Facinelli of AdvanSix; Brandy Herrmann of Sikora; and Rick Barnes of Paulson Training

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measuring and testing systems detect small defects and material deviations of extruded rubber profiles, cables, tubing, pipes and plastic foils. It also checks raw materials in an automated inspection process – to ensure that production runs smoothly from the start. Its systems feature its proprietary, high-performance machine vision technology. Its systems are used in the automotive, medical, building and infrastructure sectors, as well as in consumer goods.

› **www.pixargus.com**

PrintSafe

PrintSafe supplies product marking systems. The company says its low-cost, high-resolution ink jet extrusion markers involve no maintenance, no hazardous waste and no solvents.

› **https://printsafe.com**

Process Control

Process Control supplies plastics manufacturers with high-accuracy resin blending and pellet/powder processing equipment. These include: gravimetric continuous and batch blenders; rapid investment-return scrap recycling systems; grinders; pneumatic conveying; material handling machinery; vacuum-pressure railcar unloaders; precision resin powder feeders; and extrusion control systems.

› **www.process-control.com**

Promix Solutions

Promix Solutions designs and builds systems and equipment for mixing, foaming and cooling plastics. It delivers key components combined with process know-how. Customers can optimise their process, use less raw material, increase output and improve product quality. Promix makes physical foam extrusion systems, gas dosing and injection systems, melt coolers, cooling mixers, in-line viscosity measurement systems, nucleating agents for foaming, and static mixers for extrusion.

› **https://promix-solutions.com**

PSI-Polymer Systems

PSI-Polymer Systems is a global supplier of high-performance gear pumps, screen changers, die changers, diverters, custom ancillaries and rebuilds for the polymer and other industries. Its quick-response consultative approach is designed

to help processors find efficient, cost-effective solutions to extrusion process problems. The company says that a combination of its equipment, systems and service help it to satisfy its customers.
› **https://psi-polymersystems.com**

Sanyo Denki America
Sanmotion Servo Systems by Sanyo Denki America offers a range of energy-efficient servo motors for injection moulding equipment. Its products are continuously improved to reduce loss, optimise cooling and improve motion efficiency – including the large-capacity servo motors (frame size up to 320mm). Sanmotion products include AC and DC servo and stepping systems and motion controllers with high performance and reliability, especially for multi-axis synchronous motion control.
› **www.sanyodenki.com**

Shini USA - Budzar Industries
Shini USA, part of Budzar Industries, provides a range of plastics processing equipment, including portable chillers, hot water units, hot oil units, desiccant dryers, hot air dryers, drying hoppers, screenless granulators, top teed granulators, staggered granulators, central open rotor granulators, material loaders, blowers, feeders, mixers, blenders and conveyors. It provides solutions for blown film, plastic extrusion, thermoforming and compound mixing.
› **www.budzar.com**

TCF Precision Machining
TCF Precision Machining designs and manufactures custom tooling and components for the plastics manufacturing industries. It can also build replacement components for existing tooling systems, to support ongoing operations. It has built replacement pelletising dies, breaker plates, wear seals and bed knives – as well as new dies for pipe, profile, and pelletising systems. It offers a consulting service for process optimisation – in either existing manufacturing systems or when considering a new installation.
› **www.tcfprecisionmachining.com**

Union Officine Meccaniche
Italy-based Union offers complete extrusion lines for the production of roll-stock sheets, cast film, flat and hollow sheets, and corrugated and Greca sheets. It also has special lines for composite plastic/metal panels and complete equipment for foam boards, sheets and profiles. It has more than 1,200 lines installed in 54 countries around the world. Union also provides extensive technical service to its worldwide customers.
› **www.unionextrusion.it**


Xaloy is a leading manufacturer of barrels and screws
IMAGE: XALOY

US Extruders
US Extruders has developed a new generation of custom single-screw extruder solutions. It says it is committed to providing a high level of machinery and support to achieve the best possible end product. It understands customer needs – and has created a plain language guarantee to build the machine the customer wants, on-time, with the expected performance and backed by its full support.
› **www.us-extruders.com**

Xaloy
Xaloy is a leading manufacturer of bimetallic barrels, high-performance screws, screw tips, nozzles and valves for plastics processing. It has designed and developed many innovative plasticising technologies, components and systems for extrusion applications. It aims to use its resources to optimise customers' production processes, reduce costs, increase productivity and support sustainability in extrusion. As a global company, it offers a sales, engineering and production presence that ensures comprehensive manufacturing capabilities, customer service and technical support.
› **https://xaloy.com**


IMAGE: PSI-POLYMER SYSTEMS

Left: PSI-Polymer Systems supplies equipment including gear pumps, screen changers and die changers

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IMAGE: MOLECOR

Recent advances in oriented PVC (PVC-O) include a 1200mm diameter pipe, a tool that allows geo-positioning in a network, and a belling machine to produce Rieber-type sockets

Smooth operator: latest in PVC-O pipe

Oriented PVC (PVC-O) can be used to create pipes that are stronger – though less dense – than their PVC-U equivalents. This makes the pipes sought after in applications such as water transport.

At K2022, **Molecor** will present a range of PVC-O innovations and new products.

Firstly, it says it will present the world's largest diameter of PVC-O pipe. The 1200mm pipe – which is currently undergoing certification – "opens up new possibilities to supply population centres and carry out pumping to reservoirs in a sustainable and environmentally friendly manner as never before done", said the company.

The new pipe builds on earlier generations, which are available in diameters of 630, 800 and 1000mm.

The new pipe, like others made using Molecor's TOM technology, is made in accordance with the UNE-EN 17176:2019 standard – which itself is based on European standard EN 17176.

In addition, Molecor will present geoTOM – a new tool that will allow geo-positioning of all elements in a network. All products can be geolocated, regardless of the manufacturer. In this way, installation projects are generated and – for Molecor products – have complete traceability once the project has finished.

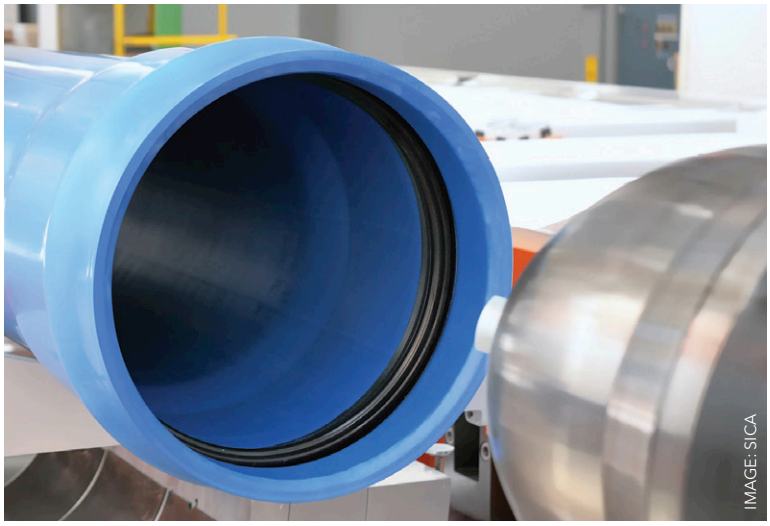
Last year, Molecor installed 22km of oriented PVC (PVC-O) pipe at a mining project in Serbia.

The pipe, which is up to 1,000mm in diameter, forms part of a treatment plant that pumps away surface water. Molecor says the pipe was chosen for its high installation performance – even when the terrain and water table slow down the work – and its superior corrosion resistance.

Around half the pipe supplied for the project is 315mm in diameter. The rest is split between 110, 250, 400 and 1,000mm.

Excess volumes of drainage water are removed via a 1,000mm pipe. A pumping station from a water treatment plant transfers the accumulated water with pressure pipes to an open channel that

Main image: Molecor says its new geoTOM tool allows geo-positioning of all elements in a PVC-O pipe network



Above: Sica's Starbell belling machine can produce Rieber-type sockets on PVC-O pipes

borders the mine and empties the water into a river.

The pipe's lower roughness helps to reduce the energy costs of the water transport. It also reduces water hammer, higher impact resistance and watertight performance.

In addition, Molecor has increased its stake in a PVC-O business in south-east Asia. It previously owned less than 3% of Molecor (SEA), based in Malaysia – but has now bought the stake owned by safety equipment manufacturer Fitters Diversified. This takes Molecor's ownership in the business to 75%, according to a report in *The Edge Markets*. The remaining 25% is held by Sanlens. Molecor and United Sapphire offered RM30 million (around US$6.5m) for the shares, said the report.

Product addition

Westlake Pipe & Fittings – formerly Napco – has begun offering PVC-O pipe to its customers. The company says the pipe has a lower manufacturing carbon footprint than other water main materials.

The investment helps to expand production capacity at the company's pipe and fittings facility in Woodbridge, Ontario.

"Our focus is on delivering pipe and fitting systems that address our customers' most difficult infrastructure challenges – including product longevity, ease of installation and enhancing water flow," said Andre Battistin, vice president at Westlake Pipe & Fittings.

"We are bringing new products to market with lower environmental impacts throughout the life cycle assessment."

During manufacturing, PVC molecules are stretched and reorganised to increase material strength, said the company. This orientation realigns the molecules in line with the extrusion process to produce PVC pipe with greater stress resistance, better impact performance and increased flow capacity – as well as a lower density.

The PVC-O pipe meets AWWA C909 requirements and is certified by third-party listing agencies, says Westlake. It is compatible with the company's C900 pipe and C907 fittings and accessories and is available in sizes ranging from 6in (150mm) to 12in (300mm).

Westlake says that PVC-O pipe production forms part of its strategy towards reducing carbon dioxide emissions. It has a target to reduce Scope 1 and Scope 2 CO_2 equivalent emissions per tonne of production by 20% by 2030 – from a 2016 baseline.

It says that independent studies have shown that PVC-O materials have lower embodied energy than other commonly used pipe options, helping to improve the environmental profile.

PVC-O belling

Sica of Italy has developed a belling machine for oriented PVC (PVC-O) pipe.

The Starbell model can produce Rieber-type sockets on PVC-O pipes – which are typically thinner than conventional PVC pipes due to their molecular orientation.

Rieber-type sockets have a gasket integrated during the belling phase They are popular because, during installation, the chance of accidentally displacing the gasket is reduced – which cuts the risk of external water dispersion.

Producing the socket in PVC-O pipe requires different procedures than for conventional PVC. To date, these procedures have only been industrially applicable for forming 'Anger-type' sockets – but are now available for Rieber socket joints, says Sica. The new belling machine can process pipes that are made and oriented continuously, as well as those oriented off-line in a tank. Sica says its Rieber belling system complies with a large number of international technical standards.

The process can be applied to pipes up to class 500 – established by ISO 16422 – which imposes the most stringent requirements for resistance to hydrostatic pressure, says the company.

Three models are available, based on a maximum external pipe diameter of 250, 500 and 630mm.

Each model complies with a number of relevant standards, including those in Europe, the USA, Australia and Canada.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.molecor.com**
- **www.westlakepipe.com**
- **www.sica-italy.it**

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INOEX: WARP PIPE MEASUREMENT

The WARP contact-less radar-based pipe measurement system from Inoex uses terahertz technology to provide simple and effective multi-point dimensional control of thick and thin wall plastic pipes. Learn more in this brochure.

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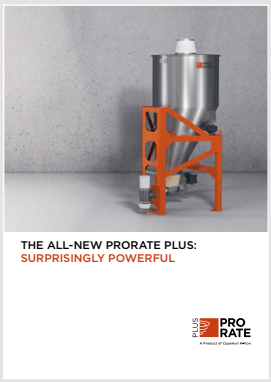
COPERION: PRORATE PLUS FEEDER



The new ProRate Plus feeder system from Coperion K-Tron offers a cost-effective and simple-to-configure gravimetric option for processors looking for reliable handling of pellets and free-flowing bulk powders.

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MIXACO: I4 CONTAINER MIXER

Mixaco is a leading innovator in container mixing technology. It developed its i4 Container Mixer design to deliver the level of performance, flexibility, quality and efficiency expected in the age of Industry 4.0.

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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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NDC: PRECISION GAUGING

The Accuscan Pro series single-axis diameter gauges are the latest addition to the NDC Technologies precision on-line measurement product line. Learn more about performance and features in this four-page brochure.

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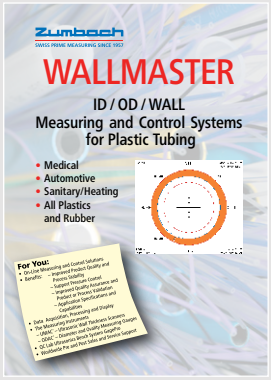
ZUMBACH: MEASUREMENT CONTROL



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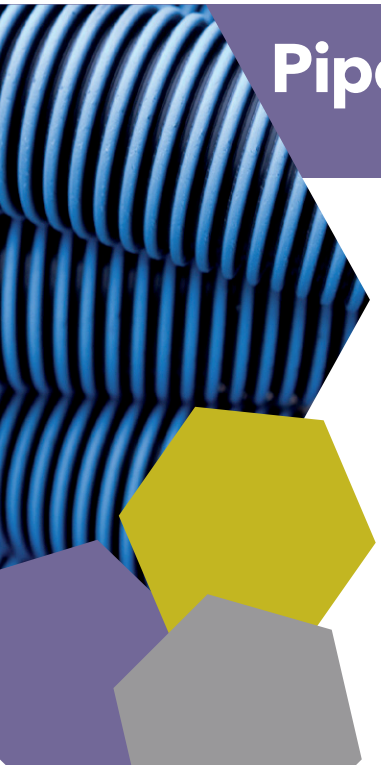
If you would like your brochure to be included on this page, please contact Claire Bishop claire.bishop@amiplastics.com. Tel: +44 (0)1732 682948

WL Plastics

Head office:	Fort Worth, Texas, USA
CEO:	Mark Wason
Founded:	2000
Ownership:	Private (owned by Ineos)
Profile:	WL Plastics, founded in 2000, is a specialist in polyethylene pipe. Its products are used in the potable water, wastewater, mining, oil & gas, gas distribution and power & communications sectors. In addition to HDPE pipe, the company also produces conduit. Since 2016, it has been owned by UK-based chemical company Ineos.
Product lines:	The company makes HDPE pipe for a variety of applications. In potable water, its pipe meets a range of relevant standards, including AWWA standards. The company offers pipe in 0.75-54in diameters with pressure ratings up to 335psi. In waste water, HDPE offers chemical resistance and durability. Pipes are available in solid black, in 0.75-54in diameters. Pipe for mining applications must also be durable – and offer surge resistance. In oil & gas, WL uses bimodal PE4710, which delivers ratings up to 500psi. For gas distribution, pipe is made from PE2708 and PE4710, in 0.5-1.25in diameters. In power & communications, it produces telecommunications and electrical conduit pipe that is often installed using Horizontal Directional Drilling (HDD) due to its flexibility and high tensile strength.
Factory locations:	WL Plastics has nine manufacturing sites across the USA, including three in Texas. In total, the company says it has an annual output of around 900,000lbs (XX tonnes) of pipe. At the end of last year, the company bought out Charter Plastics – and its facility in Titusville, Pennsylvania. In 2018, WL built a new 50,000 sq ft plant in Lubbock, Texas – which produces pipe for the oil, gas and water markets. It now plans to expand the site and create up to 95 new jobs.

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:

November/December 2022
Wood-plastic composites
Pipe joining
Mixers
K2022 Show Review

January/February 2023
Engineering plastics/composites
Titanium dioxide
Screenchangers/melt filters
Control & instrumentation

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

For information on advertising in these issues, please contact:
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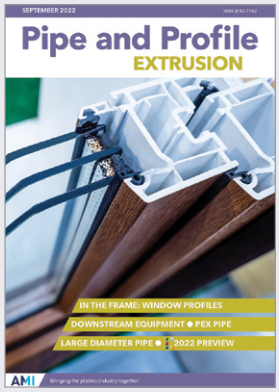

Pipe and Profile
September 2022
Pipe and Profile Extrusion's September edition has a cover story about advances in PVC window profile production, plus what's new in PEX, large diameter pipe production, downstream equipment and a preview of K2022 machinery exhibitors.

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Pipe and Profile
July/August2022
Pipe and Profile Extrusion's July-August edition has its main focus on PVC, with features on the progress made in PVC recycling and developments in PVC stabilisers. Plus a feature on the latest extruder technology and a Visitor Guide to K2022.

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Compounding World
September 2022
The September edition of Compounding World contains features on colour pigments, developments in bio-based plastics, new antioxidants and stabilisers. The issue also includes an extensive preview of materials and additives from major exhibitors at the K2022 exhibition.

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Plastics Recycling World
September 2022
The September edition of Plastics Recycling World looks at innovations in sorting technology. It also explores developments in granulation and food grade PP recycling. Plus, a preview of planned material introductions at K2022.

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Injection World
September 2022
The September issue of Injection World looks at an ownership shake-up going on in the engineering plastics production sector. Other features are on digital production and medical moulding, plus there is a K2022 preview on injection moulding materials.

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Film and Sheet
September 2022
The September 2022 edition of Film and Sheet Extrusion provides an update on thermoforming developments and explores innovations in plasticisers, multi-layer film recycling, and lab extruders. Plus, we preview some of the new machinery to see at K2022.

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GLOBAL EXHIBITION GUIDE

2022	**4-7 October**	Plastex, Brno, Czech Republic	www.bvv.cz/en/plastex
	19-26 October	K2022, Dusseldorf, Germany	www.k-online.com
	9-10 November	Plastics Extrusion World Expo, Cleveland, USA	https://na.extrusion-expo.com
	23-26 November	PlastEurasia, Istanbul, Turkey	https://plasteurasia.com/en/
	29 Nov-1 Dec	Plastic Print Pack West Africa, Accra, Ghana	www.ppp-westafrica.com
2023	**17-19 January**	Swiss Plastics Expo, Lucerne, Switzerland	https://www.visit.swissplastics-expo.ch/de
	1-5 February	PlastIndia, New Delhi, India	www.plastindia.org
	28-30 March	Plastic Print Pack Nigeria, Lagos, Nigeria	www.ppp-nigeria.com
	28-30 March	Expo Plasticos, Guadalajara, Mexico	www.expoplasticos.com.mx
	17-20 April	Chinaplas, Shenzhen, China	www.chinaplasonline.com
	25-27 April	JEC, Paris, France	www.jec-world.events
	30 May-2 June	Equiplast, Barcelona, Spain	www.equiplast.com
	5-8 September	Plast 2023, Milan, Italy	www.plastonline.org/en
	26-28 September	Interplas, Birmingham, UK	www.interplasuk.com
	17-21 October	Fakuma, Friedrichshafen, German	www.fakuma-messe.de

AMI CONFERENCES

7-8 December 2022	Oil & Gas Non-Metallics, London, UK
8-9 December 2022	PVC Formulation Asia, Bangkok, Thailand
14-15 December 2022	Medical Tubing & Catheters North America, Orlando, USA
21-23 February 2023	PVC Formulation North America, Cleveland, USA
6-8 March 2023	Cables Europe, Cologne, Germany
23-25 May 2023	Masterbatch Europe, Munich, Germany
6-7 June 2023	Medical Tubing & Catheters Europe, Munich, Germany

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

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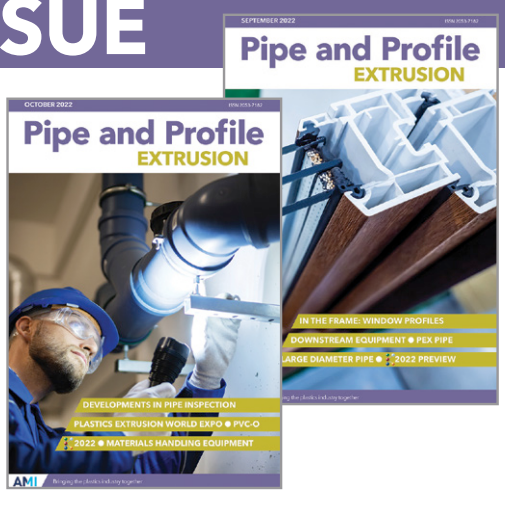

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