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RECENT ADVANCES IN INFRASTRUCTURE PIPE

PLASTICS EXTRUSION WORLD EXPOS: REVIEWS

EXTRUDER WEAR ● WOOD-PLASTIC COMPOSITES

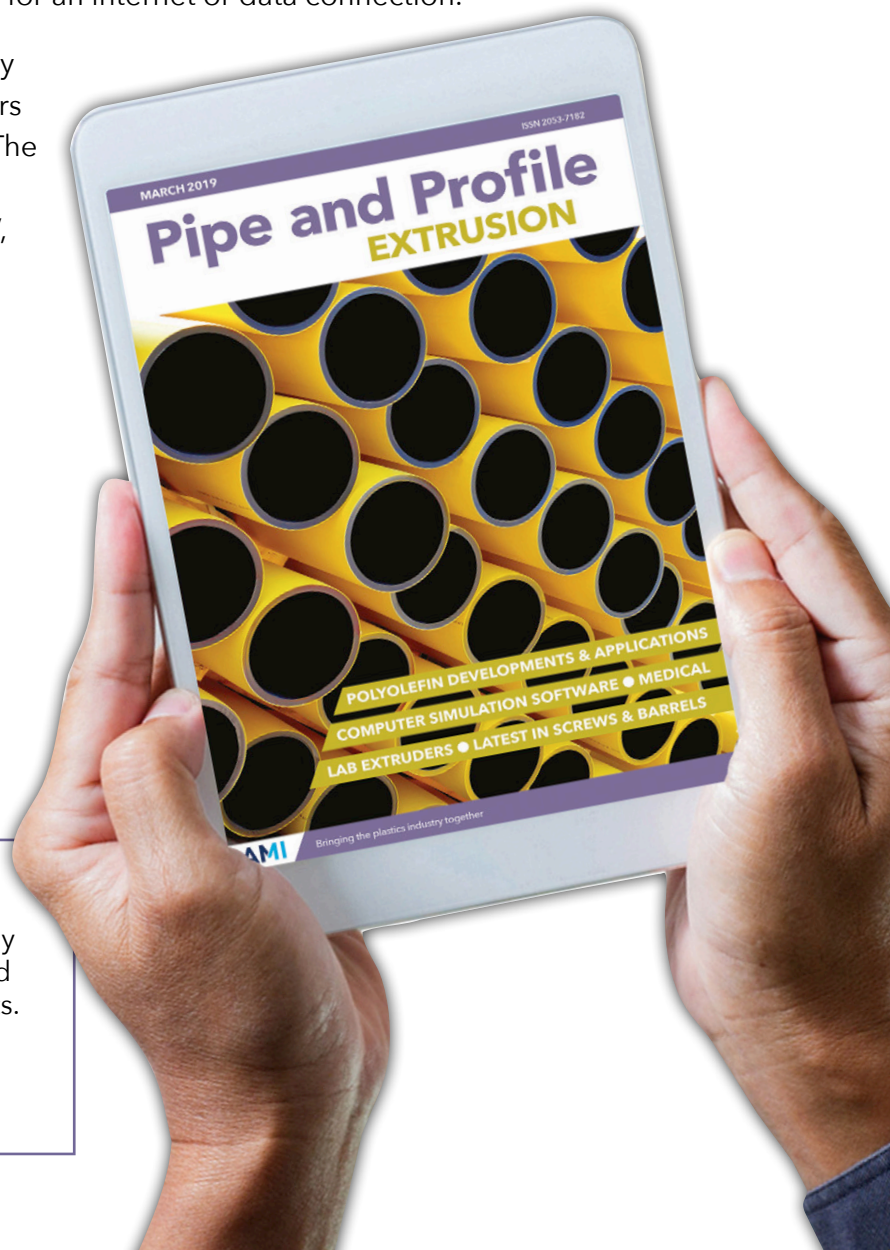
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ADS posts sales increase in first half of this year

US-based pipe extruder Advanced Drainage Systems (ADS) improved both sales and profits in the first half of this year.

The company reported sales of nearly US\$1.4 billion – an increase of nearly 31% compared to the equivalent period last year. At the same time, net profits exceeded US\$153 million – a slight increase compared to the previous year.

For the second quarter alone, sales rose nearly 10% to US\$544m, while net profits increased tenfold, to nearly US\$81m. Net profit in the second quarter of the

year alone fell by around 5%.

"We achieved another quarter of record revenue results," said Scott Barbour, president and CEO of ADS. "Sales growth of 30% was driven by favourable pricing as we capitalised on strong demand across our product portfolio and geographic footprint."

He said that higher prices offset inflationary pressure on materials and diesel. However, labour shortages affected its manufacturing and transportation operations – meaning it had to use more expensive external logistics services.

"We also took action to simplify our production processes and increase production rates," he said.

Capital spending for the first half of the year more than doubled compared to the same period in 2020, he said.

"We have approved capital investments that will result in double-digit increases in capacity," he said.

Net sales for the year are now expected to be US\$2.55-2.65 billion, with a capital expenditure of US\$130-\$150 million.

➤ www.ads-pipe.com

Molecor adds new facilities

Spanish pipes specialist Molecor has acquired three new production sites in Spain.

This follows the company's acquisition of Adequa, which was formerly known as Uralita Sistemas de Tuberías.

Molecor says the acquisition will allow it to triple its turnover.

The three new plants in Alovera, Alcázar de San Juan and Antequera join Molecor's existing sites in Getafe and Loeches – which are both focused on oriented PVC (PVC-O) pipe.

➤ www.molecor.com

Custom extruder expands

US-based custom extruder Engineered Profiles has added a new production facility in Ironton, Ohio.

The company will invest US\$4 million to retrofit an existing plant, which will include adding new machinery and equipment to the 93,000 sq ft space, it said.

The company plans to add 10-12 extrusion lines within the next five years. In that time, it also plans to add around 55 new jobs – including machine operators, tool and die makers and maintenance staff.

➤ www.engineeredprofiles.com



IMAGE: HEXPOL

Above: Hexpol is to expand capacity of medical-grade TPEs in Sweden

Hexpol invests €5.6m in medical TPEs

Hexpol TPE is to invest more than €5 million (US\$6m) at its site at Amal in Sweden. The investment will expand TPE production capacity and support growing demand and changing market requirements.

Construction of a new production hall has already begun and should be

completed in the autumn of 2022. The new space will be dedicated to production of materials for medical devices. Its Mediprene grades are used in applications including medical packaging and tubing.

The facility has been designed to minimise contamination risk and will

house a new twin-screw compounding line with gravimetric feeders and monitoring systems.

"This investment confirms our ongoing commitment to this important product area," said Georg Brunstam, president and CEO of Hexpol.

➤ www.hexpol.com

IMAGE: WAVIN



Above: Wavin has acquired its second plant in India this year

Wavin expands further in India with new plant

Dutch pipe manufacturer Wavin has bought another production plant in India – its second such acquisition this year.

The plant, in Neemrana, Rajasthan, was acquired from Dura-Line.

Both Wavin and Dura-Line are part of Mexico's Orbia group.

The acquisition is part of Wavin's ongoing expansion into the Indian and the Asia-Pacific markets. It also taps into the Indian government's 'Make in India'

initiative, which includes a number of infrastructure investments – including the supply of drinking water to a growing urban population – especially in the north of India.

The Neemrana plant, will continue to make water and gas products for below-ground use and invest in other extrusion lines to produce CPVC, uPVC and SWR pipes for above-ground applications, according to Wavin.

In July of this year, Wavin

bought another manufacturing plant from Dura-Line, which is based in Hyderabad, Telangana.

"We are now well positioned to serve the growing Indian market," said Maarten Roef, president of Wavin.

"The geographical coverage offered by these two plants is quite extensive. We are set to efficiently serve the districts where most of the market growth is taking place," he added.

➤ www.wavin.com

Gamut buys Davis-Standard

Gamut Capital Management, a middle-market private equity firm, has signed an agreement to acquire machinery maker Davis-Standard from Oncap – its current private-equity owner.

Financial details of the transaction were not revealed. The acquisition is expected to close in the fourth quarter of this year.

"The resources that Gamut brings to this investment will enable us to accelerate growth within our markets and transform ourselves into a global process solutions business," said Jim Murphy, CEO of Davis-Standard.

Jordan Zaken, founding partner of Gamut, added: "Davis-Standard offers not only the opportunity to expand with customers, but also to further extend its service offering to support its customers in the aftermarket."

➤ www.davis-standard.com

➤ www.gamutcapital.com

Cautious welcome for US infrastructure Act

The US-based Plastics Industry Association has given a cautious welcome to the US government's *Infrastructure Investment and Jobs Act* – which was recently signed into law by President Joe Biden.

"The inclusion of key recycling infrastructure and waste management provisions demonstrates the bipartisan support from Congress and the Biden Administration to invest in the sustainability of plastic now and well into the

future," said Tony Radoszewski, president and CEO of the organisation.

However, he said the organisation was "disappointed" with the reinstatement of Superfund Taxes – saying this would increase costs for consumers.

"Whether it is used in pavement, pipes or electric vehicles, plastic improves our daily lives, and protects the environment," said Radoszewski.

Some plastic-related aspects of the Act include: US\$48 billion in funding to

improve water infrastructure – including with \$15bn to replace ageing lead pipes; US\$75m to increase consumer education and participation in recycling; and US\$275m for a recycling infrastructure grant programme created by the Save Our Seas 2.0 Act.

"Plastic is essential to our infrastructure due to its performance and its sustainability," according to Radoszewski.

➤ www.plasticsindustry.org

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US plastics sector rises in first half as trade deficit increases

The US plastics industry saw increased trading in the first six months of this year – but with imports far exceeding exports.

Figures in the Plastics Industry Association's Global Trends report reveal that trading volume – exports plus imports – rose by nearly 28% for the first half of the year, compared to the same period in 2020.

In this period, exports have risen by 21% and imports by nearly 35%. This turned the trade balance (exports minus imports)

from a deficit of US\$400 million in H1 2020 to one of US\$4.5 billion in H1 2021.

The figures encompass all types of plastics-related trade, including resins, finished parts, machinery and moulds.

Resin exports rose nearly 23% in the first six months of 2021, while imports rose by almost 35%. This boosted the USA's resin trade surplus by 13%. The trade deficit in finished plastics products rose by nearly 60% at the same time.

Machinery exports

increased 12% in the first half of 2021, while imports grew by nearly 22%. The US trade deficit in machinery rose by almost 28%.

"While US plastics industry trade volume rose in the first six months of 2021, it still has a trade deficit," said Perc Pineda, chief economist at the association. "The plastics industry outside the US will continue to compete for overseas markets as well as for their own domestic markets."

The Global Trends report

also includes figures for 2020 as a whole. Here, the entire industry had a trade deficit of US\$5.5bn. However, it had a trade surplus of nearly US\$19bn in resin – including a US\$3bn resin surplus with China.

Mexico and Canada remained the US plastics industry's largest export markets. In 2020, the industry exported nearly \$14bn to Mexico and US\$12bn to Canada. The trade surplus with Mexico was more than US\$8bn.

➤ www.plasticsindustry.org

Profine starts profile extrusion in new Bosnia-Herzegovina facility

German profile extruder Profine has begun production in Bosnia-Herzegovina, at its subsidiary company Profine BH.

The facility, in Živinice, will allow Profine to make products that are specific to local needs. Production began at the end of September.

"We now produce the goods where they are needed," said Christian Amling, COO of Profine. "With the principle of decentralised production and less transport, we are also making a positive contribution to sustainability."

In 2023, Profine intends to expand production in a new building, which will house eight extra extruders



Above: Profine has begun production in Bosnia-Herzegovina, with plans to expand annual capacity to 10,000 tonnes in 2023

and have a capacity of more than 10,000 tonnes/year.

Prior to this, Profine only manufactured foiling systems in the country.

Peter Mrosik, CEO of Profine, added: "With the start of extrusion here, we

continue our international expansion. We are sending a clear signal to our partners for mutual success in the region. The new location is a trend-setting step for us and for sustainability."

➤ www.profine-group.com

Tekni-Plex buys in Mexico

US-based Tekni-Plex has bought Mexico-based extruder Johnson Plastic Group (JPG) as part of a strategy to expand in patient care solutions.

JPG specialises in precision extrusions for medical device applications.

It provides complete extrusion solutions for a variety of medical devices.

"This acquisition builds on our existing capabilities and increases our geographic reach, bringing us close to our key customer base in Mexico and the Baja region," said Chris Qualters, CEO of Tekni-Plex Healthcare.

➤ www.tekni-plex.com

Teel expands swab stick extrusion

US-based extruder Teel Plastics has won a contract worth nearly US\$5 million to ramp up production of swab sticks.

The deal will help the company – based in Baraboo, Wisconsin – raise monthly production by 200 million, to more than 330 million/month by July 2022. The swab sticks will be supplied to Puritan Medical Products as part of its Covid-19 test kits.

The contract was awarded by the Department of Defense and the Department of Health and Human Services.

Teel is planning to add over 25 employees to meet the increased production rate.

In October 2020, Teel was awarded a similar contract worth

almost US\$7m to make both extruded and injection moulded swab sticks. This raised extruded swab stick production by around 66 million/month. In response, the company installed two new Davis-Standard extrusion lines earlier this year, to meet the demand.

"Before the pandemic, we were the only US company to make diagnostic swabs needed for coronavirus testing," said Christian Herrild, director of growth strategies for Teel. "This required us to react quickly to support the surge in test kits."

Davis-Standard provided a demo line almost immediately – and two additional lines within 10 weeks of the order, he added.

➤ www.teel.com



IMAGE: TEEL PLASTICS

Above: Teel plans to raise monthly production of swabs to more than 330 million

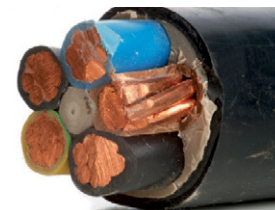
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Extrusion industry meets at Covid-delayed Cleveland expo

Plastics Extrusion World Expo and its co-located events went ahead in Cleveland, USA in November - with delegates enjoying both face-to-face meetings and conference sessions

In early November, Plastics Extrusion World Expo and three co-located events organised by **AMI** finally took place - after a one-year delay - in Cleveland, USA. The events had been held up by Covid restrictions - and visitors wasted no time catching up on lost time.

More than 3,000 people attended the two-day event - which hosted over 200 exhibitors of machinery, materials and ancillary equipment. As well as visiting the exhibition, visitors had the chance to listen to more than 100 conference speakers - who addressed a range of topics in compounding, recycling, testing and extrusion.

Conference highlights

At the Plastics Extrusion World Expo conference, Haikan Xu, a process engineer at **KraussMaffei**, said it was vital to choose the correct screw when making PVC profiles using counter-rotating twin screw extruders.

"The main reason to use counter-rotating screws for PVC is the forced feeding of the powder," he said.

Secondary reasons are: high output at low screw speeds; high pressure-



Above: Haikan Xu of KraussMaffei explained the importance of screw selection for PVC profile extrusion

building capacity of the screws; and low shear rates in the melt.

The company's KMD extruders are used to make a variety of products, including PVC pipes and profiles.

He said that a particular benefit of counter-rotating screws was the ability to process powders - and any materials that are sensitive to heat or shearing - such as those used for WPCs.

General advantages of counter-rotation include: relatively low and consistent residence time and shear rates; gentle processing due to low and even friction;

self-cleaning screws; and a pressure build up for more than 500 bar.

Foam advantage

Andy Cauffman, president of **Promix Solutions**, explained how extrusion lines can be configured for physical foaming with either nitrogen or carbon dioxide - which can help to reduce the amount of plastic needed to make a product.

"Less plastic reduces the carbon footprint," he said. Reducing the plastic content can also help to lower costs, he added - thanks to possible density reductions of 10-70%. In one example,

PP foamcore pipe can be 30% lighter than a regular pipe, he said.

There are three main steps to the process. The first is analysis - in which a converter considers why they should consider foam extrusion. This is done by assessing equipment and checking its compatibility. The next step is to develop a tailored solution - including the manufacture of the correct process equipment. The final phase is commissioning and start-up. This will include the need to train staff, while the supplier will provide support in process optimisation and process development.

An extrusion line will need to be modified with various pieces of kit, such as a cooling mixer and a gas dosing station. This can be more effective than chemical dosing, according to Cauffman, who cited a number of advantages: payback times of less than one year; high process stability; lower foam densities; no remaining chemical residues; and fully recyclable production waste.

Pipe advances

Gerry Lamorte, service director at **Custom Downstream Machines (CDS)** told delegates that machinery such as pulling, cooling and cutting equipment has changed a lot in 30 years - thanks to both mechanical and automation improvements.

"These have helped to



IMAGE: AMI



IMAGE: AMI

Above: The event welcomed more than 3,000 visitors and hosted over 200 exhibitors

change plastic pipe," he said.

Mechanical improvements to cooling equipment include spring systems to secure lids, he said, while automation improvements include: system integration through PLC; alarm and diagnostic pages for easy troubleshooting; and the inclusion of recipe packages as standard.

Advances in pulling equipment include direct drive operation, system integration through PLC, and alarm and diagnostic pages for easy troubleshooting.

In cutting equipment, he listed a range of improvements: swarfless rotary cutting; chipless cutting; the lack of dust collectors; and higher energy efficiency.

On the move

Rotating parts are critical to extrusion machinery – and one part that is often central to any system is the gear-box. Keeping it running smoothly – through correct maintenance – helps to ensure that the extrusion process is not subject to any catastrophic failures of unplanned shutdowns.

"The two most common root causes of gear tooth failure are improper load distribution and inadequate

lubrication," said John Amendola, president and head engineer at **Artec Machine Systems**.

The load distribution problems typically arise from not using enough of the face width, while inadequate lubrication can be caused by dirty or insufficient oil – or oil not getting to the correct places.

Gear tooth pitting occurs when they come into contact and deform slightly under imposed loads. Applying Prussian Blue to machined surfaces helps to identify high spots on bearings, valves, gears and other close tolerance components. Similarly, Dykem layout fluid helps to pinpoint exactly where tooth-to-tooth contact is made during a full-load, full-speed operation.

The most common root cause of gear tooth failure is improper lubrication. This can be remedied in several ways, including using the manufacturer's recommended brand, using oil filters during operation and checking that pressure lines are clear.

Although component failure is inevitable in rotating machinery, many conditions

– such as pitting, scuffing and corrosion – can be prevented, said Amendola.

Measured approach

Bill Desrosiers, vice president of business development at **Dynisco**, explained the importance of measuring rheological properties during production.

He said that measuring viscosity – as either melt flow index (MFI) or intrinsic viscosity (IV) – offered several benefits: validation of the polymer ordered; to verify consistency from supplier to supplier; to understand the impact of a process on the material and to know what is needed to introduce the material back into the process.

Measurement can be carried out either online or offline – and there is a need to correct results between lab testing and the production line. These are typically performed at different temperatures – around 190°C for a lab test and around 300°C on an extrusion line. This is done in a number of ways – such as using a 'historical based' correction or an activation energy correlation.

Choosing the most appropriate online viscom-

eter depends on the application to which it is applied – such as cost, risk of contamination and the frequency of material changes.

The rheometer is mounted to the extruder in a near-horizontal position. Around 1m of space is typically needed underneath, for material collection. The data produced will help to address quality issues in real time and monitor the performance of each extruder. Desrosiers cited the example of identifying a 'rogue' batch of material – in which a PE material is contaminated with recycled PP flakes.

■ **Plastics Extrusion World Expo North America** – with AMI's three co-located shows – will next take place in Cleveland, USA on 9-10 November 2022. For more information on visiting or exhibiting at the expos, visit **www.ami.international/exhibitions**

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Waste not, want not: advances in WPCs

Recent advances in WPCs include new methods to make materials from a variety of waste products – including olive stones, a common Brazilian fruit and even municipal waste

The original idea behind wood-plastic composites (WPCs) was to incorporate a waste product (in this case, wood shavings) into a plastic matrix. Today, the industry continues to make the most of some unlikely waste products.

As part of the pan-European **Basajaun** project, **Aimplas** of Spain is to develop a range of bio-based profiles.

The profiles will be pultruded from resins derived from forestry products – and reinforced with natural fibres. The materials produced will be tested before manufacture of the final prototypes. Their processability will be checked, their combustion analysed, and the materials will be mechanically characterised.

The 48-month project involves 30 partners from across Europe, who are trying “to get the most

added value possible from forest products as a raw material for the construction industry”.

The project aims to construct full-scale demo buildings in Finland and France that pull together the various parts of the project.

Other developments in the project include thermal insulation – using foams made from renewable sources – as well as wood-plastic composites (WPCs) and fire-resistant composites, says Aimplas.

Olive residues

Separate to this, Aimplas is looking to use residues from olive cultivation in plastics.

It starts from the premise that the main crops in the Mediterranean basin that generate lignocellulosic residues – potential raw material for compos-

Main image:
Aimplas is to develop bio-based profiles as part of the pan-European Basajaun project

Right: Aimplas is exploring the use of fillers derived from olive stones in the Oliplast project



ites and particleboards – are woody crops including olives.

Global olive oil production has tripled over the past 60 years and is an industry that creates considerable volumes of waste material. Pruning olive trees generates a large amount of biomass, which is made up of leaves (25% in dry weight) and branches. The olives themselves amount to 85% pulp and 15% stone.

All of these lignocellulosic residues of olive cultivation can be recovered to obtain composites, says Aimplas. With Spanish olive oil producer Olivarera los Pedroches, it is working on a project in which the stones are recovered to develop novel bio-based, biodegradable and compostable compounds.

“A new possibility for this by-product is the incorporation of olive stones as a reinforcing material in plastic materials providing a wood-like appearance,” said Aimplas.

A new material, named Oliplast, incorporates this filler/reinforcement derived from olive stones in a bioplastic matrix.

Preparing the olive stone fibres for incorporation into plastics compounds is not straightforward and requires various treatments. The stones pass through several cleaning and grinding steps before being separated into different fractions depending on the particle size obtained. These different particle sizes produce compounds with differing characteristics.

Waste to WPCs

Researchers in Turkey have produced wood-plastic composites

(WPCs) using municipal waste.

The researchers, from **Izmir Institute of Technology**, created the WPC from “post-consumer bulky wastes of recycled plastic and wood”, which they said helped to minimise waste and conserve natural resources.

Five different types of polypropylene (PP) or polyethylene (PE) based recycled plastics and wood – from urban household waste – were used to make the recycled WPCs (r-WPCs). Both virgin and recycled WPC compounds were prepared with wood flour and maleic anhydride-grafted compatibiliser (MAPP or MAPE) to evaluate the effect of recycled polymer type and compatibiliser on mechanical properties.

The study found that the tensile strength of r-WPCs made from recycled PP was higher than those made from mixed polyolefins or recycled PE.

Based on the tensile, impact, flexural, and water sorption properties of r-WPC compounds with different formulations, the researchers determined the optimum conditions of r-WPC compounds for industrial manufacturing. Surface morphology of fractured surfaces – as well as tensile, flexural and density results of r-WPC compounds – revealed that MAPP enhanced the effect on interfacial adhesion in r-WPCs.

“The study shows that r-WPC compounds made from recycled bulky plastic and wood wastes can be used as a potential raw material in plastic and the WPC industry,” said the researchers.

The study was published in the journal *Waste and Biomass Valorization*.

Fruit fibres

In similar fashion, Brazilian researchers have created WPCs based on PP – and waste fibres from a widely eaten fruit.

“In tropical countries such as Brazil, many lignocellulosic residues are discarded and pollute the environment, such as the Tucuma fruit – which generates about 50 tonnes/month of solid waste in the city of Manaus,” said the researchers, from three Brazilian universities including the **State University of Amazonas**.

This project investigated a new type of WPC made from PP and Tucuma endocarp powder (TEP), but no coupling agents. The materials were composed of 10-50 wt% of TEP combined with PP, and were characterised using various methods including SEM, FTIR,

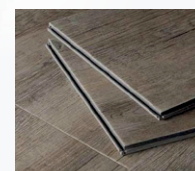
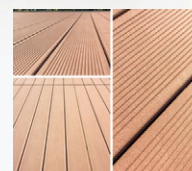
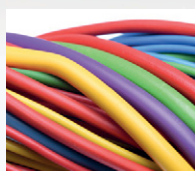


Right: Brazilian researchers are using waste from the Tucuma fruit to make a new kind of WPC

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(WPCs)

flammability, water absorption and scratch tests.

In general, TEP increased the elastic modulus and dynamic friction coefficient, while reducing the strength and the burning rate of WPCs. The WPC preserved its physical integrity after ageing, absorbing up to 1.6% of water.

"Composites made with 20 wt% of TEP can be considered promising materials to be used as wood plastic for sustainable engineering applications," said the researchers.

The research was published in *Fibers and Polymers*.

Colour change

Scientists at the **Institute of Wood Science and Technology** in Bangalore, India have made a comparative study of the effect of coupling agents and particle size on the weathering behaviour of WPCs.

Two different coupling agents - maleic anhydride grafted PP and m-TMI grafted PP - were used to prepare the materials. The WPCS were exposed to outdoor conditions for one year. Changes in surface colour and mechanical properties were measured after 2, 4, 8 and 12 months of natural weathering.

During the initial four months, considerable colour change was seen, with an increase in lightness. Mechanical properties were largely unaffected for the first four months - but began to decline afterwards.

Overall, tensile strength fell by about 15% and flexural strength by 8% after one year of weathering. Flexural modulus also fell by around 10%. Wood particle size affected the appearance and strength of the composite after weathering.

"Coupling agents had a positive impact on mechanical properties but their influence on weathering degradation was not noticeable," said the researchers, in a paper in *Maderas - ciencia y tecnologia*.



IMAGE: TEKNOR APEX

Cellulose sensors

Austrian research institute **Wood KPlus** has received funding for a project to develop "sustainable composites" that incorporate "impregnated cellulose-based sensors".

The I3Sense project is one of six that will share €12 million (US\$14m) in funding, as part of the Comet programme.

"Climate-friendly innovations are the best way for Austria to prepare for the future," said Leonore Gewessler, climate action minister. "The Comet programme is the optimal tool to support our companies in R&D and develop new products and processes."

Projects such as this aim to convert high-risk research into concrete applications and products.

Wood KPlus says that load-bearing wood and natural fibre-based composites (NFCs) are inherently sustainable. This makes the materials a good choice for high-performance structures - if limitations such as moisture absorption can be overcome.

"In timber construction, this is achieved by observing substantial safety coefficients - by means of external bulky sensors in critical areas," accord-



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Above:
Decking
manufacturer
Trex is to open
a third US
production
facility, in
Arkansas

ing to the project application. "In more delicate NFCs, these sensors are disruptive - weakening the overall structure."

To solve this, the researchers aim to turn the material itself - such as wood, reinforcing fibres or polymer matrix - into an "imperceptible, embedded sensor system". This will be able to measure changes in humidity, mechanical stress and temperature without affecting the structural integrity of the composite.

"Our approach will allow us to close the gap between sustainability and performance," said Wood KPlus.

The research goals include:

- understanding how different stresses change the electrical properties of the materials used;
- exploring how these properties can be modified, and using this knowledge to detect the changes in state in real time;
- exploring how modifications interact with the matrix and alters the properties; and,
- monitoring structural integrity over long periods of time.

The project includes partners from the timber construction, automotive and aerospace industries, and "paves the way for natural-based materials in high-tech applications", said the organisation.

Capstock protection

US-based **Teknor Apex** has developed a range of weatherable capstocks to protect dark-coloured wood-plastic composites (WPCs).

The company says that its Weatherguard WG-9000 materials provide greater durability and scratch-resistance than widely used competing compounds. After 5,000 hours in QUV accelerated weathering tests, the polyolefin-based materials exhibited a colour change of less than 0.5 Delta E for dark brown.

Teknor says that they offer five- to tenfold

improvements in elongation and impact strength in comparison with a standard competitors, while sacrificing only 15% in tensile strength.

The WG-9015 LG grade helps reduce cost because it is designed to be used as a 50% concentrate in a blend with a fractional-melt index polyethylene. Manufacturers looking for a cost-effective grade that needs no blending with PE can use the WG-9003 LG grade as a 100% capstock. Both grades are sold pre-coloured to meet the customised colour palette of the end customer.

"The cost-containment possibilities of these capstocks offer an advantage in the competition between WPCs and wood," said John Macaluso, industry manager for building and construction in the vinyl division of Teknor Apex.

Building a future

US-based decking manufacturer **Trex** is to open its third production facility in Little Rock, Arkansas.

Construction is due to begin in early 2022, with the first production output expected in 2024. Over time, the site will expand output "substantially" - and have the potential to become Trex's largest manufacturing facility. In time, Trex expects the plant to bring more than 500 new jobs to the area.

Trex expects to invest around US\$400 million in the site over the next five years. It will sit on nearly 300 acres of land and will eventually include buildings for decking and railing production, plastic film recycling and processing, reclaimed wood storage, warehousing and administrative offices.

The plant is intended to serve customers in central USA, who are currently supplied by the existing facilities in Virginia and Nevada.

Trex says that the new facility should give customers better access to its residential products, while positioning the company for future growth.

"This site represents a strategic investment - not only in our future but in the success of our channel partners," said Bryan Fairbanks, president and CEO of Trex. "With the outdoor living category continuing to show strong momentum - and our success in converting share from the wood decking market - the time is right to further expand our capacity."

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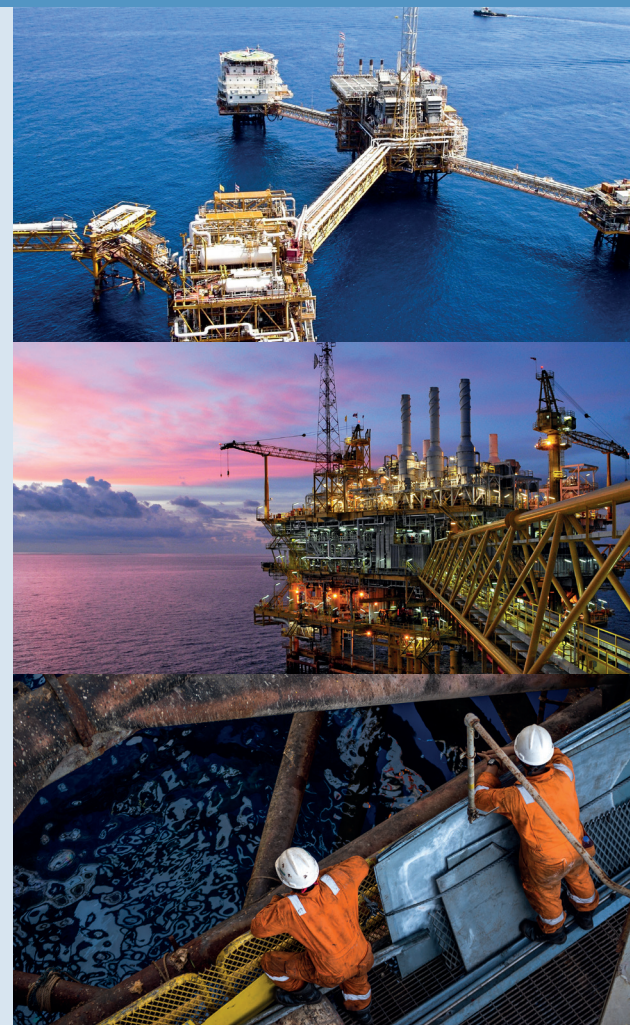
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IMAGE: AQUASPIRA

Transfer market: update on pipes in infrastructure

Manufacturers of infrastructure pipe are striving to improve performance – in areas including product protection and increased sustainability

Pipes for infrastructure take many forms – whether it is transporting fresh water, removing wastewater or protecting cables. In each case, the pipe must be robust – and, increasingly, produced in a sustainable way.

IFK of Austria recently used trenchless installation to install **Egeplast** drinking water and sewage pipes in the Czech Republic.

The confined space of the location and the presence of a gradient meant a great degree of precision was required. This was met by using GPS-controlled plough installation of the SLM 3.0 Protective Layer pipes – which also allowed faster laying speed than for open-trench installation.

The client insisted on compliance with the local ÖNORM EN 12889 standard – which describes the electronic measurement and precise documenta-

tion of the position of the pipe following installation. GPS-controlled ploughing involves digitally recording all planning data in the computer, making it possible to monitor and document the location and depth of the new pipe.

SLM 3.0 Protective Layer pipe was delivered in outside diameters of 110mm, 180mm and 225mm – up to OD 180mm as coiled bundles, and as rods for OD 225mm. Before plough-assisted laying, the pipes were laid out along the marked pipe route and underwent electrofusion welding.

Drinking water pipes, which had been supplied as rods, were connected using heating element butt welding. After this, the pipe ends were inserted into the pipe-laying chute of the plough. This allowed for strict adherence to the specified location and the incline. Coordinate controlled

Main image:
Aquaspira
plans to
produce a
zero-carbon
pipe by the
end of the
decade

plough-assisted laying also made it possible to install two pipe strings parallel to each other – at a precise distance apart – in several segments of the route.

With open-trench installation, around 50m per day can be installed on average, but this method laid around 1,000m per day.

SLM 3.0 is a patented, multi-layered protective piping system. When using alternative installation techniques, the protective pipe ensures longevity and efficiency. A protective coating (wearing surface) enables damage-free installation of the new pressure pipe, says Egeplast.



IMAGE: UPONOR

Above: Uponor Infra's Ultra Rib 2 Blue PP sewer pipe is partially based on renewable feedstock

Cutting carbon

UK-based pipe maker **Aquaspira** says it is on course to reduce its embodied carbon by half, with a target of producing a zero-carbon product by the end of the decade.

The company is a specialist manufacturer of large-diameter, steel-reinforced drainage pipes. In collaboration with the University of Birmingham and the UKCRIC National Buried Infrastructure Facility, it is developing a lower carbon pipe for large-scale buried infrastructure projects.

It has already produced its first drainage product using 20% recycled material, and has also invested in a new laboratory. The company will explore the use of recycled materials for storm and drainage water pipes and the backfill required for their installation, as well as incorporating innovative sensing equipment for long-term asset monitoring.

In addition, the company is ramping up investment in on-site solar panels, and also aims to eliminate landfill waste from its site.

"Not only are we producing some of the most sustainable drainage products available, but we are also taking great strides to minimise and ultimately eliminate our carbon footprint," said Neil Wallace, managing director of Aquaspira.

Emission reduction

Uponor Infra and **Borealis** have teamed up to create a gravity plastic pipe that claims to reduce CO₂ emissions by up to 70%.

Ultra Rib 2 Blue is a new generation of polypropylene (PP) sewer pipe which offers a significant carbon footprint reduction over its lifetime. This is achieved because more than half of the raw material used in its construction comes from renewable feedstock.

It uses Borealis' Borneowables – a portfolio of polyolefins made with renewable feedstocks, which offer the same material performance as virgin polyolefins.

The specifications of the pipe are the same – in terms of properties and performance – as the standard Ultra Rib 2. The pipes are made at Uponor's factory in Fristad, Sweden. Customers receive a sustainability declaration of the amount of renewable raw material in their Ultra Rib 2 Blue, following the mass balance approach.

"We are pleased to collaborate with Borealis to create this plastic pipe," said Sebastian Bondestam, president of Uponor Infra. "We are delivering on our promise to offer the highest quality in a sustainable product."

The Ultra Rib 2 Blue is backed with independently verified data, said Uponor.

Pulling power

The **Plastics Pipe Institute** (PPI) has published a new guide to help conduit installers to calculate safe pulling loads – to avoid damaging high-density polyethylene (HDPE) conduit.

"When pulling HDPE conduit into place, an increasing axial tensile load will be exerted on it," said Patrick Vibien, director of engineering for PPI's power and communications division. "If the safe pull strength is exceeded during installation the conduit may permanently deform at some location along its length."

This may create an obstruction within the conduit, preventing cable being pulled into place later.

Technical note PPI TN-63, *Safe Pull Strength Calculations for Conduit: including Derating Factors*, provides the equations needed to calculate the safe pull strength (SPS) for HDPE conduit, and tables of pre-calculated SPS values for typical industry HDPE conduit wall diameters and thick-

Right: A new guide from PPI helps conduit installers calculate safe pulling loads for HDPE conduit



IMAGE: PPI

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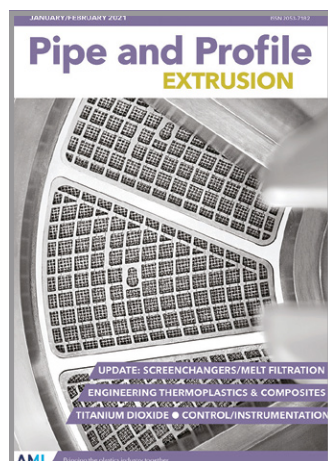
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Above:
McElroy's Talon
fusion machine
was used to
join pipe
sections for a
hydropower
project

ness types. It also provides guidance on how to derate the SPS for elevated temperature installation and time-under-tension considerations.

Installers can quickly look-up the SPS for the conduit they are using from the tables. TN-63 is applicable to any pulled into place installation, including open trench and horizontal directional drilling (HDD) methods.

The technical note can be downloaded free from PPI's website.

PA gas pipe

United Poly Systems is to extrude natural gas pipelines made from Vestamid NRG, a polyamide 12 (PA12) from **Evonik**. The pipes will be sold in the southern region of the USA.

The polymer was developed specifically for making industrial pipes in varying diameters. It is approved for use in gas distribution piping through recently updated regulations issued by the Pipeline and Hazardous Materials Safety Administration

(PHMSA). For many years, steel was the only material available for gas distribution lines for pressures of 120-250 psi, but now Vestamid NRG – which can withstand operating pressures up to 250 psi – can also be used. Pipelines affected by hydrocarbon permeation can also be made from the material.

"We have seen the need for PA12 pipe in the gas distribution industry at higher pressures and as an alternative to steel for quite some time," said Terry McConnell, business development manager at Evonik.

He said PA12 piping can be used at higher operating pressures than polyethylene, has no chemical derations, a higher temperature performance and few permeation issues.

United Poly Systems produces pipes with diameters from 0.75in to 26in IPS and 4in to 24in DIPS for use in a number of industries, including telecommunications, power utility, electrical and oil and gas.

The high chemical resistance of PA12 and the joining of the pipes with butt welding or electrofusion ensures a long shelf-life without costly maintenance measures, says Evonik.

Power project

A Talon fusion machine from **McElroy** was recently used to fuse large diameter pipe sections for a hydropower project in Alaska.

Alaska has nearly 50 hydropower facilities, and the Bradley Lake Hydroelectric Plant is the largest. The Homer Electric Association wanted to boost its power capacity, but to do this it needed more water in Bradley Lake. This involved building a



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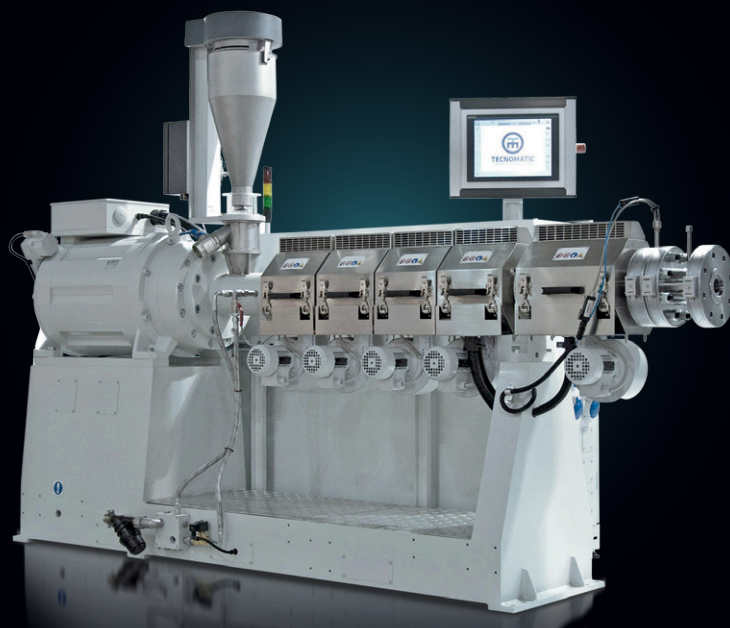


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Right: Agru's pre-assembled pipeline was towed across Lake Geneva before installation



10,000 ft HDPE pipeline to divert glacier runoff from Battle Creek to Bradley Lake – across steep, rugged terrain in a remote location.

The Talon – McElroy's largest fusion machine – was designed to handle pipe up to 2000mm. The company wanted a safer, more efficient way to fuse large-diameter pipe – because the larger the pipe, the higher it must be loaded up and over into a traditional fusion machine, which requires the assistance of large, onsite material-handling equipment.

The solution was to turn the machine upside down and incorporate a unique jaw design. This allows it to drive over pipe and lift it up from the ground, position it for fusion, and move from joint to joint down the pipeline.

However, most previous jobs had been carried out in flat, straight environments. This one featured steep upward and downward gradients and tight corners. The 1600mm (63in) HDPE pipeline would be fused up the side of a mountain on a narrow roadway – not much wider than the Talon itself.

Factors to take into consideration in the analysis of joint reports included the pipe thickness of the Borouge PE100 DR21 pipe. This varied in thickness from 3 to 3.75in, which added to the alignment, heat soak and cool time. Initial test fusions were conducted to undergo bend back testing. It was decided to remove all the internal bead formations to create a smooth surface and check for proper alignment.

The Talon managed to fuse four joints each day – and sometimes reached as high as six per day. Water was flowing in the pipeline in July, after taking less than two months to complete – which beat the time allotted for fusion. Altogether the Talon performed 155 fusions.

Cool performance

An organisation in Switzerland has installed a system that pumps water from a nearby lake – via

Agru pipes – to provide environmentally friendly cooling.

Centre Patronal is a Swiss employers' organisation based in Lausanne. It recently installed the system, which uses water from Lake Geneva to cool and heat its building. Deep water is drawn in, heated or cooled with heat pump technology, and returned to the lake after use.

Agru supplied 800 metres of Agruline piping systems with external diameters of 500mm in SDR 11 for the construction work, which was completed in March 2021.

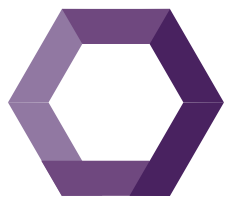
Hydrokarst Swiss, which was commissioned with the installation, welded the Agru pipes into inlet and outlet pipes. Agru supplied special parts, such as 6m high 'sweep bends', which have very low flow resistance.

The ready-assembled pipeline was provided with concrete ballast and pulled over a distance of 20km to the site on the water surface. To avoid kinks, divers lowered the pipelines in an S-shaped curve to a depth of 80m. There, the temperature is a near-constant 4-8°C, which is ideal for operating a heat pump.

"Even before the start of the project, we were able to convince the planner of the advantages of our solid-wall extruded plastic pipe solution compared to the originally planned GRP pipes," said Markus Ebster, head of XXL piping systems at Agru.

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IMAGE: REIFENHÄUSER

Wearing it well: screw and barrel protection

Protecting screws and barrels from wear - and monitoring their performance over time - can help to extend lifespan and raise extrusion efficiency

Protecting screws and barrels from excessive wear helps to lengthen their lifespan - which helps to raise the production efficiency of an extrusion line. Wear protection is typically imparted with some kind of surface coating.

The hardness of the coating is usually considered the most important factor. But it is not the only one, according to Anna Rottstegge, head of research and development at Reiloy, the screws and barrels division of **Reifenhäuser**.

"We got some interesting feedback from our customers," she said. "They found that alloy hardness is very similar in every manufacturer's data sheets - so they assume this is the decisive factor for wear protection."

However, she said the service life of different barrels could vary - despite them all having the same nominal hardness.

"That was the incentive to get to the bottom of the cause, so we took a closer look at the microstructures and carried out our own wear tests," she said.

The research began by analysing nickel-based alloys. This is typically where suppliers use high-hardness tungsten monocarbides, she said. The company analysed alloy compositions, tested the microhardness of individual phases, evaluated surface coatings with optical analysis, and carried out an optical analysis of size distribution.

"We assumed that longer service life would go hand in hand with higher carbide density," she said. "But it turned out that the carbide size distribution

is also important, giving an additional advantage."

She said that Reiloy screws use larger carbides in order to overcome coarse abrasive wear in the barrel.

"The carbides themselves are not attacked by abrasive substances, but are simply in the way," she said.

At the recent Fakuma exhibition in Germany, Reifenhäuser showcased a number of innovations including those related to wear protection.

"In recycle processing, the extruder plays a vital role, since recycle quality often varies - and impurities or wear-inducing substances must be safely processed," said Ralf Pampus, managing director of Reifenhäuser Reiloy. "This is why we offer highly wear-resistant screws and barrels. In fact, we are the only manufacturer that develops and produces hard-metal alloys for wear protection in-house."

This, he says, helps the company achieve very long service life - which raises the economic efficiency of production lines.

The company says that Reiloy screws and barrels offer precise matching of raw materials and additives, alloys with powders developed in-house, and process-optimised surfaces.

Measured response

At this year's Chinaplas, **CA Picard** of Germany presented its barrel measurement device (BMD) which allows users to improve maintenance by checking barrel wear on their extruder lines. ➤

Main image: Reifenhäuser showed a range of wear-protected Reiloy screws at Fakuma

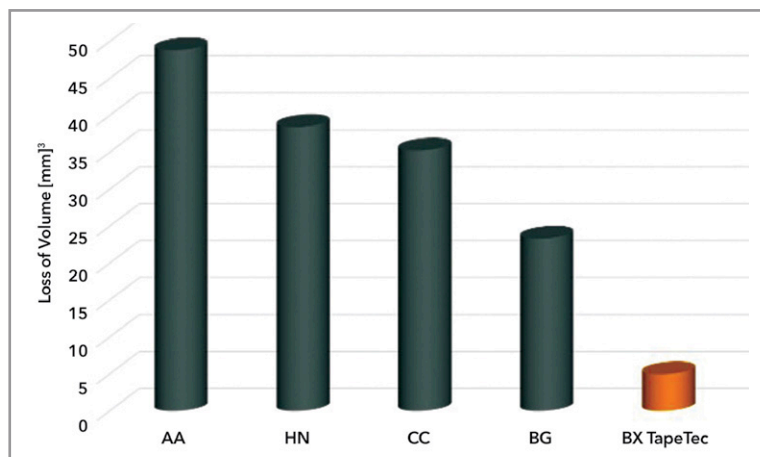


Figure 1. Wear resistance tests comparing CA Picard's BX TapeTec against alternative barrel liner alloys (ASTM G65-04)

Source: C A Picard

With the BMD, it is only necessary to perform a simple setting operation to detect the wear of the inner bore – giving an immediate detection report – instead of removing all barrels from the production line.

The device has passed CE authentication, so meets the European security safety standard.

The company has also developed a barrel liner for demanding processing environments.

"New applications demand innovative materials that guarantee a stable process," said Katharina Diehl, development engineer at CA Picard.

In most processes, the need for high-performance wear protection is confined to a specific zone, she said.

As a consequence, this zone must be replaced at regular intervals that are too frequent from the producer's perspective.

"The process of replacing this wear zone involves machinery shutdowns that can easily last several days," said Diehl. "Since this downtime cannot be made up, the output of the entire plant is reduced."

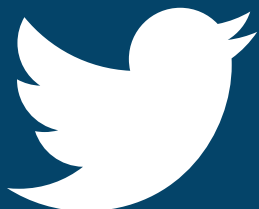
In response, the company has developed a wear liner solution for wear-resistant protection zones that involves a coating – BX TapeTec – formulated to combine abrasion and corrosion resistance. The company says it uses ultra-strong carbides embedded in a ductile metal matrix – and says the two components provide high resistance to wear and corrosion.

Picard has also developed a coating process that allows a very high adhesion coating to be applied using a diffusion bond. It says other coating methods typically generate a mechanical bond which has a higher risk of spalling. This spalling also often takes place as thick layers due to the residual stresses within the coating.

Picard says that, while its BX TapeTec coating has a layer thickness of 2-3 mm, no spalling occurs thanks to the highly adhesive nature of the bond and the particular conditions of the coating process. To evaluate the capabilities of the coating, wear tests were performed according to ASTM G65-04 and wear resistance compared to that of the company's other standard materials (Figure 1). Abrasive wear was much reduced, even in comparison to highly wear-resistant BG steel, the company claims.

Aside from the promising laboratory results, the BX TapeTec coating has also performed well in demanding real-world projects, according to the company. ➤

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Right: Glycon's detection sensors fit into machined ports on the barrel, to measure screw and barrel wear

Quick work

UK-based **Magog Industries** designs, manufactures and supplies a range of screws and barrels for processes including extrusion – as well as offering repair and refurbishment of pre-used parts.

"One of our key advantages is that we design everything to meet specific processing and production requirements," said John Allsop, general manager of Magog.

Using materials such as EN 41B Steel gives hard-wearing properties while allowing refurbishment of hard-welded flights at a later date. Surface treatments include ceramic, chrome, Hastelloy and Armoloy, in addition to nitride and bi-metallic hardened.

The company has used surface treatment against abrasion and potential corrosion to increase screw resilience and longevity – specifically in ceramic and chrome seal coatings for demanding applications.

"By working closely with customers, we develop solutions to meet demanding process applications," he said.

Magog has also designed screws and barrels that can cope with the extra demands of regrind material – which has become more prevalent recently.

Dual measurement

US-based **Glycon** has developed a system that monitors wear on both the screw and barrel.

The company has used its EMT system – which stands for Electronic Measurement and Tracking – for some time, but has never made it commercially available before. The system uses an eddy current sensor – combined with a barrel wear plug – to provide accurate data on both screw and barrel wear.

"With the data from these measurements, processors can predict the rate of wear, and the best time to replace or repair the screw or barrel," said Jeff Kuhman, president of Glycon.

Kuhman says the system can be used in pipe and profile extrusion, as well as for film and sheet. EMT has been field tested at a number of Beta sites and offers simplicity, accuracy and reliability, he says.

"Many processors still run to failure because it is time-consuming and costly to take a line out of production, dismantle the screw and barrel and physically measure the parts with micrometers and bore gauges," he said. "EMT requires one hour per line, once or twice a year – which gives the processor all the information they need to make a sound economic decision."

The system relies on a Glycon product called



IMAGE: GLYCON

Smartbarrel, which has several apertures along its length. A barrel wear plug is installed in the aperture and seals the port. This is done during manufacturing so that it matches the surface and inside diameter of the barrel.

To take a measurement, the plug is removed from the port and replaced with a threaded retainer – which secures an eddy current sensor in place. With the barrel and screw at or near operating temperatures, the screw is rotated slowly. The sensor generates an accurate reading that is averaged over many rotations to allow for 'precession' or 'orbital' rotation of the screw inside the barrel.

"We have refined and improved sensor accuracy over the years to a point where the reading is accurate to .001 or better," said Kuhman.

The system can track total wear per million lbs of material processed – from which the wear rate can be calculated.

"By comparing the wear rate to the amount per hour produced, you can determine the rate of wear, cost of wear and from that determine the best time to replace the screw and barrel," he said.

The customer can analyse the data independently and will typically use it to boost productivity, lower scrap rates and cut energy costs, says Kuhman.

CLICK ON THE LINKS FOR MORE INFORMATION:

- > www.reifenhauser.com
- > www.capicard.de
- > www.magog.co.uk
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Prior to Cleveland, AMI's four shows ran at Essen in Germany - attracting more than 3,000 visitors over the course of two days



European event on the rise



IMAGES: AMI

AMI's four co-located events also ran earlier this year - at Messe Essen in Germany, in late September.

Here, 217 exhibitors participated in the overall event - 18% more than when it ran in 2018. This was despite many overseas exhibitors being unable to take part due to travel restrictions.

The event attracted 3,269 visitors, with 52% from outside Germany. For many attendees, it was the first opportunity for face-to-face meetings with customers and suppliers for more than 18 months.

Simon Bousquet, technical manager for polymer recycling at TotalEnergy, said: "The biggest players are here and it's nice to be able to see everybody."

Plastics Extrusion World Expo and Polymer Testing World Expo were running for the first time in Essen, while Compounding World Expo and Plastics Recycling World Expo were running for the second time.

"Although the number of attendees was slightly

lower than in 2018, this was expected given the ongoing travel restrictions on some overseas and company travel," said Nikola Whyman, head of marketing at AMI, which organised the event.

As well as the exhibition, five conference theatres at the event hosted a number of presentations on industry trends, developments and technology in pipe and profile extrusion.

Inline improvement

At the Plastics Extrusion World Expo conference, Jan Petermann, product manager at **Inoex**, explained how inline measurement can help to improve the pipe extrusion process.

Inline measurement can help to accelerate start-up, boost process knowledge, detect and correct process drift, and document acquired data.

Inoex has developed its Warp series - based on radar technology - that can measure wall thickness,

Above: Despite ongoing Covid restrictions, the Essen event offered plenty of opportunity for face-to-face meetings. The event attracted more than 3,000 visitors - more than half from outside Germany

IMAGE: AMI



Above:
Conference sessions were well attended across the whole event

ovality and eccentricity of extruded pipe. It works with a variety of materials, and a minimum wall thickness of 5mm.

It can be used in areas such as process control. In one example, it can detect whether there is thickness variation in a pipe wall. This information is fed back to the control software, which calculates a new weight-per-metre setpoint. Haul-off speed is then adjusted, which changes the wall thickness at the die head.

"The next control step starts when the influenced part reaches the scanner," he said.

He pointed to a case study of a PVC pipe with a nominal thickness of 5.9mm and 250mm diameter. The line was fitted with a Warp 100-400 system, which led to a cost reduction of around 9%. This was due mainly to a 2% reduction in material usage. Return on investment is typically around one year, he said.

Cold comfort

Davide Chiavinato, export area manager for **EuroChiller**, said that cooling is critical for both extrusion and recycling – in processes ranging from degassing to boosting the mechanical properties of the finished product.

In a degassing system, for instance, it is important to control the water flow rate.

"If humidity is not removed it can reach the top of the screw – creating abnormal pressure on the head of the extruder," said Chiavinato.

Temperature in the area below the load hopper must also be controlled, in order to avoid fluctuations – and ensure correct functioning of the extrusion screw.

Indirect benefits of efficient cooling include maintenance reduction and increased energy efficiency – resulting in lower energy consumption, he said.

Conditions should also be modified according to the prevailing climate, he said – from cold to tropical. In each case, efficient cooling can help to reduce costs.

In a cold climate, for instance (ranging between -20 and +20°C), replacing a standard chiller with one that incorporates a free-cooler can cut energy bills in half.

In continental climates (-10 to +35°C), using an adiabatic chiller with free-cooler can save around 22% in energy costs

In tropical climates (ranging from +10 to +52°C) an adiabatic chiller can reduce bills by around 9%, according to Chiavinato.

"It's possible to save energy wherever your installation is located," he said.



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Debate: the future for plastic pipes

During the Essen event, Andy Beevers, director of events and magazines at AMI, chaired a debate on the future of plastic pipes. He began by asking the panellists about the greatest challenges facing the pipe industry.

"I think our biggest challenge is general misconceptions around plastics - and that's what hurts our industry," said Zoran Davidovski, head of R&D and sustainability at Pipelife. "We have to explain that our pipes last 100 years - but most people just say that plastic is plastic waste."

Christian Apfel, international projects manager at Polyplastic - whose territory includes the CIS region in Eastern Europe - had a more immediate concern.

"We're facing real challenges at the moment in terms of raw material supply availability," he said. "Standard raw materials, additives and fibres are not available in the way we need them. This makes it difficult to ensure production and delivery of products. This year and next year - at least the first half of next year - we are going to



Above: The Plastics Extrusion World Expo conference hosted a debate on the future of plastic pipes

be in a difficult situation because of it."

However, he added that he saw a number of opportunities in the next five years - including cable ducting, due to rising demand for the product.

"In the CIS, it is the replacement of existing piping systems - due to their deterioration," he said. "Current consumption is around 450,000 tonnes in the CIS and will be 1.8 million tonnes around 2030 - so these are great opportunities for plastic pipes."

Both panellists thought that

sustainability will continue to grow in importance, in issues such as the use of recycled materials.

"Although it's not possible - or logical - to use recycled material for pressure pipes, there's a lot of potential in other areas," said Davidovski.

For Apfel, a plastic pipe is typically the most sustainable option: "In most cases, the most environmentally sound solution is the plastic pipe - in terms of carbon footprint and lifetime, for instance."

Efficiency gain

The impetus for increased recycling is also driven by a need for improved efficiency.

Andreas Holt, European sales representative for US-based **Advanced Blending Solutions** (ABS), told delegates that the move towards 'circular extrusion' has helped to drive innovation in blending technology.

European initiatives such as Rewindo (PVC window recycling) and Ceflex (recycling of flexible packaging) have increased the need for efficiency recycling processes.

While elements such as sorting technologies have tended to get the most publicity, he said that processes such as blending are also playing their part - helping to ensure factors such as traceability and quality control.

He said that the Smart distribution tower from ABS allows full traceability "from source to extruder". Here, issues such as the 'wrong resin' are eliminated. It also promises shorter changeover times.

"It may pay for itself in installation cost savings alone," he said.

ABS also offers an unloading system that incorporates a Smart stand. It allows users to trace and verify that the correct amount of resin has been unloaded from rail cars or hopper trucks.

Resin flow is tracked by loss-in-weight through a weigh hopper.

"Real-time data keeps a precise delivery record, which assists supply and inventory management," he said.

■ AMI's four co-located shows will next take place in Messe Essen in Germany on 14-15 June 2023. For more information on visiting or exhibiting at the expos, visit www.ami.international/exhibitions

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and Coastal Communities
IUCN

TWIN SCREW EXTRUSION

Extruder replacement helps German PVC pipe manufacturer raise output

German pipe manufacturer Fränkische Rohrwerke recently purchased a ConEx NG extruder from Battenfeld-Cincinnati.

The conical twin screw extruder replaces an older machine and helps Fränkische to raise both output and quality of corrugated PVC pipes – a core product line.

"The extruder has a screw optimised for the application," said Frank Beck, head of operations and supply chain building construction at Fränkische. "We are enthusiastic about this high-precision job in terms of melt homogeneity and product quality."

The corrugated pipes are used

for water management and drainage, as well as cable conduits. Cable conduit pipes range from DN 40 to DN 200 in nominal width. Water

management and drainage pipes are up to 800mm in diameter.

ConEx NG conical twin screw extruders can process a wide range of different PVC types and withstand high tooling pressures of up to 520 bar.

They have a lengthened preheating zone and an optimised screw design to provide high output rates combined with optimal melt quality. Additional advantages include a reduced footprint, lower investment costs (in relation to output rates), and a lower energy consumption than the predecessor model.

➤ www.battenfeld-cincinnati.com

➤ www.fraenkische.com



MEDICAL TUBING

Upgrade adds sophistication to medical tube production

Davis-Standard has updated the design of its MEDD extruder for medical tubing applications.

The MEDD is the company's signature extruder for tight-tolerance medical tubing applications, including microbore, multi-lumen and catheter tubing. Advantages include a compact footprint, interchangeable barrel assembly, linear machine movement, and replaceable feed section liner.

"The new design is a more sophisticated version of our first model,"

said Kevin Dipollino, senior product manager for Davis-Standard's pipe, profile and tubing business.

Improvements include: improved cable management, with specified cable

lengths, cable storage, defined cable routing and improved configuration; stainless steel electrical enclosure/machine base and cigar hood, for easier cleaning; and flip-down doors for easy access.

The ability to change barrels quickly – for faster material changeover or different diameter barrels – is a significant benefit of the MEDD, says the company.

The new model has a bidirectional hood vent to improve air circulation.

The MEDD is available in three product ranges: 0.75-1in; 1-1.25in; and 1.25-1.5in.

➤ www.davis-standard.com



MEDICAL

Extrusion line for PP pipettes

Boston Matthews has developed an extrusion line specifically for producing polystyrene (PS) pipette tubes.

Its PS Pipette Line, designed in collaboration with medical device manufacturers, can extrude, size, dry and cut the PS tubes without marking or swarf. Typical tube sizes range from 1ml to 25ml capacity. They are manufactured and cut to length in-line, with an output of up to 30 tubes per minute.

A direct-drive extruder ensures a clean, brushless operation.

➤ www.bostonmatthews.co.uk

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STRUKTOL: INNOVATIVE ADDITIVES



Struktol manufactures a wide range of additives that benefit performance and processing of resins and compounds. Its portfolio includes additives for PVC, wood-plastic composites, recycling, odour control and more.

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PIXARGUS: PROFILE CONTROL



The iProfilControl system from Pixargus allows 100% 360° inspection of profiles at a highly competitive price. The combination of calibrated laser technology with up to eight high capacity cameras delivers accuracy and precision.

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MIXACO: MIXING TECHNOLOGY



Mixaco has been driving innovation in PVC mixing technology for more than 50 years and has 7,500+ machines installed worldwide. This brochure explains some of the details that make its HM and KMH heating cooling mixers stand out.

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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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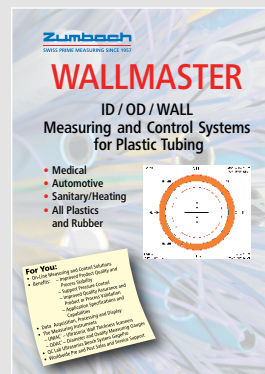
NDC: PRECISION GAUGING



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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Alwasail Industrial

Head office:	Buraydah, Saudi Arabia
Managing director:	Saleh Almushaigeh
Founded:	1979
Ownership:	Private (in process of public listing)
Employees:	Around 550
Profile:	Alwasail Industrial began producing polyethylene pipes for irrigation in 1979. The company now makes PE pipes (and fittings) for a range of other markets and applications including drinking water, wastewater, sanitation, gas, and conduits for both power cables and telecoms cables. It has a daughter company, Saudi Rubber Products, which makes products such as rubber joints. It recently began making foamed rubber, to make insulated tubing for air conditioning pipes.
Product lines:	The company has six main business lines for pipes: irrigation; potable water; gas, oil and RTP; conduits; industrial; and wastewater. Its irrigation products include standard LDPE pipe, as well as small diameter tubing (for micro-irrigation) and drip lines. Potable water products include pressure pipe up to 160mm in diameter. Yellow gas pipe includes both PE80 and PE100 variants. Its only non-PE pipe is its PP-based corrugated twin-wall pipe for wastewater applications.
Factory locations:	The company has five manufacturing facilities in Saudi Arabia, including three pipe extrusion plants. These three plants accommodate around 46 extrusion lines with coilers. Plant 'A' has a daily production of around 50 tonnes of small diameter pipe (3-63mm); Plant 'B' makes 20-110mm pipe, with a daily capacity of around 95 tonnes; Plant 'C' makes large (110-1200mm) pipe and has a daily capacity of around 150 tonnes. The other two plants make injection moulded fittings, and rubber products.

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

Pipe and Profile FORTHCOMING FEATURES EXTRUSION

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

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Engineering plastics & composites
Titanium dioxide
Screenchangers/melt filtration
Control & instrumentation

March/April 2021

Screws & barrels
Polyolefin developments
Computer modelling software
Chinaplas 202 preview

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

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Pipe and Profile October 2021

The October issue of Pipe and Profile Extrusion has a cover feature on new products in materials handling. Other features cover advances in oriented pipe production and pipe inspection. Plus a preview on Plastics Extrusion World Expo North America.

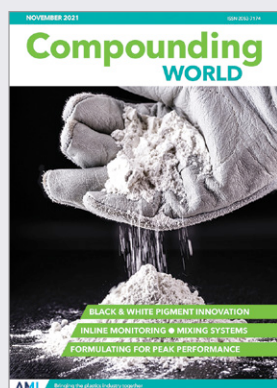
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Pipe and Profile September 2021

The September 2021 edition of Pipe and Profile Extrusion magazine looks at the latest innovations in PEX pipe production and application. It also reviews developments in downstream equipment, large diameter pipe, and window profiles.

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Compounding World November 2021

The Compounding World November edition looks at issues around safety and sustainability in black and white pigments, inline measurement systems for compounders, new mixing equipment and the use of additives and reinforcement.

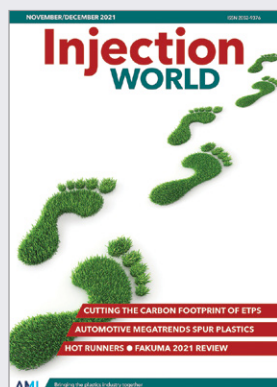
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Plastics Recycling World October 2021

The October issue of Plastics Recycling World has technology features on the growing choice of recycling extruders and recompounders, the challenge of odours in recydate, and R&D in additives. Plus a preview of Plastics Recycling World Expo North America.

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Injection World November/December 2021

The November/December 2021 edition of Injection World magazine looks at the steps engineering plastics producers are taking to reduce carbon footprint. It also explores hot runner innovations and developments in automotive moulding.

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Film and Sheet November 2021

The November 2021 edition of Film and Sheet Extrusion explores some of the latest applications for film and sheet in the construction sector. Plus, innovations in thin wall packaging, engineered sheet, and smart packaging.

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GLOBAL EXHIBITION GUIDE

2022	25-28 January	Interplastica, Moscow, Russia	www.interplastica.de
	8-10 March	JEC World, Paris, France	www.jec-world.events
	8-11 March	Plastimagen, Mexico City, Mexico	www.plastimagen.com.mx
	15-17 March	Swiss Plastics Expo, Lucerne, Switzerland	www.visit.swissplastics-expo.ch/en/
	5-8 April	FIP, Lyon, France	www.f-i-p.com
	25-28 April	Chinaplas, Shanghai, China	www.chinaplasonline.com
	3-6 May	GreenPlast, Milan, Italy	www.greenplast.org
	26-30 September	Colombiaplast, Bogota, Colombia	www.colombiaplast.org
	3-7 October	Plastex, Brno, Czech Republic	www.bvv.cz/en/plastex
2023	19-26 October	K2022, Dusseldorf, Germany	www.k-online.com
	1-3 December	Plastic Print Pack West Africa, Accra, Ghana	www.ppp-westafrica.com
	1-5 February	PlastIndia, New Delhi, India NEW DATE	www.plastindia.org
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	17-21 October	Fakuma, Friedrichshafen, German	www.fakuma-messe.de


AMI CONFERENCES

1-2 March 2022	PVC Formulation North America, Cleveland, USA
14-16 March 2022	Cables Europe, Cologne, Germany
10-12 May 2022	Masterbatch, Frankfurt, Germany
21-22 June 2022	Oil & Gas Polymer Engineering, Houston, USA
28-29 June 2022	Polymers in Cables North America, Philadelphia, USA
19-20 July 2022	PVC Formulation Asia, Bangkok, Thailand
7-8 December 2022	Oil & Gas Non-Metallics, London, UK

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