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Andersen invests \$105m in new US window profile manufacturing plant

Andersen Corporation, a leading US window and door manufacturer, is to build a new manufacturing facility in Goodyear, Arizona.

The company plans to invest more than US\$105 million - and create more than 415 jobs - during the first phase of the expansion.

Andersen says the move is part of its strategy to invest in order to meet the demand for products based on its Fibrex material, which incorporates wood fibres.

"This new manufacturing campus is an opportunity for us to increase manufacturing and distribution capacity for our Fibrex products and expand our presence in the western US, where we are experiencing

significant growth," said Jay Lund, chairman and CEO of Andersen Corporation.

The proposed campus will initially include around 500,000 sq ft of manufacturing and distribution space for Andersen's 100 Series product line. The first phase of construction is expected to begin in early 2019, with operations expected to begin in mid 2020. The campus will be owned and operated by Andersen Regional Manufacturing, a subsidiary of Andersen Corporation.

The company anticipates a potential total investment of more than US\$200m, through additional future expansion of the campus.

Fibrex is an engineered composite with more than

25 US patents, says Andersen. The to be manufactured at the new plant will use a formulation of Fibrex material that contains a blend of wood fibre, which is mostly reclaimed from Andersen manufacturing processes, and thermoplastic polymer - some of which is also reclaimed.

Andersen, a privately held company, was founded in 1903 and employs more than 12,000 people at manufacturing sites in North America and Europe. In August 2018, it agreed to sell its Silver Line window and patio door division to Ply Gem - a transaction that is expected to close by the end of the year.

> www.andersenwindows.com

Results flat in Belgium

In the first half of the year, Tessenderlo of Belgium saw flat sales - and reduced profits - in its Industrial Solutions division, which includes plastic pipe manufacture.

The division saw sales flat at €259m, while REBITDA dipped 25% to €17.4m. However, the pipes segment performed well, said the company, posting increased revenues.

One highlight for the company during the period was the opening of two new branches in the Netherlands and one in the UK.

Tessenderlo added that the results were marginally affected by the Euro/US dollar exchange rate.

> www.tessenderlo.com

Eurocell boosts sales while profits dip



Kelly: "Demand for recycled material could be more than our in-house capability within two years"

UK-based PVC profile manufacturer Eurocell posted improved sales - but reduced profits - for the first half of the year.

Sales grew 10% to reach nearly £119m (US\$155m) despite a slow start to the year caused by bad weather, said Mark Kelly, CEO. A 9% growth in the profiles division was a major factor in the increase, he said.

However, profitability dipped slightly, with pre-tax profits registering a decline of 3%. This was ascribed to factors including higher raw materials costs, short-term increases in manufacturing costs, and the cost of extra branch openings.

In the first half of 2018 it made around 23,000 tonnes of rigid and foam PVC profiles, a 5% increase on the first half of 2017.

One of Eurocell's key priorities is to boost the use of recycled materials in its primary extrusion processes - and to this end, it recently acquired Ecoplas - a recycler of PVC windows with a single site, which has a current output of around 7,000 tonnes/year of recycled compound.

"The combination of planned growth in our business and developments in extrusion tooling indicate that our demand for recycled material could be greater than our existing in-house production capability within two years," said Kelly.

Eurocell also increased its use of recycled material by 17% in the period, to around 4,300 tonnes.

> www.eurocell.co.uk

Machine deliveries in North America rise for fifth quarter in a row

Deliveries of primary plastics machinery in North America increased for the fifth quarter in succession to exceed US\$335m in the second quarter of this year - with extrusion machinery sales showing particularly high growth.

According to the Plastics Industry Association's Committee on Equipment Statistics (CES), this was less than 2% up on the first quarter of the year, but nearly 6% higher than the corresponding period in 2017.

"Plastics machinery shipments seemed to have hit a speed bump in the second quarter, but there's no indication that shipments for the remainder of the year are trending down," said Perc Pineda, chief economist at the association. "US economic fundamentals remain strong. As the economy fast approaches - if it hasn't already attained - full capacity, businesses will have to cope with tighter resources, and output increases will not be as robust as in previous periods."

The delivery value of single-screw extruders increased by 23% from the corresponding quarter last year, while that of twinscrew extruders - including both co- and counter-rotating machines - increased by 80%. In comparison, the value of injection moulding machinery rose by 4.5%.

"We can expect to see continued uneven quarterly data moving forward, but by and large the outlook for plastics machinery remains positive," Pineda added.

In the CES' second quarter survey of members, 11% of respondents reported that their customers were having difficulty obtaining financing for new equipment. This was a 7.4% increase from the first quarter. However, the remaining 89% reported no such financing difficulties. CES says this suggests that financing rates were not cost prohibitive and financing for new plastics equipment remains largely accessible.

> www.plasticsindustry.org

Chelsea expands capacity

US-based window profile extruder Chelsea Building Products - which became part of Aluplast last year is to open a second manufacturing facility.

The new 126,000 sq ft facility - in Greenville, Texas - was previously used as an extrusion operation and could be further expanded in future. New extrusion equipment is expected to be delivered late this year, with production beginning in early 2019.

"The addition of the Greenville facility will significantly increase our overall capacity," said Peter Dewil, president and CEO.

At the same time, the company has added capacity to its main facility in Oakmont, Pennsylvania.

- > www.chelseabuildingproducts.com
- > www.aluplast.net

PPI issues warning on sub-standard pipe



PPI's warning comes after sub-standard pipe was found in the oil and gas sector

Plastics Pipe Institute (PPI), the North American trade body, has issued a warning about sub-standard products.

The move comes after HDPE pipe that does not comply with the relevant product industry standards was found in oil and gas gathering operations of the Permian and Delaware basins in Texas and New Mexico.

"We're issuing this advisory because we are seeing HDPE pipes that have significant quality issues," said Tony Radoszewski, president of PPI. "In some cases, neither the manufacturer nor the origin of the pipe could be identified."

The pipelines are not marked in accordance with relevant product standard requirements, so may not comply with them, said PPI.

"A properly marked pipe includes relevant standards on its printline, but this cannot be relied upon by itself," he added

> http://plasticpipe.org



O-PVC (oriented PVC) is a material that offers improved end product properties through a molecular orientation process of the PVC material.

For this specialized PVC material, **battenfeld-cincinnati** and its **partner Molecor** have developed specially adapted equipment and complete line systems for pipes with outer diameters from 90 up to 800 mm such as:

- twinEX 28D parallel twin screw extruders with sizes of 93,114,135 or 148 and outputs ranging from 150 1,500 kg/h
- spider pipe heads for gentle and homogeneous O-PVC processing
- Synchronized downstream components



O-PVC pipe extrusion line with twinEX 114-28D extruder (© Molecor)

w w w . m o l e c o r . c o m www.youtube.com/MolecorPVCOriented



www.youtube.com/BattenfeldCincinnati



'Secret' pipe is blocked

Authorities in Ukraine have discovered a hidden plastic water pipe crossing the border into Russiaoccupied Crimea - and blocked it.

A report in the *Kyiv*Postsaid that the pipe led from a well near the border on the unoccupied side, to the Crimean Titan chemical plant - which makes titanium dioxide - a few miles away.

The pipe was supplying the plant with around 250 cubic metres of water per hour, according to Ukrainian prosecutors - who are now trying to identify who is responsible for the "hidden and unregistered water supply". The discovery was made as part of a pre-trial investigation into Crimean Titan, said Interfax, the Ukraine News Agency.

Ukraine had previously stopped water supplies by damming a canal.

German exports to Iran fall in first half of 2018

German plastics and rubber machinery exports to Iran have dipped in the first half of this year - though the sector remains cautiously optimistic about its prospects for the full year.

In the first half of this year, German plastics and rubber machinery exports to Iran reached €22 million - a decline of 11% compared to the first six months of 2017. As a result, Iran has dropped from position 25 to 28 as an export destination for Germany.

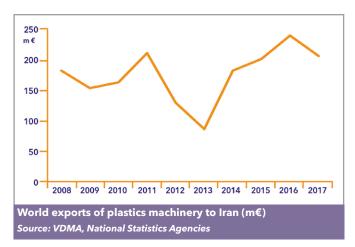
"With annual growth rates of almost 6% for plastics consumption, Iran is still considered a high-potential market for the plastics sector," said Thorsten Kühmann, managing director of VDMA Plastics and Rubber Machinery. "The increasingly difficult political framework conditions – accompanied by still insufficient financing options – are

showing their effects. We counteract this with continuity - by nailing our colours to the mast in difficult times."

Decreasing export figures for 2018 also affected the size of the German Pavilion at the Iranplast trade fair. This year, 17 German enterprises presented their products there – around half the number that did so at the last edition.

German's dip in first-half exports to Iran is a turnaround from last year, when it saw its market share in the country increase. In 2017, German plastics and rubber machinery exports to Iran rose by more than 87% to reach almost €38m. This raised its share of the market from around 8% to more than 18%. At the same time, China saw its share decline from around 63% to 48%. Overall, plastics and rubber exports to Iran declined by more than 13%, to nearly €206m.

> http://plastics.vdma.org



Weak Euro drags down results at Aliaxis

Belgium-based pipe manufacturer Aliaxis reported flat results for the first six months of the year, due mainly to a weakening of the Euro against other currencies, it said.

The company announced sales of nearly €1.6 billion for the period - a dip of nearly 2%, though the company said this would have been a 5% increase in constant currency. Similarly, its profitability (EBITDA) of nearly €215m was down almost 4% (which would have been a rise of about 2% in constant currency).

The company said that sales growth

- at constant rate - was mainly predominantly driven by strong growth in Australia and North America, and higher PVC resin prices.

"Most of our key markets are showing top as well as bottom line growth at constant currency - either organically, through innovation or further cost rationalisation," said Laurent Lenoir, CEO of Aliaxis.

In the EMEA region, the company reported "moderate growth", with solid growth in Southern Europe.

Its North American business performed strongly, but is said that some

Latin American countries were facing "socio-political environments that are adversely impacting the infrastructure segment and construction demand". In other, countries like Colombia, a low demand for public infrastructure was balanced by demand for agricultural irrigation projects.

In Asia, Lenoir said that, in July, the company acquired the remaining 40% stake in its Indian joint venture, Ashirvad.

"This is an important step towards strengthening our leadership position in this fast- growing market," he said.

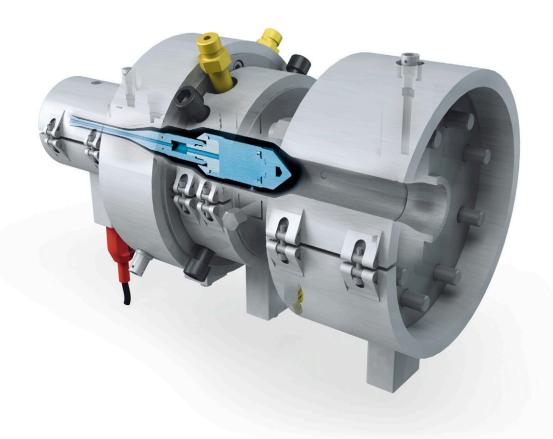
> www.aliaxis.com



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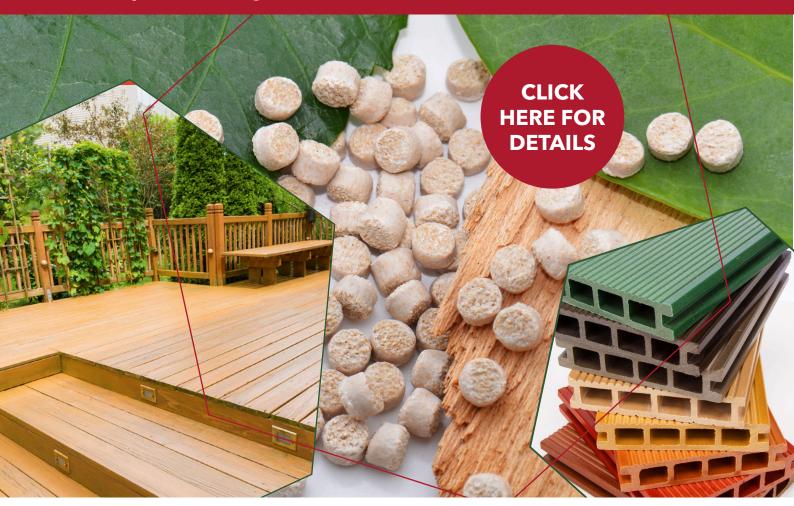
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Uponor sells North American Infra division to Wynnchurch

Uponor has divested the North American arm of its infrastructure business, by selling it to private equity firm Wynnchurch Capital. The new company will be called Infra Pipe Solutions (IPS).

The purchase price is C\$62.5 million (around €41m).

The transaction will have positive impact on Uponor's cash flow on Q3, but none on Uponor's full-year 2018 comparable operating profit, according to the company.

In 2017, the net sales of



Luomakoski: "Our strategic focus for Uponor Infra is Europe, so this is a logical step"

Uponor Infra's North American business were around C\$120m (€80m) and it employed about 150 people. Uponor Infra Oy is a joint venture of Uponor and KWH, with Uponor ownership of 55.3%.

"Since the foundation of Uponor Infra, our strategic focus has been in the European business, where we have possibilities to find synergies with the Building Solutions - Europe segment," said Jyri Luomakoski, president and CEO of Uponor.

"This divestment is a logical step, following the divestments of machinery company Extron Engineering and business in Thailand made in 2015."

The company has three manufacturing facilities in North America - all of them in Canada. It will be led by Sandeep Dhillon, who was previously president of Uponor Infra.

"With the opportunities we have before us, this is an exciting time," said Dhillon, who becomes CEO at IPS. "Wynnchurch has the resources and expertise to take our company into a new phase of expansion."

- > www.uponor.com
- > www.wynnchurch.com

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Pipe inspection technologies ensure that leaks and other faults are identified early - while other forms of testing keep a close eye on manufactured pipe quality. Lou Reade reports

Plastic pipe does not suffer corrosion, and the latest material grades can ensure a very long service life - but all the same it is important to be able to fix problems quickly when they occur.

Festo, a major German engineering company, has developed an autonomous underwater robot with a 'fin drive' that can be deployed within pipe systems.

Its BionicFinWave was seen at the Achema exhibition earlier this year, negotiating its way through a system of transparent acrylic pipes. Festo says the concept could be further developed for tasks such as inspection, measurement or data acquisition in water and wastewater technology or other areas of the process industry.

The design was inspired by the "undulating fin movements" of marine animals such as cuttlefish.

The cuttlefish uses its longitudinal fins to generate a continuous wave along the entire length of its body. This forces the water backwards, to produce a forward thrust.

"The BionicFinWave also uses this principle to manoeuvre itself forwards or backwards," says Festo.

This slow, precise motion causes less turbulence in the water than a conventional screw propulsion drive, says the company. As it moves through the tube system, the robot can communicate with the outside world via radio, and transmit data such as temperature and pressure sensor readings to a tablet.

Its two lateral fins of the 370mm long robot are moulded from flexible silicone, and each is attached to nine small lever arms with a deflection angle of 45 degrees which are driven by two servo motors in the body of the robot.

Main image: At Achema. Festo's **BionicFinWave** was seen negotiating its way through a system of transparent acrylic pipes

Right: The LeakFinder-ST from Echologics pinpoints the location of leaks using acoustic technology A pressure sensor and ultrasound sensors constantly register the BionicFinWave's distance to the walls and its depth in the water, which prevents collisions with the tube system. This required Festo to develop compact, waterproof (or water-resistant) components that can be coordinated and regulated by appropriate software.

Sound advice

Canada-based **Echologics** says that its proprietary acoustic technologies can find leaks in all types of pipe – including those made from PVC.

The company measure time-of-flight of the sound of a leak using acoustic sensors and a correlation function. The sensors can be placed on a fire hydrant or in specific places on a pipe, for instance - and can accurately measure exactly where a leak occurs by determining the time taken for the sound of the leak to reach two different sensors. The sound it measure travels through the pipe itself - rather than the liquid it is transporting - which means that

Developing a system that could work in PVC pipes was a challenge, because plastic has far higher attenuation and dampening than metal. Also, some old metal systems have been repaired with sections of plastic pipe.

Recently, Echologics helped a UK company to identify a leak on a 3in PVC pipe. The LeakFinder-ST correlator identified the precise location of the leak by bracketing it over 420ft (128m). Field technicians accurately correlated the location, which was confirmed by ground-sounding over the main. An excavation team was dispatched to fix the leak - which had a flow rate of 3.5gpm (0.8 m³/hr).

Combination unit

The ability to check pipe quality is also important earlier in the process - at the production stage.





scanner and flaw detector into a single unit. Its Odac Trio laser diameter gauges boast three measurement axes in a single plane to give comprehensive measurement coverage, peak-precision diameter and ovality measurement, with fast detection of flaws, it says.

A combination of fast scan rates and precise measurement helps to reduce both scrap and production costs, claims the company.

Thanks to a compact design, the Odac Trio measuring heads can be used in many manufacturing processes. The devices use laser diodes as light sources combined with powerful processors that facilitate simple and flexible integration.

Some of the features of the new gauges include: 9,000 measurements per second; reliable ovality detection; accurate mean value, regardless of the orientation of the product ovality; increased measurement accuracy and reliability; and high dirt and dust tolerance.

It also includes single scan calibration (CSS), single scan monitoring and high data rate output of up to 200 data packages per second - depending on the measuring head model, the number of transmitted measured values and baud rate of the interface. The measuring heads can be used with all line speeds. Vibrations during production have no noticeable influence on measurements, says Zumbach.

Measured approach

For its part, **Beta LaserMike** - part of NDC Technologies - has developed a number of measurement and control systems, which it showcased at NPE earlier this year. For instance, its new LaserSpeed Pro



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non-contact length and speed gauge offers an accuracy exceeding +/-0.03%, with a wide measurement depth of field for the full velocity range. The company has incorporated a faster processing engine into it, allowing faster communications - while it also has Ethernet connectivity. Beta LaserMike says it is an ideal replacement for contact encoders.

At the same time, its new Ultrascan Pro provides high-speed, precision measurement of product wall thickness and concentricity and offers faster processing and measurement capabilities, highspeed tolerance checking, multi-layer measurements (up to four layers), enhanced Ethernet connectivity via built-in web server and other advances. It is already well-known for its patented 'Snap' technology with full automatic setup and calibration for fast, simple operation.

Also, its BenchMike Pro now has a larger, higher-resolution display and provides faster communications processing - offering Ethernet and USB connectivity.

At this year's Chinaplas and NPE shows, **Incex** showed its Warp 100 terahertz system that measures the wall thickness of gas and pressure pipes.

It inspects 100% of a pipe wall thickness - in both lengthwise and circumferential directions - at line speeds of 60 m/min.

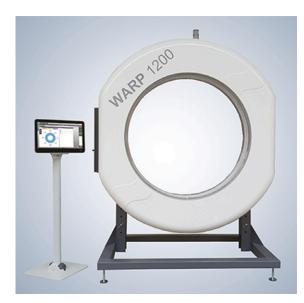
Measuring accuracy is ± 10 microns (depending on material types and applicable measuring method) and measuring results are independent of pipe temperature.

Together with gravimetric mass throughput control or weight per metre control, Warp 100 can significantly reduce production costs, says Inoex.

There are four models in the range, for pipe dimensions ranging from 90mm all the way up to 1200mm.

Some benefits include: detailed information on

Right: The Warp 100 terahertz system from **Inoex measures** the wall thickness of gas and pressure pipes.



dimensions including thickness, ovality and eccentricity; maintenance free; material saving of 5% or more; and easy connection to extruder control systems.

And at Fakuma next month, **Sikora** will show its Centerwave 6000, which uses millimetre wave technology to measures the diameter, ovality, wall thickness and the sagging of extruded plastic pipe. The measuring principle does not require any coupling media, is not influenced by temperature or the plastic material and measures without the need for calibration. Pre-setting of the product parameters is not required.

At the same time, the company will highlight its X-Ray 6000 Pro, which measures wall thickness, eccentricity, the inner and outer diameter and the ovality of hoses and tubes. It can measure the thickness of up to three different material layers. It will also present diameter measuring systems in its Laser series 2000 and 6000 - which also offer lump detection in addition to diameter measurement.

Testing times

As well as being able to assess pipes in situ, and during production, it is also vital that producers have a firm idea of how pipes will behave in new or existing applications. At the recent Plastic Pipes in Infrastructure conference in London, Kiwa Technology, a testing firm based in The Netherlands, said that it had assessed the suitability of polyethylene (PE) pipes for hydrogen transport.

Pressurised gas pipes are normally used to transport natural gas (methane), because that is the gas used as household fuel. However, a number of pilot projects are investigating the use of hydrogen as a fuel. In many cases, it would be mixed with the methane. One advantage is that, because it contains no carbon molecules, it would not produce carbon dioxide when it burns - and so would reduce greenhouse gas emissions.

René Hermkens, senior consultant at Kiwa, said that PE100 was a sensible choice for hydrogen transport pipes - as they were easy to install, and had both low maintenance costs and a limited number of welds.

"We already have a huge gas grid in the Netherlands, which uses mainly PE and PVC," he said. "PE is used to transport gas above 2 bar."

Although plastic pipe was well proven for natural gas transport, Hermkens said there were still several questions related to its use with hydrogen - concerning chemical resistance, permeation, the best installation method, and maintenance and repair.

Kiwa first carried out chemical resistance testing



Right: Sikora's Centerwave 6000, which will be seen at Fakuma next month, uses millimetre wave technology to measures pipe dimensions

by measuring weight loss. Pipe samples were exposed to 100% hydrogen for 1,000 hours - and found no evidence of chemical attack. And, while hydrogen is a far smaller molecule than methane - and so might be expected to permeate a plastic barrier more easily - Kiwa found that permeability was low. Projected gas low was very low - at less than 1m³ per year from

Because it is such a small amount, he said that venting the hydrogen was a safe option, with minimal risk of fire or explosion.

an SDR 11 pipe at 2 bar.

To further mitigate the risk, he said that a casing pipe should not be used - in case of hydrogen build up.

Kiwa also found that PE100 was suitable for welding after exposure to hydrogen (allowing the use of electrofusion coupling to repair pipes).

"It is possible and safe to use PE100 RC to transport hydrogen," he said, but stressed: "In service, safety precautions - such as a more frequent leak surveys - must be taken, due to the different nature of hydrogen."

Another area of concern was fracture toughness when moving from methane to hydrogen - which Hermkens said "needed evaluation".

Facing failure

At the same event, Michail Kalloudis, technical manager at Impact Solutions, took delegates through the many reasons for pipe failure - and how testing can help to avert them. He said a using a combination of "popular, accurate, efficient and low cost" techniques could help to determine potential problems in the raw material.

These techniques include: Fourier Transform Infrared spectroscopy, which gives a 'fingerprint' of a polymer sample; differential scanning calorimetry (DSC), which accurately measures thermal transitions such as melting and crystallisation in a polymer - which can determine contamination; thermogravimetric analysis (TGA), which gives information on thermal stability; and melt flow rate (MFR) analysis, which determines the molecular weight of the polymer.

"These techniques still require experts to do the analysis," said Kalloudis.

He added that they can be supported by more

advanced techniques such as scanning electron microscopy (SEM), gas chromatographymass spectrometry (GCMS) and nuclear magnetic

resonance (NMR).

Kalloudis presented several case studies to illustrate various types of pipe failure, including hot water PVC pipe and PE100 water pipes.

Several failures of the PVC pipe had caused a factory shutdown. Some pipe sections were removed and analysed by DSC - which revealed that the PVC's glass transition temperature had been

lowered - as the elevated temperatures had led to thermal relaxation and resulted in physical ageing.

PE100 water pipe butt welds were exhibiting brittle mode failures, though no problems were identified in the welding process. The problem was identified through micrographs - which revealed large agglomerates of carbon black. This was confirmed using SEM.

In a similar case, a butt fusion-welded PE100 pipe showed excessive blistering on the welding surface - though DSC, FTIR and SEM showed nothing suspicious. However, GCMS revealed trace amounts of a saturated hydrocarbon on the non-heated side of the pipe - leading to the conclusion that diesel had contaminated the PE100 during processing.

As well as using techniques like these to identify the reasons for failure, Kalloudis said it was vital to implement effective QA and QC programmes.

"Although a lot of research has been done in the production of PE pipe materials, bad QA and QC processes can threaten the pipelines," he said. "Contractors and utility companies must establish tight QA/QC procedures and follow the requirements of the relevant standards."

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Innovations in oriented PVC

Molecular orientation can boost the properties of PVC in certain pipe applications - and now, there are even moves to apply the technology new chlorinated PVC. Lou Reade reports

Oriented PVC - or PVC-O - is produced by 'stretching' standard PVC-U to produce pipe with higher mechanical properties. It is generally used to transport potable water and its use is growing worldwide. However, in addition to the spread of PVC-O, one leading producer has also applied orientation technology to a variant of 'standard' PVC.

Molecor of Spain - which makes both the machinery to produce PVC-O pipe as well as the pipe itself - has taken its research a step further by applying molecular orientation to chlorinated PVC (C-PVC).

"By applying molecular orientation principles to C-PVC, we want to achieve a product with all the advantages of PVC-O but with greater temperature resistance," said Ignacio Muñoz, CEO of Molecor.

The company has adapted its molecular orientation technology to make it applicable to C-PVC, he says.

"Work in the formula of the C-PVC was required to be able to apply molecular orientation to this kind of pipe," he said.

The first samples of C-PVC-O pipe have already been tested - and preliminary results obtained, he

The vision of the project was to determine whether C-PVC-O was "a competitive solution in manufacturing civil works pressure pipes in hot environments".

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

Adapted technology

In order to analyse the properties of C-PVC-O pipe, Molecor developed a way to apply orientation in the Main image: Molecor's Paraguay plant has an initial annual capacity of 3,000 tonnes of **PVC-O** pipe

Right: C-PVC-O (right) retained its dimensional properties at higher temperatures than PVC-O, says Molecor

same way as does to standard PVC pipes. An existing orientation machine (Molecor model M-OR- P-1640) was adapted to work at temperatures up to 150°C (although this was ultimately too high). The tests were done on DN160mm pipe, which is a popular size for PVC-O. The raw material, TempRite 88708, was supplied by Lubrizol, and the pipe was made on a Battenfeld Cincinnati Argo 93 extrusion line.

The main changes had to be made in the orientation stage. Temperature was

increased, in steps of 5°C, until the ideal temperature for orientation was obtained. Other parameters such as pressure and expansion speed were also adjusted. After fixing these, a set of pipes was made under standard conditions, which proved that the line could be used to produce C-PVC-O.

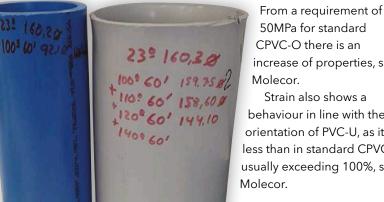
Once the pipe samples had been produced, they were tested according to the ISO 16422 Standard for PVC-O pipes - allowing a comparison between PVC-U, PVC-O, CPVC and CPVC-O.

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

showed a pipe stress of 54.78MPa, and a pipe strain of 94.6%. These results are in line with those of PVC-O, showing a higher stress samples after orientation than standard as it happens in PVC-O.

In an axial sample test, oriented C-PVC-O





54262

50MPa for standard CPVC-O there is an increase of properties, said

Strain also shows a behaviour in line with the orientation of PVC-U, as it is less than in standard CPVC usually exceeding 100%, said

Hoop testing

The corresponding values for a hoop sample test were: stress, 94.8MPa; and strain, 28.6%. The stress value for CPVC-O is quite similar to that obtained for

PVC-O. Taking into account that the preform value is a little higher for CPVC, it seems that orientation effect is less than the one in PVC-U.

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

A value of 28.6 % is smaller than that for PVC-O in the hoop direction - which is usually above 80% - or even the standard CPVC before orientation, with values above 100%. This reduced capability to deform has also been shown in pressure tests, where pipes failed - but not with significant deformations, he said.

Testing also revealed that the impact resistance of C-PVC-O is far greater than that of normal C-PVC, though it has a lower improvement compared with PVC-O. For instance, in impact tests designed for PVC-O, C-PVC-O failed three out of 25 tests - then, in a repeat, failed four out of eight.

"I have never seen PVC-O fail this kind of test," said Muñoz.

However, in thermal tests, C-PVC-O proved more resilient: it retained its dimensions up to around 110°C, while PVC-O began to shrink at about 80°C. This pattern follows the trend of the original (unoriented) materials.

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

"Compared with PVC-O, C-PVC-O behaves worse in impact test - and has a lower young modulus in the ring stiffness test - but when compared with C-PVC it is superior," said Muñoz.

The Minimum Required Strength (MRS) of C-PVC-O is similar to PVC-O at ambient temperature, but as temperature increases its performance

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PVC-O production capacity on the rise

PVC-O production capacity is on the rise worldwide, according to suppliers.

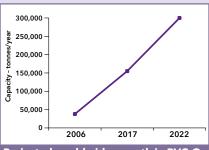
At this year's Plastic Pipes in Infrastructure conference in London, both Wavin and Molecor pointed to statistics showing the growth in PVC-O installed capacity - both now and projected into the future.

"PVC-O is starting to substitute PVC-U," said Andre Nijland, area manager for technology licensing at Wavin.

He told delegates that many countries already have PVC-O standards in place, while others have such standards in preparation. Europe recently introduced a new standard covering PVC-O pipe (EN17176).

Recent countries to publish a PVC-O standard include Morocco and India.

At the same event, Darren Daly, sales manager for UK and Ireland at Molecor, highlighted the growth in worldwide PVC-O capacity. Total



Projected worldwide growth in PVC-O Source: Molecor

installed capacity in 2006 was around 38,000 tonnes/year - split almost equally between the Americas, Europe and Australasia. By 2017, this has swelled by around 155,000 tonnes/year: annual capacity in Europe reached nearly 50,000 tonnes, which there was also an 8,000 tonnes/ vear in South Africa.

By 2022, Molecor expects capacity to double to around 300,000 tonnes/ year, and be spread across every continent. Annual production in South America is expected to reach around 65,000 tonnes, North America around 45,000 tonnes, and Europe around 60,000 tonnes - with Asia-Pacific exceeding 100,000 tonnes.

improves (+1% at 20°C, +6% at 45°C and +12% at 60°C).

The main advantage of C-PVC-O (against PVC-O) is the higher Tg, but there is no substantial increase in mechanical properties in the range of 20-45°C, said Molecor.

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

PVC-O in Paraguay

Elsewhere - and sticking with its more traditional technology - Molecor has begun production of PVC-O pipe in Paraguay, with a manufacturing partner.

The company has teamed up with Grupo Titan to create a plant in Villa Elisa. The plant, which cost \$6m to build, will have an initial annual production capacity of 3,000 tonnes - equivalent to 850km of pipe. The pipe will be used mainly for completion of the aqueduct for the Chaco project - which will deliver drinking water to around 70,000 people living in three cities and more than 80 indigenous villages.

The partners say that its objectives include improving hydraulic infrastructures and the water distribution networks in the country. The plant will use Molecor's molecular orientation technology (or Tom) to produce the pipes.

Molecor also recently published the latest edition of its technical manual for using its Tom PVC-O pipes and fittings in network design. The manual brings together the characteristics, advantages, applications, suitability of use and sustainability of these products, offering many practical cases of mechanical and hydraulic calculations of the pipes and fittings.

Molecor says that any material - such as PVC-O - requires adequate installation conditions so that the trench-fill-pipe system works properly to achieve the necessary stability to quarantee maximum durability of the network.

The manual explains the characteristics and advantages of PVC-O - which Molecor says offers the way to convey water under pressure, thanks to its hydraulic capacity, efficiency in the exploitation phase and low maintenance costs.

There is growing demand for PVC-O pipe in Paraguay - as evidenced by a recent project there. In an interview in La Nacion, Carlos Arce, president of the Sanitary Services Company of Paraguay (Essap), explained how the city of Villarrica now has a 21km PVC-O pipeline, which cost US\$7m to install. The installation provides permanent potable water to Villarrica - something that was not previously available. The pipeline is used to transport the water from a treatment plant in nearby Tebicuarymi - and there are plans for "a network extension to the surroundings of Villarrica", he said.

And, while PVC-O is usually reserved for potable water, a city in Spain has chosen it to expand its washdown network. The Bailen-Miraflores district in Malaga will use PVC-O pipe. Technicians at the municipal water company, Emasa, designed a



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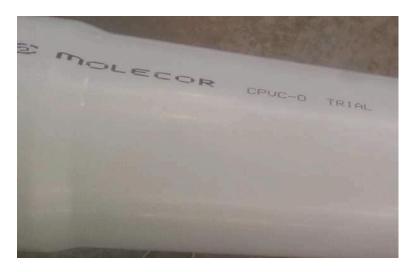
2,450m network that uses PVC-O pipes (110m diameter) and HDPE pipe of 32mm diameter. The cost of the extension project was around €360,000 (US\$420,000). The main washdown network will also include several shorter branches, to guarantee the cleaning of an area of nearly 90,000 sq m.

Indian expansion

The popularity of PVC-O pipe is spreading - with one company setting up a whole new division devoted to the product.

Indian chemicals company **Chemfab Alkalis** - which was formerly Teamec Chlorates - recently announced its plans to begin making PVC-O pipe. Its existing business is as a chlor-alkali producer. However, the company recently invested INR50m (around US\$7m) in a manufacturing facility in Sri City in Andhra Pradesh.

"Our strategic foray into the manufacturing of PVC-O pipes is driven by the huge demand that we see coming up for advanced and efficient pipes as a result of the large-scale investments being made by the Government of India to strengthen water connectivity," said Suresh Krishnamurthi Rao, chairman of Chemfab Alkalis.



The plant is scheduled to begin production during 2019.

"These highly advanced pipes are designed to convey high pressure water with the best-in-class operational and cost efficiencies," he added. that its C-PVC-O tests show a potential new market for the

Molecor says

Above:

material

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Pipe and Profile



Material gains: latest in materials handling

Conveying, blending, mixing and other processes ensure that raw materials such as resins and additives are brought together prior to the extrusion process

Materials handling equipment is generally seen as playing a subsidiary role to that of the main extrusion process - fetching and carrying the raw materials that are then converted into finished products. However, improvements in control systems mean that some systems can play a greater role in the process than ever before.

For example, Maguire has developed a new blender with built-in extrusion control which, when combined with a suitable supervisory system, can control the extrusion line from start to finish. The system has been shown to be effective in pipe and profile applications, as well as for

sheet, and blown and cast film.

The WXB Weigh Extrusion Blender incorporates a gain-in-weight (GIW) weigh bin and a loss-inweight (LIW) mix chamber in a single machine, along with a 4088 controller. While GIW weighs batch ingredients as they are dosed sequentially into the weigh bin, the LIW mix chamber allows accurate metering of the blend into the processing machine and facilitates control of extrusion and haul-off in accordance with process variables. The tight tolerance achieved by the blender (within +/-0.1%) is a key to conserving raw material.

The 4088 controller, Maguire's most advanced

Main image: The M2000/ K8000 mixing unit that MTI showed at NPE was delivered to PVC pipe producer **Northern Pipe Products after** the show

Right:
Maguire's WXB
Weigh
Extrusion
Blender can
control an
extrusion line
from start to
finish when
combined with
a supervisory
system

blender control, is designed for communication with other systems in an Industry 4.0 setting. It enables the WXB blender to interface with the Maguire + Syncro supervisory system, which provides control of all segments of the production line from a single touchscreen HMI control. In blown film production, for example, the system controls extruder temperature, raw material metering and consumption data, air ring automation, gauging, internal bubble cooling, web and cage handling, haul-off, and winder. The system can be deployed for coextrusion with multiple

The Maguire + Syncro control display allows users to easily visualize single-layer and coextrusion processes. Modes of extrusion control available include pounds or kilogrammes per hour; weight per length of extrudate; and product thickness in microns.

The WXB is initially available in three models: WXB 100 for throughputs of 100-220 lbs/hr (50-100 kg/hr); WXB 200 for 220-440 lbs/hr (100-200 kg/hr); and WXB 400 for 440-880 lbs/hr (200-400 kg/hr). The blenders can be configured for up to 12 ingredients, each with a separate dispenser.

Feeding time

extruders.

At Fakuma later this month, **Coperion** and **Coperion K-Tron** will present a number of solutions for efficient feeding of bulk material.

Among them is the Coperion ZS-B side feeder, which is used to feed raw materials into numerous extrusion processes. The side feeder includes the patented Feed Enhancement Technology (FET) that increases the material intake capacity in the processing of feed limited products by up to three

times, says the company. For improved feeding accuracy of loss-in-weight feeders, Coperion K-Tron will present its EPC electronic pressure compensation system.

The ZS-B twin screw side feeder enables the reliable side feeding of fillers and additives in powder or pellet form or cut glass fibres into the process section of tahe twin screw extruder. It features a self-cleaning profile of the twin screws and

product feeding into the screw flights of the extruder without stagnant zones. It requires little space due to its compact design. Coperion's FET applies a vacuum to the feed zone by means of a porous, gas-permeable wall. The resulting gas extraction increases material intake capacity in the processing of feed limited products up to threefold, says the company - boosting throughput rates.

At the same time, Coperion K-Tron will present the electronic pressure compensation system (EPC) for its high-accuracy loss-in-weight feeders. The

main advantages of the new system include improved accuracy and reliability as well as lower initial cost and easier installation compared to traditional mechanical pressure compensation systems.

Coperion K-Tron presents a clever but simple electronic solution for accurate and steady pressure compensation in feeder hoppers and outlets. The modular design incorporates pressure sensors and electronics tailored to interact smoothly with Coperion K-Tron's KCM feeder control system. Retrofitting options for existing feeders are available. EPC can be installed on most of the company's gravimetric feeders.

Also at Fakuma, **Piovan** of Italy will show a number of materials handling products - including an EL20 model in its Easylink+ range, which includes a state-of-the-art pipe cleaning procedure that guarantees the absence of cross-material contamination, says the company.

Easylink+ will be in operation together with a Modula series auto-adaptive dryer and Pureflo filterless granule receivers.

And, for the first time at Fakuma, Piovan will show its Quantum E gravimetric batch blender with continuous extrusion control, complete with a 15in touch-screen panel control.

Under its FDM brand, the company will exhibit a gravimtric dosing system in the GDS series, which features Siemens control, and is designed for the needs of pellet, flakes, regrind, additives and powder treatment.

Mixing it up

At the NPE exhibition in the USA earlier this year, **MTI Mischtechnik** exhibited a heating/cooling mixer combination Flex-line that was later delivered to PVC pipe producer Northern Pipe Products after the show.

Below:
Coperion's
ZS-B side
feeder with FET
can increase
material intake
capacity by up
to three times

PHOTO: COPERION



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The two days event will bring together materials scientists and researchers alongside oil industry engineers, service companies and oilfield operators to examine the options for polymers in oilfield applications and debate on regulations, specifications, standards, polymer selection, performance, and lifetime prediction with the aim of ensuring long-term productivity and safety on onshore and offshore rigs.

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Right: At Plast, Plas Mec showed two flagship machines - the Combimix-HC and TRR container mixer



The M2000/K8000 unit features an 8,000 litre cooling vessel and is over 7m (23ft) long and nearly 5m (16.5ft) high. Installing the system - the largest heating/cooling mixer combination MTI has ever supplied to the USA - will almost double mixing capacity at the customer's site.

Burkhard Wulf, area sales manager at MTI, said: "We have seen a trend towards increasing production volumes in the US market for some time."

The M2000/K8000 is a heating/cooling mixer combination for a typical batch volume of 950kg (around 2,100lbs). It can provide more than

7,500kg (16,600lbs) of mixed material per hour. Designed on a modular principle, these mixers can be put to use in most applications because their sizes, drive units and equipment options can be individually configured.

Northern Pipe had used an MTI heating/cooling mixer combination for around 30 years, and installed a new system in 2014.

"At that time, it was not possible to install a larger system as we had used the available floor space already," said Derek Hanson, vice president of engineering at Northern Pipe.

And, at the Plast exhibition in Italy, Plas Mec showed two flagship machines: the Combimix-HC mixing system and the TRR container mixer. The first, used mainly for PVC dryblends, comprises a TRM heating mixer and an HEC cooling mixer. The TRR container mixer is a multipurpose unit for applications where production changes are frequent and easy cleaning is very important - masterbatch is a typical example.

Commercial director Massimo Grigolon says Plas Mec has increased its focus in recent years on efficiency, productivity and safe operation. He cites an improved water circuit design with enhanced cooling capacity on the HEC cooling mixer, as well

Handling

Motan has moved closer to picking a winner in its biennial innovation awards - with six entrants presenting their ideas in detail to the competition jury in July. The winner will be announced at an award ceremony at the Fakuma exhibition later this month. The award is held every two years.

Motan says that award encourages entrants to come up with "resourceful ideas" - and exploit them to the full.

"Too many good ideas are never developed or pursued," said Sandra Füllsack, managing director of Motan. "As a result, the industry loses enormous potential. We want to find these treasures which are often found inside people's heads and left to languish."

The nominated project ideas are: Adaptive central vacuum control (Stefan Endres); Controlled conveying of bulk solids (Peter Haupt); Gravimet-



Six entrants to Motan's innovation award presented their ideas to the jury in July

ric, selective throughput control with batch traceability (Reinhard Herro); Local visualisation and control on a mobile device (Phillip Mählmeyer); An efficient, flexible system to install material and vacuum lines (Bernd Michael); and, Gentle pneumatic conveying of materials (Karl Wolfgang).

The most important criteria for the jury of four were: degree of innovation; relevance for practical use in the plastics industry; and, feasibility and market potential within materials handling.

The jury will decide on an overall winner - and how the €20,000 prize money will be split between the three top-placed finalists.

As well as prize money, winners will receive support with patent applications, and development of their innovation until it is ready for market.

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as its new jacket that can withstand a working pressure up to 2.5 bar, typically found in factory closed circuit chillers.

"With the Combimix-HC, it is now a straightforward task to cool more than eight batches per hour of U-PVC dryblend from 120°C to 40°C," he said.

During the same event, **Promixon** showed machine elements at the heart of its plants: large blades for a horizontal cooling mixer and a 2000-L vertical tank with blades for four-stage powder mixing. The tank on display was fitted with two outlets, enabling it to feed two cooling mixers placed on opposite sides.

Conveying control

Conair has updated its Wave Conveying materials handling system.

The system now gives processors a range of options to control the vacuum conveying process. The patented system now makes it possible to move any resin, at almost any speed, with higher throughputs, over longer distances without the damage to materials and equipment normally associated with conventional, dilute-phase vacuum conveying, says Conair.

With material lines running through Conair's booth, the system was a major feature of the company's display at NPE.

"We originally introduced this technology under the name R-Pro, or resin-protection conveying system," said Chad Stover, marketing communications manager at Conair. "Our focus then was on slow-speed, dense-phase conveying in order to prevent problems like angel hair and pellet fracturing. Since then, we have refined the concept to give processors the freedom to move different materials at the ideal speed for each application."

The system can also change speeds automatically when different resins are called for.

Conair says the Wave Conveying system is the

Wave Conveying Pulse Wave Conair says its Wave Conveying technology moves resin in compact slugs of material that move at much slower speeds

first vacuum-powered material-handling system to give processors precise control of material speed and material flow. It does this through the interaction of Conair's FLX-128 Plus conveying control, a vacuum pump with a variable-frequency drive, and a control valve, with standard receivers and tubing. Starting at speeds of about 300 ft/min, the system draws material through in the form of compact pulses or waves, each separated by an air space. As velocity increases, the interval between the pulses becomes shorter, and the waves flow faster. Pellets do not become suspended in conveying air as they do in conventional high-speed systems. Instead, they look like waves as pellets roll and tumble along the bottom of the conveying line.

The system's ability to regulate the conveying process - even to allow for programmable resinconveying 'recipes' to be stored in the FLX-128 Plus - is found in a series of patented control and equipment innovations. These include:

- Using a Conair LDP Series vacuum pump equipped with variable frequency drives. Unlike typical vacuum pumps, which are 100% on or off, LDP pumps with variable-speed drives can operate at the precise level of capacity and power consumption needed to maintain a specific material velocity in the system, which can result in substantial energy savings;
- The Wave Conveying hardware, together with the FLX-128 Plus control, regulates material flow fine tuning both the vacuum level and the influx of material from the material supply point to the conveying system; and,
- A new type of conveying speed sensor which measures material velocity, not air velocity - monitors the speed of material moving in the mixedpulse and wave phases. It provides feedback, helping the system maintain correct material flows.

Other benefits of Wave Conveying include: higher throughput (up to 2.4 times greater than dilute phase systems); better powder handling; longer conveying distances – up to 1,000 ft horizontally and 250 ft vertically, compared to about 600 ft horizontally and 70 ft vertically for dilute-phase systems.

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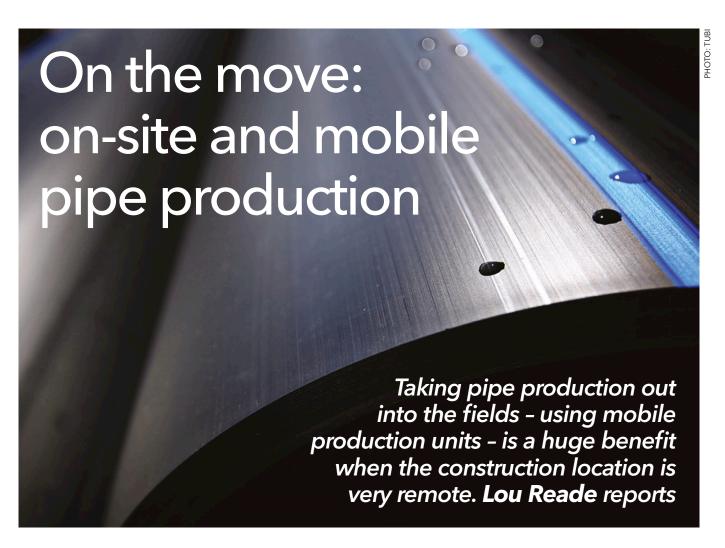












Laying pipe in remote locations - such as oilfields - can cause problems, as transporting the pipe to the site can be long and arduous. So, it makes sense to produce the pipe locally - so that it needs minimal (or even no) transfer. The best way to do this is to use specially designed mobile production facilities that allow high quality pipe to be extruded out in the field - exactly where it is required.

Milford, a US-based pipeline construction company for the oil and gas industry, recently entered into a strategic partnership and distribution deal with **Tubi** - which uses a patented mobile production system to produce HDPE pipe.

Using custom-designed shipping containers, the ISO:9001-registered Tubi system can be mobilised and deployed to remote project locations to produce HDPE on site, in as little as 48 hours, it says. Pipe is made to exacting industry standards, including ASTM and ISO, using the latest technology and quality control - in lengths up to 300ft (compared with the usual 50ft lengths available on the market, it says).

Marcello Russo, founder and CEO of Tubi which has its headquarters in Australia - said: "Our production system has proven itself on projects in

Australia and New Zealand and we are excited to put our capabilities to work in the United States. We've been looking for the right company to partner with in the US market for some time, and Milford's unique business structure - which supports customers from project conception to completion - is exactly what we were looking for."

One of Milford's largest customers asked if it could supply HDPE pipe lengths in excess of 50ft - and jumped at the chance to have 300ft sections.

"When we told them about Tubi's abilities, they demanded that we do our best to bring the system to the US," said Shawn Beard, CEO of Milford. "While the reality is that Tubi will only represent a small percentage of our total HDPE pipe business, we feel the system will create great value for customers."

The company added that Tubi's on-site extrusion system was the first in the country - and helps Milford to minimise logistical issues while maximising pipe integrity.

Mark Tufts, vice president of business development at Milford, added: "More importantly, it eliminates the biggest safety concern with HDPE - which is loading and unloading the pipe when it's

Main image: Pipe made using mobile technology must meet the same standard as that produced in conventional plants

From deserts - to the Moon?

Polyline Piping Systems is another Australian company specialising in mobile pipe production technology – and says the technology could have far-reaching implications in the future.

"Imagine in 50 years building pipes on the Moon or on Mars," said David Wilkie, managing director. "Would we build a dedicated factory - with specialist workers - and then transport the finished pipe to where it is needed? It would be more logical to build a mobile plant that makes and lays the pipe right where it's needed?"

While such exploration may be some way off, he says of his company's MPX 630 mobile extrusion system: "It is available on the doorstep of many of the world's deserts. These are very like the lunar landscape, and they

need water, gas and other fluids to be carried across large distances."

One advantage of mobile pipe production is that joining together sections becomes unnecessary - unlike with conventional systems, which need to be joined every 12m or so, he says.

"Right now, this system can save 20% on pipeline budgets," he said.

> www.polypipesystems.com

Right: Mobile production facilities allow high quality pipe to be produced exactly where it is required shipped on trucks."

In an interview with the local Midland Reporter-Telegram (MRT) newspaper - located in West Texas, in the heart of the state's oil and gas industry in the Permian Basic - Beard said that a huge demand for pipe was behind the decision to deploy mobile production technology.

"Normally, you have a brick-and-mortar plant but this can be moved in 48 hours," he said of the Tubi system. "Tubi has proven this technology, and our customers reached out to us and said: 'We need more pipe, we need longer lengths.'"

Beard told *MRT* that the agreement with Tubi was six months in the making – and that the first systems have been in the US for the last few months at Milford's Pecos location. It was tested for a few weeks to ensure it was completely operational, he said.

"We've had a huge response," he said. "Now we're evaluating our customers who want it and see how it best fits."

Mobile irrigation

Tubi originally began in the 1970s by supplying 'fixed' plant, but diversified in 2009 to specialise in mobile production technology.

In the past year, it has been involved in a project





to irrigate 20,000 hectares of the Canterbury plains in New Zealand, for which the head contractor was Downer. For this, it has produced more than 170km of HDPE pipe using its mobile equipment.

"For these kinds of irrigation projects in rural areas, it's key to have the opportunity to manufacture your pipe locally," said Tony Pink, project director at Downer. "Had it come out of Christchurch or - even worse - Auckland, getting the pipe to this location would have been spectacularly difficult."

Tubi's mobile plant could be moved to any location in the area where the pipe was to be laid, he said, which meant that transportation of pipe on public roads was minimised.

The client was very impressed with the technology - which was the only technology of this type local to the project, said Pink. Tubi ended up making 150km of the 170km of pipe, in three location across the project site. The pipe was produced in 100m lengths and transferred from the manufacturing site to the installation location.

In addition to oil and gas and irrigation, Tubi also works in sectors including mining, shale gas, water infrastructure and pipe relining.

CLICK ON THE LINKS FOR MORE INFORMATION:

> www.tubigroup.com

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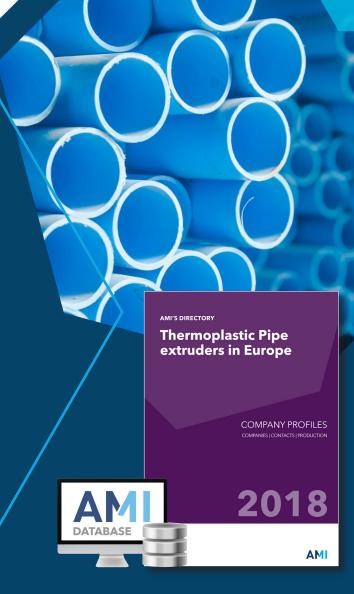
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Blockchain: redefining industry supply chains

Blockchain - the encrypted ledger technology that secures cryptocurrency and potentially a whole raft of business transactions - is simultaneously one of the most hyped and criticised technologies in living memory. And it is sometimes hard to sift the truth from the fiction.

Last month, the professional services specialist PwC published global research suggesting that 84% of organisations are experimenting with the technology. 25% of organisations have projects that are either live or at the pilot stage, it said, while 32% have projects in development and a further 20% are researching the market.

However, in May the technology analyst firm Gartner had published a very different set of findings. Its 2018 CIO survey said that only 1% of CIOs report live blockchain programmes within their organisations and just 8% are either planning blockchain initiatives or looking at or experimenting with the technology. According to Gartner, 77%

of CIOs said their organisation had no interest in the technology and/or no plans to investigate or develop it.

Two highly reputable organisations and two detailed, global surveys presenting contradictory findings published just three months apart. These extremes of claim and counter-claim have typified discussions about the technology. However, Gartner's latest Hype Cycle report, published at the end of August, acknowledged that blockchain is a fast-maturing technology.

Blockchain explained

Essentially, a blockchain is a distributed ledger. It is a continuously expanding chain of records (blocks) that are linked and secured via strong cryptography to create a networked audit trail of transactions. Because each block, ledger, or record usually contains a cryptographic hash of the preceding one, together with a timestamp and data about the

Main image: Blockchain technology could reshape supply chains in industries such as chemicals and plastics

Below:

Blockchain

technology

provides a

mean to track,

monitor and record

condition of

point in the

supply chain

goods at every

transaction, the system is designed to be resistant to tampering and modification.

Typically, blockchains work using the processing and mirroring power of distributed/peer-to-peer computing systems, which is both the technology's advantage and, some argue, its inherent problem, because it replaces trust with networked complexity.

Theoretically, tampering with any one record creates a ledger entry that differs to all of the verified copies across the network. This is why blockchain's proponents believe it could become the foundation of a new data commons, challenging the concept of proprietary data and data landlords. The disadvantage is that this type of distributed processing is typically slower and more resource intensive than others. And that means that the cost of every transaction is higher and uses more energy.

Most blockchains are either public/permissionless - meaning anyone can join or add their processing power - or private/permissioned. The latter demands that someone's identity can be verified before they are allowed onto the closed system.

Linked with blockchain are the concepts of digital tokens and cryptocurrencies. Indeed, the technology was developed as a decentralised computing model to support cryptocurrencies and verify transactions. On some distributed, blockchain-supported systems, digital tokens are exchanged for work/processing and may represent an asset of any kind - that could include plastics, chemicals and compounding or mixing services.

The big attraction

The concept of an immutable system of record makes blockchain attractive for many applications that demand verification and authentication, which is why use cases are fast developing in supply chain management, logistics, transport, manufacturing, financial services, publishing, intellectual

property, contracting, legal services, and more.

And in an increasingly interconnected world of smart things - from smart, connected cities, transport networks, factories, industrial installations, offices, and homes, to smart trucks, shipping containers, delivery boxes, and even sensor-filled labels on perishable goods - the idea of an inviolable system of record, together with smart contracts and automated payments, is even more attractive.

Blockchain is making its presence felt in all of these areas, because of the Internet of Things (IoT), the same technology, incidentally, driving interest in Industry 4.0 manufacturing management systems. Imagine a supply chain for sensitive, fragile, and/or perishable goods on which they could be authenticated at source and throughout the chain, shipped in ideal conditions, and delivered safely, on time, to the correct recipient. Each stage of that process could be logged and stored on an immutable ledger, with payments made automatically if and when all conditions are satisfied. That's the promise of blockchain in the chemicals sector - and in others that face similar challenges.

Blockchain realities

So how does blockchain look in practice? In March IoT supply chain specialist Brieftrace developed a blockchain solution to transform the way that pharmaceutical companies track their assets and perishable goods, allowing them to ensure that they are being handled correctly and delivered safely. The firm teamed up with transport and logistics company DSV on a pilot programme that deploys blockchain-connected tracking and sensing devices to monitor shipments. The pilot is based on the Traceum blockchain, which facilitates smart contracts, fiat currency transactions (currencies backed by a government as legal tender, rather than by a commodity such as gold), fixed transaction fees,

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partner transparency, trusted data, and archiving.

The new system gives companies the ability to monitor issues such as product temperature, humidity, and light exposure, which can affect many drugs, chemicals, and other sensitive or perishable goods. This information is then stored on the blockchain, along with the vehicles' locations at every point.

Meanwhile, in the meat supply chain, the Arc-net initiative connects each step of pork product journeys using blockchain technology. This extends to encoding the DNA signature of each pig into the blockchain so the system can ensure that the same meat is being processed throughout the supply chain.

Blockchain is also being used in the diamond industry to authenticate the origin of each stone from a specific pit in a specific mine, and to then trace it all the way to the end customer.

There are other indications that blockchain is changing the business landscape, according to the August PwC report. For example, the concept of tokenisation is spreading to raw materials, finished goods, income-producing securities, membership rights, carbon offset trading, and even charitable donations. At the same time, initial coin offerings (ICOs), in which a company sells a predefined number of digital tokens to the public, are funnelling billions of dollars into blockchain platforms. ICOs raised \$13.7bn in the first five months of 2018 alone, according to PwC.

There are other potential advantages in the technology. "Using blockchain in concert with enterprise resource planning platforms will enable companies to streamline processes, facilitate data sharing, and improve data integrity," said the PwC



report. As a distributed, tamperproof ledger, a welldesigned blockchain doesn't just cut out intermediaries, reduce cost, and increase speed and reach, it also offers greater transparency and traceability for many business processes, the firm said.

Securing transactions

However, while such a blockchain validates data and eliminates the need for a central authority to approve and process transactions, cutting out that authority also removes the institutions important to ensuring market stability, combating fraud, and more. And that is a challenge to any long-established, risk-filled sector. Some organisations are working to ensure that centralised trust and blockchain are not mutually exclusive concepts by being in the vanguard of the change. In September 2018, for example, IBM officially launched its Blockchain World Wire (BWW) banking payments network.

Blockchain World Wire uses the Stellar block-

Above: Systems such as IBM's **Blockchain World Wire aim** to provide trusted "near real time" international payments

Learn at Blockchain for Chemicals

Blockchain technology is much more than cryptocurrency - it holds the potential to redefine supply chains across industry. Blockchain for Chemicals is a two-day conference that will focus on application of this emerging technology in the chemicals and plastics industries. It will explain how it could be used in the future to demonstrate traceability of materials, save time with paperwork, prevent fraud and lost goods in transit, build trust in the supply chain, and provide the plastics/chemical industries with a new tool for growth.

Taking place at the Sofitel Kur-

fürstendamm in Berlin, Germany, on 12-13 December 2018, the event will bring together industry leaders to discuss the opportunities for the chemicals industry and to explain how early adopters can save time and money for their businesses through fast and secure access to end-to-end supply chain information.

The conference will be chaired by Chris Middleton, an expert author and journalist covering blockchain technology and application. Other key participants include: Peter Busch, Mobility Lead Distributed Ledger Technologies at Robert Bosch in

Germany; Heinz Lux, Senior Digital Strategist at Evonik Industries in Germany; Rafael Cayuela, Chief Economist at Dow Europe in Switzerland; Nicolas Buhmann, Commercial Manager at Maersk in Denmark; and Dr Stefan Guertzgen, Global Senior Director Industry Marketing and Communication for Chemicals at SAP in Germany.

For information about attending the event, taking an exhibition space, or sponsoring the conference, visit the conference website or contact Grace Midgley. Tel: +44 (0) 117 314 8111; grace.midgley@ami.international.



Above:
Blockchain is being touted as a means to assess and rank logistics suppliers and create new on-demand options

chain to clear and settle international payments between banks in "near real-time", according to IBM, via a mutually agreed digital currency. Using the new system, two financial institutions agree to use a digital asset as the bridge between any two fiat currencies. That digital asset facilitates the trade and supplies settlement instructions.

Using their own payment system, the first bank converts the fiat currency into the digital asset. IBM's World Wire system then simultaneously converts that digital asset into the second fiat currency, completing the transaction, which is then immuta-

bly recorded on the Stellar blockchain for clearing.

The financial services industry has been in the vanguard of exploring blockchain and what IBM terms "programmable money" for some years. In July, for example, a number of European banks, including HSBC and Deutsche Bank, adopted their own blockchain platform - we.trade. Earlier in the year Japan's biggest bank, Mitsubishi UFJ, announced its own blockchain payment platform in partnership with US cloud provider, Akamai.

Linking to business

This summer, Swiss B2B blockchain company Equidato Technologies announced the launch of its SophiaTX blockchain - main net. It is a decentralised computing system that extends traditional enterprise applications, such as enterprise resource planning (ERP), supply chain management (SCM), and customer relationship management (CRM), into the blockchain environment.

The aim of main.net is to use the distributed ledger and decentralised processing structure of the Graphene blockchain to underpin enterprises' operational and management processes "to ensure maximum transparency, traceability, and trust",

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according to the company.

Meanwhile, DB Schenker, the transport and logistics division of the German railway company Deutsche Bahn, has co-developed a decentralised application for supplier evaluation using the VeChainThor blockchain. Its system aims to rank and track service providers by such factors as the quality of their packaging, transportation times, and overall service.

Blockchain could also underpin an entire integrated transport system in the future without the need for large, costly, centralised control mechanisms, according to a UK research paper from the Transport Systems Catapult (TSC) and the University of Sheffield.

Counting carbon

Another novel venture, which is being billed as the "world's first retail platform that connects consumers to their own carbon footprints" was launched as a pilot programme in the UK by non-profit organisation the Poseidon Foundation earlier this year. The Poseidon retail platform uses blockchain technology to integrate carbon markets into transactions at the point of sale. Poseidon is partnering with ice cream giant Ben & Jerry's to demonstrate the system at one of its stores in London. The back end of the system runs on the Stellar blockchain network.

Environmental fintech company Veridium Labs is also working in the area of carbon offset trading. The company is partnering with IBM to transform carbon credits into fungible (exchangeable or interchangeable) digital assets that can be redeemed or traded on Stellar. In this relationship, Stellar acts as the underlying ledger, IBM as the token manager or broker, and Veridium provides the environmental expertise and industry structure. The resulting 'digital environmental assets' are designed to help companies and investors purchase carbon credits to mitigate their own environmental impacts, and/or hedge against future liabilities.

Also in the summer, the Mobility Open Blockchain Initiative (MOBI) announced its foundation



Right: GDPR is one of the challenges blockchain technology providers and users will have to address

across the transport industry. The aim is to create "a minimum viable network" for the technology that includes car makers such as Ford, GM, Renault, and BMW, public transportation and toll road providers, technology firms such as IBM, blockchain innovators such as Fetch and the IOTA Foundation, academic institutions, startups, and regulatory bodies across the globe.

Blockchain challenges do remain in terms of complexity, cost, energy usage, and, some argue, GDPR compliance. GDPR stipulates that data should be permanently erased from storage systems, should that be requested by a data subject. In theory, blockchain makes that impossible, although various initiatives claim to work around the problem, as this report explains.

Taken together, however, it seems clear that the potential that these and other blockchain initiatives are demonstrating to transform supply chains for fragile or sensitive goods in terms of authentication, transport, contracting, finance and payments will see this emerging technology adopted across the chemicals sector in the future. And these initiatives are being backed by some trusted names. Welcome to blockchain!



About the author

Chris Middleton is a leading business and technology journalist and author specialising in information technology, artificial intelligence, machine learning, automation, enterprise policy and technology ethics. He is editor of InternetofBusiness.com, contributing editor to diginomica and Computing, and a former editor of Computing and Computer Business Review. He has also written for The Guardian, BBC, Computer Weekly and The Times. Middleton will be chairing AMI's Blockchain in Chemicals conference, which takes place in Berlin in Germany on 12-13 December 2018.

Exploring conductive plastics

Smart devices and safety-critical electronics are driving interest in polymer compounds offering enhanced electrical and thermal conductivity. Conductive Plastics 2018 explores the enabling technologies and potential opportunities

Main image:
Polymer
compounds
that offer
enhanced
thermal and
electrical
conductivity
could find
applications as
varied as heat
exchangers to
smart sensors

The increasing penetration of electronics into today's industrial and consumer products, together with the emergence of critical application sectors such as autonomous vehicles, is driving demand for enclosures that can eliminate the risk of signal interference while protecting sensitive electronic components and dissipating heat. Meanwhile, traditional applications for conductive polymer applications, such as ATEX and ESD products and trace heating, could extend to include heat exchangers and decorative surfaces with optimised haptics.

AMI's third European Conductive Plastics 2018 conference, which takes place in Vienna in Austria on 6-7 November, explores the latest developments in additive and compounding technologies that will enable the production of electrically and/or thermally conductive plastics compounds capable of meeting these demanding new requirements.

With automotive a key potential market for conductive plastics, the conference will open with a presentation by **Dr Tamim P Sidiki**, Global Marketing Director at **DSM Engineering Plastics** in the Netherlands, who will identify some of the key upcoming application areas. He will be followed by **Klaus Rathberger**, Managing Director of **Georg H Lüh** in Germany, who will discuss carbon-based additives ranging from graphite to graphene. Then

Seçil Yilancioğlu, R&D Manager at **Eurotec Engineering Plastics** in Turkey, will talk through the performance of some electrically and thermally conductive PA materials.

The focus then turns to electrically conductive additives. **Michael Claes**, Chief Technology Officer and Global Strategic Account Manager at **Nanocyl** in Belgium, will detail its work on creating costoptimised compounds using multi-wall carbon nanotubes (MWCNTs). **Dr Christian Maus**, Development and Support Leader at **OCSiAl** in Luxembourg, will explain how its single-wall carbon nanotubes (SWCNTs) can be used in thermoplastic compounds. And **Tom Daniels**, Market Manager Conductive Plastics at **Bekaert** in Belgium will discuss the use of its stainless steel fibres products.

Moving on to thermally conductive additives, **Dr Stefanie Wildhack**, Senior Specialist Product and

Application Development at **3M Technical Ceramics** in Germany, will cover the latest experience with its boron nitride filler products. **Dr Carsten Ihmels**, Head of Department R&D at **Nabaltec** in Germany, will cover the use of mineral FR fillers and metal oxides to enhance thermal conductivity. **Péter Sebö**, Head of Marketing & Market Development at **Quarzwerke** in Germany, will cover fillers for white and colourable applications. And **Dr Bashar Diar**

Bakerly, Senior R&D Specialist at Huber-Martinswerk in Germany, will detail the use of aluminabased fillers in thermal management applications.

Day One ends on novel conductive technologies. Morten Lindberget, VP Business Development & Sales at Condalign in Norway, will explain how it is producing conductive films using a particle alignment technique, and **Dr Daniela** Sordi, Chief Technology Officer at CarbonX in the Netherlands, will detail use of its porous carbon nanostructures in films and 3D print applications.

Day Two opens with a review of the processing of electrically conductive polymers by additive manufacturing techniques, presented by **Dr** Christof Hübner, Group Leader Nanocomposites at Fraunhofer ICT in Germany. This forward-looking presentation will be followed with an end user panel session including DSM's Tamim P Sadiki plus Urszula Kosidlo, Materials Research Manager at Motherson Innovations Deutschland in Germany, Miloslav Smutny, Material Engineer and Technical Professional Polymeric Materials at Varroc Lighting Systems in the Czech Republic, and Andreas Brunner, Materials Engineer at Georg Fischer Piping Systems in Germany.

The conference then looks at some application challenges. Jean-Michel Poncelet, Business Development Manager at Cabot Performance Materials in Belgium, will detail how advanced carbons can be used in electrically conductive applications. Christine Van Bellingen, Business Development Manager at compounder Witcom Engineering Plastics in the Netherlands, will explain how overall compound properties can be optimised while achieving electrical performance. And Yves Trolez, Manager of Polymer Material Department at Total Research and Technology in Belgium, will detail application of CNTs in industrial ATEX applications.

















Expert speakers and panellists include (top row from left) Bekaert Market Manager Conductive Plastics Tom Daniels, 3M Technical Ceramics Senior Specialist Product and Application Development Dr Stefanie Wildhack, Nabaltec Head of Department R&D Dr Carsten Ihmels, Condalign VP **Business Development & Sales Morten Lindberget, (bottom row from left)** Fraunhofer ICT Group Leader Nanocomposites Dr Christof Hübner, Georg Fischer Piping Systems Materials Engineer Andreas Brunner, Witcom **Engineering Plastics Business Development Manager Christine Van** Bellingen and Dr Andreas Kaiser, Technical Marketing Manager at Arlanxeo

The final session of the conference focuses on thermally conductive applications. Luca Posca, Technical Service & Marketing Director at Lati Industria Termoplastici in Italy, will speak about development of heat sinks for high power LED lamps. Marco Grundler, Group Leader Materials and Compounding Technology at the **ZBT** fuel cell research centre in Germany, will detail its work with graphite filled heat sinks. Michael Schäfer, Product Specialist at Celanese Services in Germany, will explain the influence of molecular orientation on thermal conductivity of polymer compounds. And Dr Andreas Kaiser, Technical Marketing Manager at Arlanxeo in Germany, will review developments in thermally conductive synthetic rubbers.

About Conductive Plastics Europe 2018

Taking place in Vienna in Austria on 6-7 November, Conductive Plastics 2018 is AMI's third conference covering this topic in Europe and its sixth globally. It is now firmly established as a high level learning point for OEMs, engineering designers, processors, compounders and additive producers to learn about the latest developments in the use and formulation of electrically and/or thermally conductive plastic materials.

Expert speakers will cover the opportunities and challenges in the development and application of these materials in sectors ranging from LED lighting and electric vehicles through to wireless communication systems and ATEX-compliant equipment. Presentations will focus on compound formulation as well as product design and processing. This year's event also includes an end user panel session where attendees can learn how some leading technology providers see applications developing in their markets.

Conductive **Plastics**

To find out more about Conductive Plastics 2018, visit the conference website or contact Conference Organiser Grace Midgley. Tel: +44 117 314 8111; Email: grace.midgley@ami.international

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CONSTRUCTION

Extruded panels deliver significant weight saving

SABIC has introduced a lightweight, extruded panel for the building and construction industry.

Stadeck, which is made from glass fibre-reinforced thermoplastic, is light and strong, says the company, and is suited to applications such as scaffolding, frame works decking, fencing, floodwalls, jetties, sheathing and wheel chair ramps.

The panels also have high weather- and chemical resistance, as well as good anti-slip properties and fire resistance. They are NEN-EN 12811-1 certified which makes them a good candidate for scaffolding applications.

They are more sustainable than the standard wooden planks that are commonly used in the

building industry, says the company, due to their easy recyclability and weight savings - which can be as much as 60%, which helps to reduce overall construction weight.

On top of this, the company claims they can deliver cost savings of up to 32%.

"The addition of Stadeck panels to our portfolio is testament to our commitment to delivering greater productivity, safety and profitability to our building

and construction customers," said Peter van den Bleek, senior product manager at the company.

The panels can be produced in different patterns such as wood and stone and come in standard dimensions (gauge 55mm, width 230mm, and lengths of 3,000 and 6,000mm) though custom lengths can be supplied on request.

The panels are quick to install and suited to temporary applications.

> www.sabic.com

STORM PROTECTION

Gully chute benefits from PP

UK-based Polypipe has developed a new gully chute which ensures that stormwater does not collect on road networks.

Ridgichute - which is made from lightweight polypropylene (PP) - allows captured water and sediment from high-risk carriageways to pass straight through into a Ridgidrain drainage system, preventing surface flooding.

The sumpless design reduces the risk to roadside workers needing to undertake gully maintenance by preventing blockages caused by silt accumulation. Captured water, silt and sediment is carried down the Ridgidrain system into a chamber to the side of the carriageway, allowing safer maintenance activities to commence.

> www.polypipe.co.uk

PVDF offers benefits for flexible pipe

Solvay says that its latest grade of polyvinlylidene fluoride (PVDF) can boost the protection and performance of rigid and flexible pipes used in oil and gas recovery.

Solef 90615/2002, launched recently at the Offshore Technology Conference in the USA, combines high ductility, thermal stability up to 150°C (302F) and chemical resistance in applications including steel pipes, flexible risers and flowlines.

"The material introduces a combination of high-performance properties that can help expand design options, improve the lifetime of oil and gas assets, and lower operating costs over the lifetime of the pipe," according to Mike O'Brien, oil and gas market manager for Solvay's speciality polymers division.

Its high ductility offers benefits in flexible pipes as a pressure sheath material, particularly in high-pressure applications. It delivers reliable performance across temperatures ranging from -30 to +150°C (-22 to +302F).

This reduces the risk of rupture during installation in colder climates and expands options for use in newly drilled, hotter fields.

The material can also resist blistering in rapid gas decompression up to 1500 bar, says Solvay.

> www.solvayspecialtypolymers.com

MELT FILTRATION

Filters use automation to cut operator intervention

ADG Solutions has made improvements to its CFO Line of continuous melt filtration systems, while also adding a new model.

It says that its CFO (Continuous Filter Operation) models can operate automatically during a shift, with minimal operator attention. As extruded material enters the unit, it passes through a stainless-steel screen plate that is micro drilled and hard faced, filtering contaminants that are caught on the screen-plate surface. When waste builds up and back pressure reaches a pre-set level, a rotating blade sweeps the screen and removes the contamination through a discharge port.

CFO models handle a broad range of materials and the filter can cope with up to 10% paper and other foreign objects - including contaminants such as metal, wood, textile fibres and unmelted plastic granules.

Recent refinements include: a new scraper design to handle smaller purges; updated computer program/controls which allows the number of scrapes between purgings to be varied, so the user can maximise

contamination collection; and a thicker harder screen plate filter with more uniform hole quality. Before the end of the year, a new diamond hard plate surface will be available for aggressive and abrasive processes. This will make screen life up to three times longer than the existing design.

Its latest model, CFO 25, offers a 10% larger screen surface area, while the cover includes 360 degrees of studs - which fully seals the surface and prevents any leaks. The robust design tolerates much higher pressures of up to 3500 psi, says ADG.

> www.adgs.net



Boosting PVC tube capacity

Maillefer says that improvements to its PML 032 Explore extrusion line have allowed a 33% increase in the production capacity of PVC medical tubing.

"We wanted more speed from our extrusion lines for soft PVC intravenous (IV) tube and we got it," said Philippe Giovangrandi, technical sales director.

Improvements to the cooling section have helped to boost capacity by more than a third.

At the same time, the extra performance called for more melt flow, which was found by increasing the extruder size. Overall, the PML 032 Explore line gives more performance while keeping within a compact layout, he said.

> www.maillefer.net

Hybrid tool adds layering efficiency

Guill Tool says that a new version of its 800 series of extrusion toolina - known as 800 series Hybrid - has benefits in applications that typically use crossheads and inlines.

In some typical applications, layers of the same material are applied multiple times with a single die. This method is used to reduce the chance of errors caused by gels breaking through a thin

wall, weld lines, inconsistent wall thickness, plus material and process variations. Other errors include difficult-to-process materials and demanding applications where there is zero fault tolerance.

The 800 series Hybrid was designed to overcome these problems. Its efficient design reduces cost and size, compared to other methods of overlapping layers, says Guill.

The main benefits include: eliminating weld lines in materials through patented overlapping technology, resulting in a more consistent finished product; reduced sensitivity to changes in viscosity; reduced sensitivity to changes in line speed; many material and multi-layer application possibilities; the ability to work in all tubing and jacketing applications with a wide range of

materials; low residence time; compact design; and a low tolerance stack-up error factor.

Overall, the main benefit is an improvement in concentricity, says Guill.

The new tool reduces stagnation, because overlapping layers are more inherently balanced than single layers and also because each semi-deflector is 'tuned to flush'.

> www.guill.com

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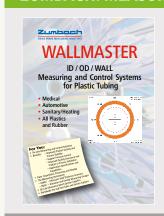
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This brochure from Sica covers the company's wide range of downstream equipment for plastic pipe production. It includes haul-off devices, saws, cutting systems and belling machines.

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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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MEDICAL TUBING USA 2018



AMI's third medical tubing conference takes place at Boston in Massachussetts in the USA on 2-3
October 2018. The event addresses regulatory, material and production technology developments in tubing and catheters for all medical applications.

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FIELD JOINT COATING 2018



AMI's Field Joint Coating conference returns to London in the UK for its fifth edition on 9-10 October. The two-day event brings together pipeline owners and operators with installers, coaters, contractors and technology providers.

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SELF-HEALING POLYMERS



This brand new conference takes place in London, UK on 8-9 October and will explore the fast-developing world of polymeric materials designed to repair themselves in industries as diverse as automotive, aviation, medical, and oil & gas.

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POLYOLEFIN ADDITIVES EUROPE 2018



Now in its 11th year, AMI's European Polyolefin Additives conference takes place on 9-11 October in Cologne in Germany. It examines commercial developments and technical innovations impacting on the PE and PP additives market.

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PLASTIC PIPE FITTINGS & JOINTS 2018



Taking place in Berlin, Germany on 24-25 October 2018, the Plastic Pipe Fittings & Joints conference covers the polymers, production technologies and design innovations, as well as testing and certification, of these system critical components.

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OIL& GAS NON-METALLICS



AMI's fourth Oil & Gas Non-Metallics conference takes place in London in the UK on 30-31 October. It will explore all polymerbased solutions for O&G industry infrastructure and equipment, including thermoplastics, thermosets, elastomers and composites.

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CONDUCTIVE PLASTICS EUROPE 2018



The third European edition of AMI's Conductive Plastics conference takes place on 6-7 November 2018 in Vienna in Austria. It presents a unique opportunity to learn about the latest technologies for achieving electrical and thermal conductivity.

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PIPELINE COATING USA 2018



The third edition of AMI's North American Pipeline Coating conference takes place on 13-14 November 2018 in Houston, Texas, bringing together leading pipeline contractors and operators, pipe producers and coaters with specifiers and materials and machinery suppliers.

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WOOD-PLASTIC COMPOSITES 2018



Now in its 12th year, AMI's Wood-Plastic Composites conference will be held in Vienna in Austria on 14-15 November, bringing together expert speakers to discuss the latest product, process and materials developments in the US and European WPC markets.

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POLYMER FOAM 2018



Taking place in Hamburg in Germany on 28-29 November 2018, AMI's sixth Polymer Foam conference brings together international experts to learn about the latest developments in blowing agents and physical foaming of polymers.

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COMPOUNDING WORLD FORUM 2018



The 6th Compounding World Forum takes place on 4-6 December 2018 in Coral Springs, Florida, USA. This annual meeting point for US technical compounders covers business strategies and new materials and processing technologies.

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FIRE RESISTANCE IN PLASTICS 2018



AMI's Fire Resistance in Plastics conference takes place on 10-12 December 2018 in Cologne, Germany. Now in its 13th year, the event provides a forum to debate fire safety requirements and regulatory and technical developments.

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materials.

Adopen

Head office:	Antalya, Turkey
President:	Mustafa Sak
Founded:	1956
Ownership:	Private
Employees:	Around 3,000 worldwide
Profile:	Adopen, which was founded in 1956 as a manufacturer of rubber footwear, has since grown to become Turkey's leading manufacturer of PVC door and window profiles. It also produces wood and aluminium profiles, composite panels, door and window accessories such as decorative window film, as well as other building

Product lines:

The company's main focus is on PVC windows and doors, which are sold to more than 50 countries. Its main Adopen brand is distributed worldwide, to regions including Europe, Eastern Europe and North Africa. Examples include its Penwood range of window profiles. In addition, its international Wintech brand is produced at all its overseas production facilities. It also offers wood-PVC composite doors under its Adokapi brand. Its other brands include Plaspen (which was acquired in a takeover) and Accado (accessories).

Factory locations:

The bulk of Adopen's products are made at its main plant in Antalya - where it recently took delivery of 16 new extrusion machines from KraussMaffei Berstorff, taking its total there to almost 100 machines. Its production facilities in Antalya cover 185,000 sq m, with a total area of more than 500,000 sq m. Adopen also has Wintech-branded production facilities in Russia (which has a production area of around 18,000 sq m), as well as other facilities in Azerbaijan, Ukraine, India and Iran.

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:

November/December 2018

Wood-plastic composites
Cross-linked polyethylene (PEX)
Extruder wear protection
Multi-layer pipe extrusion

January/February 2019

Engineering plastics and composites
Screenchangers/melt filtration
Titanium dioxide trends
Continuous/batch mixers

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

For information on advertising in these issues, please contact:

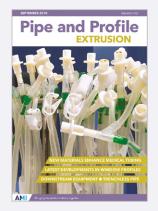
Claire Bishop: claire.bishop@ami.international Tel: +44 (0)1732 682948

Levent Tounier: levent.tounier@ami.international Tel: +44 (0)117 314 8183



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Pipe and Profile September 2018

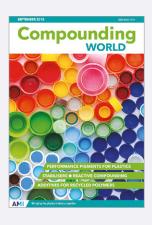
The September edition of Pipe and Profile Extrusion features medical tubing, window profiles, trenchless pipe technology, PVC additives and news of AMI's first Extrusion Expo in Cleveland, US, in May



Pipe and Profile July/August 2018

The July-August issue of Pipe and Profile Extrusion explores ways of boosting energy efficiency in pipe extrusion. The edition also looks at optimising weathering for dark PVC, designing RCP out of PE pipe, and the economies of scale in large diameter pipe.





Compounding World September 2018

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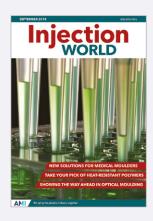
The September edition of Compounding World looks at developments in the world of colours, where pigment price rises are causing pressure. The issue also covers reactive compounding, new stabilisers and additives for recycling.



Plastics Recycling World September/October 2018

The September/October edition of Plastics Recycling World looks at the equipment on offer for direct recycling to sheet. Plus, exclusive analysis of Europe's recycling capacity needs and a review of the latest optical sorting technologies.





Injection World September 2018

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The September edition of Injection World magazine takes a close up look at the latest medical polymers and processing technologies. It also reviews developments in heat-resistant polymers and moulding of optical parts.

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Film and Sheet September 2018

The September 2018 edition of Film and Sheet Extrusion magazine takes a detailed look at the latest developments in the plasticiser sector. It also reviews innovations in biaxial films, laboratory extruders and downstream equipment.

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Compounding

Film and Sheet

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Injection Plastics Recycling

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5-8 December

5-8 January

12-16 March

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AMI CONFERENCES

2-3 October 2018 Medical Tubing US, Woburn, USA 8-9 October 2018 Self-healing Polymers, London, UK 24-25 October 2018 Plastic Pipe Fittings & Joints, Berlin, Germany 30-31 October 2018 Oil & Gas Non-Metallics, London, UK 14-15 November 2018 Wood-Plastic Composites, Vienna, Austria 26-27 February 2019 PVC Formulation, Pittsburgh, USA 1-3 April 2019 PVC Formulation, Cologne, Germany 9-10 April 2019 Plastic Pipes in Infrastructure, Dusseldorf, Germany

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

www.ami.international

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