

pipe and profile

July/August 2013

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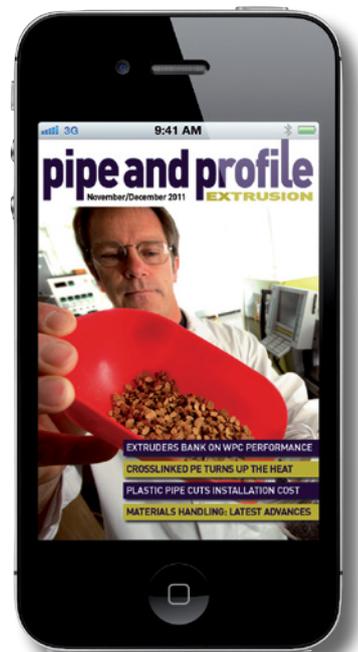


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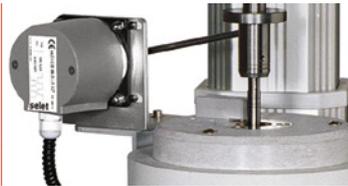
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Evonik adds to plasticiser production

Evonik has commissioned its new plant for the production of phthalate-free plasticisers for PVC compounds at its Marl Chemical Park in Germany. The 40,000 tonnes/year plant is producing 1,2-cyclohexane dicarboxylic acid diisononyl ester, which will be sold under the Elatur CH brand name. It shares the same chemistry as BASF's established Hexamoll DINCH products.

Evonik is also developing bio-based plasticisers that it plans to launch under the Elatur brand. Negotiations with cooperation partners are said to be "at the final stage".

Dr Rainer Fretzen, head of Evonik's Performance Intermediates business line, said: "The expansion of the portfolio with phthalate-free and bio-based plasticisers is an ideal addition to our existing Vestinol product family that has been tried and tested for decades".

www.evonik.com

FPIG buys Spanish pipe manufacturer Protesa

UAE-based Future Pipe Industries Group (FPIG) has taken over Spanish pipe producer Protesa, to extend its operations in fibreglass pipe manufacturing.

"This is an important step in our strategy to diversify outside our core market in the [Middle East]," said Fouad Makhzoumi, chairman and CEO of FPIG.

FPIG says that the takeover improve sales to clients in the water, desalination, industrial and infrastructure sectors in Europe, North West Africa and Latin America. It also gives FPIG its first manufacturing

facility in India.

Protesa has headquarters in Barcelona, Spain, and production facilities in Zaragoza (Spain), Pune (India) and Jorf Lasfar (Morocco).

It has made glass fibre-reinforced Polyester (GFRP) composite pipe systems for more than 50 years.

"This significantly increases our ability to service our clients from a dedicated GRP facility in Europe," added Makhzoumi.

FPIG made a similar acquisition in April, when it bought US fibreglass reinforced pipe maker Specialty Plastics

Inc (SPI) in the US. SPI, based in Baton Rouge, Louisiana, supplies fibreglass pipes and systems for offshore platforms and marine vessels.

"The takeover will enhance our existing manufacturing and sales operations in the US and expand our reach within the oil & gas sector," said Makhzoumi.

FPIG supplies to the oil & gas, marine, industrial and infrastructure sectors. It operates nine factories and employs more than 3500 people.

www.futurepipe.com

www.protesapipes.com

Unicor moves into North America

German pipe corrugator manufacturer Unicor has expanded into North America through the acquisition of Adescor of Canada.

Adescor manufactures downstream equipment for corrugated pipe, including saws, cutters and bell in-line trimmers. The two companies

have previously worked together on the North American market, supplying equipment to numerous projects.

Unicor says the acquisition will help it to service its North American customers from a local base.

Klaus Kaufmann, Unicor's managing director, said: "We

are pleased to purchase an experienced company like Adescor. We will add Adescor products to the Unicor range, and offer them worldwide."

Adescor already supplies pipe producers in both Europe and North America.

www.unicor.com

www.adescor.com

Australia completes phase-out of lead in PVC

The Vinyl Council of Australia has reported that the signatories to its PVC Product Stewardship Program have completed the phase out of lead-based stabilisers in all product sectors.

When the voluntary initiative was launched in 2002, the signatories were using more than 1,000 tonnes of lead in stabiliser compounds, according to Sophi Macmillan, chief executive of the Vinyl Council. "By the end of 2012, the Program signatories had successfully switched from these stabilisers to alternatives that don't have the environmental and occupational health concerns lead compounds pose," she added.

www.vinyl.org.au



Italy and Germany foresee a tough 2013

Europe's two main producers of plastics and rubber machinery are predicting a difficult time in 2013.

Italy has reported reduced exports in the first quarter, while Germany expects growth of only 1% for the whole year.

Figures from industry association Assocomplast show that Italian machinery exports fell by 4% in the period, in comparison with the previous year. At the same time, it said there was a "nine-point drop in imports".

"The result is not surprising, given that orders had started to slow at the end of 2012," said Assocomplast.

It based this on its 'business climate survey' that was conducted at the start of 2013. However, a more recent survey, conducted in April and May, indicated a modest upturn in orders.

The association was also pessimistic about sales within Italy.



Reifenhäuser. "Incoming orders gives us reason to hope that things have bottomed out"

"On the domestic front there are no signs in the near future of any increase in production output," it said. "It will be interesting to see whether the "decree of doing", recently enacted by the government, will give processors the means they need to invest in new equipment."

At the same time, German plastics and rubber machinery manufacturers are not

expecting a recovery in sales until next year.

Industry association VDMA estimates a 1% fall in sales this year, taking output to around €6.5bn. In 2014, producers expect a 6% increase to €6.9bn.

"In October last year, we predicted 3% growth for 2013. Based on the last six months, this has been revised downwards," said VDMA chairman Ulrich Reifenhäuser. "The level of incoming orders in April gives us reason to hope that things have now bottomed out."

Exports are expected to grow in 2013 and 2014, with sales to Asia picking up again.

VDMA managing director Thorsten Kühmann added: "Demand from Central and Eastern Europe will also continue to rise. As a result, foreign sales are set to be up slightly this year overall."

■ www.assocomplast.org

■ <http://kug.vdma.org>

Ferro backs dibenzoate plasticisers

Ferro is adding 28,000 tonnes of production capacity for dibenzoate-based plasticisers at its plant in Antwerp, Belgium. The new capacity for the non-phthalate, fast-fusing plasticisers is expected to come on stream in the second half of 2014.

The project includes installation of technologies to produce benzoic acid, which will allow backward-integration into this key raw material at the Antwerp facility. The dibenzoate product offerings will complement Ferro's existing Santicizer family of benzyl phthalate plasticisers.

Ferro operates a plasticiser application laboratory at its Mont-Saint-Guibert facility in Belgium. The dibenzoate project will benefit from this facility which helps customers to optimize their formulations.

■ www.ferro.com



PolyOne completes PVC sell-off

PolyOne Corporation has completed the sale of its vinyl dispersion, blending and suspension resin assets to Mexichem for \$250m.

It expects after-tax proceeds of around \$150m, and to recognise an after-tax gain on the sale of around \$140m.

The sale represents the last of PolyOne's resin production assets – which it says marks an important milestone in its

ongoing "specialty transformation" that began in 2006.

"This was a natural next step in the evolution of our portfolio and ultimate vision for PolyOne," said Stephen Newlin, chairman, president and CEO of PolyOne.

Assets transferred in the sale related only to resin production. They included manufacturing plants in Pedricktown, New Jersey and

Henry, Illinois, plus a resin research facility in Avon Lake, Ohio. PolyOne continues to own and operate its Geon Performance Materials and Specialty Coatings businesses, which produce vinyl-based formulations, plastisols and powder coatings under the Geon brand name.

■ www.polyone.com

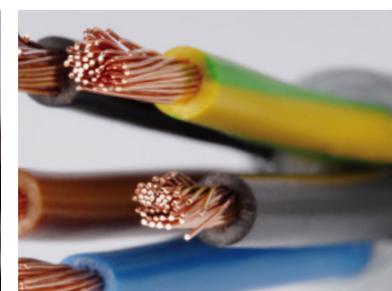
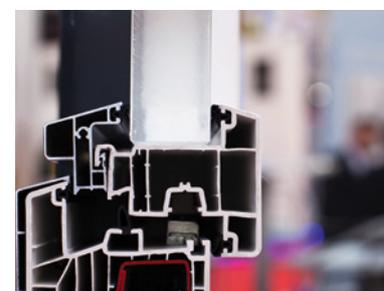
■ www.mexichem.com



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Putnam extends medical tube manufacturing with cleanroom

US-based Putnam Plastics has built a new manufacturing site to expand production of its range of medical tubing.

The 92,000 sq ft (8500 sq m) facility in Dayville, Connecticut will allow for expansion of extrusion technology development and manufacturing operations. It will include dedicated space for Putnam's three key growth initiatives: clean manufacturing, product finishing and technology development.

This includes a new 6,000 sq ft (560 sq m) ISO Class 8



Putnam's new site will include cleanroom extrusion facilities

cleanroom for extruding and finishing components that require greater regulatory controls. Finishing operations will include printing, insert moulding, tipping, welding and

assembly for finished tube components used in medical devices.

"Our existing space will continue to provide traditional extrusion services," said Jim

Dandeneau, Putnam's chief executive officer. "The expansion allows us to support increased demand for more complex, comprehensive extrusion components and will serve as a showcase for emerging extrusion technologies available for medical devices."

Putnam's new technology developments include continuous manufacturing technologies that minimise manual operations to produce complex, composite catheter designs.

www.putnamplastics.com

HDPE stops water leaks in South Africa



Pietermaritzburg, the capital of KwaZulu-Natal province in South Africa, has switched to high density polyethylene in order to replace 2km of old, leaking metal pipes.

To minimise inconvenience to inhabitants, the existing water mains were replaced without excavation, by bursting the old metal pipes and replacing them with Wavin TS

DOQ pipes, made from Total's XSene XSC50 material.

Total's latest generation of HDPE pipes rely on its PE100-RC (resistance to crack) grades.

"PE100-RC was developed between our companies and we have used it extensively in our TS DOQ pipes," said Wavin.

www.total.com

www.wavin.com

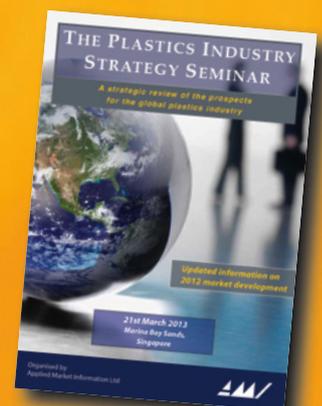
AMI Strategy Seminars

These one-day seminars are given by an AMI director and provide invaluable insights into market trends and industry strategies. They are held in small groups and provide ample opportunities for questions and discussions.

15 October 2013: Cologne, Germany

9 December 2013: Dubai, UAE

Contact: **Katy Cheng**, kb@amiplastics.com, +44 117 924 9442
www.amiplastics.com/seminars





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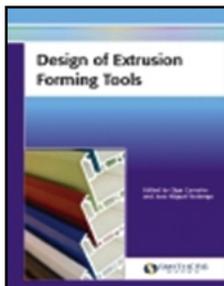




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DESIGN OF EXTRUSION FORMING TOOLS



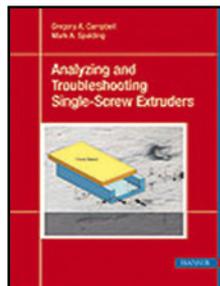
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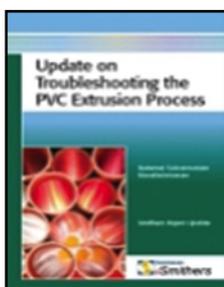
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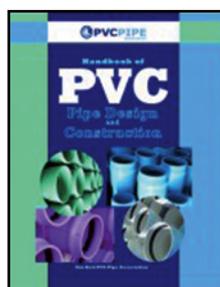
2011, by Muralisrinivasan,
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Association,
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Whether it's software to help pipe meet industry standards or equipment to assess material purity, manufacturers rely on systems to help them improve quality. **Lou Reade** reports



Setting standards

The quest to achieve perfection in plastics manufacturing starts from the moment that goods are received at the factory – through testing of raw materials – through to the end of the line, as finished goods are signed off. Anything that can help manufacturers to assess their performance adds to efficiency and profits.

And, surprisingly, it doesn't have to cost a fortune. The **Plastics Pipe Institute** (PPI) has developed free software that allows engineers to make pressure calculations for pipe products used in water distribution, transmission main systems and force mains.

The beta version of the software, called Plastics Pipe Institute Pipeline Analysis & Calculation Environment (PPI Pace), is available online (at www.ppipace.com).

"PPI Pace allows engineers and industry professionals to perform plastic pipe pressure design calculations in accordance with AWWA and ASTM industry standards," said Tony Radoszewski, executive director of the PPI. "It will help in the selection of an appropriate pipe class for the required design life, by providing an easy-to-use tool that is consistent with existing standards and practices."

Standards used in PPI Pace include AWWA C900, AWWA C901, AWWA C905, AWWA C906, ASTM F714 and ASTM D2241.

Input parameters include material type, pipe size, pipeline length, design velocity for recurring and occasional surges, working pressure, anticipated recurring surges, temperature, and minimum design life.

PPI Pace produces a summary report and then pressure and life charts comparing PE4710, ASTM-F714, PE4710 AWWA-C906 and PVC AWWA-C900, for example.

The system was developed by Karl Lawrence, of eTrenchless Consulting in Waterloo, Ontario, and Mark Knight, associate professor and executive director of the Center for the Advancement of Trenchless Technology (CATT) at the University of Waterloo.

Lawrence and Knight also developed PPI-BoreAid and BoreAid, earlier design tools for trenchless applications of PE pipe used in gas distribution, water and sewer systems.

PPI Pace can be used with BoreAid, as well as with the PPI Design and Engineering Calculator, which also improves understanding of PE pipe capabilities.

The calculator will help design engineers to perform multiple computations relating to internal and external pressure ratings, pressure and gravity water flow, water hammer, low pressure and high pressure gas flow, according to PPI.

Modular measurement

The modular **Instron** Ceast MF20 and MF30 Melt Flow Testers are single-weight measurement systems that can be used in research and development as well as quality control. They provide increased convenience and accurate measurement of plastic flow properties according to ASTM D1238 and ISO 1133. Both lines of

Atlas has added enhancements to its Weather-Ometers including an email notification tool

PPI Pace software allows engineers to make pressure calculations for pipe products

melt flow testers conform to strict tolerances with regard to temperature accuracy and stability, specimen quantity and pre-treatment.

They comply with the requirements of the new testing standard ISO 1133-2 for materials sensitive to time-temperature history and/or moisture.

The MF30 includes a weight magazine and weight lifter (which is available as an option for MF20). The weight magazine contains a complete set of eight test masses ranging from 0.325 kg (piston mass) up to 21.6 kg for testing a wide spectrum of materials, from fast-flowing masterbatches to highly viscous elastomers or filled thermoplastic polymers. A high-convenience mechanical system, the newly developed Manual Mass Selector, enables pre-selection of the required test mass. All test masses remain installed on the machine at all times: this eliminates the need to handle and apply heavy test masses and enhances the safety of laboratory staff.

A further standard feature of the MF30 model is a high-resolution load cell for controlled compacting of the material before the test, with a maximum force of 750N. Also included as standard is a high-precision encoder, which allows the controlled extrusion of the melt to a defined height. The software also enables purging of the barrel at the end of a test, specifically when testing low MFR materials.

The MF20 is a basic instrument that can be configured with a variety of options, such as a manual or motorised melt cutting device and a high-resolution digital encoder for MVR measurements according to ASTM D1238, Methods B and C (included as standard on MF30 models).

Depending on the application, both models can be extended with additional modules, including a die plugging device to prevent material flowing during pre-heating, a nitrogen blanket device for testing hygroscopic materials, an acid-resistant version for chemically aggressive materials and the Ceast Visual-Melt Software for storage, analysis and graphical presentation of results.

Both models feature an integrated operator panel with LCD display and a compact design, which enables testing, service and maintenance to be done easily, quickly and safely.

At the interface

Atlas Material Testing Technology has introduced new user interface software for its current series of Weather-Ometers. This latest software includes a number of enhancements, including email notification and sample management.

The email notification tool prompts the instrument to



automatically send an email when several user-defined conditions are met, including: completion of a test; when a scheduled stop is reached; triggering of an alarm; and, when a scheduled maintenance or calibration is required.

The software allows users to input multiple e-mail addresses, as well as specifying when to send e-mails based on the conditions.

Because of the Weather-Ometer's capacity, it is common for multiple tests with multiple start times to run on the same instrument. Recording and monitoring these individual tests has been a manual process, usually using log books or home made spreadsheets and databases.

The sample management tool keeps track of exposure time very easily. Operators can keep track of multiple tests within the same Weather-Ometer on the user interface.

This allows users to: name specific sets of samples; input the number of specimens within each sample set; tell the Weather-Ometer if the samples are currently on exposure or out of the instrument for evaluation purposes, and, delete sample sets once exposures are complete.

Up to 10 individual sample sets can be tracked at once, either by time or by radiant dosage, says Atlas.

In hot water

Researchers from **Kyoto Institute of Technology** in Japan have studied the lifetime performance and

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New Instron melt flow testers meet the stricter requirements imposed by ISO 1133-2



recyclability of pipes made from polyethylene of raised temperature resistance (PE-RT), which are used to transport hot water for applications such as under-floor heating.

The greater recyclability of PE-RT, compared to cross-linked PE (PEX) could lead to it being specified more often in

Pipe lifetimes were tested using a hydrostatic pressure test at high temperature, as well as a new method using hydrodynamic pressure test at high temperature. PE-RT pipes were compared with PEX-b pipes, using both methods.

The researchers found that the pipes made of PE-RT resin, in combination with hindered phenol stabilisers and hindered amine light stabilisers (Hals) failed in ductile mode over 14,000 hours – and the high concentration of stabilisers was not necessary. Instead, the researchers determined an effective combination of stabilisers to extend pipe lifetime.

Regarding the comparison results of hydrostatic and hydrodynamics pressure tests, there was little difference of the failure time between PEX-b pipes in the hydrostatic pressure test, but there was a large difference in the hydrodynamic pressure test. The failure time for PE-RT using the two tests was also minimal.

“The failure time of the hydrodynamic pressure depended on oxidative induction time (OIT) in the PEX-b pipes,” said the researchers.

However, the failure time of the PE-RT test pipes was similar using both tests.

“The hydrodynamic pressure test was more sensitive than the hydrostatic pressure test, and was more similar to actual usage,” the researchers concluded.

Cracking the problem

Meanwhile, US-based **Engineering Systems** has analysed environmental stress cracking (ESC) failures in CPVC fire-suppression sprinkler pipes. It looked at three separate cases of failed pipe that were linked to ESC due to chemical exposure.

“The investigations highlight the importance of interpreting fracture surface morphology, review of background information regarding service history, performing material characterisation testing, and understanding the interaction of various chemicals with CPVC when attributing a failure to ESC,” it said.

Attributing a CPVC pipe failure is difficult in comparison with other causes of failure, due mainly to the fact that it is a complex failure mode, said the company.

In the first case, a CPVC pipe developed a long crack during service. A portion of the pipe was inspected. It was seen to have failed well below the yield strength of the material. The inner surface was covered with an oily substance similar to castor oil. The investigators concluded that it was traces of an incompatible thread cutting oil,

In the second case, pipe failures had occurred in a multi-storey residential building, which was attributed to low temperatures – and confirmed by lab testing.

In the third case, pipes had failed where a mould disinfectant had been applied to the outside of pipes. The chemical was known to be incompatible with the pipe, and analysis of the samples showed that the fractures had initiated on the outer surface of the sprinkler pipe.

However, specimens that were swabbed with the disinfectant were tested, and found to last longer than material from the fittings. The conclusion was a failure of the fitting, due to injection moulding defects, rather than chemically-induced ESC.

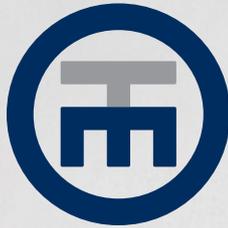
“There is a need to develop a standard test method by which to evaluate the compatibility of chemicals that may be present in CPVC sprinkler pipe systems,” said the company.

Click on the links for more information:

- | www.plasticpipe.org
- | www.instron.de
- | www.atlas-mts.com
- | www.kit.ac.jp/english
- | www.esi-website.com

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The growing importance of recycling has led to the development of many more sophisticated systems to reclaim usable material. **Lou Reade** reports

Cut down to size

Where once recycling of plastic was done instantly, in order to maximise the use of off-cuts, it is now the basis of a thriving business. Ways of sorting and separating plastics are continuing to improve, while a host of specialist companies have developed ways of getting the maximum use from used material.

Austrian recycling systems developer **Erema** has developed a new 'upcycling' technology with German compounding specialist **Coperion**. Their Corema technology combines Erema's recycling know-how with Coperion's compounding expertise. It comprises an Erema shredder/compactor unit, single-screw extruder and melt filter which feed molten recyclate directly into a Coperion twin-screw compounding extruder.

Direct feeding of the molten recyclate into the compounding extruder is claimed to reduce energy costs and minimise residence time and shear, while allowing the system operator access to the full range of filler, reinforcing, degassing and blending technologies provided by a twin-screw compounding installation.

According to Erema, the Corema system allows recycled polymers to be used in formulations with up to 80% calcium carbonate filler and up to 50% glass or wood fibre reinforcement. It is not possible to incorporate such high non-polymer addition levels in the

standard Erema single screw recycling system, according to the company. It said this opens up possibilities to manufacture customised high added-value compounds for high-performance applications.

Erema has also opened a new €5m customer centre at Ansfelden, near Linz in Austria. The 1,200m² facility houses seven recycling lines, which are available for customers to carry out trials and test runs using their own material feedstreams.

At the same time, US-based Rainier Plastics, of Yakima, Washington, has brought on line its fourth Erema plastics reprocessing system, a 1512 TVEplus with Erema SW RTF back flushing screen changer.

Rainier bales, shreds, grinds, pelletises, and blends more than 35m pounds (16,000 tonnes) of raw materials per year, delivering custom-processed pellets that are matched to customer requirements.

In the basic Erema system, scrap is fed into a large vertical cutter/compactor that uses friction to densify, size-reduce and pre-warm the plastic material. An advantage of the large cutter/compactor is the ability to blend scrap materials dynamically while they are in the chamber. Scrap, which is inconsistent in its make-up and amounts, is blended to produce a steady, predictable melt. The preheated, densified material is then fed

Rainier Plastics has invested in a 1512 TVEplus with Erema SW RTF back flushing screen changer



Erema's €5m customer centre houses seven recycling lines and includes equipment for end product evaluation

directly to the extruder screw. Compacting and melting occur gradually, at a precisely controlled temperature, adding minimal heat history to the reclaim.

Kathy Williamson, general manager of Rainier, said: "Plastics reprocessing is a rapidly evolving industry, demanding increasingly more precision in material engineering for specific applications. Erema technology has more than kept pace. They anticipate our markets and provide the systems we need to match our customers' expectations."

Magnetic attraction

Researchers in a pan-European project, called **W2Plastics**, have developed a way to separate different types of plastic by their specific weight, or density – in a single step.

The technique, called magnetic density sorting, consists of passing plastic waste through a tank with a suspension of nanometre-scale iron oxide particles, placed on top of a magnet. By attracting the iron oxide particles, the magnet artificially increases the density of the liquid – so it is highest at the bottom of the container, and lowest at the top. As the plastic, mixed in the iron oxide suspension, flows through the tank, it separates into different layers that match the densities of the different types of plastic flake. The sorting process consists of collecting the flakes at different heights.

"In one step the process eliminates contaminants,

such as wood or foam, and we get separate streams for polypropylene, polyethylene, PET, and polystyrene, at a cost below €100 per tonne," said Peter Rem, a researcher in resources and recycling at the Technical University of Delft in the Netherlands, and a member of the project.

He says the technique is precise enough to separate plastics whose densities differ by 0.1%. Project partner Redox Recycling Technology in the Netherlands is operating a prototype magnetic separator that can handle 200kg of plastic waste per hour.

Dutch recycling company Van Vliet Utrecht has also completed an experimental magnetic density sorter for heavy polymers with a capacity of 400kg/hour of plastic waste.

Rem says there are reasons why such a new technology is not guaranteed wide adoption: polymer manufacturers are not involved in the recycling of their products – unlike in the steel industry – and view recycling as conflicting with their own interests, said Rem. As a consequence, he added, technical information about them is lacking.

"The manufacturers also engineer the polymers in such a way that they can't be easily recycled," said Rem.

The wide variety of plastics creates another obstacle to recycling.

"A polymer that has to be extruded is entirely different from a polymer used for blow-moulding bottles," he said. "It is difficult to separate these different types of plastic from waste, so that they can be recycled easily into a new product."

Jean-Marc Saiter, a researcher in dense matter and materials at the University of Rouen, in France, wonders whether the cost of recycling technology can be justified for polyolefins.

"They are not toxic, so why would we recycle them?" he said. "The recycling process itself is not 'green', and recycling uses energy and transport, making it expensive."

But he believes that the magnetic separation technique is worth developing, especially for potential applications in the future.

"What is expensive today can be economic tomorrow," he said.

The pan-European W2Plastics project separates different plastics using magnetic density sorting



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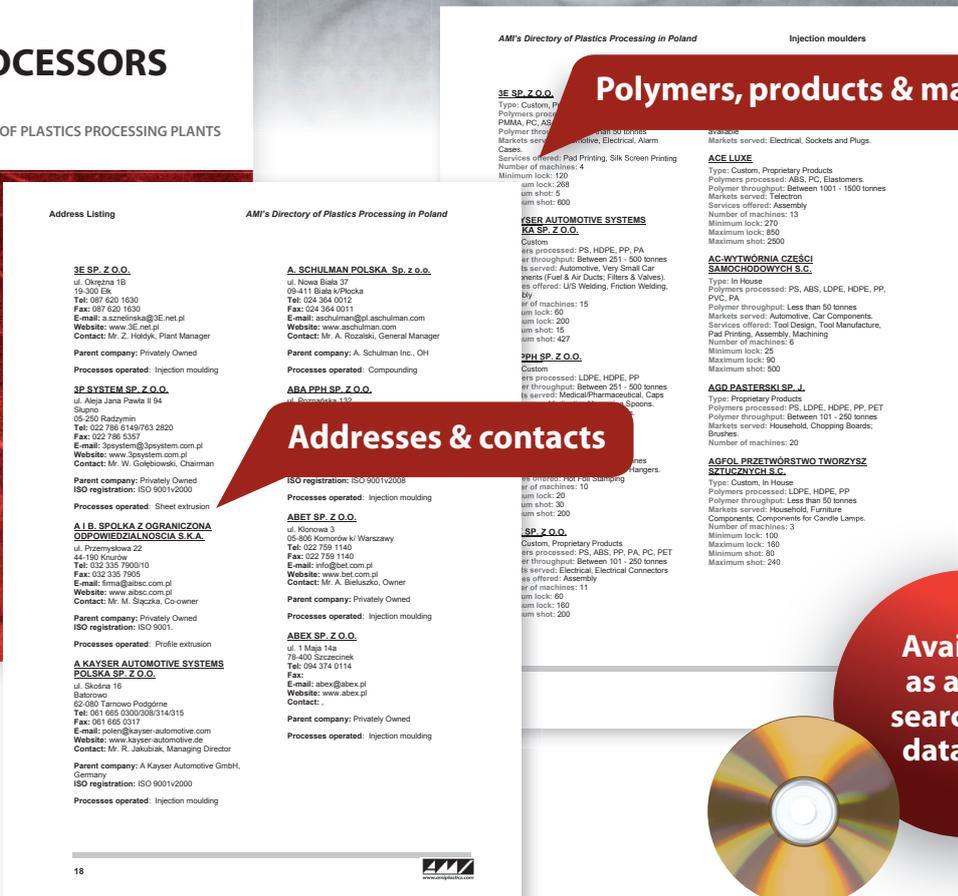
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Nylon 11 regrind

K2 Polymers, a UK-based specialist in recycling engineering plastics, has used an MRS extrusion system from **Gneuss Kunststofftechnik** of Germany to reprocess heavily contaminated nylon 11 regrind.

Reground nylon 11 is available when deep sea oil pipes are scrapped after having been recovered from the sea floor from a depleted oilfield. This valuable material is contaminated with oil, after years of use. Some of the oil is on the surface of the material, but some has diffused into the polymer itself, which is a problem when processing the material.

With the MRS (multi rotation system) extruder, processing and decontamination of the material can be carried out in one step. No complicated and expensive washing of the material is necessary prior to extrusion. The oil is extracted thanks to the patented processing technology of the MRS extruder, with its high devolatilising capacity (around 25 times greater surface area exchange rate under vacuum than an equivalent twin screw extruder).

The system requires a vacuum of only 25 to 40 mbar in order to remove the volatiles from the melt, including the necessary quantity of oil. K2 Polymers selected the MRS 70, which has a throughput rate of up to 150kg/h.

The system includes an RSFgenius Rotary Melt Filtration System for efficient, process and pressure constant of solid and semi-solid contamination.



The quality of the recovered nylon 11 can be used for making high quality vacuum and compressed air hoses for the automotive industry.

Pallmann is boosting its position in briquette and pelletising recycling with the acquisition of technology from Swiss company BP Recycling Systems.

Pallmann is a specialist provider of equipment and services for size reduction and preparation techniques in various industries. Its equipment handles materials ranging from soft through medium-hard, brittle to viscoelastic and fibrous.

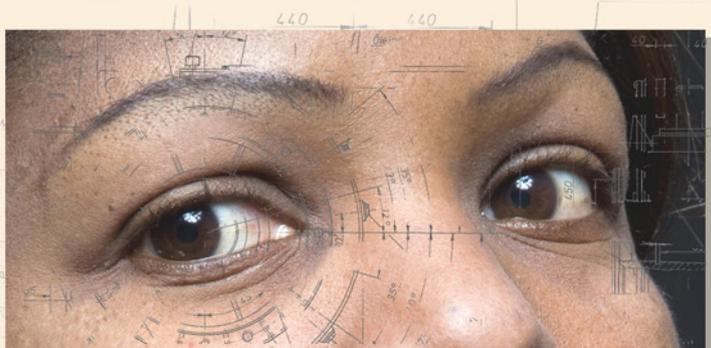
The acquisition will enable the company to extend its offering to include a full line of equipment for making briquettes and pellets from municipal and industrial solid waste, biomass, plastics, textiles and other materials.

Briquetting and pelletising are technologies downstream of pre-shredding and sorting of waste into homogenous waste streams, and are key for preparing the waste going into recycling and fuel.

Small footprint

Conair says that its NCF super-tangential granulators have a footprint at least 30% smaller than many other

NCF super-tangential granulators from Conair have a smaller footprint than comparable granulators



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granulators with similar capabilities. The cutting chamber configuration is ideal for handling lightweight bulky parts, but also produces clean uniform granulate from smaller parts.

Different hopper designs and rotor/knife choices are available to maximise performance with a wide variety of scrap types.

Four different models feature 8in (203mm) diameter rotors, in widths of 10, 14, 19 and 24in (240, 360, 480 and 600mm), and deliver standard maximum throughputs of 150-450lb (68-205kg). The smallest unit is powered by a 5hp motor and the three larger sizes have 7.5hp motors with options to 15hp. Standard rotor speed for the NCF 810 is 260rpm and standard speed on the larger models is 400rpm, although 260, 400 or 840rpm can be specified on any of the granulators to increase capacity, improve regrind quality and minimise energy consumption.

A tilt-back hopper and drop-down screen cradle provide easy access to the cutting chamber for maintenance and cleaning. These contribute to increased productivity and reduced downtime. An optional sound attenuation package makes the NCF series quieter than other small granulators, says Conair.

The super-tangential chamber design ensures that the rotor grips bulky scrap on the downward stroke, drawing it into the knives and preventing it from bouncing on the rotor.

Standard tangential and straight-drop in-feed configurations are also available.

The rotor itself can be open with three rows of double-angled knives for a clean scissors cut with minimum heat generation. For tougher materials, a



solid rotor can be equipped with three rows of up to five cassette knives in a staggered array. Cassette knives allow for quick and easy knife changes and reduce downtime for service and maintenance. The knives require no adjusting to maintain a consistent knife gap for improved quality.

K2 Polymers has used the MRS 70 system from Gneuss to reprocess contaminated nylon 11 regrind

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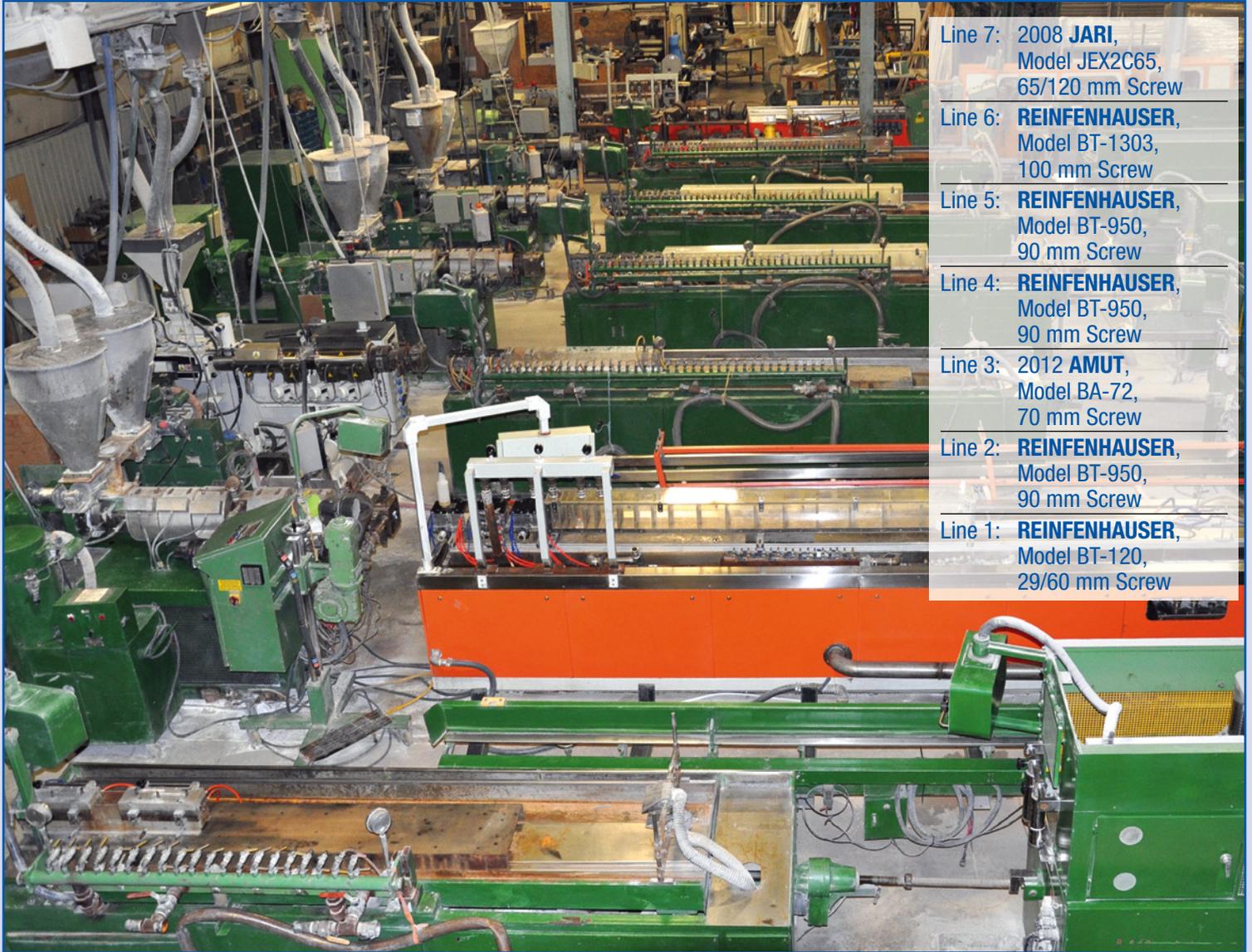


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Modern window profile production is relying more and more on sophisticated co-extrusion techniques.
Lou Reade reports

Double vision

Plastics continue to push other materials aside as the basis of window profile systems. And it is not just plastics, but recycled plastics that often make up the bulk of the structure – despite being hidden under the surface.

KraussMaffei Berstorff has developed a number of co-extrusion models, to help window profile manufacturers make more use of recycled material.

“Our systems help profile manufacturers to reduce material costs enormously, ensuring economical production,” said the company.

Its KMD 53 K/P model, launched on the market in 2012, completes the series of conical twin-screw extruders for the medium outputs and extends the company’s range of co-extrusion solutions.

Premium quality

“Our co-extrusion models allow processors to manufacture a premium quality end product using cost-effective raw materials,” said Peter Oswald, director of the profile extrusion product group at KraussMaffei Berstorff. “Our machine combinations are ideally suited for window profile production based on the standard market technologies: core technology, layer technology and combination technology.”

Extruders are using increasing quantities of fillers is growing continuously, as they use them to produce the hidden profile ‘core’, which is covered by a thin external layer of colour-fast virgin material.

Depending on the output of the separate layers, KraussMaffei Berstorff says a co-extruder can be used to process both the core layer and the top layer: for example, the conical KMD 63 K/P co-extruder in a KraussMaffei Berstorff line has a parallel twin-screw extruder to extrude the invisible core – but can also be used in layer technology to produce the outer layer of the profile.

The company says that the concept of using parallel and conical twin-screw extruders ensures optimum melt homogeneity and allows processing of different formulations with a single screw geometry.

When designing the conical screws, KraussMaffei Berstorff paid close attention to the increased requirement relating to the pressure stability of conical extruders. All screws in the series are molybdenum-plated and, when combined with the deep-nitrided barrels, provide active wear resistance – especially when processing recyclables and dry blends with high filler proportions.

One satisfied customer is Azerbaijan’s largest construction company, Azenco, which ordered a series of twin-screw extruders from KraussMaffei Berstorff to make window profile extrusions.

The order included: 32D series machines; rubber profile extrusion machines, for window and pipe seals; and a double-band system for making sandwich panels which, when insulated with polyurethane or mineral wool, are used in the construction of industrial buildings.

Star’s extended range of StarXtrude formulations can be used to make window seals



Bulgaria's Profilink has installed 10 new extrusion lines, increasing production capacity by 30%

All the machines are used at Azerco subsidiary STP Az, in the Sumqayit Technology Park in Sumqayid. The company runs more than 15 production lines there.

Increased capacity

Bulgarian window profile extruder Profilink recently installed 10 new extrusion lines, increasing production capacity by 30%. The machinery was supplied by **Battenfeld-Cincinnati** of Austria, while the tooling and downstream equipment came from **Greiner Extrusion**.

The order included six parallel twin screw extruders from the TwinEx 34D series and six conical twin screw extruders from the ConEx series. Each coextrusion line consisted of a TwinEx 78, with a ConEx 50 as coextruder. The TwinEx extruders are used to extrude main profiles, while smaller secondary profiles are made on the ConEx lines.

All the lines were equipped with the Greiner Energy Saving System, which regulates the vacuum level in the dry calibration units and tanks. It claims energy savings of 80% compared with conventional systems. The delivery also included post-coextrusion equipment (PCE) units for inline extrusion of sealing gaskets. These will fit different profile geometries and are easy to operate. Profilink also ordered dies with coex core technology, allowing material saving of up to 40% in the production of five-chamber window profiles.

Profilink now operates 37 extrusion lines, of which more than half have come from Austria.

"It was very important to us to purchase state-of-the-art equipment which combines maximum output with minimal energy consumption and space requirements," said Jordan Fidanov, managing director at Profilink.

Battenfeld-Cincinnati

KraussMaffei Berstorff's twin-screw extruder KMD 90-32/P is commonly used to make window profiles

has also seen success further East, having delivered 24 extruders to window profile manufacturer Wuhu Conch Profiles and Science in Anhui, China.

The extruders have diameters of 63-93mm and outputs of 70-380 kg/h. They have been in operation since the middle of 2012. With this expansion of its machinery and equipment, Conch Profiles has increased its PVC processing capacity to more than 700,000 tonnes per year. It also has factories in Ninbo (Zhejiang province), Tangshan (Hebei Province) and Yingde (Guangdong Province), running more than 400 extrusion lines.

Battenfeld-Cincinnati Extrusion Systems in Foshan, China assembles all extruders using core components made in Austria and Germany. A trained service team provides sales support to the processor after the machines have been installed.

"The demand on the Asian market for continuously higher quality standards in end products are increasing the pressure on processors," said Battenfeld-Cincinnati.

At the same time, German window profile extruder **Salamander** has launched its energy efficient BluEvolution 82 system.

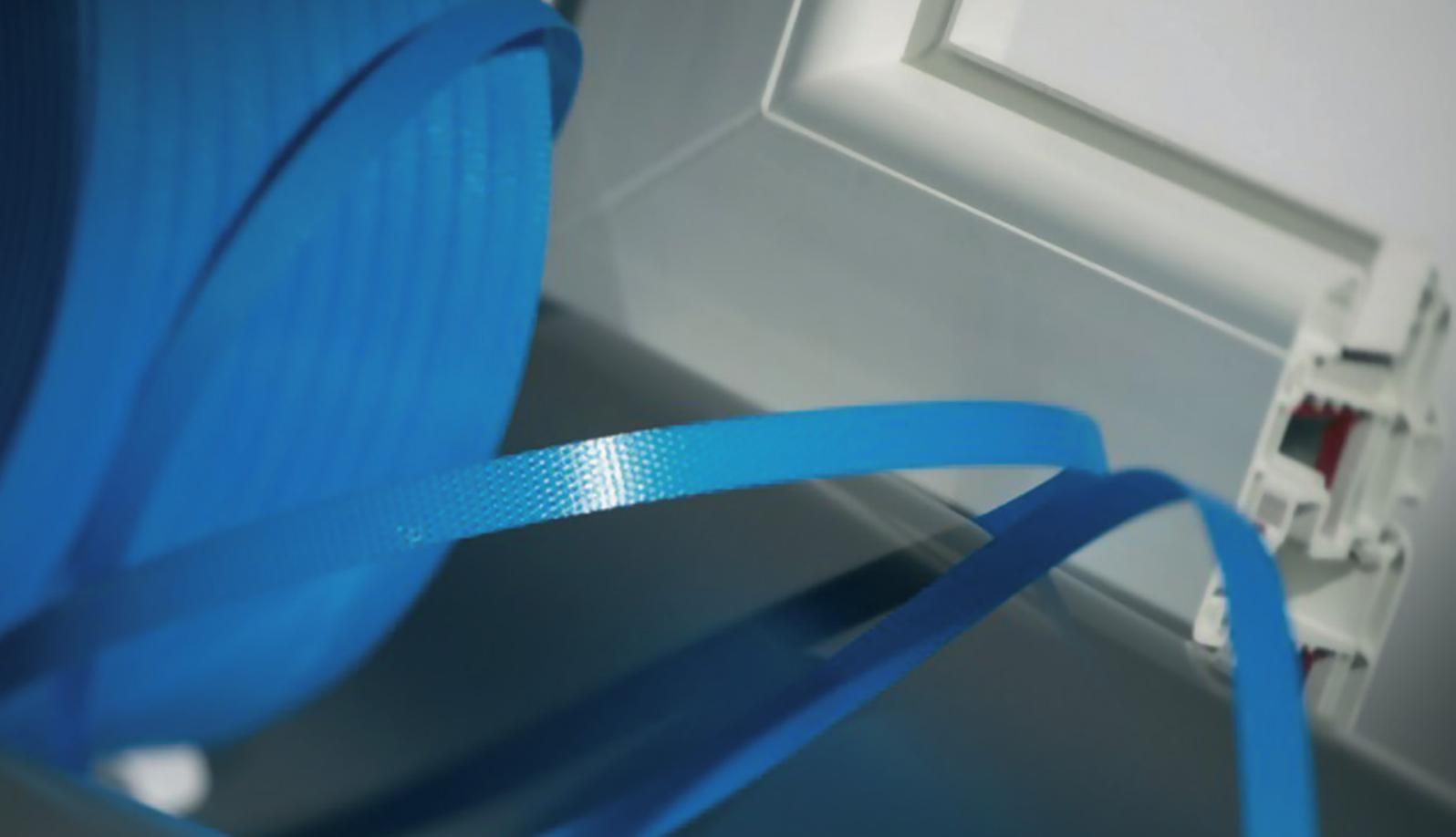
Two types of seal can be combined within the PVC profile system: it has either two rebate seals as standard, or as a centre seal system. The rebate profile is identically constructed in both versions, so separate stocks are not necessary. Also, the same steel reinforcement can be used both in frames, casements, jambs and in the meeting rail.

U values of up to 0.74 W/m²K can be achieved when using the centre seal, making it highly energy efficient.

Indian opening

Profine, the German window profile extruder, has expanded eastwards by opening a production site in





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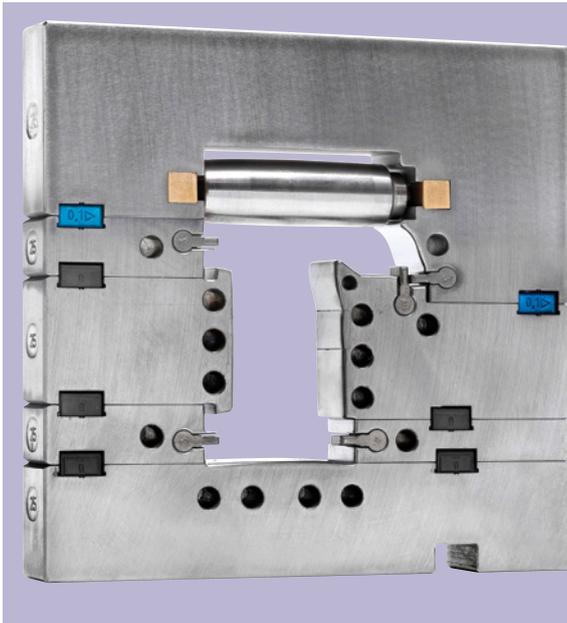


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Rolling vacuum

Austrian profile die specialist Greiner Extrusion has incorporated roller templates into the vacuum tank of its Red Tooling system, to provide virtually scratch-free window profile surfaces.

The roller templates improve energy efficiency, while reducing the reject rate to about 16%. There are also handling benefits: colourful marks are ultrasonic-resistant and give substantial guidance in regards to installation direction and positioning in the vacuum tank. They are easily reworked using the roller tuner, and can provide long service life.

A multi-cyclone tube supplies the tank with a vacuum, which controls the water level automatically. This minimises the sources of error, and reduces water consumption by nearly 50%, compared to traditional systems.

“Energy-efficiency, economical use of resources and high productivity are the fundamental factors in modern profile extrusion,” said Michael Schleiss, CEO of Greiner Extrusion.

India. The new plant, in Vadodara, is running three extrusion lines that produce profiles to German quality standards with a maximum output of 3,000 tonnes/year. Profine has invested more than €4m in the 14,000m² facility.

“We are pleased to take this further step in one of the world’s largest growth regions,” said Peter Mrosik, owner and CEO of Profine Group.

The company has been present in India for six years, by importing its Kömmerling brand through its subsidiary in New Delhi.

The new production site will make systems specifically for India, including the outward-opening 58mm ‘Gold Asea’ and the ‘Orta’ sliding system.

“The production plant in Vadodara is a clear sign of our commitment to the Indian market and to its extraordinary growth opportunities,” said Mrosik.

flexible function combined into a single part.

Star says that the new grades can reduce assembly costs while enhancing performance and function.

An added benefit of the materials is the ability to reprocess and remould them, which provides a level of design and fabrication flexibility that is not usually possible with thermoset rubber.

The grades, offered in a range of Shore A hardnesses, are fully colourable.

Click on the links for more information:

! www.kraussmaffei.com

! www.battenfeld-cincinnati.com

! www.greiner-extrusion.com

! www.sip-windows.com

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Wuhu Conch Profiles recently ordered 24 extruders from Battenfeld-Cincinnati

Sealed up

Star Thermoplastic Alloys & Rubbers of the US has increased the number of formulations of its StarXtrude extrusion grades of SEBS-based thermoplastic elastomers (TPEs).

The grades offer a flexible, rubber-like feel, and are formulated for extrusion and co-extrusion applications that fuse different StarXtrude compounds – offering rigidity and strength as well as soft, flexible one-piece profiles.

Applications include window and door seals, as well as tubing, gaskets, valves, bumpers, cushions and grips. The new formulations were developed for products where end use characteristics call for slip resistance, shock absorption, weatherability, smooth surface and lubricity, as well as structural integrity and



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Close control



Keeping an eye on the production process – from product dimensions to line speed – helps to ensure that everything runs smoothly

The interface between a machine operator and the machine itself is a critical one. And, while many processes are automatic, there is often no alternative to human intervention – which needs to be as fast as possible if the production process is to see as little disruption as possible.

Theysohn Extrusion has extended the capability of its TEC 4 extruder control system by adding remote diagnosis via the internet.

On the extruder screen, a failure is displayed and the production stops. Solving the problem may take hours. While this can be speeded up with the help of an expert, somebody is not always available at such short notice.

In many cases, it is much more effective to have the expert connect to the extruder control via remote access. This allows them to read all production data, identify possible faults and take appropriate action. In most cases, this can be done online.

This quick and secure failure diagnosis reduces extrusion line downtime, and increases productivity.

Advantages of the failure remote diagnosis include: reduced downtime; quicker software update; and avoidance of expensive technicians at the customer's site.

Working through a Siemens control system, the failure remote diagnosis offers these options: remote view and control of the visualising system; data transfer for analysing or clearing the failure; update of the visualising system; access to the operating system; support for handling of the extruder; reading of parameters and failure messages of the frequency converter; connection to PLC to support failure diagnosis; and, clearing possible program failures in the PLC.

Gathering data

New software for the **Dynisco** LMI Series of melt-flow indexers offers simplicity in gathering, storing and managing polymer test data collected by the system. The Lava Suite software (which stands for 'Laboratory Viscosity Analysis') is a proprietary development.

"The LMI is Dynisco's approach to reinventing one of the most common pieces of equipment in any polymer laboratory," said Joe DiOrio, product manager. "Along with its ergonomic features, our new software turns a standard piece of laboratory equipment into a 21st century test operator's dream come true."

Innovation on LMI melt flow indexers include an ergonomic weight-handling system, automated resin-sample packing, improved digital piston-displacement measurement and a touch-screen user interface.

The new software captures not only melt index values, but also shear stress, shear rate, viscosity and apparent melt density, while also recording testing conditions. It has the look and feel of applications for

The ATC990 is ideal for managing critical process parameters such as polymer melt pressure or temperature on an extruder

The SmartLinc processor is a direct interface from Laser-Linc's laser micrometers to control systems



BMS Vision has delivered “several hundred” DU11 data units to the plastics industry, since its launch this year



PCs or mobile devices.

At the same time, the company has made its new controllers and indicators easier to use, with a number of modifications.

Large, backlit LCD displays, which use clear text messages instead of mnemonic codes, make the new UPR900 process indicator and ATC990 pressure/temperature controller easier to use than earlier devices.

Connected up

Network and Internet connectivity, via the Modbus protocol, simplifies operations like programming, process monitoring and control, and data-logging. Both units are compact 1/4 DIN units that are IP66 rated for use in rugged plastics processing applications.

Set-up of both devices is quick and easy, thanks to a step-by-step configuration wizard that opens automatically the first time the unit is powered up. In everyday use, a menu-driven user interface simplifies operation and increases flexibility.

The ATC990 is a discrete, auto-tuning controller that is ideal for managing critical process parameters such as polymer melt pressure or temperature on a plastics extruder.

“When the plant needs only a single point of control – but that loop is critical – the ATC990 has the sophistication users need in a very simple package,” said DiOrio. “The ATC990 is a cost-effective way to display pressure and temperature, all while controlling the process.”

Standard inputs include strain gage, thermocouple or linear (dc-voltage or milliamps), and the unit can also control differential pressure when an optional secondary strain gauge input is used.

The UPR900 process indicator can display a range of engineering units related to standard strain gage,

thermocouple or voltage/current inputs. An optional secondary input makes it possible for the user to display pressure and temperature simultaneously. If the two inputs are selected as pressure inputs, the user could monitor differential pressure – on a melt screen changer, for instance.

Mixing onscreen

Plasticolor volumetric and gravimetric mixing stations, in combination with extruder regulation and length/weight regulation, are now being controlled by the company’s PPM II modules.

The PPM II controls now include new software that allows the system to work on industrial PC with touchscreen.

Many mixing stations with this new touchscreen control have been supplied to the market, says the company.

On the screen the mixing stations and other components are displayed graphically. The complete operation can be done via touchscreen, without mouse or keyboard. Based on the graphic display, the functions are self-explanatory and all functions of the mixing stations are intuitive.

In order to handle larger extrusion lines (such as co-extrusion lines), the industrial panel PC is available with displays of 10, 15 and 19in. It can be mounted in cabinets and in conformity with VDE and UL regulations. A main power switch, short key push buttons for the mixing station or extruder regulation can also be included in the same cabinet.

BMS Vision says that it has delivered “several hundred” DU11 data units to the plastics industry, since its launch earlier this year.

The touch screen data unit is the high end member of the BMSvision data collection terminals featuring a 7in touch screen and a graphical intuitive web-based user interface. It is ideal for companies that are striving for paperless manufacturing. It can be used as data collection terminal and HMI in combination with all BMSvision’s Master systems.

The DU11 incorporates wired Ethernet as well as the company’s Bluetooth-based wireless network interface. Onscreen language selection allows users to switch between several languages on the spot.

By selecting a menu button on the touch screen, the operator can enter stop declarations, quality information, request information about current and planned orders, view the most important key performance indicators (KPIs) and enter notes or comments.

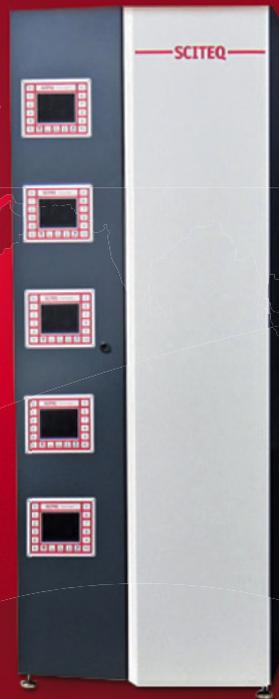
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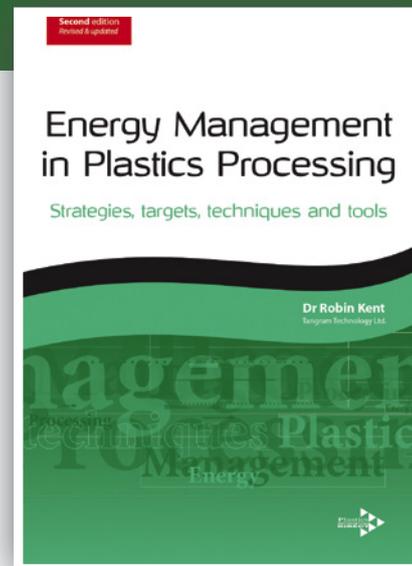
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Plasticolor's volumetric and gravimetric mixing stations are now being controlled by the company's touchscreen PPM II modules

instructions related to the job can be displayed thus eliminating the distribution of physical documents on the shop floor.

Profile inspection

Starrett-Bytewise has introduced the Profile360 Generation3 in-line profile measurement system.

The sensors inside it have been re-engineered around higher-resolution detectors to deliver a number of benefits, including: 40% improvement in resolution, accuracy and repeatability, in comparison with the previous model; a faster measurement rate (14 per second). It also includes a C-frame angle indicator, and a vortex cooling system.

The system is used by extruders of PVC window frames, PVC sheet, wood-plastic composites (WPCs) and rubber to inspect profile geometry in-line on the extruder. This monitoring helps to improve quality and yield, and reduce scrap and the need for manual off-line sample testing.

The system includes ProfileView-er2.03 software, which provides many new features, including: remote web diagnostics; auto-save PDF snapshot; independent exposure time setting, which allows the operator to optimise the exposure for multi-material profiles; and sub-region matching, which allows the measurement of profiles that flex around a hinge point.

Current customers include extruders of window profiles, rubber spacers, PVC sheet and WPC decking board.

The Masterspeed range of non-contact laser Doppler gauges from Scantron is available with built in zero-speed sensing



Doppler gauges

The Masterspeed range of non-contact laser Doppler gauges from **Scantron** is available with built in zero-speed sensing. They automatically detect direction and take

An advantage of in-line monitoring is that it allows automatic control of the size of WPC board, and allows manufacturers to run near a lower spec limit.

For a typical nominal board size of 1 x 5.5in (5.50 sq in), the usual minimum allowable size is 0.94 x 5.44in (5.11 sq in). The potential saving is the difference between the two, which is 0.39 sq in.

For each foot of board, this is a saving of 4.68 cubic inches. Assuming an extrusion speed to 12 ft/min and a cost of \$0.6/lb, this equates to around \$55/hr, more than \$1,000 per 20-hour day and around \$385,000 per year.

"If you run at 1/4 spec, you would save half this amount – not too bad on a \$55,000 investment," said the company.

One WPC extruder estimates savings at \$4,000 per month based on scrap reduction, running near a lower spec limit, and headcount reduction.

LaserLinc is introducing the SmartLinc processor, a device for direct interface from its laser micrometers to control systems.

SmartLinc integrates easily into the line control system, communicating via Ethernet or serial port to the PLC. A single unit provides a communications link for one, two, or three of LaserLinc's full line of single, dual, and triple-axis laser scanning micrometers.

To simplify communication management, the processor transmits data to the PLC at user-defined intervals and to user-specified locations in the PLC via tags. Once configured and integrated, SmartLinc provides unattended and reliable operation. No ongoing monitoring is needed.

Easy-to-use configuration and diagnostics tools enable the user to access and manage all SmartLinc devices over the plant network, or by Ethernet cable-connection from a laptop directly to a SmartLinc device.

LaserLinc says that its systems can provide a time-to-payoff in months – or even weeks – by reducing scrap and waste, shortening startup times, ensuring product quality, and through process improvement and optimisation.

Best Selling Books in 2013

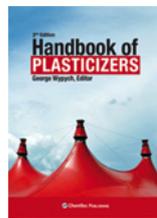
What have your colleagues and competitors been reading this year?



1
Cost Management in Plastics Processing: Strategies, targets, techniques and tools, 3rd edn.

Kent, 2012
 €130.00 or £110.00 or \$175.00

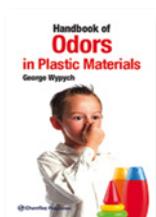
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7
Handbook of Plasticizers, 2nd Edn.

Wypych, 2012
 €215.00 or £180.00 or \$285.00

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2
Handbook of Odors in Plastic Materials

Wypych, 2013
 €210.00 or £175.00 or \$275.00

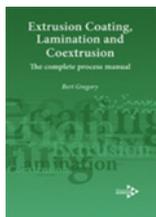
[MORE INFO/BUY NOW](#)



8
Design of Extrusion Forming Tools

Carneiro and Nobrega, 2012
 €150.00 or £125.00 or \$200.00

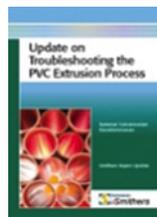
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3
Extrusion Coating, Lamination and Coextrusion: The complete process manual

Gregory, 2012
 €150.00 or £125.00 or \$200.00

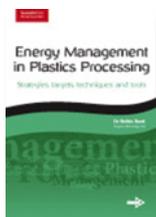
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9
Update on Troubleshooting the PVC Extrusion Process

Muralisrinivasan, 2011
 €95.00 or £80.00 or \$120.00

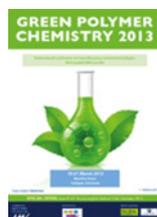
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4
Energy Management in Plastics Processing: Strategies, Targets, Techniques and Tools, 2nd Edn.

Kent, 2013
 €155.00 or £130.00 or \$205.00

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10
Green Polymer Chemistry 2013 - Conference Proceedings

AMI Conferences, 2013
 €335.00 or £280.00 or \$420.00

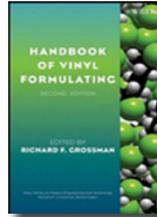
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5
Plastic Films in Food Packaging: Materials, Technology and Applications

Ebnesajjad, 2013
 €185.00 or £155.00 or \$245.00

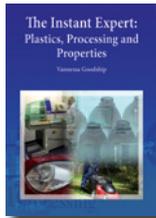
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11
Handbook of Vinyl Formulating, 2nd Edn.

Grossman, 2008
 €120.00 or £100.00 or \$150.00

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6
The Instant Expert: Plastics, Processing and Properties

Goodship, 2010
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12
PVC Formulation 2013 - Conference Proceedings

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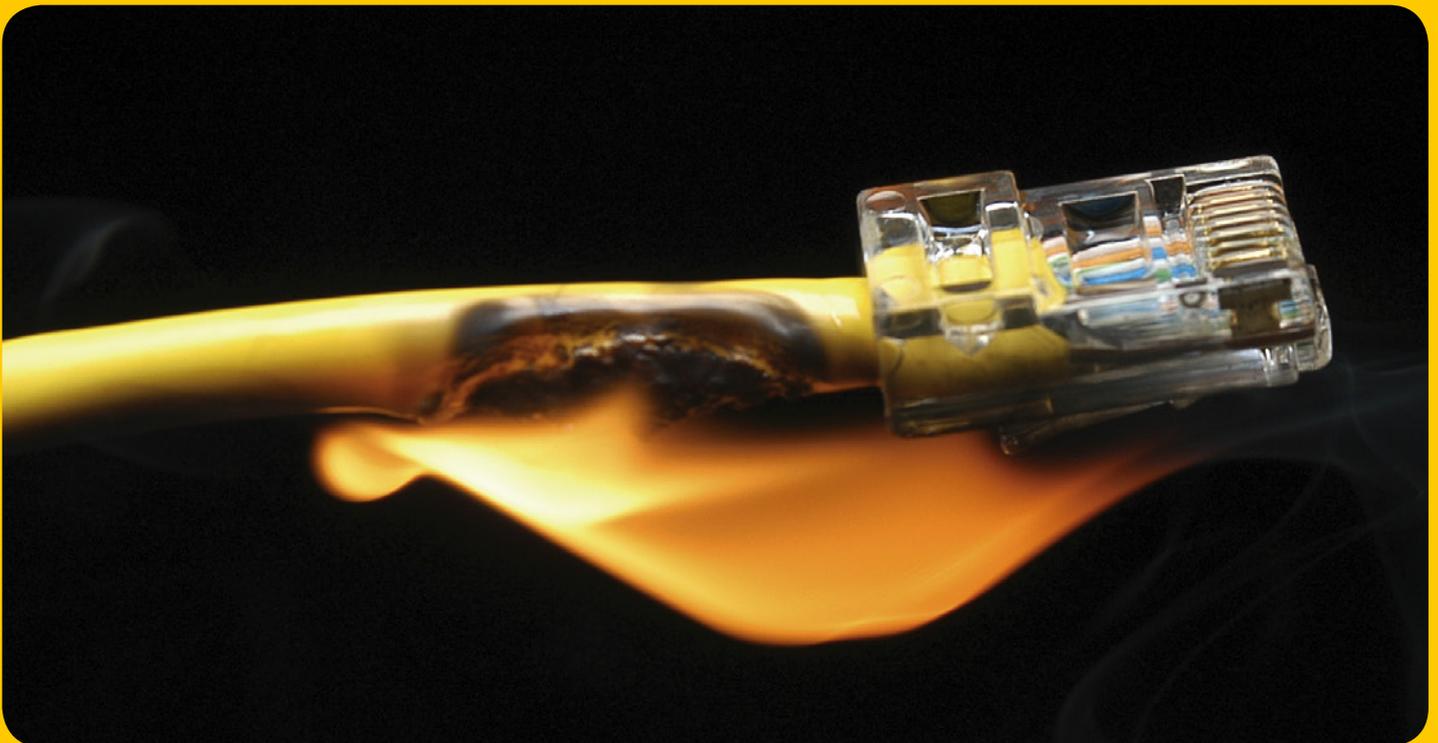


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accurate speed and length measurements of paper or plastic, even in the event of the line stopping or going into reverse.

This reduces scrap, increases uptime and improves material yield. It also eliminates product give away and short length claims, saving time and money, says the company.

The gauge is permanently calibrated and only requires minimal operator input. With stand-off distances ranging from 150mm up to 2.5m, plus an extended depth of field of up to 60mm, most sizes of product can be accommodated and measured accurately on-line.

All systems in the Masterspeed range are direct replacements for the traditional contact wheel and roller-type devices. They are completely non-contact, so there is no marking or slippage, and no wear or contamination of a wheel. They are also easy to install, integrate and use.

The gauges are versatile and are ideal for a wide variety of speed or length applications, especially where direct contact with the product is undesirable or impossible.



Theysohn Extrusion has extended its TEC 4 system with remote diagnosis via the internet, to decrease machine downtime

Click on the links for more information:

- ! www.theysohn.at
- ! www.dynisco.com
- ! www.plasticolor.de
- ! www.visionbms.com
- ! www.starrett.com
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Meet the experts behind AMI Magazines

AMI Plastics launched its market-focused digital magazines for the global plastics industry nearly five years ago. Our aim is to deliver the highest quality and most relevant technical information and industry analysis.

In order to achieve this, we have assembled one of the most experienced and technically qualified teams in the plastics magazine sector.

Technically qualified – Unlike most plastics magazine editors and journalists, all of our editors have a relevant science or engineering degree. They also have extensive experience of covering the plastics industry, each having spent at least 20 years in this market.

Expert support – Our three editors are backed up by a highly experienced team of regular contributors, plus the

expertise of the AMI Consulting team. No other plastics magazine has direct in-house access to this level of international industry knowledge and understanding.

Meet us in Düsseldorf – Our team will be at the K 2013 exhibition in Düsseldorf, Germany in October. Meet us on the AMI Magazine stand in the North Entrance (EN03).

OUR MAGAZINE TEAM



Andy Beevers

Andy Beevers is head of business publishing at AMI, responsible for launching and managing the digital magazines business. He is also editor of *Compounding World* magazine.

Andy graduated in Chemical Engineering from the University of Birmingham in the UK and subsequently trained as a journalist. He has more than 25 years of editorial and publishing experience in the international plastics sector.

He was editor-in-chief of *European Plastics News* and *Asian Plastics* and went on to be publishing director for these titles plus *Plastics & Rubber Weekly* and *PRW.com*. Andy has also launched, managed and chaired many international conferences in the plastics arena.

Andy has attended all eight K shows since 1989.

Chris Smith

Chris Smith is editor of *Injection World* magazine and he also oversees our special projects including magazines on *Pipeline Coating*, *Wind Turbine Blade Manufacture* and *Rigid Plastics Packaging*.

Chris has a degree in Materials Science and worked in the polymer industry for several years before moving into magazine publishing.

For the past 20 years he has been writing about plastics technology, including stints as technology editor on *Plastics & Rubber Weekly* and as editor of *European Plastics News*. He also has extensive experience of launching, managing and chairing international plastics industry conferences.

Chris has been to six K exhibitions.



Lou Reade

Lou Reade is editor of our two plastics extrusion titles: *Film and Sheet Extrusion* plus *Pipe and Profile Extrusion*.

After graduating in Chemistry, he trained as a business-to-business journalist. He has since built up more than 20 years of technical journalism experience, including eight years as technology editor and editor-in-chief of *European Plastics News* magazine. In addition, Lou has worked as a journalist and editor on industry magazines covering design engineering and the laboratory equipment market.

Lou will be attending his sixth K show this year.

Claire Bishop

Claire Bishop manages the advertisement sales for all of our magazines. She has held this role since the magazines were launched and has developed our large and loyal customer base of global advertisers.

She is a highly experienced media sales specialist with more than 10 years working in this field. Claire has worked with major business-to-business publishing companies, including Emap, and with the UK's market-leading *Daily Mail* newspaper. She has particular experience in advertisement sales in the industrial and construction markets.

Claire is looking forward to her second K show.



Nicola Crane

Nicola Crane is responsible for the design of all of our magazines, preparing them for distribution on-line and via our free apps for the iPad/iPhone and Android devices

She is a very experienced magazine designer, working on a wide range of business-to-business and consumer titles over the past 26 years.



AMI'S INDUSTRY CONSULTANTS

AMI's magazines also benefit from the input of AMI Consulting's industry and market experts. This team of consultants provides strategic advice for a wide range of clients around the world, as well as publishing detailed multi-client and single-client reports. The team includes:

Andrew Reynolds, research director: areas of expertise include masterbatch, polyethylene markets and film applications.

John Nash, head of strategic research: areas of expertise include polypropylene resin and compound markets, artificial grass yarns and roofing membranes.

Noru Tsalic, senior vice president: areas of expertise include pipe applications, pipe coating, cables and construction markets.

Sylvia Tabero, research consultant: areas of expertise include injection moulding, telectronics, automotive, and technical compounds.

Martyna Zimakiewicz, packaging consultant: areas of expertise include caps and closures, bottles, thin-wall packaging and plastic labels.

Karla Vittova, research analyst: areas of expertise include agricultural films, heavy-duty sacks, polymer distribution and Central European markets.



Shu-Lan Cheng, research analyst: areas of expertise include BOPP films and the plastics markets in China and Asia.

Vitas Sabaliauskas, research analyst: areas of expertise include flame retardant additives, pipe coating, insulation and Russian markets.

Carole Kluth, senior project manager: areas of expertise include BOPP films, flexible packaging and polymer markets in Europe.

REGULAR CONTRIBUTORS

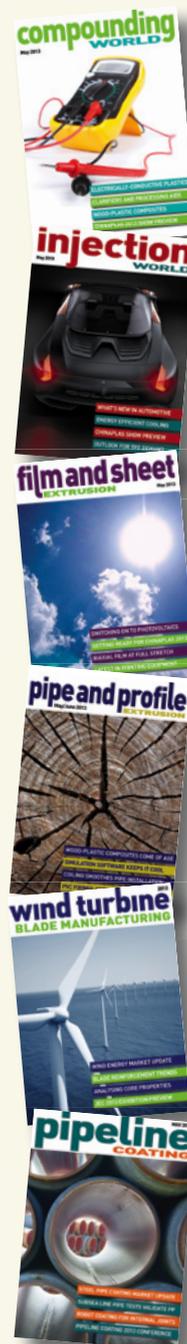
In addition to our UK-based magazine team we have a number of regular contributors to our magazines. These highly experienced writers and industry experts are based in Europe and the USA.

Jennifer Markarian: Based in the USA, Jennifer Markarian is a chemical engineering graduate and a highly experienced technical writer covering the plastics, pharmaceuticals and chemicals sectors. She also has industry experience, working for seven years with Mobil Chemical's polyethylene group as a development and technical service engineer.

Peter Mapleston: Based in Italy, Peter Mapleston is a very experienced plastics industry journalist and editor. He has a degree in polymer science and technology from the University of Manchester in the UK. Peter spent 17 years with *Modern Plastics* magazine, becoming its senior editor covering the full range of materials and processing technologies.

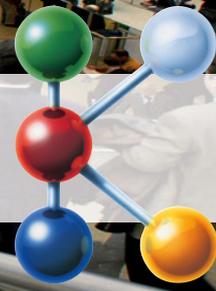
John Goff: Based in the UK, John Goff is a well respected expert and author on injection moulding technology with more than 35 years of industry experience. He was a senior lecturer at the University of London, and process engineering manager at Demag. He is now managing director of G&A Moulding Technology, a global consultancy.

Pat Toensmeier: Based in the USA, Pat Toensmeier is a highly experienced plastics industry writer and editor. He was with *Modern Plastics* magazine for 17 years, including eight years as its editor-in-chief. He has also written for *Plastics Technology*, *Plastics Engineering*, *Defense Technology International* and *Modern Mold and Tooling* magazines.





EXHIBITING AT K 2013?



Promote your presence at the global plastics show using our global plastics magazines

The great thing about the K show in Düsseldorf is that it attracts visitors from every corner of the world. Make sure that these international attendees know where to find your booth among the 3,000 other exhibitors at this year's show by advertising in our targeted magazines. These have a truly global readership, both online and through our apps for the iPad/iPhone and Android devices (full details in our media packs – use the relevant links).

Take your pick from these 17 dedicated issues: ➔

- August:** K 2013 first look
- September:** K 2013 preview
- October:** K 2013 show issue
- November:** News from K 2013
- December:** K 2013 review

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- July/August:** K 2013 first look
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- November/December:** K 2013 review

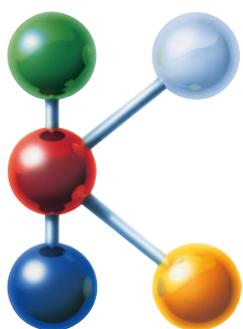
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We will be exhibiting at K ourselves, with a well-positioned booth in the North Entrance, plus our highly-experienced and technically-qualified editors will be back in Düsseldorf to report direct from the show.

Our special K issues are always very popular, so reserve your advertisement space now by contacting Claire Bishop on +44 20 8686 8139 or at claire@amimagazines.com

www.amimagazines.com





The countdown to K2013 has begun. Over the next three pages, we take a look ahead to this essential event for the global plastics industry and provide some useful links to help you get the most from your visit

K2013: Get set for Düsseldorf

The world's biggest plastics exhibition is less than four months away. More than 220,000 plastics industry visitors will be descending on Düsseldorf in Germany this October for eight days of doing deals, making new contacts, meeting old friends, and learning about the latest innovations from a huge range of suppliers.

K 2013 will fill all 19 halls at Messe Düsseldorf from 16 to 23 October. Around 3,000 exhibitors will be promoting their raw materials, additives, semi-finished products, machinery, ancillary equipment and services for the plastics industry.

The special feature for the 2013 event is 'Plastics move the world,' which adopts the theme of mobility. Organised by the German plastics industry under the overall management of PlasticsEurope Deutschland and Messe Düsseldorf, this special event includes multimedia presentations, selected exhibits and daily

discussions between scientific and industry experts that will put the spotlight on the role of plastics in construction of lightweight vehicles, aircraft and ships, as well as innovations in electromobility.

The last K show in 2010 was the most international ever, drawing 222,486 trade visitors from 109 countries. The organisers are predicting another big turnout this year despite the economic challenges facing many countries, especially some of the key European economies.

Turn the page to see our essential guide to planning your trip to Düsseldorf with loads of useful links.

FAST FACTS

Dates: 16-23 October 2013
Venue: Düsseldorf Fairground, Düsseldorf, Germany
Hours: 10:00 to 18:30 daily
Organiser: Messe Düsseldorf
Website: www.k-online.de

pipeandprofile EXTRUSION magazine at K 2013

Pipe & Profile Extrusion will be exhibiting at K on stand EN03 in the North Entrance, where you can find out more about our all four of our digital plastics magazines and Apps and meet the team.

Our company, Applied Market Information (AMI) is also exhibiting on stand 70C11 in Hall 7.0, where you will be able to view and purchase our latest industry directories, market reports and

a huge range of technical books.

In the run up to the big event, *Pipe & Profile Extrusion* will be publishing detailed previews of the innovations that will be on show. Look out for our K Preview Issue in September and our K Show Special in October. Our journalists will also be covering the show from start to finish (you can follow the news as it happens on our Twitter feed

[@Plasticsworld](https://twitter.com/Plasticsworld) and we will also be reviewing the event in detail in our November/December edition.

If you are exhibiting at K, then please let us know about the new products you will be showing.

Send your press releases to the editor, Lou Reade at lou@pipeandprofile.com. Full details of our special coverage of K can be found in our [media pack](#).

Click for info

Use our hand-picked selection of weblinks to make sure you have a productive and enjoyable visit to K2013



Buy your tickets

Purchasing your tickets online in advance can save you up to €27. A three-day ticket bought online costs €108 instead of €135 when purchased at the exhibition. One-day tickets are €49 in advance or €65 at the show. Order your tickets now at: <http://bit.ly/K13tickets>

Book your hotel

Düsseldorf's hotels quickly fill up for the eight days of K and the best options go early. Find out what's still available and make your reservation as soon as possible at the official website: <http://bit.ly/K13hotels>

Get K on your smartphone

Lots of useful K 2013 data is now available on your smartphone or tablet, including exhibitor and product databases, exhibition plans, travel information, hotel listings, city guides and restaurant reviews. Download the App for Apple iPads and iPhone here:

<http://bit.ly/K13appleapp>

Get the Android version here:

<http://bit.ly/K13androidapp>



Make the most of Düsseldorf

After a hard day at the show you will have earned some relaxation time. Make the most of your evenings in the city by checking out the restaurants, pubs, bars, culture and entertainment on offer.

This official guide has useful listings as well as guides to the sights and neighbourhoods: <http://bit.ly/Dusseldorfguide>

Also worth a look is the Wikitravel page on the city: <http://bit.ly/wikiguide>

And if the Altstadt and its 260 pubs get too crowded, try heading to the Media Harbour for its modern architecture and venues: <http://bit.ly/media-harbour>



Organise your travel

Düsseldorf is well connected and getting around the city is easy thanks to its excellent public transport network. And don't forget that your admission ticket for the exhibition allows you to use the local buses and trains for free. Full details of this offer can be found in the Messe Düsseldorf travel guide along with lots of information about travelling to and around the city. It also contains plenty of useful maps. Download the guide from: <http://bit.ly/K13travel>

Check out the exhibitors

With more than 3,000 exhibitors to choose from and a total exhibition area of more than 160,000m², it makes sense to plan your time at the show before you head off. The good news is that you can search for participating companies by name and by product using the daily-updated online K2013 database. To search by company, visit: <http://bit.ly/K13exhibitors>. To search by products, visit: <http://bit.ly/K13products>. You can also locate companies using the interactive floorplan which can be found here: <http://bit.ly/K13floorplan>. Finally, you can download a list of all the exhibitors in a variety of formats here: <http://bit.ly/K13download>



Soak up some culture

Believe it or not, there is more to Düsseldorf than K – it is the capital of North Rhine-Westphalia, after all. The city is home to more than 100 galleries and museums but the biggest by some way is the Museum Kunstpalast, located in the centre of the city near Königsallee. During the fair the Kunstpalast's special exhibitions include a collection of photographs by Candida Höfer capturing 40 years of the city's finest buildings and public spaces. Find out more at: www.smkp.de

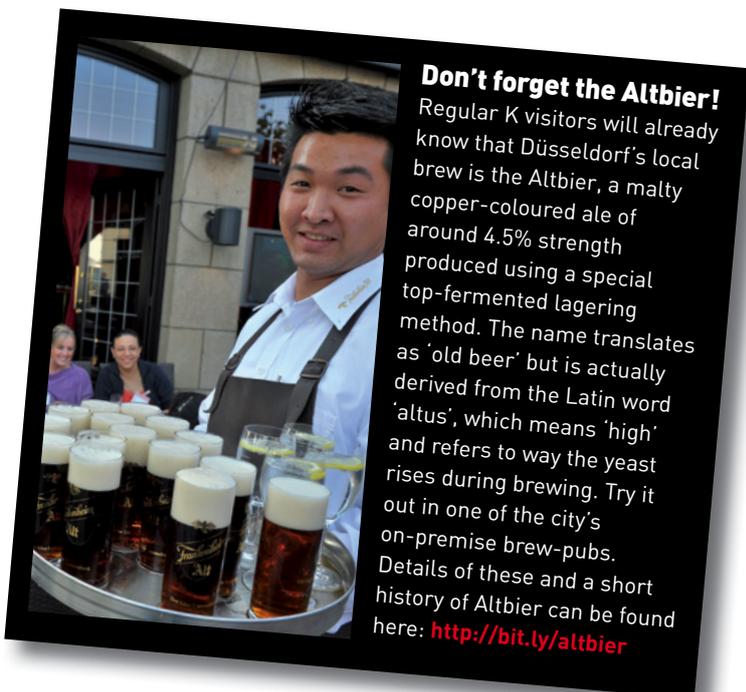
Try the retail experience

If retail is your thing – and especially designer goods – then Düsseldorf will not disappoint. Königsallee – known as 'Kö' to locals – includes many of Europe's leading fashion names and is likened with Knightsbridge in London or Fifth Avenue in New York. But neither of those locations can boast a setting to match the tree-lined man-made 'river' that runs through this premium shopping district. Catch the flavour here: <http://bit.ly/koenigsallee>



Don't forget the Altbier!

Regular K visitors will already know that Düsseldorf's local brew is the Altbier, a malty copper-coloured ale of around 4.5% strength produced using a special top-fermented lagering method. The name translates as 'old beer' but is actually derived from the Latin word 'altus', which means 'high' and refers to way the yeast rises during brewing. Try it out in one of the city's on-premise brew-pubs. Details of these and a short history of Altbier can be found here: <http://bit.ly/altbier>



Polyolefin Additives 2013

*International conference on compounding of polyolefins focusing on
PP and PE materials and applications*

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10-12 September 2013
Hotel Nikko, Düsseldorf, Germany

Images courtesy of: **Songwon International AG**

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PURGING

Purging compound helps Hozelock clean up its act

UK-based purging compound specialist Aquapurge has helped Hozelock to clean its extrusion equipment much more quickly and efficiently.

Hozelock, which makes garden hoses, had a supplier issue that caused its PVC to burn up prematurely. The

time needed to strip down and clean each extruder of this material was around three hours.

By feeding through 25kg of Aquapurge's Scrubber Freeze – a PVC-based, Ca/Zn stabilised scrubbing purge – the company cleared the

burnt-on material from its 75mm screws in just 20 minutes.

Once it was finished, the screw was removed from the barrel and inspected.

"On the clean screw the you can still see partial degradation in the metering zone – which highlights how Scrubber Freeze cleans," said John Steadman, technical director. "It does not push out large chunks but scrubs off the carbon so the purge looks dark brown, brown, dark green and finally light blue when it's finished."

www.aquapurge.com



PVC



Rigid vinyl withstands UV damage

Teknor Apex has developed a rigid, UV-resistant vinyl compound, aimed at photobioreactors and other outdoor tubing applications.

The grade can also be used to make tough, high gloss weatherable profiles.

Apex RE 9118A is a transparent compound with less than 15% haze. The formulation reduces the harmful effects of ultraviolet radiation on the PVC while transmitting wavelengths that are essential in processes like algae farming for biofuel.

The tensile, flexural, and impact properties of the compound are comparable to those of standard general-purpose rigid vinyl.

"Rigid vinyl provides a superior cost-performance alternative to the glass piping used in 'green energy' applications, as well as to thermoplastics such as polycarbonate," said Michael Renzi, business development manager for the company's vinyl division.

www.teknorapex.com

FLAME RETARDANTS

Modifier boosts FR for LLDPE

Addivant's Polybond range of polymer modifiers can help halogen-free polyolefin compounds to replace PVC in flame retardant wire and cable applications.

Replacing PVC in wire and cable insulation and jacketing is driven by regulatory changes and customer demand. But polyolefins are not inherently flame retardant (like PVC), so must usually be augmented with halogenated flame retardants.

Addivant's LLDPE-based range of Polybond polymer modifiers are used in conjunction with halogen-free flame retardants such as ATH or Magnesium Hydroxide to increase their flame retardant

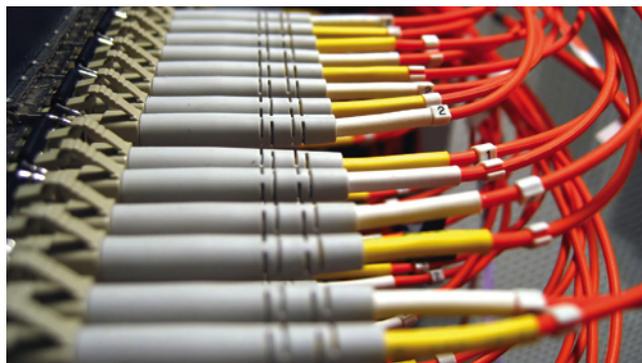
characteristics and enhance physical properties, says the company.

Polybond 3149 is a general purpose LLDPE, while Polybond 3249 and 3349 are suited to applications requiring higher elongation values with reduced gel formation during mixing.

The new formulations

complement existing Addivant Polybond PP and HDPE polymer modifiers, as well as the wider Addivant portfolio of wire and cable products, including antioxidants, UV stabilisers, metal deactivators and customised, non-dusting blends of various additives.

www.addivant.com



MULTILAYER PIPE

R&B accelerates into fuel lines

R&B Plastics Machinery has supplied a Max multi-layer single-screw extruder to TG Fluid Systems USA, to produce automotive fuel lines.

The three-layer fuel line system has an advanced control system platform and adjustable extruder assemblies to improve productivity.

“There’s a surge of new orders as OEMs and Tier suppliers develop new applications, expand capacity, and bring on new multilayer fuel line systems,” said Dave Corson, director of sales and marketing at R&B.

TG Fluid Systems, part of Toyoda Gosei North America, supplies fuel systems to



major car makers including Toyota, Honda, and General Motors. It will produce three-layer fuel lines made of nylon and fluoropolymer materials.

The Max extruder line’s control platform features Allen Bradley and Ifix systems that manage the line from one

operator station. R&B also provides customisation of all control platforms.

New adjustable extruder assemblies feature linear bearings with a ratchet adjustment to eliminate the traditional pole assemblies and overhung weight issues.

www.rbplasticsmachinery.com

HEATING

Heater combines IR with air

US-based Radiant Energy Systems has introduced a heater that combines infrared with air for use in the manufacture of pipe, tube, hose, extrusions and wire.

The SFA-Q is a stamped foil element heater with a quartz plate in front of the elements. The plate allows infrared energy to pass through to the product while isolating the heater from the process.

The inclusion of flowing air cools the quartz plate and internal heater components, while pressurising the heater.

www.radiantenergy.com

MATERIALS TESTING

AutoX speeds up lab testing



The AutoX 750 automatic contacting extensometer from Instron claims to support faster, more precise materials testing.

Instron says it can enhance the productivity of testing laboratories by removing time-consuming manual steps, simplifying testing routines and improving throughput. It also reduces inconsistencies in how a traditional clip-on extensometer is attached, which improves repeatability and reproducibility.

Other features including automatic gauge length positioning and automatic attachment to the test specimen with adjustable contact force.

Its accuracy to within 1 micron, maximum travel of 750mm and multiple knife edge options make it ideal for tensile, flexure and compression testing of various

materials including composites and plastics, says the company.

Patent-pending features of the device include: simultaneous opening and closing of both arms via a rotating common bar with just one motor, which makes the arms lighter; a shield to protect the extensometer from damage through ingress of dirt and debris; and an ergonomic tensioner to adjust the gripping force of the measurement arms.

When not in use, the mounting allows operators to quickly position the extensometer out of the test area, providing a safe storage environment for the device, says the company.

www.instron.com



PLASTICS IN PHOTOVOLTAICS

2 0 1 3

International conference on backsheets, encapsulants and other polymer materials in photovoltaic systems

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September 10-11, 2013
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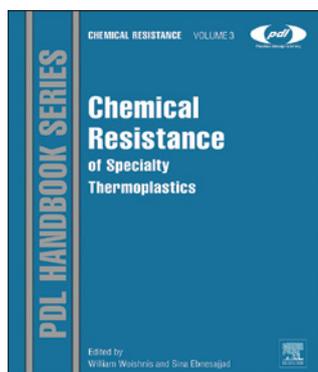
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Chemical Resistance of Specialty Thermoplastics



WOISHNIS AND EBNESAJJAD, 2012

This book is important to anybody who specifies and uses high performance materials in engineering, infrastructure, chemical plant and other corrosive environments.

It provides a unique compilation of exposure data

for 36 classes of specialised thermoplastic materials, categorised as fluoropolymers, olefins, polyarylenes, polyesters, polyimides, vinyl chloride and vinylidene chloride polymers, liquid crystal polymers and polyallomers, in a wide range of environments including foodstuffs, household products and industrial

chemicals.

Every material/chemical combination has a standardised numerical resistance ranking, as well as comments and property retention data when available.

Purchasers of the book also have access to an online version of the data.

[Order the book here >](#)

Design of Extrusion Forming Tools

CARNEIRO & NÓBREGA, 2012

The book aims to examine all the phenomena involved in extrusion die design, and their influence on product geometry and ultimate performance, as well as extrusion line operation. Bringing together expertise from academia and industry, it should serve as a reference for researchers and engineers, as well as a practical hands-on guide. Early chapters address the fundamental principles of extrusion dies and calibration and cooling systems and the relevant rheological, thermal and physical properties of polymers. Later chapters are devoted to specific die types: pipe and profile tools, flat and blown film dies, flexible dies and rotating mandrel dies.

The approach is highly mathematical and includes extensive referencing, but in all cases the theory is clearly related to practical processability.

[Order the book here >](#)

Handbook of Material Weathering

WYPYCH, 2013

Devoted almost entirely to polymers, this new 5th edition is reportedly three times the size of the 1990 original, reflecting the importance of the subject.

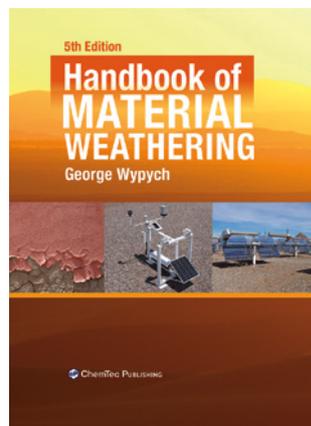
The book can be considered in four main sections: an explanation of the science of weathering and its effect on materials (photophysics and photochemistry); descriptions of environmental and climatic conditions, and methods to measure and simulate their effects; a survey of the data on more than 50 specific poly-

mers including the good and bad influences of additives; and a survey on more than 40 specific product types. The last two sections are derived from

an analysis of published literature (almost 3000 references are cited in the book). The author has extracted the most useful data on degradation routes and product durability and indicated where research is still required.

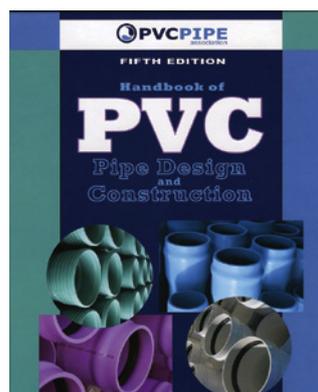
The effects of weathering range from cosmetic to catastrophic and this book provides a comprehensive and up-to-date guide for product designers, as well as anyone seeking an explanation of premature product failure.

[Order the book here >](#)



PVC Pipe Design and Construction

UNI-BELL PVC PIPE ASSOCIATION, 2012



This is the fifth edition of a book first published in 1977 and used extensively in industry and education. It has been updated and expanded with new chapters on trenchless technology and molecularly oriented PVC pipe. Written for engineers, designers, installers and students, this practical, well organised guide to the use of underground PVC piping contains extensive data,

illustrations and referencing. Coverage starts with pipe materials and their resistance to aggressive environments, followed by manufacturing technology, hydraulics and design for specific applications, and the installation of underground pipes for pressure and non-pressure applications. Further design data and unit conversions are provided as appendices.

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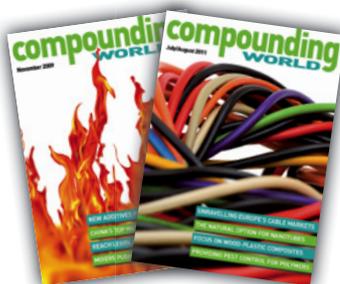
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Fill in the gaps with a full set of AMI's plastics industry magazines. Our new USB memory stick contains 134 back issues of our four titles, which are packed with informative features on technical developments, market trends and practical tips for more efficient factory operations.

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The majority of these editions are no longer available online or via our apps, so this USB memory stick is the only way to obtain a complete set of back issues of AMI's four plastics industry magazines. The flash drive contains all of the following issues:



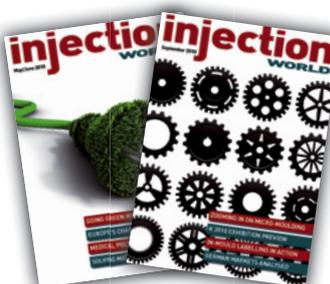
Compounding World

50 editions
(December 2008 to April 2013)



Film and Sheet Extrusion

28 editions
(April/May 2009 to March 2013)



Injection World

30 editions
(October 2009 to March 2013)



Pipe and Profile Extrusion

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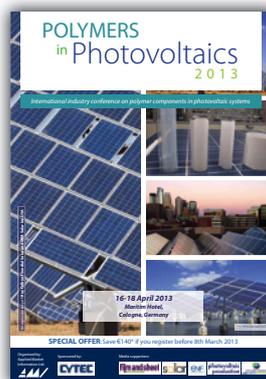
Polyolefin Additives



The sixth Polyolefin Additives conference is being organised by AMI in Düsseldorf, Germany on 10-12 September. The programme covers the latest developments in a variety of additives for improving the properties, durability and appearance of PE and PP.

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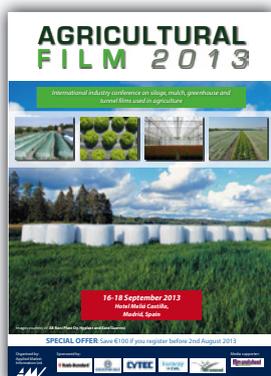
Polymers in Photovoltaics



AMI's international conference on polymer components in photovoltaic systems is taking place in Cologne, Germany, on 16-18 April. Check out the programme that covers new developments in this exciting market.

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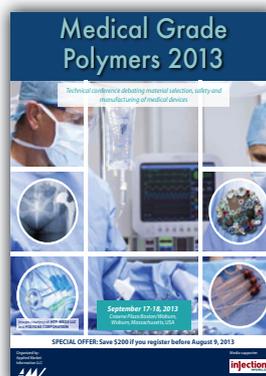
Agricultural Film



Taking place on 16-18 September in Madrid, AMI's sixth Agricultural Films conference will bring together leading players in this dynamic and competitive market. Check out the programme which covers new technologies and strategies for success.

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Medical Grade Polymers



AMI's next conference on Medical Grade Polymers takes place in Woburn/Boston, Massachusetts, USA, on 17-18 September. Download the brochure, which has the full programme with its impressive selection of expert speakers.

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Polymer Foam



AMI is holding the Polymer Foam 2013 conference in Hamburg, Germany, on 19-21 November. Download this brochure to see the line-up of speakers who will cover developments in blowing agents and foaming technology for polymers.

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Compounding World Forum



AMI and Compounding World magazine are holding the first Compounding World Forum in Philadelphia on 10-11 December. It will cover technical compounding developments, including market trends, new additive technologies and getting the most from twin-screw extruders.

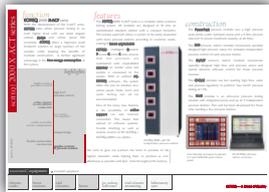
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Sciteq: pressure testing



This brochure features Sciteq's 2000 X-ACT modular system for the airless pressure testing of pipes. Its intelligent Dynamic Pressure Control System ensures that such tests are maintained with the highest accuracy.

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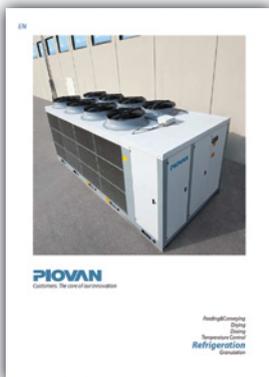
Unicor: pipe corrugation



This updated 52-page brochure from Unicor covers the design, production, applications and advantages of corrugated pipes. Plus it has details on the firm's wide range of pipe corrugation systems.

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Piovan: refrigeration systems



This 12-page brochure from Piovan focuses on the company's refrigeration systems, including scroll-compressor chillers, screw-compressor chillers, inverter-driven chillers, thermo-refrigerators and free-cooling systems.

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Colloids: Colour expertise



Tosaf Group company Colloids is a specialist producer of black, white and colour masterbatch. This eight-page brochure details the company's market strategy, development directions and key personnel.

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Tecnomatic: extrusion die heads



This 24-page brochure from Tecnomatic provides detailed information on the company's wide range of extrusion die heads. These include the latest Venus designs for PE/PP processing and its Radial-Type Distributor for PVC pipes.

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PlasMec: PVC mixing/cooling



This brochure covers PlasMec's HEC High Efficiency Horizontal Cooler for the production of rigid or plasticized PVC dry-blend. Available in sizes up to 8,000 litres, it delivers high levels of efficiency, throughput and quality.

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If you would like your brochure to be included on this page, please contact Claire Bishop. claire@amimagazines.com. Tel: +44 (0)20 8686 8139

Versaprofiles

| | |
|-------------------------|--|
| Head office: | Saint-Lazare, Quebec, Canada |
| Date founded: | 2011 |
| President: | Stéphane Gonthier |
| Ownership: | Private (management buy-out from IPL) |
| Profile: | Versaprofiles, which extrudes a range of thermoplastic products including pipes and custom profiles, was created as a buy-out of the extrusion business of IPL – a leading Canadian injection moulder. Its PE pipe products are used in the geothermal and water industries, while its custom profiles are made from a range of materials. |
| Product lines: | The company supplies PE80 and PE100 pipes to the geothermal market through its Geoperformx brand. The system is designed to enhance thermal transfer between the bedrock and the anti-freeze that circulates within the system – increasing heat pump efficiency by around 20%. As well as a range of water pipes, the company has developed a system to collect sap from maple trees (maple syrup). |
| Plant location: | At its 36,000 sq ft factory in Saint-Lazare, the company has 11 extrusion lines. Here, it makes a wide range of polyolefin pipe, including geothermal pipe of 0.75-6in diameter, and LDPE and HDPE water pipe of 0.5-6in diameter. |
| Recent projects: | Versaprofiles recently invested in a new enterprise resource planning (ERP) system, which it says will save around \$100,000 over three years. The company has also boosted sales by 25%, without adding to its workforce. The system, from CyFrame, replaced a one-tier system that had been in place under its previous ownership. It is also designed specifically for plastics production, rather than being a generic system. |

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

pipe and profile
EXTRUSION

Forthcoming features

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

September

Pipe die developments
Medical tubing
Focus on pressure pipes
K2013 preview issue

October

Extruder technology
Downstream equipment
Trenchless pipe installation
K2013 show issue

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

For information on advertising in these issues, please contact
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Pipe and Profile – May/June

The May/June edition of Pipe and Profile Extrusion takes a close look at wood plastics composites, examines options for simulating plastic pipe extrusion, and explores the latest innovations in profile dies. It also reviews PVC additive developments.

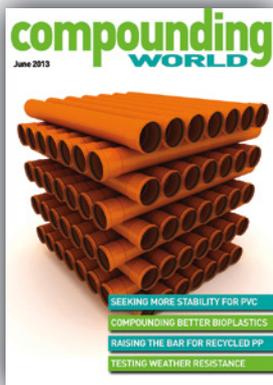
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Pipe and Profile – March/April

The March/April edition of Pipe and Profile Extrusion looks at the latest developments in extrusion screw design, techniques for joining plastics pipes and new developments in polyolefins for pipe applications. This issue also covers the Chinapias exhibition.

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Compounding World – June

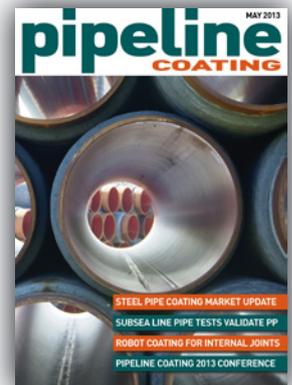
The June edition of Compounding World looks at additives for the production of bioplastic compounds as well as the latest developments in stabilizers for PVC. It also considers the options for accelerating weathering resistance tests.

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Pipeline Coating – May

The May edition of Pipeline Coating magazine includes reports on market trends in oil and gas pipelines, the long-term ageing of PP foam, the use of robotic internal joint coating to prevent corrosion, and a novel insulation system.

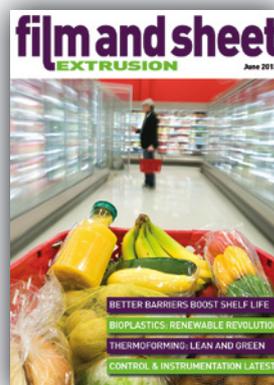
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Injection World – July/Aug

The July/August edition of Injection World has special features on: durable applications for bioplastics; the latest automation systems; optimising hot runners; developments in clarified PP; and getting ready for K 2013.

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Film and Sheet – June

The June issue of Film and Sheet Extrusion is filled with features on the following: barrier materials for boosting shelf life; recent developments in bioplastics; sustainability trends in thermoforming; and the latest control and instrumentation systems.

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Global exhibition guide

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| 5-7 September | Plasti & Pack, Lahore, Pakistan | www.pk-plastipack.com |
| 10-12 September | Plastec Midwest, Chicago, USA | www.plastecmidwest.com |
| 25-26 September | Mediplas, Birmingham, UK | www.mediplasuk.com |
| 4-6 October | Plastics Printing Packaging Kenya | www.pppexpo.expogr.com |
| 16-23 October | K 2013, Düsseldorf, Germany | www.k-online.de |
| 19-22 November | Yiwu Packaging, Printing & Plastics, China | www.yiwuppp.com |
| 20-23 November | Plastics & Rubber Indonesia, Jakarta | www.pamerindo.com |
| 5-8 December | Plast Eurasia, Istanbul, Turkey | www.plasteurasia.com |

2014

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| 21-23 January | Swiss Plastics, Lucerne, Switzerland | www.swissplastics.ch |
| 4-6 March | Plastics & Rubber Vietnam, Ho Chi Minh | www.plasticsvietnam.com |
| 16-22 June | Argenplas, Buenos Aires, Argentina | www.argenplas.com.ar |
| 30 Sept-2 Oct | Interplas, Birmingham, UK | www.britishplasticsshow.com |
| 6-10 October | Equiplast, Barcelona, Spain | www.equiplast.com |
| 14-18 October | Fakuma, Friedrichshafen, Germany | www.fakuma-messe.de |

AMI conferences for pipe & profile extruders

| | |
|-----------------------------|---|
| 10-12 September 2013 | Polyolefin Additives, Düsseldorf, Germany |
| 17-18 September 2013 | Medical Grade Polymers, Boston/Woburn, USA |
| 12-14 November 2013 | Fire Resistance in Plastics, Cologne, Germany |
| 10-11 December 2013 | Compounding World Forum, Pennsylvania, USA |
| 24-26 February 2014 | Pipeline Coating, Vienna, Austria |
| 24-26 February 2014 | PVC Formulation, Duesseldorf, Germany |
| 11-13 March 2014 | Cables, Cologne, Germany |
| 18-20 March 2014 | Masterbatch Asia, Bangkok, Thailand |
| 20-22 May 2014 | Pipes in Infrastructure, Duesseldorf, Germany |

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