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Compounding WORLD

SHOW PREVIEW

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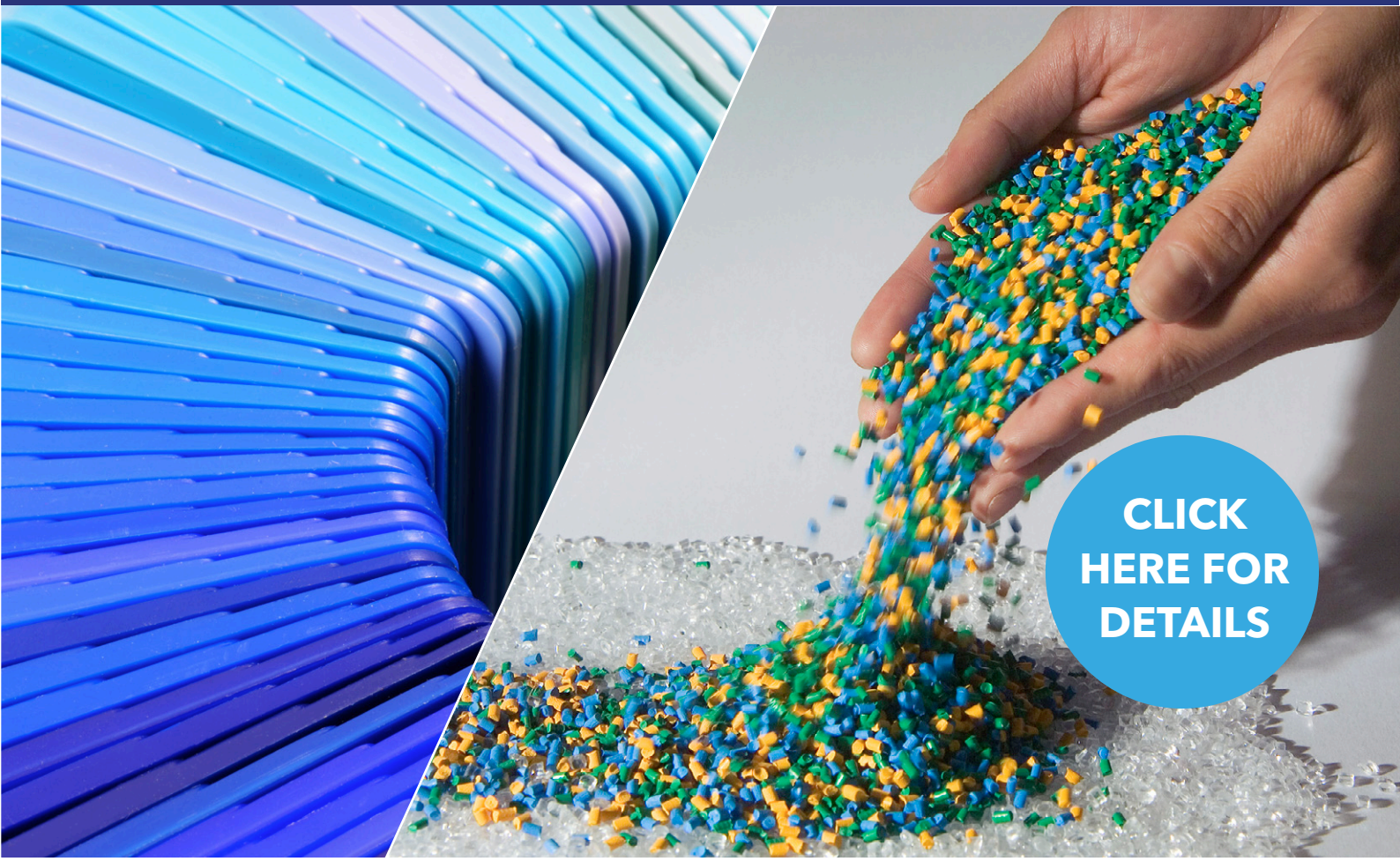

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In compounding? Get to Essen

Well, after many months of preparation we are very nearly there. The Compounding World Expo – the first dedicated exhibition and conference for the plastics compounding industry – makes its debut in Essen in Germany on 27-28 June. Bringing together more than 140 compounding equipment, materials and service suppliers, we think it will be an unmissable event for anyone involved in this business. What's more, it is free-to-attend both the exhibition and all the conference sessions taking place on the show floor over the two days.

Compounding World publisher AMI has built its business and reputation on its paid-for events and has applied the same high value approach to the two free conference streams that will run at the Compounding World Expo. Three free-to-attend debates will cover key issues impacting on the technical compounds, masterbatch and PVC markets. Participants in the technical compounds debate include A. Schulman Senior Vice President and General Manager EMEA Heinrich Lingnau, Albis Plastic Vice President Technical Compounds Bernd Sparenberg, Ensinger Head of Compounding Dr Oliver Frey, and Kingfa Sci & Tech Europe General Manager Dr Christof Krogmann.

The outlook for the masterbatch industry will be explored by Ampacet Corporation President & CEO Yves Carette, Clariant International Head of Region EMEA Norbert Merklein, Lifocolor Farben Managing Director Dr Martin Fabian, and PolyOne Corporation Global Marketing Director Color Additives and Inks Gary Fielding. Click **HERE** to view the full conference programme.

Visitors to the Compounding World Expo also benefit from its co-location with the Plastics Recycling World Exhibition. Demand for recycled content is growing fast but successfully satisfying that demand means developing plastic compounds that meet the technical and aesthetic requirements of polymer users. That means bridging the gap between recycling and compounding – something we aim to enable by bringing the leading recycling technology and compounding experts together. Visit one event or move between the two to capture the information and insight you need.

On behalf of AMI and the *Compounding World* magazine team, I look forward to meeting you at the Compounding World Expo. See you in Essen!

Chris Smith
Editor – Compounding World
Editor-in-Chief, AMI Magazines
chris.smith@ami.international

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Mitsui to compound in Europe

Japan's Mitsui Chemical and Prime Polymer, its 65-35 venture with Idemitsu Kosan, have agreed to establish a new European company to manufacture and market PP compounds.

Mitsui Prime Advanced Composites Europe will be based at the Chemelot Industrial Park in Limburg, Netherlands, and should begin operations in June 2020. It will have an annual capacity of 30,000 tonnes.

Mitsui Chemical identifies automotive as a key target market and said the investment recognises the growing use of PP compounds in lightweight automotive external and internal parts.

› **www.mitsuichem.com**

Sirmax invests in Poland; makes first move in TPEs

Italian-headquartered Sirmax is to build a second compounding plant in Poland. The €30m facility will be built on a 60,000m² site in the Lodz economic zone at Kutno and will expand capacity for the company's existing compounded products as well as supporting its first move into the TPE market.

The new plant will be located close to the company's original Polish facility, which opened in 2006 and has a capacity of around 80,000 tonnes of PP compounds. It will include a 12,000 m² production area and 10,000 m² warehouse and will produce technical polymers based on polyamides, ABS and polycarbonate, plus long glass fibre-reinforced and self-extinguishing PP compounds. It will also produce SEBS and SBS TPEs and TPVs.

PHOTO: SIRMAX

The existing Sirmax PP compounding plant at Kutno

"We want to be globally present and, with the full range of our products, at the service of our large global customers in the automotive and household appliance sectors," said Sirmax CEO and President Massimo Pavin.

Construction of the new facility will begin in August this year. The company, which expects to achieve sales of around €300m during 2018, said it expects to begin production at the plant in the second quarter of 2019.

› **www.sirmax.it**

Sorting cost of NIR pigments

UK-based Colour Tone has launched a new generation of "competitively-priced" near-infrared (NIR) detectable masterbatches that meet recyclability concerns for single-use black plastic tubs, trays and films.

Plastics coloured with carbon-black cannot be "seen" by the NIR technology used in commercial waste sorting operations. These new masterbatches overcome this problem.

PHOTO: COLOUR TONE

The first two grades are targeted primarily at polypropylene but can be applied to other polymers. The company said NIR black 958884 meets EU food contact legislation requirements. NIR black 95893 supports applications that meet the US FDA Code of Federal Regulations' criteria at up to 10% dosage (which it claims is a first for an NIR-detectable black masterbatch).

Colour Tone Director Tony Gaukroger said price has been a barrier to wide adoption of NIR-detectable black masterbatches. However, he said the NIR black 958884 grade is priced 60% below the cost quoted in the first commercialisation project study for thes products carried out by UK waste reduction organisation WRAP.

› **www.colourtone-masterbatch.co.uk**

Perstorp in 3D print JV

Swedish speciality chemicals company Perstorp has joined with 3D4Makers, a Dutch producer of high performance 3D printing filaments, to create a new 3D print materials joint venture in the Netherlands – ElogioAM.

The first products from the new venture will include Facilan C8 compostable PLA and Facilan PCL 100 polycaprolactone filaments.

› **www.perstorp.com**
› **www.3d4makers.com**

PolyOne buys PlastiComp to target LFT potential

PolyOne Corporation has continued its strategy of growth through targeted acquisition by buying US-based PlastiComp, a specialist in long fibre technology (LFT) composite formulations and production.

Founded in 2003, PlastiComp is best known for its Complēt product lines, which include long glass, carbon and hybrid reinforcements of up to 50% in matrix materials ranging from PP to PEEK. The materials are used in a variety of demanding applications in markets including medical, automotive, marine and outdoor equipment.

PlasticComp employs around 50 people at its plant at Winona, Minnesota, and operates six LFT pultrusion lines, two for carbon and four for glass products. The business and all staff, including founder Stephen Bowen, will become part of PolyOne's Specialty Engineered Materials segment.

PHOTO: POLYONE

PlastiComp installed its second carbon fibre LFT production line in 2017

"We are very excited to accelerate commercial and operational investments to further expand this important composite technology as part of our advanced composites portfolio," said Robert M Patterson, Chairman, President and CEO of PolyOne.

LFT-based materials are increasingly being used in metal replacement and light-weighting projects where they are said to offer higher strength and stiffness, greater design freedom, fatigue endurance, improved corrosion and wear resistance, EMI shielding and simple recyclability.

› **www.polyone.com**
› **www.plasticomp.com**

Addivant owner buys SI Group

Private investment firm SK Capital Partners is to acquire SI Group, adding considerably to its portfolio in performance additives and intermediates for plastics and other applications.

SK is already the owner of antioxidants and stabilisers firm Addivant and the two firms will be combined at closure, which is expected to take place in 2H 2018. Privately-owned SI Group operates 20 manufacturing facilities on five continents and posted annual sales of more than $1bn last year.

"SI Group has an excellent fit with the technologies and end markets of several SK Capital businesses," said Barry Siadat, a co-founder and Managing Director of SK Capital.

› **www.siigroup.com**
› **www.addivant.com**

Elix invests €4m in Spanish ABS facility

Elix Polymers, the Spanish manufacturer of ABS resins and derivatives, is investing €4m to optimise ABS powder production facilities at its site at Tarragona. The project will begin this year and should be completed within 2019.

ABS powder is used as an intermediate for ABS compound production and as an impact modifier in other thermoplastic compounds. Elix said the investment will ensure access to the materials and enable it to meet its future growth plans.

"Within the company's strategic plan, we are seeking to accompany customers as they grow, strengthen our position in key markets and increase our international presence by accessing new market niches and specialities in the NAFTA region and Asia," said David Castañeda, Director of Operations and New Business Development at the company.

› **www.elix-polymers.com**

Elix is expanding ABS powder capacity at Tarragona

PHOTO: ELIX POLYMERS

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NEWS IN BRIEF...

Eastman Chemical has completed a previously announced expansion for its Tritan copolyester at its headquarters site in Kingsport, Tennessee, US, and says the new plant is now fully operational. It has also revealed plans to expand PETG and PCTG capacities at the site by approximately 25%.
› **www.eastman.com**

Sigma Plastics Group has installed four S:Gran 125 recycling lines from **Next Generation Recycling-maschinen** (NGR) of Austria across its sites in Florida, South Carolina and Tennessee in the US. The $3 million investment will enable the company – the largest film producer in the US with a resin throughput of more than 900 ktonnes – to reprocess over 1,800 tonnes/month of film scrap, NGR said.
› **www.ngr.at**

Teijin has broken ground on a new carbon-fibre production facility at Teijin Carbon Fibres (TCF) at Greenwood, South Carolina, US. The move is the first phase of a $600m investment at the site. "We are strengthening Teijin's global upstream-to-downstream carbon fibre business. In particular, we have been leveraging research and development to expand carbon fibre business in the aircraft and automotive fields," said Yukito Miyajima, President of TCF.
› **www.teijin.com**

Stora Enso goes big in wood fibre composites

Swedish renewable packaging materials maker Stora Enso has launched DuraSense, a wood plastic composite (WPC) material produced at its mill at Hylte. The company said it has invested €12m in the facility to create what it believes is Europe's largest wood fibre composite operation with an annual capacity of 15,000 tonnes.

The DuraSense materials are a combination of wood fibre with polymers and other additives and are said to be suitable for a wide variety of moulded applications, including packaging as well as furniture, hand tools, pallets and automotive parts. They are based on a variety of matrix materials, including recycled resins and bio-based polymers.

"Reducing the amount of plastic and replacing it with renewable and traceable materials is a gradual process," said Jar Suominen, Head of Wood Products and Stora Enso. "With DuraSense we can offer customers a wood fibre-based alternative which improves sustainability performance and, depending on the product, significantly reduces the carbon footprint – all the way up to 80%."

PHOTO: STORA ENSO

Stora Enso is producing its DuraSense materials at what it claims is Europe's largest wood fibre composite plant

Stora Enso said DuraSense materials can be reused as a material up to seven times and can be recycled along with other plastics. Alternatively, they can be used for energy recover at the end of life.
› **www.storaenso.com**

EU consults on phthalates

The European Chemicals Agency (ECHA) has launched a **consultation** targeted at sectors affected by the listing of four phthalates in REACH XIV as subject to authorisation because of their endocrine disrupting properties. The consultation runs until 6 August.

The consultation covers bis(2-ethylhexyl) phthalate (DEHP), dibutyl phthalate (DBP), benzyl butyl phthalate (BBP) and diisobutyl phthalate (DIBP). All four were identified as substances of very high concern (SVHCs) in 2011-12 after being classified as reprotoxic and in 2014 and 2017 were listed as endocrine disrupters.

The process may lead to some previously exempt applications requiring authorisation for continued use. Information is sought about uses that might no longer be covered by generic exemptions, such as in food contact materials and medical devices, as well as transitional arrangements, exemptions and review periods.
› **https://echa.europa.eu**

PHOTO: SHUTTERSTOCK

EU is consulting on endocrine disrupting properties of four plasticisers

www.kraussmaffeiberstorff.com

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Nordson merges BKG facilities

Nordson BKG and Nordson PPS have completed their planned merger as of 4 June and are now operating as Nordson BKG from an expanded single location at Münster, Germany, which offer three times the site's original floorspace.

Transfer of staff to the new location is already well underway with integration of after-market functions already fully complete. Other departments will move on a phased basis to minimise disruption, with the full transfer expected to be completed by early autumn.

Nordson's expanded production facility at Münster in Germany

Nordson originally acquired the BKG pelletising systems manufacturing and the melt delivery systems businesses from Kreyenborg in 2013. Combining the two operations on one site will improve manufacturing efficiencies and recognises the fact that the two companies products are often sold as part of a single production system, it said.

"With the merger forming Nordson BKG GmbH and the combination of our capabilities at one Münster location, Nordson has created a united team that draws on the technical and project experience of the legacy companies to create new opportunities to serve our customers," said Godfrey Sandham, Vice President of Nordson PPS-EAME.

› **www.nordson.com**

Cabot completes expansions

Cabot has announced the completion of two projects designed to extend its global footprint in black masterbatch and compounds and increase its manufacturing capacity. The company said it has completed the acquisition of the Tech Blend operation in Canada and has commissioned a new production line at the facility in Pepinster, Belgium.

Tech Blend, based at Saint-Jean-sur-Richelieu, Québec, is a leading North American manufacturer of black masterbatches. Operating as Cabot Plastics Canada, it gives Cabot "full service manufacturing and sales capabilities in the North American region to serve both global and regional customers", according to Thomas Estienne, General Manager of Cabot Speciality Compounds North America.

Meanwhile, the new line at Pepinster in Belgium, where Cabot produces its conductive and engineering plastic formulations, makes it the largest masterbatch and compound manufacturing facility in its five-strong global network.

› **www.cabotcorp.com/plastics**

Aurora acquires JPI assets

Aurora Plastics, an Ohio, US-based producer of compounds for multiple industries, is to acquire the assets of JPI South in Pasadena, Texas. As part of the deal, the company has also entered into a long-term lease for the former JPI site, giving it a base closer to customers in the western and southern parts of the US.

Aurora Plastics CEO Darrell Hughes said that the deal gives Aurora "strategic flexibility to pursue future growth opportunities in the United States and abroad … Its location in the heart of the PVC industry also puts us in close proximity to our critical supply partners."

The company plans to invest "significant" capital in equipment for PVC blending at the Pasadena site, with production due to start there in Q1 2019.

The move is Aurora's third North American acquisition in the past year, following its purchases of S&E Speciality Polymers of Massachusetts, US, and Reinier Plastics of Quebec, Canada.

› **www.auroraplastics.com**

Corbion gives PLA a lift

Total Corbion PLA has launched a new production technology that can create full stereocomplex polylactic acid (PLA) capable of withstanding temperatures up to 200°C. It is making some glass fibre reinforced product available for testing purposes to customers looking to explore applications.

Total Corbion said the materials will be marketed under its Luminy brand and will open potential opportunities for PLA to be used in place of glass fibre-reinforced PBT and PA in areas such as automotive, aerospace, electronics, and home appliances.

› **www.total-corbion.com**

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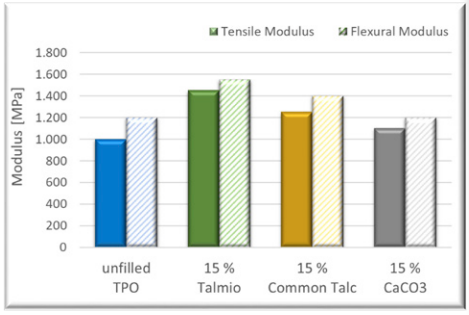
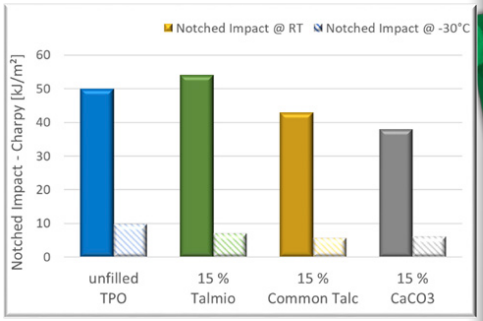
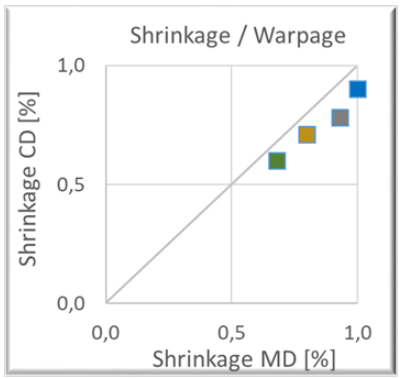


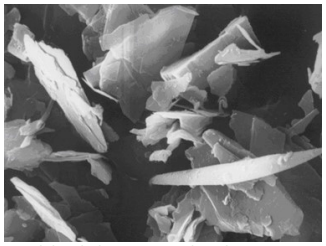
Reinforcement with 2 microns Talc in TPO



Impact strength with 2 microns Talc in TPO



Example: anisotropic shrinkage in TPO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PolyComp adds toll compounding capacity

German toll compounding company PolyComp, part of the KD Feddersen Group, has added a new production line at its plant at Norderstedt, expanding capacity and extending the flexibility of its technical and engineering compounds operation.

The line is based around a KraussMaffei Berstorff ZE65 50D Blue Power twin-screw extruder, optimised to deliver throughput rates of up to 1,500 kg/hour. The machine features a maintenance-friendly design that allows a quick transition between recipes and supports smaller run sizes, according to the company.

PolyComp Director of Process Engineering and Projects Simone Patermann said the company also expects to benefit from the increased free screw volume (Da/Di of 1.65) and torque density of up to 16 Nm/cm^3 of the new machine, which will boost throughput and energy efficiency.

The line is equipped with nine gravimetric feeders from Schenck Process Engineering, two Ultra-feed equipped side feeders, a screen changer and underwater pelletising system from Nordson BKG, and a Jöst classifier.

› **www.polycomp.de**

PHOTO: POLYCOMP

PolyComp's latest compounding investment

UBE expands in Europe

Specialty PA manufacturer UBE has completed the expansion of its production unit at Castellón in Spain, increasing annual production capacity for PA, including copolymer and terpolymer grades, from 32,000 to 72,000 tonnes.

The Castellón plant is one of three UBE PA manufacturing units; it also has operations in Japan and Thailand. Production includes PA12, PA6 and copolyimide base resins. UBE PA products are typically used for technical applications in food packaging and automotive sectors, as well as for manufacturing monofilaments and technical components.

› **www.ube.com**

Campine to recycle PP battery casings

Campine, the biggest recycler of car batteries in the Benelux region, is to invest more than €20m at its site at Beerse in Belgium over the next four years, with a large part of that spent on equipment to recycle PP battery casings.

The investment will bring the company into the plastics recycling market for the first time. It is sparked by China's decision to close its borders to waste imports; Campine said it sees growing opportunities for upcycled PP in Europe as a result.

In addition to recycling materials from car batteries, Campine also produces antimony trioxide flame retardants. The battery housing recycling investment is also expected to benefit its existing flame retardant masterbatch production operations.

› **www.campine.be**

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CPM Ruiya doubles capacity

CPM Extrusion Group is to build a 15,000 m² factory extension to its Ruiya Extrusion plant at Nanjing, China, which will lift capacity to 500 extrusion lines annually when completed in March 2019.

"Currently our capacity is strained - with this new plant we can double our output," said CPM Extrusion Group President Robert Urtel. "We focus on knowledge and the transfer of know-how to our customers, that's also one of the reasons why the factory is based in a high-tech zone."

Ruiya Extrusion saw sales rise by 40% to 247 machines in the fiscal year ending 30 September 2017 and production is expected to reach 265 machines in this fiscal year. The plant's key export markets are currently India and South-East Asia. It sees particularly strong potential in India, as well as from US multinationals.

"What we see in the market now is that a lot of our multinational customers relying on us in the States are buying machinery from Ruiya for their factories in China," said Charles Spearing, General Manager of CPM's global twin screw operations.

As well as Ruiya, CPM owns Century Extrusion in the US and last year acquired Extricom Extrusion of Germany, which specialises in premium 12-screw machines for niche applications such as PET bottle recycling. Extricom has already built its first twin screw extrusion machine.

› **www.cpmextrusiongroup.com**

PA attracts more investment

Ascend Performance Materials and Invista last month announced major investments in adiponitrile (ADN) capacity, one of the key feedstocks for PA66.

Ascend, the world's largest fully integrated producer of PA66 resin, will increase annual ADN capacity by 220,000 tonnes by 2022. Of this, 40,000 tonnes will be added by the end of 2018, with the rest coming over the following four years. The company completed its first expansion of 50,000 tonnes/year at the end of 2017. The investment value has not been disclosed.

In a separate move, Invista has entered the final design phase for a $250m ADN technology upgrade at its plant at Victoria, Texas, US. Construction is expected to start in Q1 2019. The new technology, which was developed at another Invista site in Texas and is already in use there, was developed over four years at a cost of $40m.

■ Meanwhile, in the PA6 feedstocks sector, Chinese caprolactam and PA producer Highsun is to acquire Fibrant from ChemicaInvest (a 65-35 joint venture between CVC Capital Partners and DSM). The deal covers the Fibrant caprolactam plant in Geleen, Netherlands, and 60% of a subsidiary that runs a caprolactam plant in Nanjing, China (but not Fibrant's US subsidiary).

Chen Jianlong, Chairman of the Highsun Group, described the move as "a new step in our ambition to become a leading player in the PA6 value chain". It should be completed in Q3 2018.

› **www.ascendmaterials.com**
› **www.invista.com**
› **https://en.highsunchina.com**

Polyplastics simplifies bonding

Japan's Polyplastics has developed a new additive technology that allows direct plastic-to-metal bonding for production of hybrid moulded parts without the use of primers or surface treatments.

The Quick-10 technology uses a special affinity improvement additive that allows a bond to be achieved during insert moulding by fast heating and cooling of the part.

› **www.polyplastics.com**

PHOTO: MOTAN-COLORTRONIC

Motan-Colortonic's new manufacturing plant at Taicang in China

Motan grows in China

Materials handling specialist Motan-Colortonic has opened its new sales and manufacturing facility at Taicang in China.

"With the move to the larger 4,600m2 building, we can now produce all the product lines in China," said Bing Hian Co, Managing Director of Motan-Colortronic Plastics Machinery China. "These products are intended primarily for our Chinese and Asian customers, but also for those customers who want to expand their activities from a production location in China."

The German company has had a presence in China since 1999. It opened its first production operation at Taicang in 2006.

› **www.motan-colortronic.com**

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German machinery sales and exports boom

The VDMA Plastics and Rubber Machinery Association confirmed that 2017 was another record year for Germany's plastics and rubber machinery manufacturers, with a 5% growth in sales. "This has been the eighth year of growth in a row. The current boom has been lasting unusually long," said Chairman Ulrich Reifenhäuser.

The US remains the industry's leading market and showed strong growth in demand during 2017, with sales up 10.1% to €847m. However, the association said, China is the most important foreign market for its members because it absorbed €717m of direct exports (up 14.3% on 2016) as well as buying €500m of equipment manufactured locally by German firms.

Italy also saw strong relative growth, consuming 32.1% more than last year at €250m. The VDMA attributes this in part to the Italian government's 'Industry 4.0' programme designed to stimulate investment in industrial goods. After several years of decline, Russia and Brazil also both saw rises in consumption, by 34.1% growth to €114m and by 35.4% to €75m respectively.

For 2018, VDMA members predict a further 3% growth and expect to continue to enjoy full order books.

However, VDMA Plastics and Rubber Division Managing Director Thorsten Kühmann warned that this success was leading to long delivery times for machinery manufacturers and their suppliers. He also said the industry was reporting "massive problems to find qualified skilled workers".

› **https://kug.vdma.org**

Top export destinations for German plastics and rubber machinery 2016-17

	2017 (m€)	2017/2016 Change in %)	2017 Ranking
Export	**5,345**	**7.7**	
USA	847	10.1	1
China	717	14.3	2
Mexico	269	4.5	3
Italy	250	32.1	4
Poland	233	9.7	5
France	191	-3.2	6
Czech Republic	175	7.2	7
India	172	-3.7	8
Great Britain	145	2.3	9
Spain	139	2.1	10

Source: VDMA/National Statistical Office

Venator's bright solution

Venator has launched a new TiO_2 grade - Tioxide TR48 – which it claims is its brightest to date.

Tioxide TR48 is a narrow particle size grade manufactured using selected organic and inorganic treatments to give a bright white, blue tone and high tinting strength. It is suitable for use in polyolefin packaging films and injection and blow moulded parts, as well as ABS mouldings where it delivers a bright white that is less susceptible to yellowing at high temperatures.

The non-yellowing behaviour is a major benefit in the consumer electronics industry where there is high demand for bright, white electronic devices and matching charging accessories, the company said.

"This innovative titanium dioxide pigment offers excellent dispersibility, and a high packing fraction and tint strength. As a result, it's an economic pigment choice for plastics formulators wanting to keep costs down while still delivering great end results," said Stéphane David, Global Sales and Marketing Director at Venator.

› **www.venatorcorp.com**

NEWS IN BRIEF...

Rowa Lack's newly installed pilot plant rolling mill for PVC and PMMA pigment preparations is now in operation at its site in Seevetal, Germany. The company said it will increase its flexibility and extend its range of services and portfolio for specialities. It will also be able to meet demand for laboratory and pilot plant batch sizes of 1-50 kg.

› **www.rowa-lack.de**

Turkish compounding company **Epsan** is installing a new ZSK 70 Mc18 twin-screw extrusion line from Coperion, increasing the annual capacity at its Bursa site by 13,000 tonnes/year to 48,000 tonnes. The company already has five Coperion lines and supplies PA 66, PA6, PBT and PPA compounds to Europe, Asia and North America under the Eplamid, Eplon and Epimix brand names.

› **www.epsan.com.tr**

Americhem has acquired Prescient Colour, a subsidiary of Sudarshan Chemical Industries of India. Prescient is based in Pune, near Mumbai, and employs 140 people making high-end masterbatches for niche applications, including synthetic fibres. Americhem, said that the move complements its existing position in synthetic fibres and expands its reach in a high growth region.

› **www.americhem.com**

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NPE 2018 draws 56,000 visitors

More than 56,000 visitors from 19,000 different companies attended NPE 2018, North America's biggest plastics trade show that took place in Orlando, Florida, last month. The figure was 1.7% of the previous NPE in 2015 and a record for the third NPE show event at the Florida location, according to organiser The Plastics Industry Association (it had previously set a target of 65,000 but said external analysis showed 2015 attendance had inadvertently been overstated).

The show also set exhibitor records, with 2,174 exhibitor companies taking some 111,000m^2 of floor space. NPE 2018 undoubtedly benefited from the strength of the US economy, with demand for floor space outstripping availability. "We sold out our exhibit floor nearly 14 months in advance of the show and worked diligently to accommodate the companies who were unable to secure space during our Space Draw," said Plastics Industry Association President and CEO William R Carteaux.

The organisers had opened up additional areas within the Orange County Convention Centre to create more exhibition space and some of those lacked footfall during the week. However, most exhibitors reported high, and in some cases record, levels of visitors. Over the next 12 pages, we take a look at some of the key business and technology news to emerge from the show.

NPE 2018 brought the plastics industry to Orlando in numbers

PHOTO: PLASTICS INDUSTRY ASSOCIATION

Albis resumes manufacturing in the US

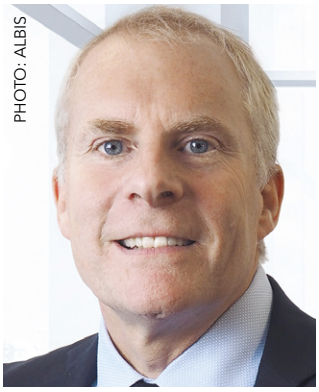
With its plant at Duncan in South Carolina now operational and producing Altech and Altech Eco recycled compounds, Albis was exhibiting at NPE as a US-based manufacturer once again (while having a US presence for around 50 years it has not compounded there since 2004).

"We had long had a wish to get back into manufacturing so we could end the toll compounding and stop importing material from Germany," said Ian Mills, Chief Sales Officer with responsibility for compounding across Albis. "We have already seen some business wins because we are manufacturing here."

The Duncan operation has grown out of the company's Barnet Polymers recycling joint venture, established in 2016 and 100% Albis-owned since October 2017. The company has invested in two production lines and a lab line at the facility and will be in full three-shift operation by July.

The Albis product slate and the US production unit's South Carolina location mean it is focused on automotive, but Mills said that it is already drawing other interest. "Automotive is a strong business for us and I don't see that changing because it is growing. But we are capturing interest from other sectors – E&E and power tools," he said.

PHOTO: ALBIS



Albis CSO John Mills: has seen business wins

In part, at least, that is due to the recycling expertise developed by Barnet. "A lot of what we do is the ECO products. The feedstock quality we have is high – we know the source so we can be quite confident."

The Albis business in the US is currently worth around £50m in turnover terms and the aim is to double that within a five-year timescale. "When we built the new facility we did it with expansion in mind. We have the space to do that," Mills said.

› **www.albis.com**

Tosaf reveals $100m US expansion plans

Israel-headquartered Tosaf revealed plans to invest around $100m over the next five years as part of its strategy to become a leader in the US plastics compounding and colour masterbatch market.

COO and Senior Vice President Giuseppe Giusto said the company, which generated global sales of around €400m last year, has already invested around $25m in establishing a presence in the US. It acquired Arlington, Texas, based Adtec Colorant in 2015 and established a production facility under the Tosaf name at Bessemer in North Carolina two years ago. That is now in full operation and able to supply any of the company's stock products.

Giusto said these investments mark a first step; he sees far more opportunity. "The [US] masterbatch market was a little stagnant," he said. "Look at the level of

PHOTO: AMI

Tosaf COO Giuseppe Giusto: wants to be a leader in US

investment in the past 10 years – no one has invested in factories or new technologies. The market was a little protected."

Giusto said Tosaf plans to focus most of its attention on the colour masterbatch market, where it wants to be able to offer the same level of service to US customers that it does elsewhere in the world. "We are able to offer colour matches in 72 hours and ship in four days in Europe; we want to do this in the US," he said.

Colour is a localised activity, according to Giusto, which means supply lines of no more than 1,000km and ideally less – the Adtec site offers a rapid service up to 500km. "We need a network. To be a [colour masterbatch] leader in the US, and we want to be, we need to multiply our initial investment by four."

Giusto has set a timeframe of three to five years for an investment programme built on acquisition and installation of new compounding lines. "Our targets are small to medium sized colour companies. We will need at least one more hub like Bessemer, probably three."

All will be in the US, he said, although the company also has South America in view for the longer term. Tosaf currently has production capacity in Israel, Europe (under the Tosaf, Colloids and Color Service brands) and China (Colloids), as well as the US.

› **www.tosaf.com**

CPM Extrusion plugs gap

CPM Extrusion Group displayed its CXE 45 sHO extruder, a new 45mm screw diameter addition to the company's product line designed to fill the gap between its current 26 and 50mm models.

The company said the new machine supports its High Performance Elements – segment and barrier screws designed for gentle incorporation of glass fibres, thermosensitive flame retardants and additives – and T-Profile Technology elements for improved mixing and degassing efficiency. It also includes a heating and cooling system for improved process temperature control.

The 45 sHO also benefits from CPM's smart monitoring technology. Vibration and temperature sensors can be applied to monitor motor, safety clutch, and gearbox.

› **www.cpmextrusiongroup.com**

Ascend targets PA66 at EVs

PHOTO: ASCEND PERFORMANCE MATERIALS

Vikram Gopal, Vice President of Technology at Ascend

Polyamide 66 specialist Ascend Performance Materials showed the latest additions to its range of flame retarded materials for electrical and electronic applications, including the new generation of EV (electric vehicle) powertrains.

"In EVs, if you look at higher voltage batteries you have higher amps and higher temperatures. That drives demand for products that will not lose performance," said Vikram Gopal, Vice President of Technology at the company.

Connectors for EVs will require electrical and flame retardant performance

Vydyne FR350J is a high performance halogenated PA66 developed for use in unattended electrical appliance connectors that achieves the highest glow wire ignition rating with zero flame and a glow wire end temperature of 775°C. Vydyne ECO366H is a non-halogenated PA66 developed for connectors and terminal blocks offering an RTI of 150°C.

› **www.ascendmaterials.com**

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PolyOne talks about shielding

PolyOne spelled out more of the thinking behind its recent decision to license the Electriplast long fibre electrically conductive technology developed by Integral Technologies at NPE, as well as displaying a number of recent additions to its colour, effect and high performance portfolio.

According to Michael Garrett, President of Specialty Engineered Materials at the company, shielding is going to be a major concern for manufacturers in the future. This is already evident in the automotive sector, he said, where the trend towards more comprehensive ADAS (Automated Driver Assistance Systems) technology is seeing the volume of electronic devices, connectors and cabling in each vehicle expand rapidly.

Integrity of ADAS data communication is going to be a vital issue, according to Garrett. "You don't want those signals interfering. The important thing is that the right signal gets through and the wrong signals don't."

While Garrett acknowledges that PolyOne has its own expertise in both conductive and long fibre compounds, he says Integral has specific process and application IP it can benefit from. "We do not want to suffer from 'not invented here' syndrome," he said.

The license arrangement with Integral Technologies allows PolyOne to use the Electriplast technology in electrical shielding applications in all countries except South Korea, where electronics moulder Chang Rim has a pre-existing relationship with Integral.

The PolyOne deal is a major step forward for Integral Technologies, according to CEO Doug Bathauer, who acknowledges that commercialisation of its technology has been much slower than it had anticipated. "We were years ahead of the market…but with EVs and ADAS you need a lot of shielding; the market has come to us," he said. "We know what applications are there; this is a metal replacement market."

While Integral has secured a handful of projects to date – mostly automotive applications – he said that as a small technology operation it lacked global scale. "I've been pretty vocal about needing a partner," he said. "We needed someone with long fibre expertise and polymer expertise. We have all of this with PolyOne."

PHOTO: POLYONE

Michael Garrett, President of Specialty Engineered Materials at PolyOne

Bathauer said that while the focus with PolyOne for the moment is on automotive, the license agreement covers all shielding applications. "There are opportunities in all enclosures; in computers and solar inverters. In many applications we will compete against cast aluminium, so weight saving is a big factor, or against plastic with an extra [production] process."

› **www.polyone.com**
› **www.electriplast.com**

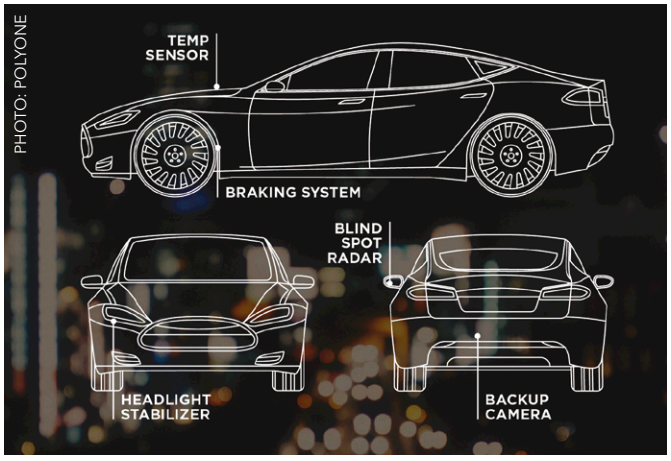

PHOTO: POLYONE

EVs and autonomous vehicles are key shielding applications

Colour-optimisation sells for Coperion

Coperion showed its new colour masterbatch-optimised STS Mc^{11} extruder at the show and took an order for two machines equipped with SP100 strand pelletisers from a US customer before the end of the second day.

The STS Mc^{11} is the first Coperion machine to be designed specifically for colour masterbatch producers. Features include placement of all electrical and water circuits beneath the barrel, allowing simple access for cleaning between runs, while a wide feed throat is included to better handle the premixes typical of the sector.

The company also showed its FluidLift ecoblue pneumatic conveying system. Primarily designed for high volume movement of polyolefin resins, which suffer from high rates of pellet attrition, the technology is said to reduce dust and streamer formation by 50-98% and energy use by 17-35%.

The reduced attrition is achieved by controlling the relative humidity of the conveying gas medium, which Coperion said is done so conveyed product is not compromised. The increased humidity enables the pellets to be moved at lower pressures and velocities, minimising the friction between particles and the conveying pipe walls.

› **www.coperion.com**

“ ENTEK Twin-Screw Extruders Have Been an Integral Part of Our Growth, and Their Technical Support Sets Them Apart”

PENN COLOR
A WORLD OF COLOR

Wayne Miller, Vice President Manufacturing, Penn Color, Inc.

Jeff Zaskoda, Penn Color Plant Manager (left) and ENTEK's Bill Petrozelli at Penn Color's Milton, WI Facility

“Business has grown strongly and consistently for Penn Color, both for our thermoplastic and liquid dispersants businesses. We've added several new facilities and added capacity at legacy facilities, all in the support of growth related to our thermoplastic color and additive businesses.

We have a wide range of ENTEK Extruders and have continued to purchase ENTEK machines over the years to support our growth. They make reliable, quality machinery. But more than that, the technical support and customer service that ENTEK provides is phenomenal.

A good example of this is ENTEK's spare parts stocking program. It helps us stay lean with our inventory; and we can call on ENTEK to ship the parts we need, when we need them.”

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Buss steps up with Compeo co-kneader

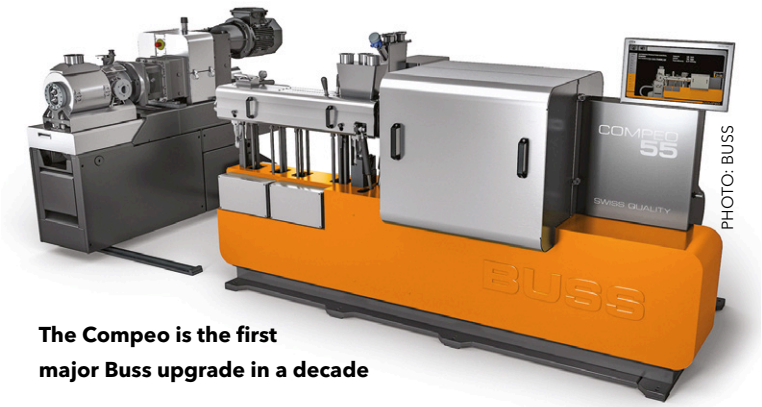

PHOTO: BUSS

The Compeo is the first major Buss upgrade in a decade

Buss unveiled its brand new Compeo co-kneader extruder at NPE. Company President and CEO Philip Nising said the striking-looking machine is the first major upgrade of its co-kneader technology for a decade and is intended to confirm its place as a premium compounding option.

"We wanted to make a machine that is better than any other on the market," Nising said. "There are some genuine differences between the old and new designs."

Aside from the visual styling – for the first time Buss took on an industrial design company to assist in the project – one key difference is Compeo's flexibility. Nising said the last machine update of its previous model was the introduction of the four-flight screw, which improves dispersion but at the price of some additional shearing. The Compeo allows process elements to be combined to suit the application.

PHOTO: AMI

Buss CEO Philip Nising: market will see this as a huge leap

"We can make each processing part to suit. We can combine three and four-flight; we can even go further and go for a two-flight or a six-flight," he said. "The two-flight section can be used to replace the restrictor ring to build up pressures hydromechanically."

Nising said the barrel can also be easily extended using new standardised modules – which are now fully symmetrical - on the standard machine base. The Compeo design also features fully integrated electrical cabling, improved thermal and acoustic insulation, a vibration-dampening concrete filled chassis, standard conical twin screw discharge, heating capability to 400°C, and a switch back from top to side feeding (to better handle higher filler loadings).

The high temperature capability and side feeding are key additions, according to Nising, who sees growing demand from compounders to be able to handle highly filled PA and PC formulations. Highly filled compounds remain the forte of co-kneader technology.

"We hope the market will see this as a huge leap in general compounding; I don't think it will be hard to win customers back from twin screws," Nising said.

The model on the Buss stand in Orlando was a 55mm prototype, with an 88mm model already in late development. The company will be taking orders for both from spring 2019. 110, 137 and 176mm models will become available during the remainder of the year.

› **www.busscorp.com**

Lighter and tougher approach from RTP

RTP Company introduced its LT (Light and Tough) series of PP, PA and PBT compounds that use glass sphere technology to achieve "drop-in" part weight savings of 5-10% with minimal loss of mechanicals compared to traditional glass reinforced grades.

Senior Product Development Engineer Structural Products Karl Hoppe said the new grades have resulted from developments in the strength of the glass spheres and optimisation of the compounding process, which has minimised their breakage.

"Previously with spheres we focused on maximising the weight saving but you lost the properties," Hoppe said. "The LT compounds are targeting the same properties that customers want with 30% glass filled PP or PA."

The LT materials provide similar weight savings to that possible by using chemical foaming additives but there are no issues with developing an even cell structure and the surface finish is much more consistent, Hoppe said. Shrinkage of the new compounds is also broadly similar to current 30% glass reinforced grades, so a drop-in substitution is possible in many cases.

› **www.rtpcompany.com**

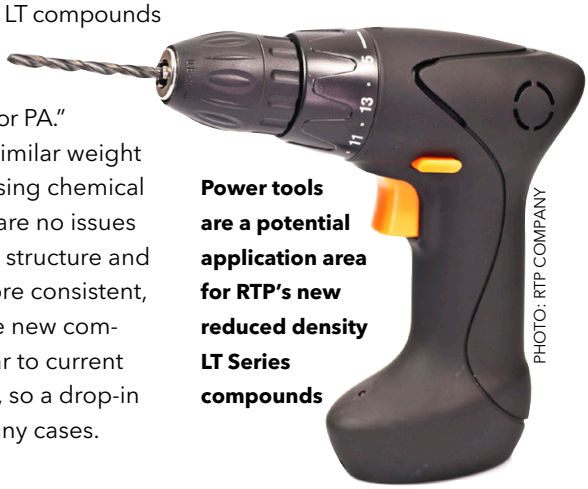

PHOTO: RTP COMPANY

Power tools are a potential application area for RTP's new reduced density LT Series compounds

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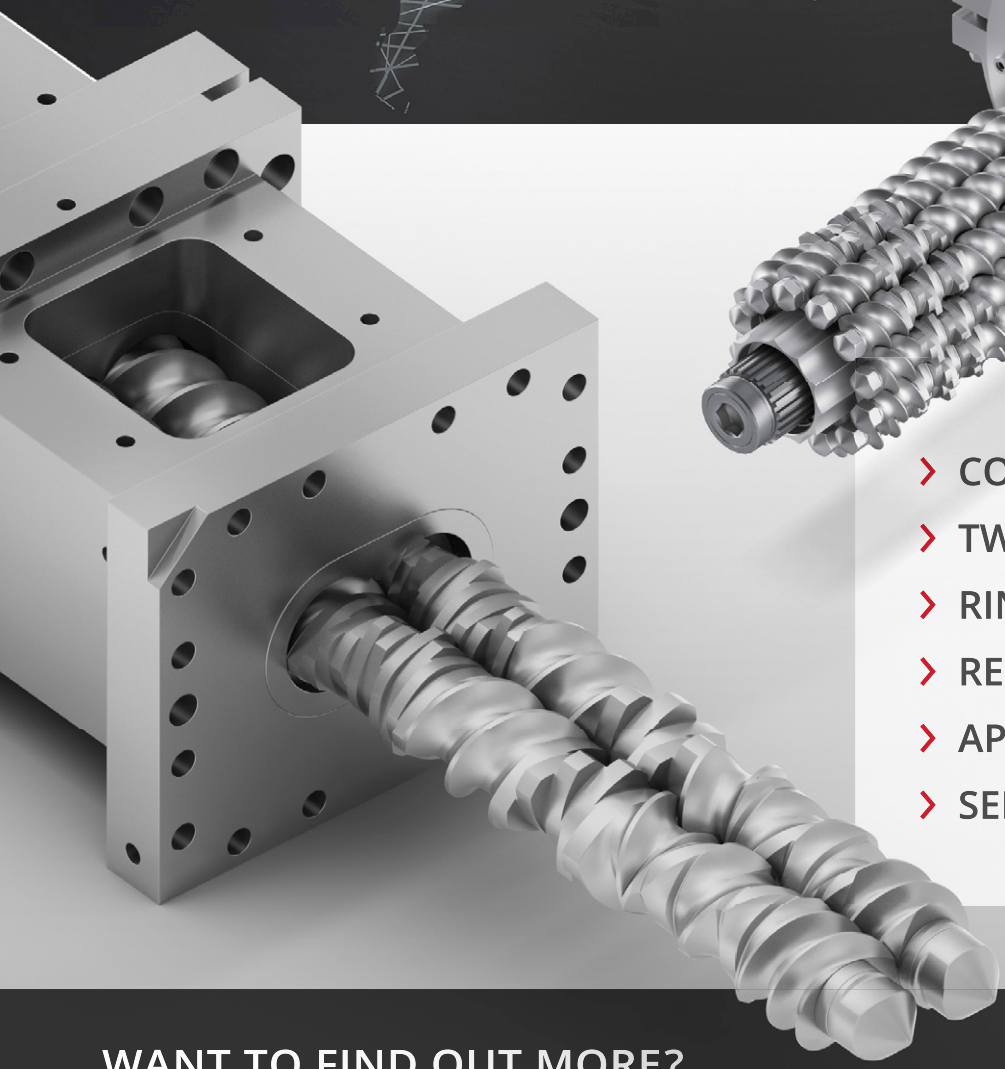

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Elastron to make TPEs in US

Turkish TPE producer Elastron announced it is investing $10m in a 2,800m² production plant and laboratory at Gainsville in Georgia in the US, its first overseas manufacturing plant.

"The facility will open around September and will be delivering commercial quantities in Q3," said Dr Zev Gurion, General Manager of Elastron North America.

"We have been in the US for around seven years, supplying customers with product from Turkey, but it pays to be closer," he said.

Privately-owned Elastron has a 30-year track record in the TPEs business, producing SBS and SEBS TPEs, EPDM/PP TPVs and TPOs in its 9,000m² facility at Gebze, around 45km south of Istanbul in Turkey. The company, which is growing at a rate of 10-15% a year, has just expanded capacity there with the installation of a new KraussMaffei Berstorff compounding line.

PHOTO: ELASTRON

PHOTO: ELASTRON

Left: Elastron's US facility will be modelled on its Turkish operation

Above: Visualisation of Elastron's new plant at Gainsville in the US

"We know the [US] market is crowded but we believe there is a place for a dedicated supplier that is willing to get into developing new applications. So our focus will be on providing a superior value proposition," Gurion said.

The Gainsville facility will be constructed to reflect the company's premium positioning, he said. The entire production area will be finished in white internally and the facility will be ISO9000 and ISO16949 approved.

Elastron's Global Business Director Yüksel Habip said the company was transferring existing compounding equipment from Turkey to the US to simplify start-up of the plant. He said the expansion into US manufacturing would likely be followed by a production investment in China "in a few years."

› **www.elastron.com**

Baerlocher targets compounders

Baerlocher used NPE to "relaunch" its recently introduced Baeropol RST resin stabilisation technology in the US market, placing a new focus on polyolefin compounders and recyclers and introducing an additional grade – Baeropol DRS 6812.

The trend in polyolefin polymer production is to one-pass stabilisation, said Baerlocher USA Director of Baeropol Products Greg Andersen, meaning that the resin is stabilised with one processing step in mind. "Compounders give the resin that single heat history when they do their part of the process, that makes them a good fit for us," he said.

"We have a couple of ongoing projects with major compounders. Their focus is on replacing phosphite in formulations as it presents a number of challenges - solubility is limited to 800ppm, if you want higher it comes out of solution as white powder."

PHOTO: BAERLOCHER

Baerlocher's DRS 6812 stabiliser is pitched to replace phosphites

Based on metal stearate technology, RST stabilisers can be used as a direct 1:1 replacement for phosphite antioxidants or as a synergist to reduce phosphite loadings or allow the use of less costly grades. Aside from oxidation protection, the additives also act as a lubricant and provide antacid properties, which is particularly useful where users are dealing with recycled content or catalysis products.

Andersen said the company continues to develop the RST technology and applications. Future developments will include an extension to other metal stearates (current products are based on zinc). RST stabilisers are also suitable for applications beyond PO, with a number of customers already said to be using them in PS and PA formulations.

› **www.baerlocher.com**

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Entek focuses on speed/volume

The main feature of the Entek display at NPE was the fast screw change capability on its smaller QC³ machines – the company was demonstrating a five-minute change on a 33m model – but the company also took the opportunity to remind customers it was a player in high volume compounding by showing a 73mm model from its latest HR³ Series.

The QC³ machine, which is available in 27, 33 and 43mm versions, has been well received since its launch in 2015. "This is the sweet spot in the colour compounding business in the US now; people don't want to tie up cash in inventory," said Entek Extruders President Kirk Hanawalt. "But we don't want to be pigeonholed as a small machine company."

Entek's high volume HR³ machine features improved feeding

The updated HR³ machines share some features with the QC3 models but are designed specifically for high output applications such as masterbatch and sheet (Hanawalt said the 55mm model has become a masterbatch workhorse). Recent developments to the line have focused on improving feeding.

The machine on the stand was destined for US customer BPC Toll Compounding & Blending, based in Meredosia, Illinois. It is part of an investment that will lift its compounding capacity from 10,000 to more than 27,000 tonnes/y.

The fast screw change capability of the QC³ machines results from a combination of mechanical and smart design features. Mechanicals include the company's patented screw guide system – a key element in the fast change – plus a simplified three-piece die.

Smart aspects include the use of quarter-turn guard fixings and building all necessary tooling on the machine (including an air ratchet).

› **www.entek.com**

Americhem takes unified approach

Americhem's key message for NPE was to underline the full integration of the Infinity LTL engineered compounds and Vi-Chem polymer composite acquisitions with its long-established colour and additive masterbatch activities. "We have unified our premium brands and now we can tap into a wider range of technical expertise," said CEO Matthew Hellstern.

PHOTO: AMERICHEM

Americhem introduced new compounds for aircraft interior applications

Hellstern does not rule out more acquisitions in the future, but for the near term the focus is on capitalising on the new technologies it can now offer customers. At the show, for example, he said the company was in the process of commissioning a new line at its plant at Suzhou in China. The second expansion at the plant since it was established 10 years ago, the new line will be used for production of TPEs and TPUs.

He said the company, which aside from the Suzhou plant has eight production sites in the US and one in the UK, is also "open-minded" about following customers into new geographies. "We are going to continue to build up our overseas markets," Hellstern said.

Americhem unveiled a number of new introductions at NPE. These included a new line of PA, PC, PPSU and PEI compounds for aerospace parts that exceed Federal Aviation Regulations sections 25.853a & 25.853d for flame, smoke and toxicity, as well as OSU heat release test requirements. They are targeted at injection moulded and extruded cabin trim, lighting, galley and overheard storage unit applications. It also extended the range of application of its nShield antimicrobial products beyond textiles into durable components for the hygiene and childcare sectors.

› **www.americhem.com**

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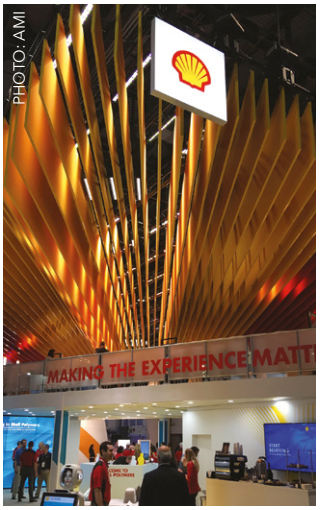
ORLEN GROUP

Shell marks out its place

Shell Polymers – which has just commenced construction of a 1.6m tpa PE plant in Pennsylvania in the US – had a big presence at the show, underlining the transformational effect the shale industry has had on the North American petrochemicals market.

Shell has not produced polyolefins in North America since 2005, when it sold its stake in the Basell joint venture with BASF (the business was merged two years later into LyondellBasell). However, the attractive economics of shale have tempted the company back.

Located in Beaver County 45km north-west of Pittsburgh, the project includes an ethane cracker and three PE polymerisation units that will produce HDPE and LLDPE grades. Construction began in the fourth quarter of last year with the first products set to reach the market in the early 2020s.



Shell had a big presence at NPE in Orlando

Shell Polymers Business Integration Lead Michael Marr explained at the show that the decision to site the facility in Pennsylvania, close to the huge Marcellus and Utica shale fields, rather than on the Gulf Coast is intended to maximise the benefits of the new resource. "Our thought was to put the plant closer to the shale fields and to the market," he said. "70% of the North American PE market is within 700 miles."

› **www.shell.us/poly-e**

MDI extends conductive lines

US compounder Modern Dispersions added to its range of electrically conductive masterbatches for antistatic and ATEX applications.

"There seems to be a trend to masterbatch in this market," said Vice President Jano A Kozma. "It can be more cost effective if you are prepared to take on responsibility and it gives you more flexibility."

PP-235 is a PP masterbatch; CF-238 is a universal masterbatch suitable for PE, PP, PVC and PLA.

› **www.moderndispersions.com**

Modular move from Leistritz

Leistritz showed a modular version of its ZSE 50 Maxx twin screw extruder configured with an extended barrel to support downstream compounding operations such as multiple venting or liquid injection.

The machine was displayed with two LSB 50 XX side stuffers. LSB XX units are equipped with high volume twin screws to push low density fibre reinforcements and fillers into the processing unit. Barrels are equipped with fluid circuits for heating and cooling and screws can be segmented and internally cooled if required.

Other equipment on show included a ZSE 27 extruder configured with a gear pump, air rack cooler, belt puller and gauging for "on-the-fly" production of 3D print filaments.

› **www.leistritz.com**

Clariant details US medical upgrades

Clariant said that the new compounding capacity installed earlier this year at its ISO 134585 medical compounding facility at Lewiston in Maine in the US has been successfully commissioned and is now ready for full scale production.

Clariant Corporation Masterbatches Head of Marketing Peter W Prusak said the 70mm extruder is part of a multi-million dollar investment at the facility that has also seen the installation of a new fluoropolymer line plus associated materials handling, weighing and water cooling.

The programme has expanded the Lewiston facility by 40%, allowing it to speed up production and to handle larger batches (pre-coloured Mevopur coloured compounds can now be produced in 6,000kg batches, twice what it could offer previously).

In the additives sector, NPE marked the introduction of Clariant's Addworks ATR 146 heat stabiliser for TPOs to the US market. This low dosage, sulphur-free product is intended for automotive interior applications requiring good heat and light stability and low VOC emissions.

› **www.clariant.com**

PHOTO: CLARIANT

The new line in Clariant's US medical compounding plant at Lewiston

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Adding strength to compounds

PHOTO: PLASTICOMP

The latest long fibre thermoplastic (LFT) technologies are accelerating the pace of metal replacement. However, Mark Holmes learns that other composite technologies may be closing the performance gap

Driven largely, but not exclusively, by the automotive sector, the process of replacement of metals by high performance thermoplastics continues to gather momentum. Long fibre thermoplastic (LFT) technology is one of the enablers of this trend, and the market is robust, according to US-based **PlastiComp** (acquired by PolyOne at the beginning of this month, see page 8 for more details).

"Market research reports indicate that trend will continue for the foreseeable future with sales of long fibre materials growing to $4bn from the current $2bn over the next decade," says Steve Ouendag, Application Development Manager at the US-based company. "LGF/PP materials for the automotive sector currently dominate production, but there is also growth occurring on a smaller scale in engineering resins, such as polyamides, for other markets such as sports and recreation and industrial equipment."

Lightweighting continues to be the driving force behind the adoption of long fibre materials. "Metal replacement is the bread and butter of applications for long fibre," says Ouendag. "Obviously increasing fuel economy and emissions regulations are the driving motivation for the automotive industry to convert components to lighter materials, but in other market segments the rise of hand-held and portable devices is also motivating them to consider alternative materials. The simplification of manufacturing and product assembly is another high motivator for designers and engineers to be looking at long fibre materials, whether an application has structural requirements or needs to be highly durable, which of course is a necessity for hand-held and portable devices."

Ouendag points out that long fibre technology is fairly mature, so we are unlikely to see great leaps forward in performance but rather iterative

Main image: Demands, from car makers in particular, are driving interest in LFTs, as well as prompting development of other high performance structural thermoplastic composites

PHOTO: PLASTICOMP

Above: LFT development is focused on developing solutions for specific applications, often through additive and polymer combinations

developments of materials and products geared toward customising long fibre formulations to the performance requirements of specific applications. "Often such customisation takes the form of additive technologies being combined with the polymer matrix during pultrusion to gain additional performance characteristics," he says.

However, from a production technology perspective, the need to increase throughput in pultrusion, while maintaining wet-out and quality standards, is an area that continues to be addressed. "If the market doubles as predicted, higher line speeds or equipment with higher strand counts are going to become a necessity to meet demand – both of those throughput factors can make the safe operation of pultrusion lines challenging for operators," says Ouendag. "Specifically what is being done by each compounder to upgrade their equipment infrastructure and processing techniques is usually considered a trade secret."

Plasticomp says that developing materials with improved surface appearance is a particular area of interest at present. "Traditionally long fibre was utilised for internal structural elements that were seldom visible, so fibre present on the surface was not a concern," Ouendag says. "However, now it is becoming more common for components made with long fibre to be used for exposed surfaces so smooth fibre-free appearance is much more critical than in the past. PlastiComp has also developed some polyamide materials that are less susceptible to performance degradation from moisture absorption. This is a factor for applications that will see exposure to a wide variety of climates - manufacturers commonly expect that their end products will function the same in a tropical environment as they do in an arid one."

Only a couple of months before acquiring PlastiComp, **PolyOne** announced a collaboration with Integral Technologies Inc and its wholly-owned subsidiary ElectriPlast Corporation to commercialise its long fibre conductive ElectriPlast material. This highly engineered, filled thermoplastic polymer replaces metal in electromagnetic and radio-frequency (EMI/RFI) shielding applications at up to 60% lighter weight. Through an exclusive, ten-year licence agreement, ElectriPlast technology will serve as a complement to PolyOne's existing speciality engineered materials portfolio, providing shielding for advanced driver assist systems (ADAS), including housings, connectors, and internal components for cameras, sensors, and electronic control units (see page 24 for more on this).

EMS-Grivory developed its Grivory HT1VA long fibre reinforced polyamide for liquid-based cooling system applications in electric vehicles (thermal management is important to maintain the battery, power electronics and electric motor at the correct temperature level for efficient operation). The new material is said to offer good resistance to hydrolysis and cooling agents and can withstand long-term use at moderate coolant temperatures. After around 12,000 hours in water at 95°C, Grivory HT1VA exhibits 30% higher strength values compared to a traditional PPA under the same conditions. A further advantage is its electro-compatible stabilisation, which makes it suitable for electronic components. The company says that in combination with electrical conductors there is no ionic migration while no corrosive effects are created in warmer climates. It foresees applications in auxiliary water pumps and thermal management modules.

Conventus Polymers has developed a range of high performance thermoplastics using long fibre technology that deliver high strength, high heat resistance and dimensional stability for firearm applications including stocks, magazines, receivers, rails, and a variety of other applications. The company says that polymers are increasingly employed in the firearms market where, in addition to lightweighting, they offer reduced recoil, corrosion resistance, serviceability, cost

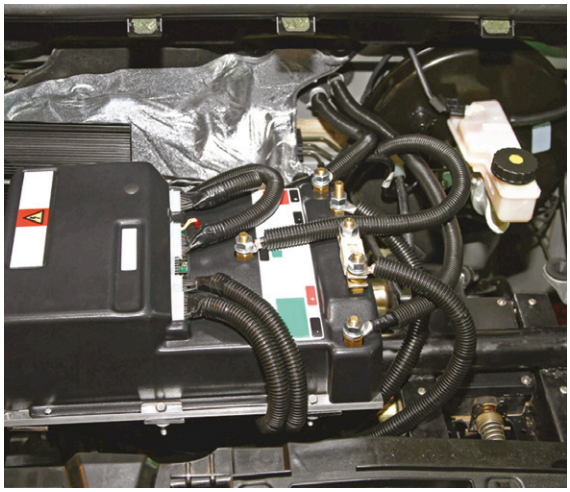

PHOTO: SHUTTERSTOCK

Right: EMS-Grivory's HT1VA long fibre reinforced PA is targeted at motor and battery cooling systems for electric vehicles

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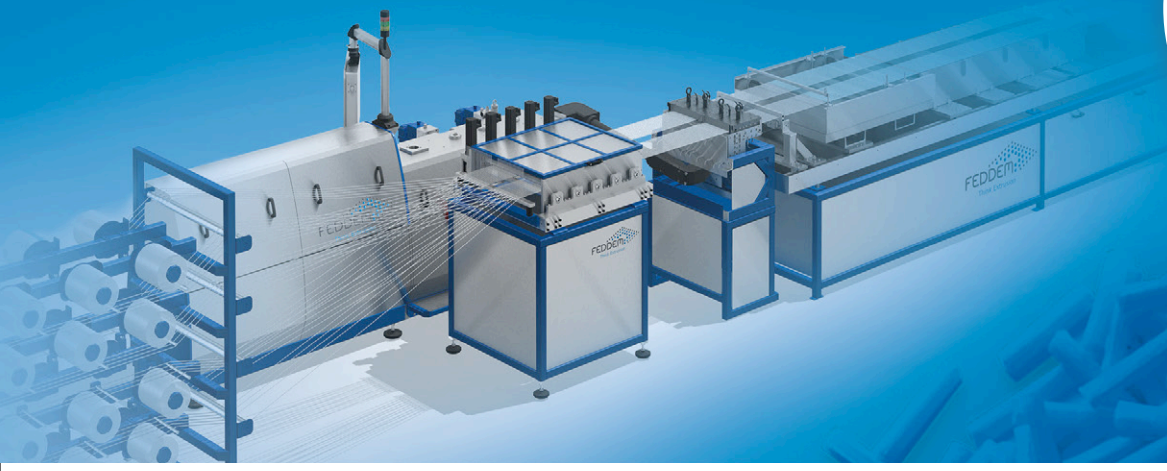

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Photo : the first reactor pot used in 1917 (exhibited in the headquarter showroom)

PHOTO: CONVENTUS POLYMERS

Right: Conventus Polymers has developed special long fibre reinforced grades for production of gun parts such as this stock

benefits and greater design freedom.

Conventus says it recently worked with a firearms manufacturer to customise a long carbon fibre reinforced PA6,6 resin that offers high modulus and good creep resistance and strength without compromising impact resistance. This was achieved using a combination of long carbon fibres and an impact modification package (standard long glass reinforced resins did not offer sufficient strength). The company has also developed a new line of long fibre technology in custom MIL-SPEC colours and soft-touch polymers in custom colours. These have been used in magazines and helmet components.

Short alternatives

Piper Plastics says its KyronMAX series of structural thermoplastic compounds meet customer demands for a short fibre thermoplastic material that outperforms the mechanical strength of long fibre thermoplastic (LFT) materials. "Our customers wanted the strongest mouldable polymers available without all the process and design limitations associated with LFT polymers," says David Wilkinson, Polymer Technology Manager at Piper Plastics.

"KyronMAX materials consistently outperform LFT polymers, especially when measuring the performance of the moulded part, which is the true test. They overcome all the limitations associated with LFT compounds while yielding stronger moulded parts that are also lighter in weight," he says.

Piper Plastics says that competitive structural compounds such as LFTs use high fibre loadings and long fibre lengths to achieve the required mechanical performance, but the performance of these materials often does not translate into the moulded parts due to weld line strength loss and fibre length reduction during processing. In contrast, it says that its KyronMAX materials use short fibre technology and much lower filler loadings to enable parts to be moulded with good mechanical performance and consistency and with wall thicknesses down to 0.038 cm (0.015 inches).

"The lower filler content results in a tough, structural plastic that can be utilised in extremely aggressive applications, yet is still processing friendly and does not require specialised moulding equipment," says Wilkinson. "We are consistently replacing LFT polymers with KyronMAX polymers that are 20% lighter and 20-50% stronger. Exhibiting tensile strengths above 51,000 psi (352 MPa) and flexural modulus above 6,500,000 psi (44,816 MPa), the KyronMAX technology platform is currently formulated in various thermoplastics including PA, PPA, PPSA, PEI, PEEK, with more in current development."

Piper Plastics says it uses a modified compounding process to produce its KyronMAX products. "Manufacturing of KyronMAX is a multi-step process, which utilises customised processing equipment developed by Piper," says Wilkinson. "The procedure starts with raw materials that are processed and modified in-house to ensure that the highest standards and consistency are achieved. The raw materials are then processed into compounds using custom-built equipment to achieve the required levels of mechanical performance. The constituents and formulations are

Akro-Plast prepared for LFT start-up

KD Feddersen group company Akro-Plastic will put its first LFT production line into operation at its plant at Niederzissen in Germany in Q3 of this year.

The line has been built and designed in partnership with fellow Feddersen group company Feddem around its ICX twin screw compounding technology and is said to be designed for cost effective and flexible production of quality LFTs.

The new line uses pultrusion technology and features an optimised impregnation die, tensioner and haul-off. Akro-Plastic Innovation and Sales Director Thilo Stier says product quality also benefits from Feddem's kneading block-free screw design.

Stier says use of LFT compounds can realise weight savings of up to 15% over conventional short fibre reinforced polymers with no loss in mechanical performance. However, he emphasised that LFTS should not be considered as an easy drop-in alternative – the component must be designed for long glass fibres to get optimal results.

› **www.akro-plastic.com**

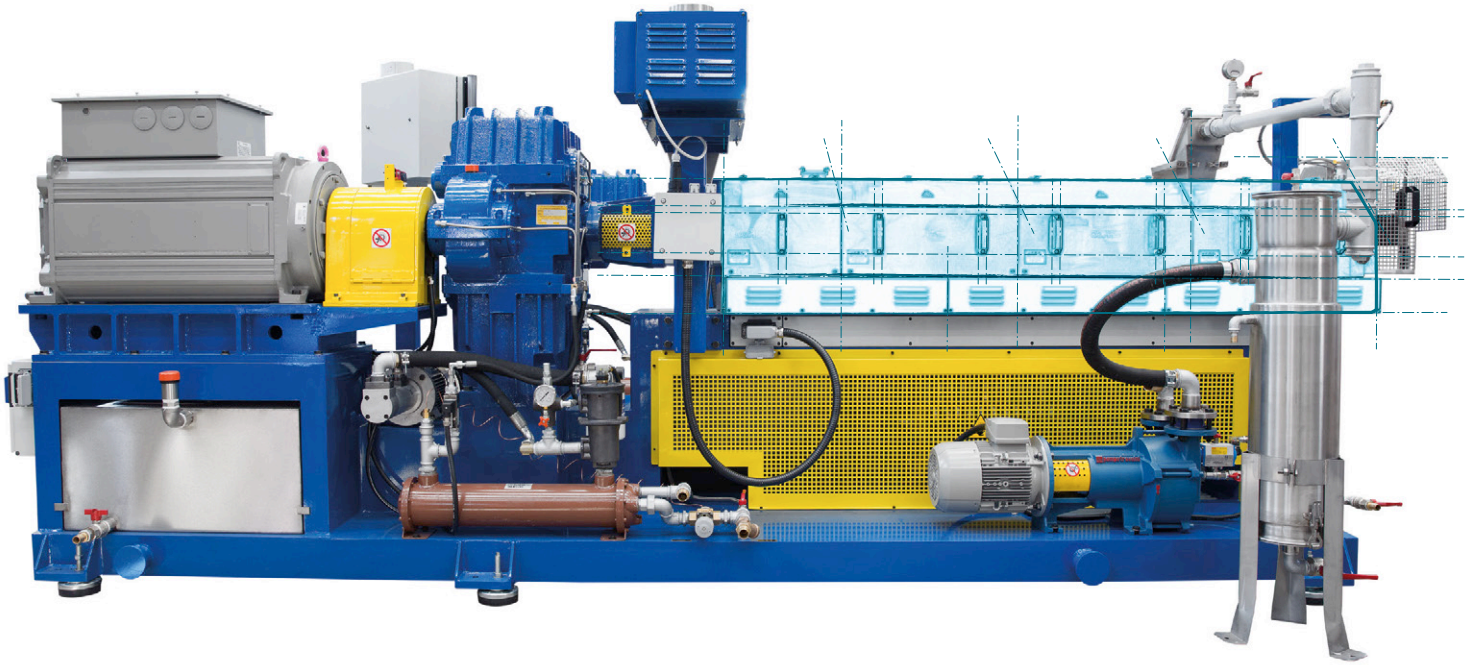

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PHOTO: PIPER PLASTICS

Above: Piper Plastics claims its KyronMAX short fibre products outperform LFTs in some applications

specifically designed for our customers' end use applications."

Carbon fills the gap

The performance gap between short glass fibre reinforced compounds and LFTs can also be plugged with new short carbon filled options, some of which are based on the availability of lower cost recycled carbon fibre material. **ELG Carbon Fibre**, one manufacturer of recycled carbon fibre, says it is increasing capacity at its UK facility to satisfy growing demand for large volume commercial applications resulting from development projects and technical collaborations with leading automotive and aerospace OEMs and Tier 1s during the past two years.

Right: ELG is increasing capacity for its recycled carbon fibre products by 70% to 1,700 tonnes/y

ELG's facility currently houses reclamation and conversion equipment that supports the manufacture of recycled carbon fibre products. The investments are focused on increasing the capacity to recover fibre from uncured prepreg and laminate feedstock and on the commercialisation of the company's own Carbiso MB line of reinforced thermoplastic compounds (ELG is upgrading its pyrolysis furnace to increase its output capacity from its current 1,000 tonnes of carbon fibre per year to 1,700 tonnes).

The Carbiso MB products have been developed by ELG with its technical partner Sanko Gosei. The automotive components maker has conducted extensive trials replacing glass fibre reinforced compounds with Carbiso MB recycled carbon fibre reinforced compound alternatives in a variety of demonstration parts and claims to have achieved significant weight reductions.

The recently launched Fibremod CFPP range of carbon fibre-reinforced PP grades from **Borealis** are now finding commercial application in the automotive sector. The company says that Fibremod CFPP compounds are engineered to achieve lightweight, integrated and high-performing alternatives to engineering plastics. Unlike polyamides, CFPP is not hygroscopic. It also helps minimise 'squeak and rattle' issues.

Borealis says Fibremod CB061SY has recently been used by a leading North American OEM to make the A-pillar brackets on a top-selling commercial vehicle. Although only 6% carbon fibre-reinforced, the product offers a stiffness of approximately 4,000 MPa and a density of 0.93 g/cm^3.

Elsewhere, a Fibremod Carbon development PP grade with 10% carbon reinforcement has been used by Magna Exteriors for a lightweight class-A fender. The part weighs 30-40% less than an

PHOTO: ELG

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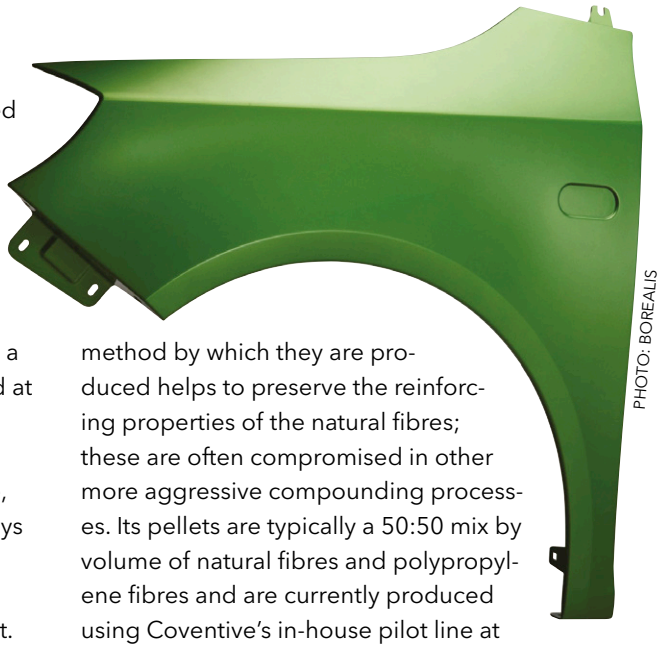

PHOTO: BOREALIS

Right: Magna Exteriors is using a 10% carbon fibre reinforced Fibremod PP grade from Borealis to produce this lightweight fender part

aluminium alternative and enables zero gap performance with very low CLTE when compared to other engineering plastics.

Meanwhile, **Solvay** has introduced Ixef 3012, a 55% carbon fibre and glass fibre hybrid reinforced grade of polyarylamide (PARA). The company says the new material has been developed to provide extremely high strength and stiffness at lower density as well as a good surface finish. "Ixef 3012 PARA is targeted at long and thin lightweighting components that require no painting and are capable of meeting demanding mechanical functions in automotive, aerospace as well as consumer applications," says Thomas Kohnert, Global Product Manager Ixef/Kalix/Omnix high-performance polyamides for Solvay's Specialty Polymers Global Business Unit.

"The carbon fibre and glass fibre hybrid loading provides outstanding flexural modulus and opens a wide potential for weight-saving metal replacement and system integration, while its high flowability enables cost-efficient injection moulding of delicate parts with long flow paths," he says. Ixef 3012 PARA exhibits good creep resistance and is electrically conductive.

Natural options

Carbon is not the only alternative to glass. **Coventive Composites** has introduced long natural fibre reinforced thermoplastic, injection moulding compounds based on flax, hemp and jute fibres in a PP matrix as a cost-effective alternative to long glass fibre thermoplastic (LFT) products for automotive applications.

Coventive says glass fibres are relative heavy, derived from non-renewable sources and cannot easily be recycled. Natural fibres, it argues, are less dense, have a similar stiffness to glass, and boast a lower environmental impact. The pellet format and method by which they are produced helps to preserve the reinforcing properties of the natural fibres; these are often compromised in other more aggressive compounding processes. Its pellets are typically a 50:50 mix by volume of natural fibres and polypropylene fibres and are currently produced using Coventive's in-house pilot line at pellet lengths of between 5-25 mm, depending upon the application. The pellets can be injection moulded using standard equipment and, because natural fibres are less abrasive than glass, they generate less tool wear

Below: Coventive Composites has developed a number of long fibre reinforced compounds based on natural fibres, claiming reduced density and improved sustainability

PHOTO: COVENTUS COMPOSITES

Continuous development

The introduction of automated processing methods for combining formed continuous fibre reinforced thermoplastic sheet with injection moulding is sparking development of a whole new range of thermoplastic composites. **Lanxess** says its Tepex range of continuous fibre-reinforced thermoplastics are becoming increasingly important for lightweight vehicle design and can be found in an increasing number of series production applications – for example, front-end mountings, underfloor protection and bumper beams, brake pedals, through-loading systems and fuel tank reinforcements. There is also significant potential for use in vehicle underbodies, for the protection of batteries, and in new concepts for highly-integrated, multi-position seats. Lanxess is currently developing variants with electromagnetic shielding properties, especially for components of electrified vehicle drivetrains.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.plasticomp.com**
- **www.polyone.com**
- **www.emsgrivory.com**
- **www.conventuspolymers.com**
- **www.piperplastics.com**
- **www.elgcf.com (ELG Carbon Fibre)**
- **www.borealisgroup.com**
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The candidate is responsible for all additive-masterbatch developments in Europe. The candidate is responsible for planning, organization and implementation of product- and technology activities to strengthen Clariant's competitiveness in product management additives. The candidate ensures customer requirements in regard to development time/quality/costs and will support the product management team. The incumbent will lead an international team of product developers including the respective application testing labs based in sites Ahrensburg and Pogliano/Italy. The position needs intensive use of technical resources at both sites and a close cooperation with the functions production, product stewardship, quality control, market segments of marketing organization and central Group Technology Innovation.

Responsibilities:

- Development of additive-masterbatch product portfolio for Europe
- Responsibility for products in regard to documentation and safeguarding patent protection of new developments
- Selection of raw materials from suppliers according to performance and sustainability criteria
- Leadership of two product development teams in Germany and Italy. Coaching and development of employees according to Clariant's values and leadership principles. Support of teams by technical input
- Innovation management: identifying market needs and initiation of projects („technology push") and managing customer projects together with product management („market pull")
- Coordination of cooperations with Group Technology Innovation of Clariant and external partners (suppliers, institutes and universities)
- Exchange with other regions, countries and global functions of business unit masterbatches
- Support of production at sites Ahrensburg und Pogliano, especially first productions and scale-ups
- Management of suppliers and strategical direction according to needs of Clariant

Requirements:

- Degree in chemistry or material science (PhD preferred) or similar qualification
- Broad technical understanding/experience in thermoplastic polymers, ideally with additional experience in compound development, processing and its properties
- 4-5 years of job experience and broad knowledge in customer requests for additives in plastics industry and ability to transfer this know-how into new products
- Leadership experience
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The German city of Essen welcomes Europe's first dedicated exhibition for the compounding industry later this month

Essen set for Europe's compounding show

Brand new, process-focused and free-to-attend, the first Compounding World Expo debuts in Essen, Germany, later this month. We preview what's in store for visitors

The very first Compounding World Expo takes place in Essen, Germany, on 27-28 of this month and it looks like being a great event – exhibition space is fully sold out and close to 3,500 visitors have registered to attend at the time of writing. Organised by Compounding World publisher AMI, the Compounding World Expo is co-located at Messe Essen with the Plastics Recycling World Exhibition. Each event combines a tightly-focused free-to-enter exhibition with high quality free conference streams that will address many of the commercial and technical issues facing these respective markets today.

The quality and breadth of the companies exhibiting at the Compounding World Expo can be seen in the preview of exhibitors over the next 23 pages. Certainly, compounders attending the show will be able to find out more about the latest developments in compounding machinery and equipment, polymers and additives, and new compound and masterbatch introductions.

Attendees can also learn from the free high quality conference sessions at the Compounding World Expo, which take the form of expert debates, technical lectures and training tips. Three free-to-attend debates will cover key issues impacting on the technical compounds, masterbatch and PVC markets.

The Compounding World Expo conference programme also features presentations examining topics such as electrically and thermally conductive compounds; flame retardants; compatibilisation; friction modification; nanocomposites; cross-linking agents; functional fillers; thermoplastic elastomers; and high-temperature polyamides. Click **HERE** to view the full conference programme.

The Compounding World Expo offers some relaxed networking opportunities too. Football fans will appreciate the screening of the World Cup match between Germany and Korea in one of the conference theatres from 16:00 on the first day. And this will be followed by a networking party for visitors and exhibitors in Messe Essen's beer garden.

Click here to register for your free ticket

Compounding WORLD EXPO 2018

Compounding World Expo 2018 – Key Information

Dates: 27-28 June 2018 **Venue:** Messe Essen, Germany – Entry is free
Opening Hours: 27 June: 9.00am to 18.00pm 28 June: 9.00am to 17.00pm
Online registration: www.compoundingworldexpo.com/eu

Right: BASF will present its pigment preparations

AIMPLAS is a Spain-based plastics technology centre that provides a range of technical and development solutions to companies in the plastics industry. It can take on R&D projects, analysis and testing, technical assistance, competitive intelligence and training.
› **www.aimplas.es**

Almaak International is an innovative and globally active compounding company with more than 45 years of experience in processing of engineered thermoplastics. Products include standard and technical compounds offering properties such as flame retardance, anti-static or low friction.
› **www.almaak.de**

Automotive Compounding Industry (ACI) is part of the Spanish family-owned Perplastic Group. Established in 1986 as a PVC compounder, the company's core business today is the manufacture of plastic compounds for production of cables and wires for the automotive industry.
› **www.aci.com.pt**

AZO provides innovative bulk material handling, raw material handling, pneumatic conveying, mixer feeding, screeners and bulk containers for reliable automation of industrial production processes in the plastic compounding, chemical, pharma and food sectors.
› **www.azo.com**

BASF, through its Colors & Effects brand, offers a comprehensive range of pigment preparations for the plastics industry. Products are formulated to provide consistent performance in a wide range of applications including food packaging and toys. The company offers dust-free and easy to meter pigment preparations.
› **www.colors-effects.basf.com**

PHOTO: BASF

Bekaert is a world market and technology leader in steel wire transformation and coating technologies. Its Beki-Shield additive is a stainless steel fibre product that can be supplied as a masterbatch or roving and can be used to add electrical conductivity and shielding properties to plastics at low additions levels.
› **www.bekaert.com**

Biesterfeld is a leading pan-European distributor for standard and engineering polymers, acrylates, polyesters, styrenic copolymers and additives. It works with many major suppliers to the plastics industry, including BASF, Cabot, Ineos, Kumho Petrochemical, Nural, RTP Company and Solvay.
› **www.biesterfeld-plastic.com**

Borealis is a leading provider of polyolefin resins, compounds and polyolefin plastomers that aims to provide innovative and value-creating solutions for its customers. It targets applications in end-use markets including automotive, consumer products, wire and cable, and pipe production.
› **www.borealisgroup.com**

Brabender produces and distributes instruments and equipment for R&D and quality control testing covering a broad range of polymer material properties. Its products can be used in a wide variety of applications from the laboratory through to small-scale production.
› **www.brabender.com**

Brabender Technologie makes systems for feeding, weighing, discharging and metering of bulk ingredients for a wide range of manufacturing industries, including plastics. The company's product line includes gravimetric, weigh-belt and volumetric feeders, as well as batching systems.
› **www.brabender-technologie.com**

Below: PP compound production at the Borealis compounding plant at Linz

PHOTO: BOREALIS

Brenntag Polymers is a leading player in chemical distribution. Its polymer industry offering includes standard, engineering and high performance polymers plus a full range of additives, extending to antioxidants, UV stabilisers, pigments and flame retardants.
› **www.brenntag-gmbh.de**

Bronkhorst is a specialist provider of low-flow fluidics handling equipment. The company develops, manufactures and markets high quality standard and customised mass flow and pressure meters, as well as a broad range of controllers for gas and (low flow) liquid applications.
› **www.bronkhorst.com**

Burgsmüller, which manufactures a wide range of replacement parts for twin screw compounders, will be showing its ScrewCon configuration software. This allows custom-fit combinations of screw and barrel elements to be assembled from library of around 3,000 parts. Brand independent, ScrewCon is said to allow processing sections to be developed for optimal performance.
› **www.burgsmueller.de**

Buss, with some 60 years of history, is the global leader in kneader extruders for demanding compounding solutions. Buss technology is especially suitable for challenging tasks such as PVC pelletising, cable compound production, masterbatch manufacturing, calender feeding, thermosets, and processing of powder coatings and toners. The company has just introduced its new Compeo range.
› **www.busscorp.com**

C A Picard is specialised in production of highly wear-resistant precision metal parts for various industries and applications. Its Extruder Technology division operates globally, developing and manufacturing parts and equipment for single, twin and multi-screw extrusion systems.
› **www.capicard.de**

Cabot Corporation is a global specialty chemical and performance additives company specialising in black masterbatches and conductive formulations. Its specialty carbon blacks can deliver a range of performance attributes in polymer compounds.
› **www.cabotcorp.com**

Campine is a leader in production of antimony derivatives, including antimony trioxide (Sb_2O_3). Its Campine-branded masterbatches include 80% or 90% antimony trioxide in polymers such as PE, EVA, PA and PBT. The company also offers products that contain one or more flame retardant additives under the Campine and Mastertek brands, including halogenated or non-halogenated varieties.
› **www.campine.be**


PHOTO: BRABENDER TECHNOLOGIE

Left: This fibre feeder is among the latest developments from Brabender Technologie (page 46)

Carl Spaeter is an independent trading company supplying a variety of functional fillers and additives to the plastics and rubber industries. Its product line includes mineral flame retardants, micro glass hollow spheres, mineral spheres, antioxidants, UV stabilisers, processing aids, and colour masterbatches.
› **www.spaeter.de**

CeNTI, the Portugal-based Centre for Nanotechnology and Smart Materials, is a non-profit research institute offering technology and R&D services including engineering and production scale-up of functional and smart materials and devices.
› **www.centi.pt**

Ceronas is a producer of wax-based products including oxidised Viscocer waxes and Addimer wax-based additives for processing and compounding of technical plastics. The latter can improve processing properties of a broad range of polar and non polar resins. Its latest product additions include Addimer ionomers for resins that process at high temperature.
› **www.ceronas.de**

PHOTO: BUSS

Compeo is the latest co-kneader compounder design from Buss

PHOTO: COPERION

Right: An STS 35 Mc^{11} twin screw extruder from Coperion optimised for colour masterbatch production

Changzhou Changlang Gearbox manufactures a broad line of gearboxes for single and twin screw extruder drive applications. The latest addition to its portfolio is what it claims is the first Chinese manufactured co-directional double-gearbox with an 18 Nm/cm^3 torque rating.
› **www.chengbrand.com**

Comac specialises in the design and production of co-rotating twin screw extruders for plastics compounding and masterbatch. Machines range from its 25mm diameter laboratory unit through to high capacity production units up to 135mm dimeter. The company also builds special machines for PET recycling and LFT-D production.
› **www.comacplast.com**

Coperion is an industry leader in compounding extruders, feeding and weighing units, bulk material handling equipment and service. From individual rotary valves through to complete compounding production lines, Coperion and Coperion K-Tron work closely with customers on a global scale to deliver what they need for their specific manufacturing processes.
› **www.coperion.com**

Dega manufactures a variety of auxiliary equipment for the plastics industry, including gravimetric and volumetric dosing units, feeding and storage units, as well as systems and components for transporting powder raw materials.
› **www.dega-america.com**

Dow Performance Silicones is a leader in silicone-based technology and innovation. From transportation and lighting to building and construction, Dow's Performance Silicones business can help solve challenging processing and performance problems.
› **consumer.dow.com**

Dr Collin Lab & Pilot Solutions develops intelligent modular pilot and laboratory compounding lines for small scale production and research applications. Its Teach Line, Pilot Line and Medical Line products are used for development, material analysis, pilot production, scale up and production duties.
› **www.drcollin.de**

Dynisco provides the tools and services that present the polymer industry with a window into its processes. Its diverse portfolio of sensing and polymer test equipment delivers accurate information for measurement of polymer rheology, pressure, and temperatures.
› **www.dynisco.com**

E Victor Meyer supplies pure white dolomite fillers produced from its core stone processing activities. The materials are marketed under the Madol name and are characterised by high whiteness. They are available in sizes from 10 to 100 microns.
› **www.victor-meyer.be**

Econ was founded in 1999 as a supplier of special machinery for plastics processing. Since then it has developed a leading position in pelletising technology and associated equipment. The company's product line now includes underwater pelletising systems, pellet and bulk material dryers, air pelletising systems, screen changers and pyrolysis furnaces.
› **www.econ.eu**

Elix Polymers is a leading manufacturer of ABS resins and ABS/SAN based polymer modifiers for the compounding industry. The Spain-headquartered company specialises in tailor-made solutions delivered through a network of representatives and distributors in more than 40 countries.
› **www.elix-polymers.com**

Entex Rust & Mitschke manufactures planetary roller extruders, which are particularly useful for processing temperature sensitive materials. Traditionally used in the PVC sector, planetary roller equipment is now often used to process ABS, TPO,

PHOTO: ECON

Right: Econ's EU10 pelletiser is its smallest model and is intended for lab duties

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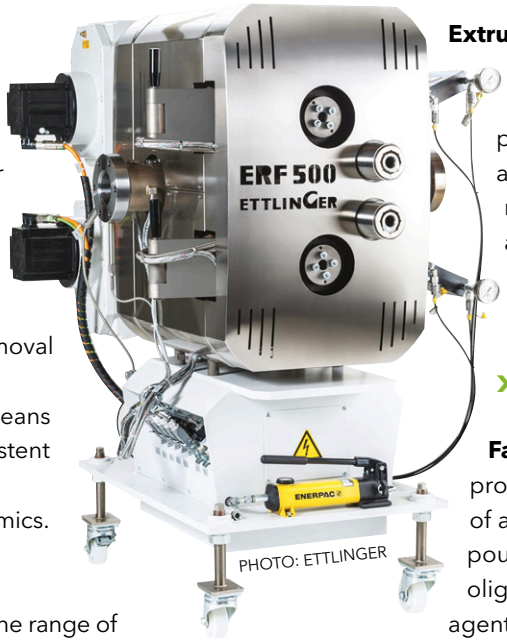


PHOTO: ETTLINGER

Right: An ERF500 melt filter from the Ettlinger product range

TPU, filled polyolefins, and elastomeric formulations.
› **www.entex.de**

Ettlinger's patented melt filter technology is developed for operation with recycled polyolefin materials with high levels of contamination. Automatic and continuous removal of contaminants by a scraper during the filtration process means more stable processing, consistent filtration area, longer machine lifetime, and improved economics.
› **www.ettlinger.com**

Euroceras supplies the Ceralene range of waxes for use as internal and external lubricants in plastics processing. Products include non-polar LDPE, HDPE, PP and PE/PP-copolymer waxes as well as PE/acrylic acid-copolymer waxes for polar resins and unique synthetic polyester waxes (which have properties similar to montan waxes).
› **www.euroceras.com**


PHOTO: EXTRICOM EXTRUSION

Above: Barrier screw elements by Extricom Extrusion

Europiren manufactures Ecopiren, a range of fire retarded fillers for polymers based on magnesium hydroxide (MDH). The company has extensive experience in the application of MDH in polymer formulations, including both PVC and HFFR compounds for cables, A2&B1 aluminium composite panels and roofing membranes.
› **www.europiren.com**

Evonik includes its Plastic Additives portfolio within its Interface & Performance Business line. Products include Tegomer and Tegopren performance additives, which help improve mechanical properties, Tegomer dispersing agents for better pigment and filler processing, and Accurel Additive Super Concentrates. Its additives support many plastics applications, including dispersion of colour pigments, antistatic treatment of polymeric material, and improving scratch resistance.
› **www.plastic-additives.com/**

Extricom Extrusion offers an extensive range of compounding support within its ImproveXtrusion programme. This includes optimisation of screw geometries for co-rotating twin screw extruders and further development of its RingExtruder technology.
› **www.cpmextrusiongroup.com**

Extruder Experts specialises in highly wear-resistant parts for twin screw extruders. Its portfolio includes standard and customised kneading and mixing elements, screw shafts and barrels. It also offers measurement, cleaning and maintenance services, plus process optimisation support.
› **www.extruder-experts.com**

Falcone Specialities will provide details of the full range of additives it offers to compounders. Key products include oligomeric silane coupling agents, high-performance pigments, and highly-effective processing aids such as silicone masterbatches, as well as other performance additives.
› **www.falcone-specialities.com**

Farrel Pomini has more than 100 years of experience in compounding and mixing technology. The group offers new processing equipment design and engineering, spare parts, remanufacturing and rebuilding, process engineering as well as field service and technical support.
› **www.farrel-pomini.com**

Feddem has more than 25 years' experience in the development, design and construction of extrusion and compounding lines. Aside from its standard range of twin screw extruders, the company also offers project planning and supplies turnkey systems globally, including peripheral equipment, as well as providing a flexible spare parts service.
› **www.feddem.com**

PHOTO: FARREL POMINI

Right: Farrel Pomini's CPeX laboratory compounding system

Fraunhofer LBF presents latest studies

Fraunhofer LBF will present two of its recent studies into plastics waste covering upcycling of PET bottles and recycling of flame retardant plastics. The UpcyclePET project involves Easicomp and the Öko-Institut and is developing a direct pultrusion process for production of LFT compounds from PET bottle scrap.

Work carried out within the flame retardant plastics project has focused on determining the ageing characteristics of the additives and base polymers. Results so far are said to be promising, showing that various PA6 and glass reinforced PA66 grades can be recycled multiple times without loss of fire resistance.

The institute will also be able to update visitors on its programme to integrate on-line emissions analysis into the compounding process. It hopes to develop a system to adjust dosing of different odour-management additives to compensate for variation in raw materials, which is a particular challenge where recycled content is being used.

On the plant operation side, Fraunhofer experts will be available to explain the organisation's Im-Process4.0 intelligent node-based monitoring system for predicting maintenance on twin screw extrusion lines and its electrochemical off-line screening process to determine the corrosive and abrasive nature of different compound formulations.

› **www.lbf.fraunhofer.de**

Frontier Laboratories is a leading company in analytical pyrolysis with a focus on research, development and production of analytical pyrolysers and UA columns for comprehensive GC/MS analysis of polymeric materials. Typical applications include reverse engineering, QC and failure analysis, and qualitative and quantitative analysis of polymers and additives.

› **www.frontier-lab.com**

Gefran's sensor technology range includes precision devices for measuring temperature, power, pressure and position. The company's portfolio also includes automation and motion control products, including a range of electric drives to regulate velocity of AC and DC motors, inverters and converters.

› **www.gefran.com**

Georg H Luh is a specialist supplier of graphite and mica products primarily supplied in flake or powder forms. The company has recently added graphene dispersions to its line-up, which also includes kaolins, aluminium silicate and glass sphere lightweight fillers, and black and coloured pigments.

› **www.luh.de**

GKG Goldmann Kunststoffe supplies plastics compounds specially tailored to automotive industry customer requirements. Its network of suppliers includes ISO 9001 and ISO TS 16949 certified manufacturers such as LG, Formosa, Shinkong, Rialti and Sitraplas, and the company's global distribution network extends to China and the NAFTA region.

› **www.gold-mann.de**

GSBI (Govoni Simo Bianca Impianti) has been designing and manufacturing automated systems for bulk material handling for more than 60 years. Its expertise includes turnkey industrial systems and single components for bulk solid handling and encompasses vertical storage silos and tanks, pneumatic and mechanical conveying, weighing systems, mixers and blenders, filters, and pellet cleaners.

› **www.gsbimpianti.com**

Güpo produces an extensive range of thermally conductive fillers. Its product line includes Güpotim A (bi-modal particle distributions), Güpotim T (based on aluminium oxides) and Güpotim WP (tri-modal particle distribution).

› **www.guepo.de**

Gülmer started mineral additive production in Turkey in 1999. Originally focused on fine calcium carbonate, arite and talc for industries such as plastics and paint, it extended into dolomite and gypsum production

Right: An MTS compounding extruder from Feddem (page 50)

PHOTO: ICMA SAN GIORGIO

Above: A turnkey compounding installation by ICMA San Giorgio

and, since 2003, ultra fine white talc production.
› **www.gulmermaden.com.tr**

HPF - The Mineral Engineers, part of Quarzwerke, produces high performance functional fillers based on acicular wollastonite, flaky mica (muscovite and phlogopite) and granular wollastonite. These high performance fillers impart increased scratch resistance, reduced mechanical and thermal distortion, and better tensile strength and tensile modulus with constant high impact strength.
› **www.hpfminerals.com**

ICMA San Giorgio is a leading manufacturer of compounding and extrusion systems supplying turn-key systems for compounding, masterbatch and extrusion applications. Its co-rotating twin screw extruders cover a wide range of plastics compounding applications requiring flexibility and reliability.
› **www.icmasangiorgio.it**

Imerys is a world leader in mineral-based industrial specialties with a portfolio that includes calcium carbonates, micas, talcs, and wollastonite. It also supplies an extensive range of graphites and carbons. Imerys products can be used to modify plastic compound attributes such as hardness, conductivity, opacity and durability.
› **www.imerys.com**

IMI Fabi is a leading mining and minerals company specialising in production of talc. IMI's global operating network produces and distributes high quality industrial talc products for plastics compounders and is supported by comprehensive and reliable service.
› **www.imifabi.com**

Interface Polymers offers a variety of compatibilisers for the polyolefin industry. The company's additives can transform polyolefin performance and cost competitiveness in many applications where interfacial compatibility or surface properties are important. Applications include polymer blends, joining and finishing.
› **www.interfacepolymers.com**

Javachem is one of China's leading suppliers of additives for plastics. Its products include silicone plastic additives, high performance antistatic agents, polypropylene special modifiers and functional masterbatches.
› **www.javachem.com**

Jiangsu Cenmen Equipment produces twin screw and reciprocating screw extruders. Its current compounding product line includes the TSH high torque and TSS super high torque series of twin screw extruders, WHS and GWHS reciprocating compounding extruders, and SDJ series (twin screw/single screw) two-stage compounding extruder.
› **www.njcmsj.com**

Jiangsu China Star New Materials Technology manufactures and markets antioxidants, accelerators, and vulcanisation additives. It will present its triallyl isocyanurate crosslinking agent, OD and TPPD series antioxidants, and HVA-2 vulcanising agents, all of which have been preregistered for REACH certification.
› **www.huaxingmaterials.com**

JSW will present its latest twin screw compounding technology developments for use in applications ranging from masterbatch compounding, polymer alloying and production of glass and carbon reinforced compounds, through to reactive processing, biomass compounding, LFT-D production, and supercritical carbon dioxide mixing.
› **www.jsw.co.jp**

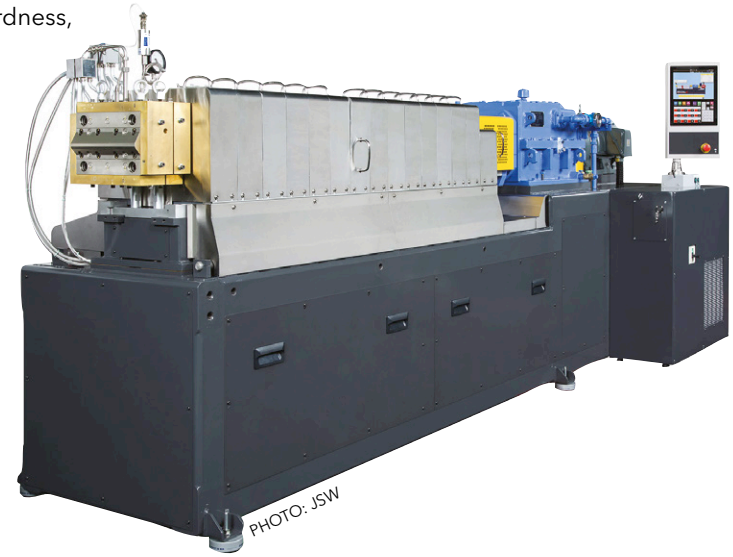


PHOTO: JSW

Right: JSW's TEX34αIII high-performance compounding extruder is now available in Europe

Right: The handheld CM-25cG spectrophotometer is a recent addition to the Konica Minolta range

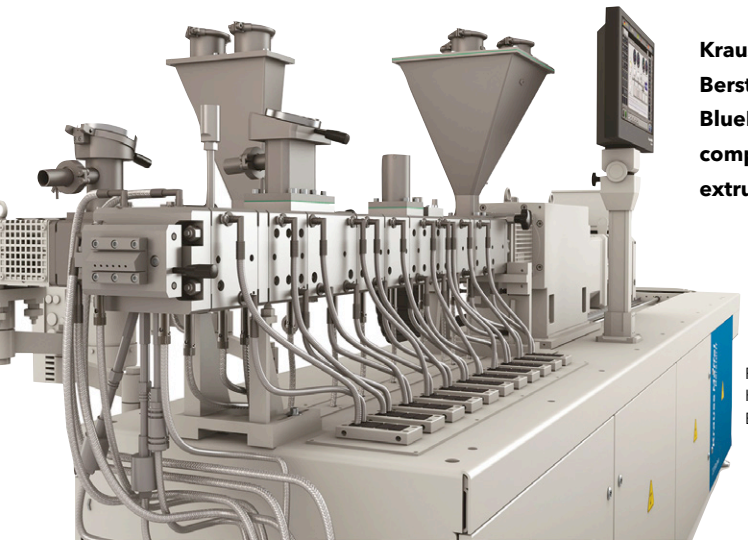
J-Tec Material Handling designs, supplies, builds and maintains powder, pellet and liquid processing systems for use in industries including plastics compounding. Its project management capabilities extend from product and process testing, mechanical and electrical engineering to construction, start-up and maintenance of each installation.
› **www.j-tec.com**

Junmei Materials, which is part of the Japanese inorganic non-metallic minerals trading company Junmei Corp, manufactures and supplies environmentally-sustainable fillers and additives for plastics and rubber applications from its production base in Dalian, China.
› **www.junmeicorp.com**

Changzhou Jwell Chemical Machinery is the twin screw extrusion systems manufacturing division of Chinese machinery maker Jwell China. It manufactures twin screw models ranging from 35mm to 132mm in four versions: CJWA basic, CJWH high torque, CJWS ultra high torque and CJWV deep groove.
› **www.czjwell.com**

Kamadur Industrial Knives supplies a full range of aftermarket knives, blades, cutters and services for pelletisers including milling cutters and bed knives for strand pelletising systems, knifeholders and die plates for underwater pelletisers, and knives and screens for recycling equipment. It also offers a sharpening service to OEM specification.
› **www.kamadur.com**

Kaneka Belgium supplies high-performance methacrylate butadiene styrene (MBS) and acrylic polymers, liquid polymers, and lightweight foamed plastics from its three production sites. It also provides logistic, commercial and marketing activities for a variety of other chemical products from its parent company Kaneka Corporation.
› **www.kaneka.be**



KraussMaffei Berstorff's ZE28 BluePower compounding extruder

PHOTO: KRAUSSMAFFEI BERSTORFF

PHOTO: KONICA MINOLTA

Kennametal Conforma Clad specialises in wear protection for twin-screw extruder barrels. Engineered to withstand the most extreme extrusion processes, its Conforma Clad cloth delivery system allows densely-packed tungsten carbide to be uniformly applied to complex geometries, resulting in a fully bonded and highly protective barrier.
› **www.conformaclad.com**

Kisuma, part of Kyowa Group, manufactures specialty synthetic magnesium additives for use in plastic compounds, including hydrotalcite. Alcamizer and DHT-4A and 4V hydrotalcites are used as acid scavengers while Kisuma 5 magnesium hydroxide is a highly effective halogen-free flame retardant.
› **www.kisuma.com**

Konica Minolta is a leading supplier of colour measurement instruments. Its Colibri software platform for colour matching and quality control presents a comprehensive solution for the plastic industry when combined with its close tolerance instruments and is fully scalable from single workplace to cloud solutions.
› **www.konicaminolta.eu**

Krahn Chemie is an independent distributor of specialty chemicals with a strong presence in the European masterbatch, compounding and PVC processing industry. It supplies plasticisers from ExxonMobil Chemical, Oxea Chemicals, Valtris Specialities and others and effect pigments from Kuncai, Toyal and Chromaflo Technologies. Plastics additive principals include BYK-Chemie, Baerlocher and Hebron.
› **www.krahn.eu**

KraussMaffei Berstorff's twin screw compounding extruder line extends to four variants – ZE BluePower, ZE Basic, ZE-UTXi and ZE UltraTorque. The company offers solutions for lab applications through to high output 230mm diameter systems.

All are supported with a full range of auxiliaries and the company can take on projects from a single unit to a full compounding plant.
› **www.kraussmaffeiberstorff.com**

Labtech Engineering manufactures an extensive range of polymer processing equipment for the laboratory, including single and twin-screw extruders, two-roll mills, mixers, single and multi-layer film blowing lines and film casting lines, 3D filament and tube lines. The Thailand-headquartered company has a European office and offers a same-day spares shipping service.
› **www.labtechengineering.com**

Lapp Engineering was founded in 2004 to focus on polymer development and project management. Its services include polymer compound development and optimisation, custom processing of small specialty lots, physical and mechanical testing, and intellectual property advice.
› **www.lappengineering.com**

Leistritz is a leading manufacturer of twin screw extruders for the plastics compounding industry. Its ZSE MAXX twin screw extruder combines very high specific torque (up to 15 Nm/cm³) and a large volume (OD/ID = 1.66), making it a highly flexible option that can be adapted to a wide range of processing applications.
› **www.leistritz.com**

Lesun Screw offers an extensive range of standard screw elements for compounding extruders. Its product line includes components developed for applications ranging from polyolefin and engineering plastic compounds, to masterbatch, thermoplastic elastomers, wood plastic composite compounds and biodegradable polymers.
› **www.lesunscrew.com**

Listgrove is one of the longest-established recruitment specialists for the plastics, packaging, petrochemical and chemical sectors. The company boasts a multi-national team of consultants capable of taking on recruitment briefs at all levels of seniority and across every job function.
› **www.listgrove.com**

PHOTO: LEISTRITZ

Above: Leistritz ZSE MAXX extruders can be adapted to a wide range of processing applications

LKAB Minerals offers natural flame retardants, lamellar minerals, and high density products for use in a wide range of polymer applications. Its products include UltraCarb (hydromagnesite and huntite), MicaFort (muscovite and phlogopite mica) and MagniF (magnetite).
› **www.lkabminerals.com**

Maag is a major manufacturer of gear pumps, pelletising systems, filtration systems and pulverisers for applications in the plastics compounding industry. Maag's brands include Maag Pump & Filtration Systems, Automatik Scheer Strand Pelletisers, Gala Automatik Underwater Pelletisers and Reduction Pulverising Systems.
› **www.maag.com**

Magnesia is an international specialist in production of magnesium and calcium compounds. It supplies high quality oxides, hydroxides, carbonates, chlorides and other minerals for use as functional fillers, flame retardants and additives in compounding formulations.
› **www.magnesia.de**

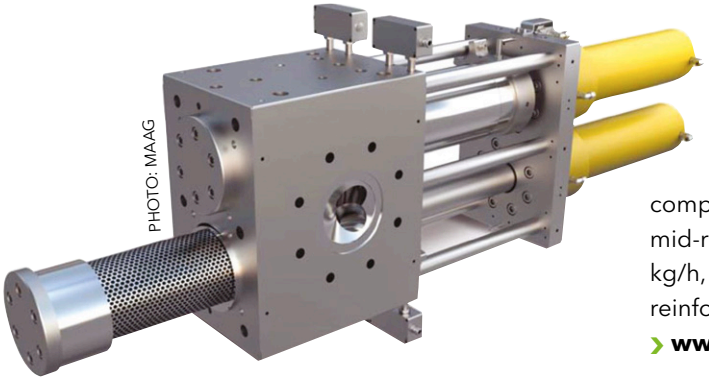


PHOTO: MAAG

Left: A CSC-R screenchanger by Maag Automatik

Maris has released the latest generation of its TM-HF high torque twin-screw extruders, first seen in prototype form at K 2016. The units provide a specific torque of up to 15 Nm/cm³ and are intended principally for compounding engineering thermoplastics. The mid-range TM-HF 58 can push out up to 1,500 kg/h, although 1,000 kg/h is more typical for glass reinforced polyamides.
› **www.mariscorp.com**

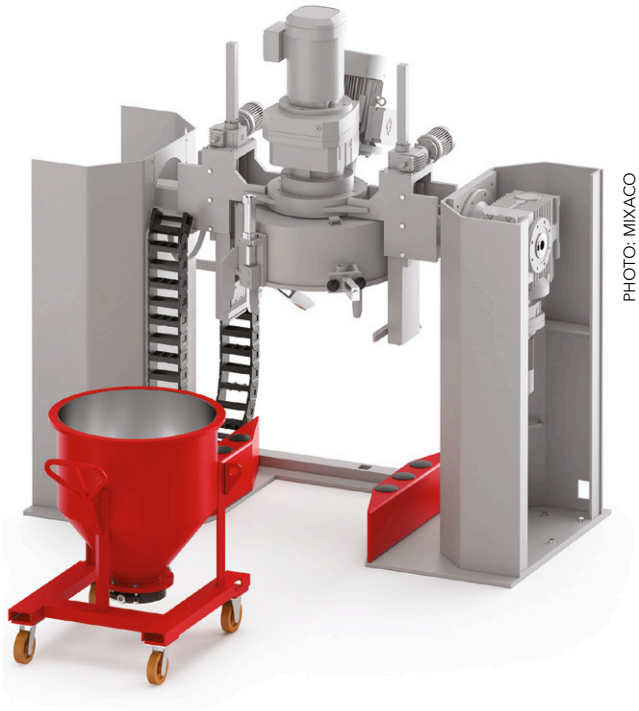


PHOTO: MIXACO

Right: CM Multi Tool container mixer system by Mixaco

MCC (Menssing Chemiehandel & Consultants) is an international distributor of chemical raw materials and plastic additives with a worldwide network, including representative offices in China, India and Mexico. MCC supports suppliers and clients in REACH regulation compliance.
› **www.mcc-hamburg.de**

Merck is a leading supplier of specialty pigments for plastics applications. Its Iriotec 8000 series of laser marking additives allow plastic parts to be marked quickly, accurately, and with razor-sharp precision. Applications include serial numbers on electronic components, best-before dates on food packaging, and scales on medical devices.
› **www.merckgroup.com**

Click here to register for your free ticket

Mitsui & Co has a strong presence in supply of basic chemicals, fine chemicals, plastics and plastic additives, biofuels and renewable energies. Its portfolio of plastic additives ranges from stabilisers to synergistic additive blend systems and tailor-made solutions for improved handling properties.
› **www.mitsui.com**

Mixaco is a leader in mixing technology. The company aims to guarantee mix quality while improving handling through detailed analysis of the customer's process requirements and development of individualised mixing solutions. Its product line includes a variety of container mixers plus heat/cool, high speed, and horizontal and vertical universal models.
› **www.mixaco.com**

Mondo Minerals is a multinational producer of talc products, which it markets under the Finntalc, Plustalc, Microtalc and Mondana names. Applications in the compounding sector range from enhancing mechanical strength of plastics and improving oxygen barrier of food packaging.
› **www.mondominerals.com**

Below: Merck will present its Iriotec laser marking additives

PHOTO: MERCK

Motan-Colortronic is a leading provider of peripheral units and systems for handling of bulk solids. The company develops solutions for plastics manufacturers and processors, all tailored to real-world applications and designed to improve efficiency, productivity and competitiveness.
› **www.motan-colortronic.com**

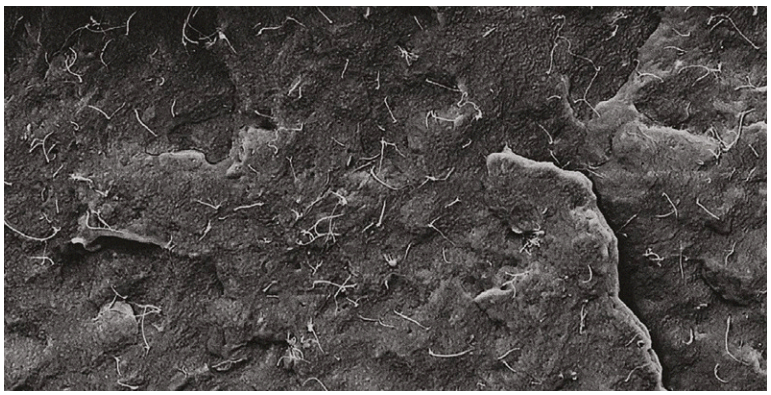
MPI Chemie is an independent chemical company with a global presence. Headquartered in the Netherlands, it supplies a wide range of additives to the European plastics compounding and coatings industries including antioxidants, light stabilisers, optical brighteners and UV absorbers.
› **www.mpi-chemie.com**

Nanjing General Extrusion Co is one of Asia's leading spare parts suppliers for co-rotating twin screw extruders. The company offers standard and special screw elements, barrels and shafts produced in a variety of steels with different abrasion and corrosion resistant finishes to suit the specific processing application.
› **www.njlaoli.com**

Nigtas Corporation is a leading calcium carbonate manufacturer and the main supplier of limestone in Turkey, employing more than 700 people across five quarries and two production plants. Its production for plastics applications includes granular, micronised and nano grades.
› **www.nigtasmikronize.com**

Nordic Grafting Company, part of the Björn Thorsen A/S Group, will present Acti-tech, its latest range of maleic anhydride-grafted Vistamaxx (propylene-based elastomer). Acti-Tech is claimed

PHOTO: OCSIAL



Above: SEM image showing OCSiAl SWCNTs dispersed in a thermoplastic matrix

to offer high functionalisation and controlled MFI.
› **www.ngc-nordic.com**

Novamak Machinery & Industrial Equipment's materials handling lines include central feeding systems, automatic bag opening machines, modular raw material storage silos, plastic granule mixers and material transportation systems.
› **www.novamak.eu**

OCSiAl is the world's largest manufacturer of single wall carbon nanotubes (SWCNTs). The company will share results of incorporating its easy-to-handle Tuball Matrix concentrate SWCNT products into compounds based on PE, PP, PA, ABS, PC and PVC. Antistatic performance has been achieved with SWCNT loadings as low as 0.01%.
› **www.ocsial.com**

Omya is a leading global producer of industrial minerals and a worldwide distributor of specialty chemicals. The company's product line for plastics includes a range of fillers and pigments derived from calcium carbonate and dolomite.
› **www.omya.com**

Orenda Pulverizers makes pulverising machines for the plastic and rubber industries suitable for throughputs ranging from 25 kg/hr to 2,000 kg/hr.

Right: Orion Engineered Carbons will present details of its latest carbon black products

PHOTO: ORION ENGINEERED CARBONS

The company offers a number of custom pulverising options for compounders, masterbatch producers and plastic recyclers.
› **www.orenda-pulverizers.com**

Orion Engineered Carbons manufactures a broad range of specialty carbon blacks for the polymer industry. Typical applications include colouring and anti-static performance but the company also offers special fine grades for UV light absorption and protection.
› **www.orioncarbons.com**

Plas Mec is a leading manufacturer of mixing equipment and services for PVC dry-blend, thermoplastic rubbers, powder coatings, masterbatch, metallic bonding and WPC. Its machinery line is designed for flexibility in application and high levels of performance.
› **www.plasmec.it**

Left: An HC 1200-4500 horizontal mixing unit from Plas Mec of Italy

PHOTO: PLAS MEC

Plasper manufactures a wide range of thermoplastic masterbatches, including highly concentrated calcium carbonate, white masterbatch, desiccant additives, compatibilisers and coupling agents. It also offers high quality recycled PVC compounds, recycling services and toll compounding.
› **www.plasper.com**

Plastic Systems manufactures advanced plastic materials handling solutions that are used in the compounding industry as well as processing plants in automotive, pharma, E&E, construction and industrial industries. Product lines include materials conveying, mixers, dosers and dryers.
› **www.plasticsystems.it**

Polical Compound, which is based in Turkey, manufactures thermoplastic compounds containing up to 80% calcium carbonate based on PE, LLDPE, LDPE, PP resins under the Polical Com-

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PHOTO: POLYCOMPOUND

Above: A 45mm co-kneader in Polycompound's Swiss development centre

pound brand. It also markets calcium carbonate fillers under the Erciyes Mikron name.
› **www.polical.com.tr**

Polimer Teknik designs and manufactures its Poex line of twin screw extruders and downstream turnkey automation for polymer compounding applications. Models range from 27mm to 70mm diameter. The company also offers an extensive range of spare parts to support its equipment.
› **www.poex.com.tr**

Right: Polyscope's additive products include the Xiran line of heat boosters

PHOTO: POLYSCOPE

Polycompound is an independent toll compounder that specialises in production of tailor-made compounds using co-kneader extruder technology. Its plant is equipped to produce specialty and standard compounds in volumes from pilot scale through to several hundred tonnes.
› **www.polycompound.ch**

Polyram Plastic Industries is a leading supplier of high performance thermoplastic compounds with production sites in Israel, China and the US. Its main products are Bondyram maleic anhydride polyolefins, Polytron PP and PA LFTs, and Ram-Clean purging agents.
› **www.polyram-group.com**

Right: Internal view of a Promixon TMX turbo mixer

Polyscope is a leader in the development, production and supply of styrene maleic anhydride (SMA) copolymers, compounds, aqueous solutions and styrene, maleic anhydride and N-phenylmaleimide terpolymers. It also offers coupling agents and compatibilisers.
› **www.polyscope.eu**

Polytrade Global is a distributor and service company that is active in more than 40 countries. Its Performance Additives business offers impact modifiers (CPE and acrylic), a range of modifiers for PVC, blowing agents (ADC and OBSH), non-phthalate plasticisers, titanium dioxide and flame retardants.
› **www.polytrade.de**

Promixon is a producer of quality mixing plant for PVC and powder processing based on container, horizontal and turbomixer designs. The company provides a full technical support service that ensures systems meet customers' requirements in terms of mix quality, productivity and reliability.
› **www.promixon.com**

Provençale has been transforming calcium carbonates extracted from its different European quarries into industrial products since 1933. Its Mikhart natural ground calcium carbonates for the plastics industry are characterised by high brightness and purity and are available in a range of particle sizes and distributions.
› **www.provencale.com**

PRS Return System, part of Pooling Partners, provides an efficient and reliable pooling system for users of CP-type pallets across Europe and Turkey. Polymer industry network partners include Borealis, LyondellBasell, Ineos, Versalis, Repsol, Total and many others.
› **www.poolingpartners.com**

R&P Polyplastic specialises in the production of thermoplastic polymer compounds for injection, blow and extrusion moulding across a range of end-use industries, including automotive, appliances and E&E. The Russian company's products

PHOTO: PROMIXON

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› **www.polyplastic-compounds.ru**

ROC Rapid Optical Control is a colour measurement system supplier that offers a single source service that ranges from consulting and engineering through to supply of high-quality machines. Its three businesses are focused on Colour Measurement Technology, Optical Sorting Technology and Colour Consulting.
› **www.roc-gmbh.de**

Rak Antenna develops environmentally-sustainable degradable polymers and compounds for manufacture of compostable mass-produced products that comply with environmental requirements and market demands. The company offers standard and custom solutions.
› **www.rakantenna.hu**

Reverté Productos Minerales is a leading producer of ultrafine and technical grade calcium carbonates. With sales offices in Spain, Germany, US and Mexico and a network of agents and distributors, it reaches 75 countries worldwide.
› **www.reverteminerals.com**

Rialti is a privately-owned Italian company that produces and trades polypropylene compounds. It manufactures virgin and industrial quality recycled PP compounds for markets including automotive, construction, E&E and household appliances.
› **www.rialtispa.com**

RSH Polymere manufactures in-house manufactured recycled compounds used in injection-moulded and extruded products in industries including automotive, construction, consumer goods and packaging industries. All products are made from clean production scrap.
› **www.rsh-polymere.de**

Below: Schenck Process will highlight its feeding systems control options

PHOTO: SCHENCK PROCESS

Sappi is a global diversified wood fibre company that has extended into plastics with its Symbio range of cellulose fibre enhanced plastics. Currently based on polypropylene, Symbio products contain 50% cellulose fibre and offer stiffness, low density, matt appearance, good acoustic properties and scratch resistance.
› **www.sappi.com**

Scamex is a French designer and manufacturer of extrusion processing technology for thermoplastics, thermosetting plastics, elastomers and other materials. Products include extrusion lines, twin screw compounders, mixers, and compression presses.
› **www.scamex.fr**

Schenck Process is a global leader in applied measuring and conveying technology with a product line that includes innovative solutions for weighing, feeding, conveying, screening, automation, and air filtration.
› **www.schenckprocess.com**

Scholz Dosiertechnik develops and manufactures gravimetric and volumetric dosing systems for granulates, powders and liquids. Its product portfolio includes dosing devices, batch meters, platform and belt scales, and process control technology.
› **www.scholz-dosiertechnik.de**

Schwing Technologies supplies thermal cleaning technologies for removal of all types of polymer and organic contaminations from metal tools and machine parts. The company's product offering extends from custom equipment development and supply through to comprehensive contract cleaning services.
› **www.schwing-technologies.com**

Sciences Computers Consultants provides consultancy and software services to the plastics compounding industry covering mixing quantification, fibre breakage, natural fibre behaviour, reactive extrusion. It works in partnership with renowned research academic centres such as the CEMEF and IJL in France.
› **www.scconsultants.com**

Shanghai Tong Hui Technology Development Co was established in 2016 to research and develop nano materials. Its core products include single-layer and multi-walled carbon nanotube and graphene-based modified plastics and conductive and functional masterbatches.
› **www.shtechwin.com**

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Above: Sikora's Purity Concept provides off-line pellet quality analysis

Sikora will present its Purity Scanner Advanced online inspection and sorting system for plastics granules and its Purity Concept solution for offline inspection and analysis. Both systems allow the combination of X-ray and optical camera technologies and image processing to provide surface and internal inspection of individual polymer granules.
› **www.sikora.net**

Simoldes Plastic Division, part of the Portuguese Simoldes Group, is a supplier of plastic parts to the automotive industry. It has developed expertise with a number of novel materials including cork composites, electro-thermal polymers, lightweight fillers, and high reflective chromium-effect pigments.
› **www.simoldes.com**

SIR Plastics specialises in the recovery and commercialisation of compounds from recovered waste. It develops custom compound grades that are formulated to meet customers' expectations in terms of quality and price.
› **www.sir-plastics.com**

SM Platek has been developing and manufacturing twin screw extrusion compounding systems for almost 30 years. Its twin screw technology is capable of handling almost all polymer compounding tasks and is supported by a wide range of accessories, including feeders, screenchangers and pelletisers.
› **www.smplatek.com**

Solvay Additive Technologies develops sustainable UV stabilisation technologies for use in markets including automotive, agriculture, electrical and electronics, building and construction. Systems are formulated for a variety of polymer processing techniques.
› **www.solvay.com**

Sonner provides high quality dosing, blending and feeding solutions for the plastics, polymer compounding and fibre production industries. With extensive R&D and manufacturing capabilities, it offers customised system solutions worldwide.
› **www.sonnerfeeder.com**

Suli Co develops and manufactures flame retardants and fine chemicals including decabromodiphenyl ethane and hydrogen bromide acid. Its products are used in plastics and construction industry applications.
› **www.suli.com**

Suzhou Armord develops specialty iron, nickel, cobalt, copper-nickel-tin, and tungsten carbide alloys and coatings and manufactures a range of parts for use in corotating twin screw compounding equipment.
› **www.armord-alloy.com**

Syncro Group manufactures reliable process control products for plastic extrusion including gravimetric dosing systems, conveying systems, IBC and lay flat control, thickness measuring systems, automatic air ring, supervisory systems and film rewinders.
› **www.syncro-group.it**

Takimsan manufactures and supplies planetary extruders and spare parts for plastics manufacturing. Its Takimsan-Platex brand features the company's own planetary gearboxes, which offer electrical power savings and high power transfer ratios.
› **www.takimsan.com**

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Velox makes an impact in PA compounds

Velox will show the latest impact modifier additive introductions from its co-exhibitor Polyram Plastic Industries**.**

Polyram will introduce a new impact modifier called Bondyram 7105 at the show. This grade is a MAH-modified ethylene/octane copolymer elastomer for improving the performance of PA66 compounds.

The company will present the latest Völpker Spezialprodukte range of Montan waxes and special wax blends, which are developed to help solve the complex processing problems in the plastics and plastic recycling industry that can compromise compound quality.

Velox will also show the current portfolio of antimicrobial additive products from Life Materials Technology (it is the exclusive distributor for these products in most European markets). And the company will highlight its broad range of halogen-free flame retardants.

› **www.velox.com**

PHOTO: VERTELLUS

Above: ZeMac Link NP from Vertellus is a compatibiliser for PA and PET blends

Technovel is a specialist in extrusion machinery producing single screw and twin screw extruders (from 6mm to 132mm diameter) as well as its novel intermeshing co-rotating parallel four and eight screw extruders claimed to offer improved dispersion with reduced stress and longer residence times.

› **www.technovel.co.jp**

Technovinyl Polymers manufactures and markets polymer compounds including PVC elastomer, over moulding TPE, SEBS and SBS thermoplastic elastomers, soft TPU alloys, nano-engineered PP compounds, halogen free flame retardant wire and cable compounds, thermoplastic vulcanisates and PVC compounds.

› **www.kkthelittlegiant.com**

Theysohn Extrusion's TSK series of co-rotating twin screw compounding extruders extend from 20mm to 176mm diameter and include high torque and high volume versions capable of handling a broad range of compounding work. The company also provides its Unity systems, which combine co and contra-rotating designs to optimise process efficiency.

› **www.theysohn.com**

TMI designs, manufactures and supplies bagging, palletising and stretch wrapping lines. It specialises in complete bagging lines for formats from 5 to 50 kg capacity in FFS, open mouth and valve bag designs, as well as big-bags.

› **www.tmipal.com**

Unipetrol, a subsidiary of PKN Orlen, is a leading refining and petrochemical firm based in the Czech Republic. Its products include olefins, aromatics, agrochemicals, carbon black, sorbents, and polyolefins (high-density polyethylene, polypropylene).

› **www.unipetrol.cz**

Vertellus is a provider of specialty chemicals to the plastics industry with a product slate that includes antioxidants, biopolymer additives, dispersion aids, polyamide stabilisers, and plasticisers. It offers solutions within its ZeMac family to upgrade recycled polyamide and polyester polymers.

› **www.vertellus.com**

Völpker Spezialprodukte's plastic and plastic recycling series of Montan waxes and wax blends are designed to overcome processing challenges and to allow compounders to develop formulations offering optimised characteristic value profiles.

› **www.voelpker.com**

Wacker Chemie develops silicones and silane products that can be used to enhance the properties of plastics. These include donor silane co-catalysts for PP polymerisation, vinyl silanes for PE crosslinking, and performance additives and

Right: Genioplast silicone additives from Wacker can enhance performance of WPC blends

PHOTO: WACKER CHEMIE

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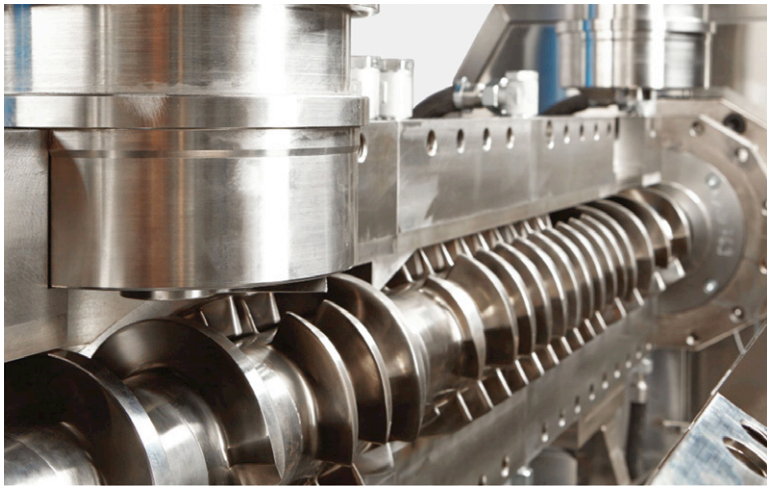
PHOTO: X-COMPOUND



Above: A CK co-kneader compounding extruder by X-Compound

polymer modifiers for improved and more efficient plastics processing.
› **www.wacker.com**

Witte Pumps produces precision gear pumps for standard and customised solutions. The company also offers pump maintenance services and spare parts support.
› **www.witte-pumps.de**

Wiwox offers comprehensive cleaning solutions for contaminated metal tools, parts and technical surfaces. It develops highly effective cleaning systems based on mechanical, aqueous and thermal technology, all of which guarantee safe treatment of valuable work pieces.
› **www.wiwox.de**

WTH Walter Thieme Handel markets additives and raw-materials for the plastics, rubber and chemical industries. It provides an efficient agency service to additive and special polymer manufacturers looking to expand sales in Germany and the EU, together with warehousing and necessary logistic support.
› **www.wthgmbh.de**

X-Compound is a Swiss-based manufacturer of compounding machinery. Part of Germany's Troester, equipment is based on continuous-kneader technology, which is particularly suitable for shear/temperature sensitive products and highly filled compounds.
› **www.x-compound.ch**

Xinda Corp manufactures compounding and extrusion systems based on twin screw and co-kneader technology. Twin screw units range from 20 to 90mm diameter while kneaders extend from 45 to 125mm and include three and four flight variants.
› **www.xindacorp.com**

ZBT (Zentrum für Brennstoffzellen Technik) is a Germany-based development centre for hydrogen and fuel cell technology. Its interdisciplinary team of almost 100 works on development of materials and processes for manufacturer of fuel cell stacks and components, including highly filled conductive polymers.
› **www.zbt-duisburg.de**

Zeppelin Systems is a leader in the design and development of plant for handling of high-quality bulk materials in sectors such as plastics, rubber and tyre, and chemicals. It offers a single source plant engineering capability that extends from system design and development through to component manufacturing, final assembly and after sales service.
› **www.zeppelin-systems.com**

Ziegler Minerals is a leading European supplier of mineral based functional fillers for plastics, composites and paints. Products include micas, calcium carbonates, cristabolite, wollastonite, glass powders and perlite microspheres.
› **www.ziegler-co.de**

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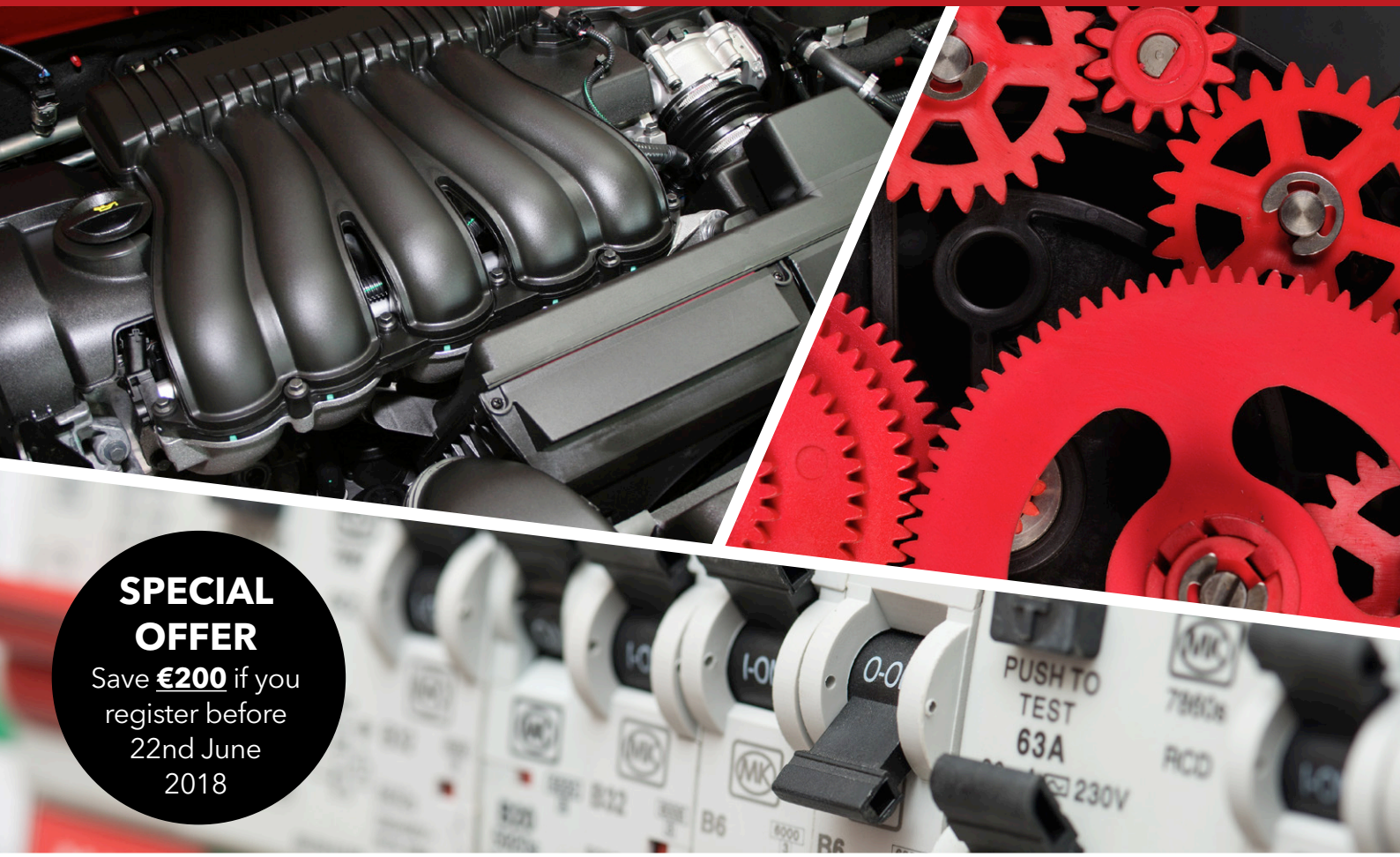

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Compounding WORLD

Process gains help TPEs penetrate new markets

*Ease of processing combined with impressive aesthetics and good mechanicals mean TPE compounds continue to offer something different. **Mark Holmes** looks at the latest developments and applications*

TPE compounds are penetrating many applications and markets, from automotive, electronics and medical to high-end packaging and construction and sporting goods. The materials are both replacing existing polymer options and finding new roles due to their unique properties, most notably their favourable mix of mechanical performance, ease of processing and aesthetics.

Sustainability remains a major theme in TPE compounding, according to **Hexpol TPE**. "With initiatives such as The New Plastics Economy, growing political discussion and an increasing awareness about how we design, use and dispose of plastic products the drive for sustainability and circular products will continue to grow," says Klas Dannäs, Global R&D Manager.

"We are supporting customers with various approaches. On the one hand we have Dryflex Green, a family of TPE compounds based on raw materials from renewable resources such as plant and vegetable crops. To give the right balance or renewable content, performance and mechanical properties, we continue to investigate new sources of raw materials as they become available. These include products and by-products from agricultural that are rich in carbohydrates, especially saccharides such as grain, sugar beet and sugar cane. We are also working with suppliers and customers to discuss how we can improve life cycle impact; from where the raw materials are sourced, how our compounds are produced, packaged, transported and what happens at the end of a products life," Dannäs says.

Recent additions to the Dryflex Green portfolio include compounds for multi-component applications that offer improved adhesion. Hexpol says its

Main image: TPEs can replace traditional elastomers in demanding applications such a medical syringe stoppers, offering lower cost and reduced volatiles

PHOTO: HEXPOL TPE

Right: Wildo Sweden uses a Dryflex Green bio-based TPE compound for its Fold-A-Cup

standard Dryflex Green compounds show good bonding behaviour to PE and PP but special bonding grades are now available for overmoulding on to ABS, PET and PLA.

Circular solutions

Dannäs says the company is also looking at how its products fit into the Circular Economy concept. "Here, the Dryflex PCW TPE compounds demonstrate how we can turn waste into a resource. The materials contain a volume of post-consumer recyclate from 33% to 80% by weight. Recyclate consists of polypropylene drawn from automotive mouldings, which are cleaned and re-ground, or rubber tyre crumb from both OEM and after-market tyres. Apart from the benefit of recycling and applying the principles of the Circular Economy, the material exhibits excellent UV and weathering resistance, conforming to EN ISO 4892-2:2006 and VW PV 3929:2008 Kalahari Test. The Dryflex PCW compounds are being used in applications such as automotive mud flaps, side-steps and anti-drag lips."

Hexpol TPE also reports that changing and increasingly demanding requirements for automotive cabling are driving new developments in TPEs. Mark Griffiths, UK R&D manager, says the company has developed a new cable compound that is halogen-free and provides improved flexibility together with the required thermal and oil resistance properties.

"Dryflex cable TPEs give halogen-free flame retardancy (IEC 60754 part 1/2) across a range of hardnesses from 80 to 95 Shore A," says Griffiths. "With thermal resistance up to 125°C in long-term ageing, they also maintain flexibility at low temperatures with a brittleness point at -50°C or lower."

Below: New TPE grades meet the tighter VOC limits required by automotive OEMs. HVAC is a key application area

PHOTO: HEXPOL TPE

Another key demand comes from the automotive sector, which is focused on reducing interior emissions. "In recent years quality standards for vehicle interiors have steadily increased particularly with regards to vehicle interior air quality [VIAQ], where the main concerns are odour, fogging and VOCs [volatile organic compounds]," says Thomas Köppl, Product Manager at the company.

"Materials and parts are tested extensively before they are used in automotive. Firstly, the raw materials undergo tests such as odour according to VDA 270 and FOG/VOC properties with thermal desorption according to VDA 278. Additional testing is done on the components, for example VDA 276, and finally the air of the whole vehicle interior is tested in large chambers [ISO 12219-1 or Chinese regulation HJ/T400-2007]. These tests allow detailed analysis of substances emitted, with many countries setting maximum levels for substances which are known to be hazardous to health, such as formaldehyde, benzene and xylene, for example the Chinese standard GB/T27630.

"Emission limits were lowered in recent years both by OEMs and legislation," adds Köppl. "These reduced levels of critical substances and total emissions can be challenging for some TPS-based compounds, therefore new materials were required. The Dryflex Interior range of TPEs are designed to minimise emissions and can be used in automotive interior applications such as floor mats, cup holder liners, fascia mats and HVAC components. They display low odour with results of 2.0 to 3.0 in standards such as VDA 270. They also show low emission values in regard to fogging and VOCs. According to gravimetric fogging standard DIN 75201, they achieve condensate of less than 1.0 mg."

Medical benefits

Teknor Apex has developed new medical-grade TPEs for injection moulded plunger stoppers that provide improved syringe performance, are less costly and easier to mould than natural and isoprene rubber, and provide processing advantages over thermoplastic vulcanisate (TPV) elastomers. The company says that stoppers moulded from the new Medalist TPEs perform well in both glass and plastic syringe barrels, achieving a consistent piston release and travel force due to a low coefficient of friction. The compounds can also

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PHOTO: POLYONE

Right: PolyOne's Versaflex PKG TPE was selected for this next-generation make-up compact case for its sealing and over-moulding performance

be over-moulded onto plungers, eliminating an assembly step. In addition to grades for over-moulding onto polypropylene, speciality grades are available that, unlike TPVs, can be over-moulded onto engineering resins such as polycarbonate, ABS, PC/ABS, acrylic, acetal, PBT, and COPE. In addition, unlike most TPVs, the Medalist TPEs do not require pre-drying, Teknor Apex says.

According to the company, Medalist TPEs show improved compression set in comparison with competing TPEs, making for a more secure seal. The compounds can be moulded in high-cavitation tooling and all grades are sterilisable and available in natural or black colours. The company says the compounds offer substantial advantages over rubber, which has been the predominant material for use in syringe stoppers. TPEs avoid the curing step required in rubber processing, eliminating concerns about extractables and leachables, and scrap can be recycled. They also process in considerably shorter moulding cycles and lend themselves to more intricate designs and tighter dimensional tolerances.

"Stoppers must move smoothly against the wall of the syringe barrel, provide an exceptional seal to preserve the integrity of the drug, and be chemically inert to prevent interaction with the syringe contents," says Ross van Royen, Senior Market Manager Regulated Products. "Teknor Apex has developed a portfolio of Medalist TPEs that meet these performance requirements while providing substantial economic advantages because of their ease of processing."

Cosmetic improvements

PolyOne has developed TPE materials for cosmetics packaging that are intended to enable new design opportunities for brand owners. "Leading cosmetic brands and converters are choosing our chemically compatible Versaflex PKG materials – in place of silicone and standard TPEs – to create a wide range of tactile finishes, improved processability, and lower production cost," says Michelle Hearn, Global Marketing Director, Specialty Engineered Materials at PolyOne. "These REACH-SVHC compliant TPEs have been particularly successful in Europe, where PolyOne application engineers are collaborating with brands in the early product development stages to help create highly effective, differentiated products."

PolyOne cites the example of a market-leading global cosmetics brand that selected Versaflex PKG for its next-generation make-up compacts. The choice was based on the material's chemical compatibility with the makeup formulation along with its REACH SVHC compliance, sealing properties, and over-moulding adhesion to polypropylene. Other claimed benefits of the Versaflex PKG TPEs include high resistance to discolouring, etching, cracking and delaminating when in contact with most soaps, lotions, oils, surfactants and solvents.

PolyOne has also developed OnFlex LO TPEs, a portfolio of low VOC/FOG and odour polymer grades that assist automotive OEMs to meet vehicle interior air quality (VIAQ) standards (VDA 278). Applications include HVAC dampers, fasteners and clips, coin trays, centre consoles, door pockets and other interior parts. They offer additional characteristics, such as high temperature sealing performance, matt surface finish, and low density.

Below: Sporting goods are one of the target markets for NYCOA's new Ny-Flex PEBA TPEs

PHOTO: NYCOA

PEBA introductions

NYCOA has launched an extended product range of PA-based TPEs, also known as polyether-block-amides (PEBA), for applications in the automotive, sporting goods, personal electronics, composite and speciality films markets. The company says that the Ny-Flex range is based on block copolymers of PA and polyether segments and represents a new class of PA-based engineering thermoplastic elastomers (E-TPE). The PA block is the hard segment and the polyether block is the soft, flexible segment. By varying the type and the ratio of these two blocks, a wide range of NyFlex grades are offered – the company currently offers grades ranging in hardness from 82 Shore D to 90 Shore A.

"These innovative materials have been designed to fill a technology gap in the E-TPE material space," says Pratik Shah, Vice-President of New Business Development for NYCOA. "During the extensive development cycle, our customers have

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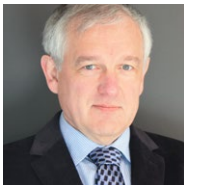

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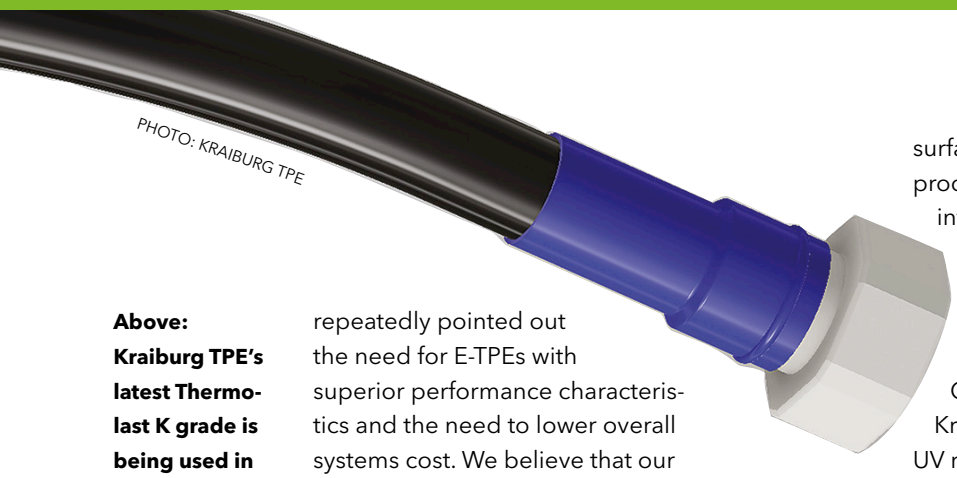

PHOTO: KRAIBURG TPE

Above: Kraiburg TPE's latest Thermolast K grade is being used in co-axial cable boots for cell tower communications

repeatedly pointed out the need for E-TPEs with superior performance characteristics and the need to lower overall systems cost. We believe that our Ny-Flex grades deliver incredible value to the customer compared to other E-TPEs."

According to the company, Ny-Flex E-TPE grades deliver a broad range of benefits including good flexibility at low temperature, retention of properties to elevated temperature, as well as toughness and resilience. They also provide high creep resistance, strong resistance to flex fatigue, good abrasion resistance, and resistance to greases, oils and solvents. Ny-Flex E-TPEs also have a low specific gravity compared to TPUs and are easily processed.

Actega DS has developed a customised TPE handle material for butcher's knives for use in shops, abattoirs and industrial meat processing. The application places high demands on the material in terms of grip and durability while the material has to comply with all regulations applying to items coming into contact with food. The company says its SoftEst TPE materials meet these requirements and are available in ultra-transparent, translucent and natural-coloured versions in Shore hardnesses ranging from A-20 to A-85. All of the materials are food-safe in accordance with EU 10/2011 and FDA regulations.

The company notes a number of additional benefits of the SoftEst TPEs in this particular application area. Antimicrobial properties can be incorporated during the compounding process to impart a germ-resistant effect that is not affected by external impacts, such as scratches, excessive use or wear. In addition, masterbatches added during injection moulding can make the TPE detectable to x-rays and other devices to ensure safety from residue in a hygienic environment.

Durable TPEs

Kraiburg TPE has introduced a new compound to its Thermolast K UV/LD/b series, designed to meet the needs of demanding outdoor applications for building and construction, electrical engineering and electronics, as well as automotive. In addition to high UV resistance, the company says the new grade combines good mechanical and thermal properties with adhesion to polyolefins and a good surface finish. Among the first applications is for production of an over-moulded boot at the interface of co-axial cables and metal connectors used in outdoor installations at cell towers.

"There is a growing demand for high performance thermoplastic elastomers in industrial outdoor applications," says Kevin Gase, Director Sales & Marketing Americas for Kraiburg TPE. In addition to good thermal and UV resistance, the new TPE compound provides a hardness of 35 Shore D - equivalent to 90 Shore A – which is at the top of Kraiburg TPE's existing range of Thermolast K UV/LD/b product range. At the same time, the material delivers the flexibility for the cable boots to ensure proper strain relief.

Kraiburg TPE has also launched silky-smooth TPE compounds for consumer electronics. The VS/AD/HM series is claimed to offer silky, satin-smooth surfaces that feature high scratch and abrasion resistance, good durability and resistance against chemicals, such as sebum oil, creams and common household detergents. The series is designed for consumer electronics applications. The VS/AD/HM series has been specially developed for applications that require surface effects along with adhesion to polar thermoplastic compounds such as PC, ABS, PC/ABS, PU, ASA, SAN, PA12 and PA6. Available in natural colour and black, the compounds also have good processing properties. Example applications include controllers for games consoles, remote controls and headphones, toys, protective covers for mobile phones, tablets and cosmetics packaging.

Kraiburg TPE recently increased TPE production capacities at its three manufacturing sites in Germany, US and Malaysia through the addition of new compounding lines. In the US, the newly-built Kraiburg TPE plant at Buford in Georgia has seen an annual capacity increase from 6,000 to 10,000 metrics tons. Also in the US, **Polymax TPE** has increased compounding capacity at its Waukegan, Illinois facility. Additional annual capacity of 3,630 tonnes has been added through a new compounding line to expand manufacturing of its line of TPEs, including SEBS, SBS, TPOs and alloy products.

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Polymers in Footwear 2018

Capitalising on advances in polymer materials and processing technologies for footwear applications

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AMI is pleased to announce the second edition of the ***Polymers in Footwear*** conference.

The event will take place from 10-11 October at the Maritim Hotel, Cologne, Germany.

Polymers in Footwear 2018 will cover the latest developments in plastics compounds and footwear manufacturing processes, covering cutting edge technologies and exploring the future of this market.

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Building demand for PVC additives

PHOTO: EMERY OLEOCHEMICALS

As markets for PVC around the world – particularly construction – continue to show healthy growth, many additive suppliers are enhancing and updating their product offerings. Peter Mapleston reports

Building and construction markets are big users of PVC so when construction activity increases the entire PVC supply chain benefits. That is certainly the case in the US, where an upbeat economy and reconstruction works in the wake of recent devastating weather events, is seeing strong PVC demand (in Europe, recovery from the 2008/9 crisis has been more gradual but remains consistent).

Data from the American Chemistry Council shows PVC resin sales for vinyl flooring manufacture during the first quarter of this year was more than twice as high as in the same period last year – and the 2017 figures were already good. Growth in luxury vinyl tiles (LVTs) is one of the contributors to this good result. In addition, sales of PVC for extruded windows and doors were up by 27% and for in fencing and decking up by 16%.

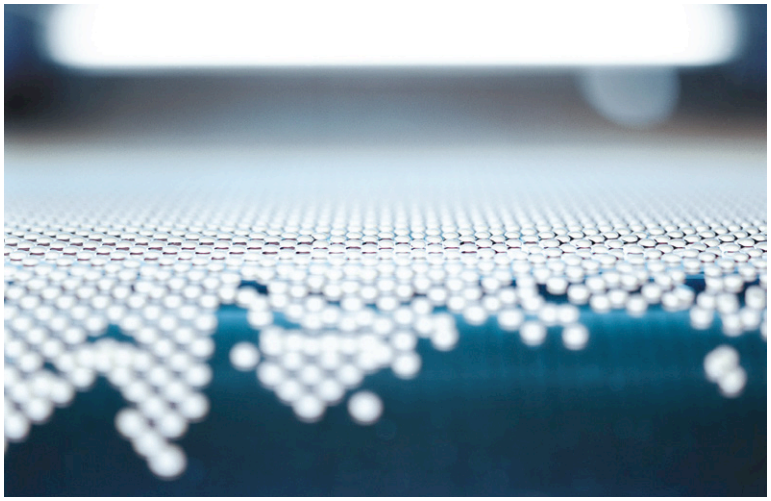
The data came out just in time for the US NPE2018 show in Orlando, which PVC additive supplier **Baerlocher** used to showcase its capabilities for customising additive blends to optimise PVC applications. A highlight was its one-packs, which feature Baerolub lubricants and Baeropan stabilisers together with other additives, and are designed to individual customer requirements. Baerlocher also illustrated its expanding portfolio of single-component Baerolub lubricants for converters and compounders choosing to formulate in-house.

The company has also developed a next-generation Baeropan stabilisation technology for the wear layer of luxury vinyl tiles (LVTs). This is said to deliver "crystal clarity" as well as non-yellowing colour, without the need for potentially hazardous chemicals such as barium. The technology is based on calcium and zinc.

Baerlocher says its formulation experts work closely with LVT manufacturers to develop customised solutions. It highlights the example of assistance it provided for the first US manufacturer of rigid LVT by creating a novel stabilisation technol-

Main image: A strong construction industry is fueling demand for PVC and associated additive products

PHOTO: BAERLOCHER



Above: Easy-to-handle PVC additive pastilles in production at Baerlocher

ogy for the new product's rigid core. This custom stabiliser met the customer's requirements for sustainability (no barium) and odour elimination (tin-free). "Baerlocher's expertise and close collaboration enabled this start-up company to successfully enter the LVT market with a unique product that was the first of its kind fully-produced in North America," the company says.

Baerlocher also offers new Baeropan products for rigid-core wood/plastic composites (WPCs) and stone/plastic composites, also for LVTs.

"Because PVC formulations can be very complex, identifying the exact mix of additives for an application requires encyclopaedic knowledge and extensive experience," says Gary Conroy, head of the North American Strategic Business Unit for Vinyl Additives at Baerlocher USA. "Baerlocher provides [this] through customised technologies and technical support [for] customers' highly specific needs. We also provide advice on formulating beyond additives supplied by Baerlocher to create a complete solution."

Baerolub and Baeropan additives can be used in rigid and semi-rigid PVC applications, such as profiles, siding (cladding), pipe and flooring. Baerolub internal lubricants lower the PVC's melt viscosity by reducing friction between molecular chains, resulting in easier processing. Baerolub external lubricants are also available to control fusion properties and enhance metal release. Baeropan technologies deliver long-term stability and durability to withstand weathering and heat aging.

Customers have the choice of custom one-packs or off-the-shelf single-component grades. Baerlocher claims to have invented ready-made additive blends over 50 years ago; today, its one-packs are made to order.

At the beginning of last year, Baerlocher said it would expand production capacity by 50% for metal soaps at its operation in Cincinnati in the US by adding a third reactor for the production of types based on calcium, zinc, sodium and other metals. That reactor is now up and running. "We continue to see growth in the metal soap demand as was expected and we are now working on efficiencies to stay ahead of the growth for the coming years," says Edward Hall, President and CEO of Baerlocher USA . "We will soon announce another large investment in blend technology to increase capacity on our Baeropol additive blend production with additional capabilities."

Change for tin

Speaking at *Compounding World* publisher AMI's PVC Formulation 2018 conference in Cologne in

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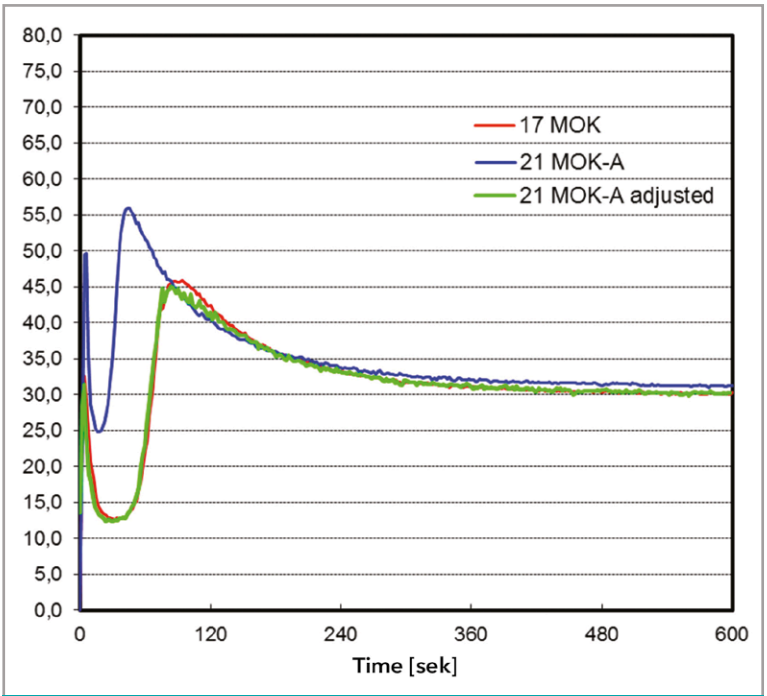

Figure 1: Comparison of Mark 17 MOK (High DOTE-containing stabiliser) with Mark 21 MOK-A (High MOTE-containing stabliser). Formulations stabilised with Mark 21 MOK-A exhibit more rapid gelation and higher fusion torque, particularly with PVC resins containing copolymer (rheology adjusted to maintain same process parameters by reducing loadings of HMW process aids and/or increasing the external/internal lubricant ratio).
Source: Galata Chemicals

April, **Galata**'s Vice President of Technology, Dr Peter Frenkel, said prospects for octyltin stabilisers are now gaining momentum in Europe.

The use by the European Chemicals Agency (**ECHA**) of the "read-across" approach for classifying products has, until recently, clouded the horizon for octyltin stabilisers. Read-across is one of a number of procedures that use similarities between chemicals within a chemical category to enable data gap-filling. A chemical category is a group of chemicals whose physicochemical and human health and/or ecotoxicological properties and/or environmental fate properties are considered likely to be similar or to follow a regular pattern. Read-across is used to predict end-point information for one chemical by using data from the same end-point for another chemical considered to be similar in some way.

"As a result of limitations in analytical methods historically it was incorrectly determined that organotin thioglycolate substances hydrolyse to corresponding alkyltin chlorides," Frenkel said. "This determination allowed for read-across [from dialkyltin chlorides] to close data gaps as part of the REACH registration process for the sulphur-containing alkyltin esters such as di-octyltin bis(2-ethylhexyl mercaptoacetate) [DOTE]."

According to a recent in-vitro metabolism study on DOTE, it has been shown with the use of ^{119}SnNMR spectroscopy that read-across from DOTC to DOTE is not justifiable, Frenkel said. As a result of the recently completed studies (including both in-vitro metabolism and prenatal development toxicity studies), it was convincingly demonstrated that DOTE is not a Category 1B reprotoxicant; Europe is now the only region where it is classified as such.

Harmonised classification

Taking into the consideration the new data in February 2016, the German Competent Authority for REACH (**BauA**) submitted a proposal for a new harmonised classification of DOTE as a Category 2 reprotoxicant. "This is the first step in reclassifying and getting DOTE removed from the SVHC list in Europe," Frenkel said. It is expected that the Committee for Risk Assessment will adopt an opinion on the proposed classification in the near future.

While this has been going on, Galata has developed Mark 21 MOK-A, a new stabiliser with high MOTE (mono-octyltin tris(2-ethylhexyl mercaptoacetate) content. Mark 21 MOK-A addresses the current regulatory status of DOTE, Frenkel said. "Heat stabilising and rheological performance of Mark 21 MOK-A in the most critical applications matched performance requirements of the conventional Mark 17 MOK, a high DOTE-containing stabiliser," he said (Figure 1).

"Reclassification should remove all the recently imposed restrictions on the use of DOTE, opening up new opportunities for using octyltin mercaptoacetate stabilisers," Frenkel concluded. "Based on initial results obtained in accordance with the similar re-testing protocol, the global regulatory outlook is positive for not only the octyltins but also for the corresponding methyltin- and butyltin mercaptoacetate stabilisers."

Tin systems are used for almost all-rigid PVC applications in the US; in Europe the main usage is for rigid, transparent applications. In addition to maintaining high transparency, tin stabilisers provide a very good early colour (no yellowing) and good colour retention. In non-transparent applications, tin stabilisers are particularly suitable where light colours are required, or when process requirements are demanding (thick plate extrusion and furniture films, for example). Tin stabilisers are also said to provide very good processability with high throughput and no plate-out. They are approved for use in food contact applications and potable water applications – and some are approved for use in rigid medical applications. ›

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AMI's Wood Plastics Composites conference is well-established as the leading European and international meeting point for the industry.

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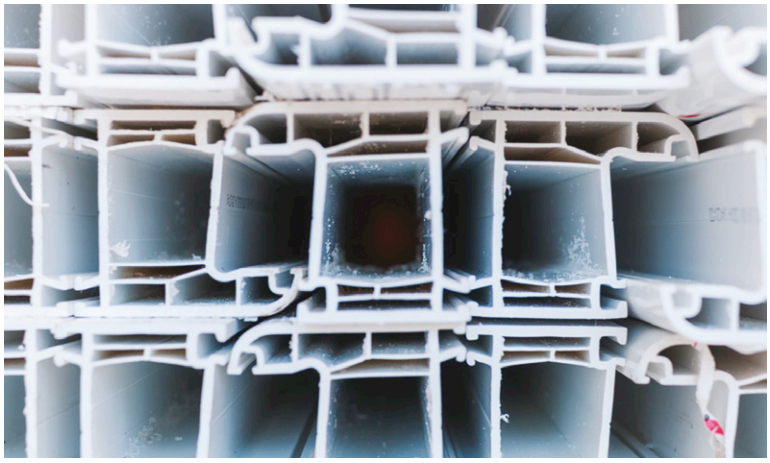

Above: Lubricants improve surface gloss of PVC profiles as well as improving process efficiency

Renewable options

Emery Oleochemicals emphasises the sustainability of its high-performance polymer additives, which include a wide range of flow property-enhancing Loxiol lubricants particularly suitable for PVC applications. Loxiol lubricants are derived from 100% renewable resources and are highly biodegradable (the company claims a 178-year history developing bio-based products).

While internal lubricants reduce the melt viscosity by lowering the friction between the molecules, external lubricants prevent the polymer melt from sticking to the metal surface of the processing equipment. Typically, a combination of internal and external lubricants is necessary to achieve the desired results, according to Emery Oleochemicals.

"Many factors, such as processing type, equipment and the PVC formulation influence the processability. Therefore, the correct choice and dosage of lubricants is crucial," says Jana Ingraham, Marketing Manager for Green Polymer Additives. "With decades of expertise in this industry, Emery Oleochemicals has gained valuable insight into the market's requirements and, in turn, the company has fine-tuned and customised its additives to help customers achieve optimal results in both processing efficiencies and finished products."

Emery Oleochemicals' Green Polymer Additives business unit has developed an extensive line of lubricants tailored to the special requirements of a variety of applications. For example, in the production of window profiles Loxiol lubricants improve surface properties such as the gloss of the finished article. For transparent applications (mostly sheet and film) it is essential that the additives do not adversely affect opticals. "Loxiol lubricants have been proven not to make transparent articles cloudy or reduce the transparency of the finished article in any other way," Ingraham says.

"While the processability and characteristics of the end-product are improved by the use of appropriate lubricants, regulatory requirements must also be considered when selecting the proper lubricant. Toys or articles with food contact require lubricants that are safe even at mechanical or physical strains. For these applications, Emery Oleochemicals offers lubricants with food contact approval according to international standards," says Ingraham.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.baerlocher.com**
- **www.galatachemicals.com**
- **www.echa.europa.eu**
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AMI's third European Polymer Testing & Analysis conference takes place in Berlin in Germany in September. We take a look at the programme and speaker line-up

Putting polymers to the test

Polymer testing and analysis underpins all stages of successful plastics processing. As the market demands new plastics products that are smaller, smarter, stronger and safer, so the challenges for materials suppliers, designers and specifiers increase. Now in its third annual edition, AMI's *Polymer Testing & Analysis* conference has established itself as one of the international meeting places for scientists, laboratory staff, researchers and R&D professionals involved in development, testing and analysis of new polymer materials, formulations and products.

The 2018 European edition of the Polymer Testing & Analysis conference provides an opportunity to discover and discuss the latest innovations in characterisation and analysis techniques specifically for plastics materials and products. This year's event moves to the German capital Berlin and takes place on 11-12 September 2018. It will bring together an international line-up of expert speakers to cover the very latest testing and analysis techniques for assessment of polymer stability, mechanical properties, flow characteristics, emissions, surface quality, and colour control. Other topics on the agenda include quality control methods, non-destructive testing technologies, and failure analysis. This article looks at what is in store for attendees.

This year's conference will be opened by **Dr Andreas Balster**, Head of Proficiency Testing at **Kunststoff-Institut Lüdenscheid** in Germany. He will detail five reasons why you should participate in a laboratory benchmarking programme. Next up is **Holger Lieder**, Sales Director at **Sikora** in Germany, who will detail a novel optical inspection and analysis system that combines the advantages of a light table with automatic material control. The third paper in the session will focus on extending the limits for elemental analysis of polymers and plastics using XRF and will be presented by **Dirk Wissmann**, Senior Product Manager at **Spectro Analytical Instruments** in Germany.

Evaluating emissions

The second session explores polymer emissions and will be opened by **Dr Nuria García Batista**, a Researcher at the **AIMPLAS** plastic technology

Main image: Testing is an essential element in plastics development and processing. AMI's Polymer Testing & Analysis conference in Berlin later this year highlights the latest developments

centre in Spain, who will present a paper covering the evaluation of plastics and air quality in the passenger compartment of automotive vehicles. Then **Christoph Wiedmer**, Research Associate at the **Fraunhofer Institute for Process Engineering and Packaging IVV** in Germany, will discuss the challenge of identifying and characterising odour-active substances in polymer materials.

The conference will then move on to discuss testing procedures for assessing the processability of plastics. **Johannes Lorenz**, Sales Manager OEM and Key Account at **Dynisco Europe** in Germany, will start the session by exploring accurate determination of the melt flow rate of plastic materials in an extrusion system using online rheometry**.** Then **Nico Laufer**, CEO of the **Institute for Polymer Technologies** in Germany, will detail the effects of volume fraction, size and geometry of different fillers on interparticle interactions in PP melts.

Polymer ageing

The final session of the first day of the conference will cover polymer ageing and will be kicked off by **Dr Emmanuelle Brendlé**, Senior Scientific Project Manager at **Intertek (Schweiz)** in Switzerland, who will provide a comprehensive analytical view on aged polymers. Then **Roland Valk**, Consultant Materials at **Kiwa Technology** in The Netherlands, will detail an evaluation of the long-term strength of polyethylene using the strain hardening test. And the formal part of the day will end with a talk by **Dr Jiří Sadílek**, Senior Researcher at **Unipetrol RPA – Polymer Institute Brno** in the Czech Republic, who will discuss the content of ethylene in PP-RC materials with a focus on properties versus the time to rupture.

Packaging issues

Day two of *Polymer Testing & Analysis 2018* opens with a presentation from **David Eaves**, Chemical Analysis & Regulatory Consultant at **ITS Testing Services** in the UK, who will look at testing for the presence of non-intentionally added substances (NIAS) in plastics materials and articles intended to contact food. He will be followed by **Martina Lindner**, Researcher in Materials Development at **Fraunhofer Institute for Process Engineering and Packaging IVV** in Germany, who will explore techniques for thickness determination of evaporated aluminium coatings on polymer web materials. Then **Elena Domínguez Solera**, a Researcher in the Sustainability and Industrial Recovery Department at **AIMPLAS** in Spain, will present a study of the degree and disintegration rate of biodegradable polymers in different environmental conditions.

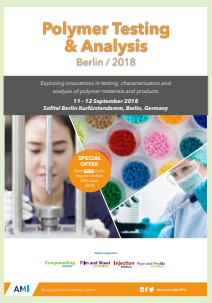
Exploring failure

The second session of the day will examine new developments in failure testing. The first presentation will analyse systematic failure of glass fibre reinforced isolation sleeves and will be given by **Sina van de Kamp**, Project Engineer, Microscopy at the **Institut Für Kunststoffverarbeitung (IKV)** in Germany. Next, **Dr Michael Soll**, EU Business Development Manager at **Frontier Laboratories** in Germany, will speak about the use of pyrolysis GC-MS for identification and damage analysis of rubber samples.

The final session of the conference will address the latest polymer testing options for demanding applications. **Prof Alois Schlarb**, Chair of Composite Engineering (CCe) at the **Technische Universität Kaiserslautern (TUK)** in Germany, will discuss the efficient analysis and determination of environmental stress cracking of polymers in different environments. And **Dr Marysilvia Ferreira da Costa**, Professor at **Coppe / Universidade Federal do Rio de Janeiro** in Brazil, will bring the conference to a close with an examination of stress-relaxation behaviour of poly(vinilidene fluoride).

Expert speakers at Polymer Testing & Analysis Europe include – top to bottom: Dr Andreas Balster from Kunststoff-Institut Lüdenscheid, Dirk Wissmann from Spectro Analytical Instruments, Christoph Wiedmer from the Fraunhofer Institute for Process Engineering and Packaging IVV, and AIMPLAS researchers Dr Nuria García Batista and Elena Domínguez Solera

About Polymer Testing & Analysis Europe 2018



The third European *Polymer Testing & Analysis* conference takes place on 11-12 September 2018 in Berlin, Germany, presenting an ideal opportunity to learn about the latest polymer testing equipment and techniques. Find out from experts how these innovations are being applied to further develop polymer materials and to ensure compliance with complex regulatory demands. In addition to the formal conference sessions, the event provides extensive networking opportunities throughout the informal breaks, including access to the table top exhibition area and complementary cocktail reception at the end of the first day. To find out more about attending the conference, taking a table-top exhibition space, or becoming a conference sponsor, visit the **conference website** or contact Conference Organiser Alexandra Fish. Tel: +44 (0)117 314 8111; email: **alexandra.fish@ami.international**

Long-Fibre Thermoplastics 2018

Capitalising on advances in LFT materials, processing technologies and applications

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AMI is pleased to announce the 2nd edition of the Long-Fibre Thermoplastics conference. The event will take place from 4-5 December 2018 in Berlin, Germany.

Long-Fibre Thermoplastics 2018 brings together leading LFT industry professionals, key players in the LFT supply chain and existing and potential end-users and processors to learn more about the utilisation, formulation and processing of these versatile, high performance and light weight polymer compounds.

The event covers the latest applications in the automotive industry – still the dominant end-use market – and explores fast developing non-automotive opportunities.

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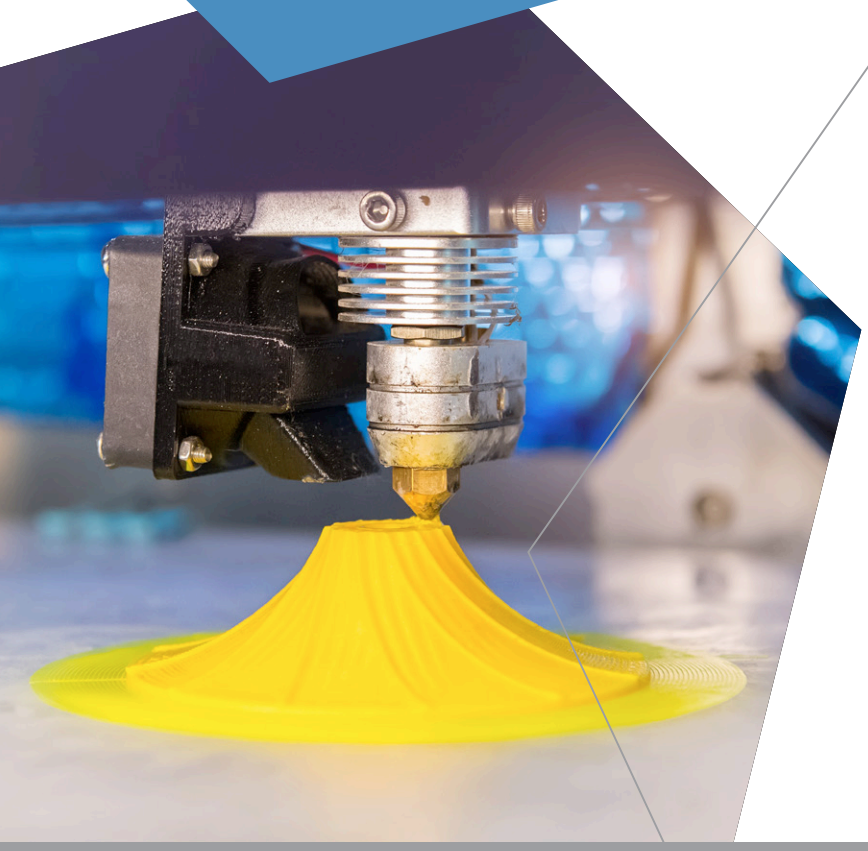

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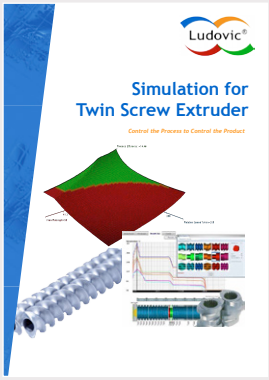
SCC: EXTRUSION MODELLING



Ludovic software from SCC is a 1D/2D based solution for modelling and simulating a wide range of extrusion compounding processes. This brochure explains the key features and gives examples of where and how it is applied.

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NIGTAS: CALCIUM CARBONATE

Turkish minerals producer NigTas Corporation is the country's leading producer of calcium carbonate with access to some of the whitest and purest deposits. This four page brochure details its product lines and typical applications.

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FRONTIER LAB: MULTISHOT PYROLYSER

This brochure details Frontier Lab's Multi-Shot Pyrolyser EGA/PY-303D. It explains the key design features and how the analytical instrument can be applied in the characterisation of polymer materials.

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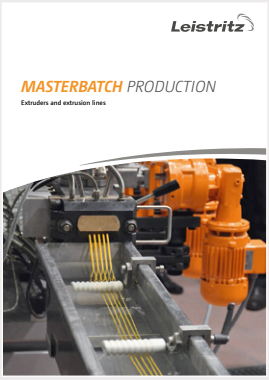
LEISTRITZ: MASTERBATCH SYSTEMS



Additive and colour masterbatch production places specific demands on compounding equipment. This 16-page brochure from Leistritz explains how its ZSE 35 iMAXX masterbatch twin screw extruder rises to the challenge.

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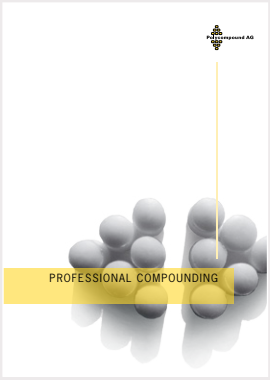
POLYCOMPOUND: TOLL SERVICES



Swiss toll compounder Polycompound marks its 30th anniversary this year. 100%-focused on production of specialty and highly filled compounds, download this brochure to learn about the services the company offers to customers.

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

Learn more about AMI's upcoming conferences

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

MEDICAL FLUID BAGS 2018

AMI's first European Medical Fluid Bags conference takes place in Cologne in Germany on 21-22 June 2018. This high level event looks at the newest innovations in design and production of polymer bags for fluid containment.

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MASTERBATCH 2018

Leading players from across the global masterbatch industry will meet in Barcelona, Spain, on 3-5 September 2018 for the 31st AMI Masterbatch conference, which will explore the latest market and technical trends.

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PERFORMANCE POLYAMIDES

The 3rd edition of AMI's Performance Polyamides conference will take place on 5-6 September 2018 in Cologne, Germany, and will take stock of the markets, trends and challenges for polyamides.

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POLYMER TESTING & ANALYSIS EUROPE

AMI's 3rd Polymer Testing & Analysis conference will take place on 11-12 September 2018 in Berlin, Germany, acting as the key meeting place for scientists, laboratory staff and R&D professionals.

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POLYMER TESTING & ANALYSIS US

Polymer Testing & Analysis US 2018 takes place on 11-12 September 2018 in Pittsburgh. The event is a great meeting place for laboratory professionals to network and discover the latest advances in polymer testing and characterisation.

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AGRICULTURAL FILM 2018

AMI's well-established Agricultural Film conference series continues on 17-19 September 2018, in Madrid, Spain, bringing together agricultural and horticultural cover specifiers, raw material and film manufacturers and agricultural stakeholders.

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WEAR-RESISTANT PLASTICS

This brand new conference will focus on the critical area of polymer tribology and explore how it can open up new applications, particularly in metal replacement. The event takes place in Dusseldorf in Germany on 19-20 September 2018.

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POLYMERS IN FLOORING USA

The second North American edition of AMI's Polymers in Flooring conference takes place in Atlanta, GA, USA, on 20-21 September 2018. It provides a unique forum in which to explore the latest flooring market, materials and technology trends.

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COMPOUNDING WORLD ASIA

AMI's Compounding World Asia conference returns to Bangkok in Thailand for 2018. Taking place on 27-28 September, the fourth edition of the conference provides a learning and networking opportunity for compounders across the Asia region.

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POLYOLEFIN ADDITIVES EUROPE 2018

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

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SMART PACKAGING 2018

Taking place in Hamburg in Germany, the third edition of AMI's Smart Packaging conference brings together brand owners, retailers, packaging producers, plastics suppliers and technology providers to explore active and intelligent packaging.

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CONDUCTIVE PLASTICS EUROPE 2018

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

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PolyOne

Head office location:	Avon Lake, Ohio, US
Date founded:	2000 (through merger of Geon Company and MA Hanna)
Chairman, President and CEO:	Robert M. Patterson
Ownership:	Corporation
No. of employees:	6,000
Sales 2017:	$3.2bn
Plant locations:	PolyOne has extensive operations in North and South America, Europe and Asia
Profile:	PolyOne Corporation is a major polymer compound and masterbatch producer with a global footprint and significant North American distribution activities. Its business includes four divisions: Color, Additives and Inks; Specialty Engineered Materials; Performance Products and Solutions; and Distribution. Over the past 12 months, the company has made a number of strategic acquisitions, including colour companies Rutland Holding, Mesa Industries and IQAP Masterbatch and, most recently, LFT producer PlastiComp.
Product line:	PolyOne is leading provider of specialty colour, special effect and additive concentrates, with the latter including UV stabilisers, antistatics, chemical blowing agents, antioxidants, lubricants, and processing aids.
Product strengths:	PolyOne offers one of the most extensive colour concentrate, liquid dispersions, dry colorants, and additive lines in North America. Its products are used in a wide variety of applications and markets where fast service and global reach are major requirements.

To be considered for 'Compounder of the Month' contact Elizabeth Carroll: elizabeth.carroll@ami.international

Compounding WORLD FORTHCOMING FEATURES

The next issues of Compounding World magazine will have special reports on the following subjects:

July	August
Antimicrobials and biocides	PVC plasticisers
Screenchangers and melt filtration	Functional fillers
Colour measurement	Screws and barrels
Impact modifiers	Feeding and dosing

Editorial submissions should be sent to Chris Smith: chris.smith@ami.international

For information on advertising in these issues, please contact:
Levent Tounjer: levent.tounjer@ami.international Tel: +44 (0)117 314 8183
Claire Bishop: claire.bishop@ami.international Tel: +44 (0)1732 682948

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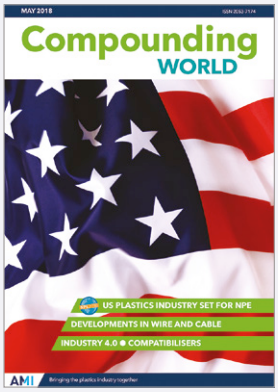
AMI publishes five process-specific FREE plastics industry magazines. Simply click on the cover below to read each magazine. Or download the issue in the relevant Apple or Android app



Compounding World May 2018
The May edition of Compounding World looks at how the EU's Construction Products Regulation is placing new demands on the cable industry. Plus Industry 4.0 technology developments and a preview of NPE 2018's compounding highlights.

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Compounding World April 2018
The April edition of Compounding World explores developments in thermally conductive additives. The issue also looks at how to maintain effective compounding equipment and greener alternatives in processing aids.

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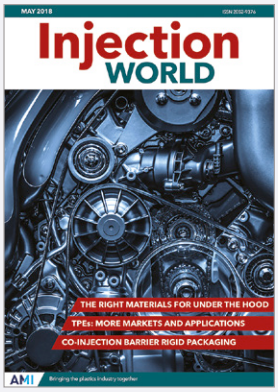

Injection World May 2018
The May edition of Injection World looks at plastics for demanding automotive under-hood applications. It also explores the development of co-injection barrier packaging and reviews the latest innovations in TPEs and process energy management.

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Plastics Recycling World May/June 2018
The May-June edition of Plastics Recycling World previews the Plastics Recycling World Exhibition, co-located with the Compounding World Expo in Essen in June. There are also features on PET recycling, shredders and new recyclate additives and compatibilisers.

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Pipe and Profile June 2018
The June 2018 edition of Pipe and Profile Extrusion takes a look at what's new in infrastructure pipe and reports industry news from NPE 2018. Plus articles on pipe joining and corrugation technology.

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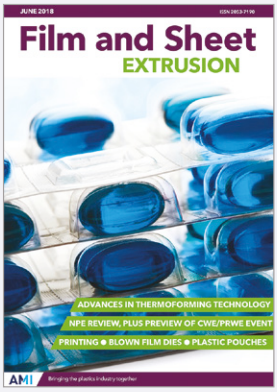

Film and Sheet June 2018
The June edition of Film and Sheet Extrusion looks at the latest developments in thermoforming. It also explores the latest innovations in blown film dies, printing technology and plastic pouches.

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Pipe and Profile EXTRUSION
Injection WORLD
Plastics Recycling WORLD

GLOBAL EXHIBITION GUIDE

2018	**27-28 June**	Compounding World Expo, Essen, Germany	www.compoundingworldexpo.com
	27-28 June	Plastics Recycling World Expo, Essen, Germany	www.plasticsrecyclingworldexpo.com/eu
	2-4 August	Plasti & Pack, Lahore, Pakistan	www.plastipacpakistan.com
	15-19 August	Taipei Plas, Tapei, Taiwan	www.taipeiplas.com.tw
	19-22 September	Indoplast, Jakarta, Indonesia	www.indoprintpackplas.com
	24-28 September	ColombiaPlast, Bogota, Colombia	www.colombiaplast.com
	28 Sept – 1 October	Koplas, Seoul, South Korea	www.koplas.com
	14-17 October	Pack Expo, Chicago, USA	www.packexpointernational.com
	16-20 October	Fakuma, Friedrichshafen, Germany	www.fakuma-messe.de
	7-9 November	Expo Plasticos, Guadalajara, Mexico	www.expoplasticos.com.mx
	14-16 November	JEC Asia, Seoul, South Korea	www.jeccomposites.com
	26-29 November	All4Pack, Paris, France	www.all4pack.com
	5-7 December	Plastic Japan, Chiba, Japan	www.plas.jp/en
	5-8 December	Plast Eurasia, Istanbul, Turkey	www.plasteurasia.com/en
2019	**5-8 January**	ArabPlast, Dubai	www.arabplast.info
	12-15 March	Pro-Pack Africa, Johannesburg, South Africa	www.propakafrica.co.za
	19-21 March	EU Coatings Show, Nuremberg, Germany	www.european-coatings-show.com
	25-29 March	Plástico Brasil, São Paulo, Brazil	www.plasticobrasil.com.br
	8-12 April	Feiplastic, Sao Paulo, Brazil	www.feiplastic.com.br
	8-9 May	Compounding World Expo, Cleveland, USA	www.compoundingworldexpo.com/na
	21-24 May	Chinaplas 2019, Guangzhou, China	www.chinaplasonline.com

AMI CONFERENCES

3-5 September	Masterbatch 2018, Madrid, Spain
5-6 September	Performance Polyamides, Cologne, Germany
11-12 September	Polymer Testing & Analysis Europe, Berlin, Germany
11-12 September	Polymer Testing & Analysis USA, Pittsburgh, PA, USA
19-20 September	Wear-Resistant Plastics, Dusseldorf, Germany
20-21 September	Polymers in Flooring USA, Atlanta, GA, USA

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

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