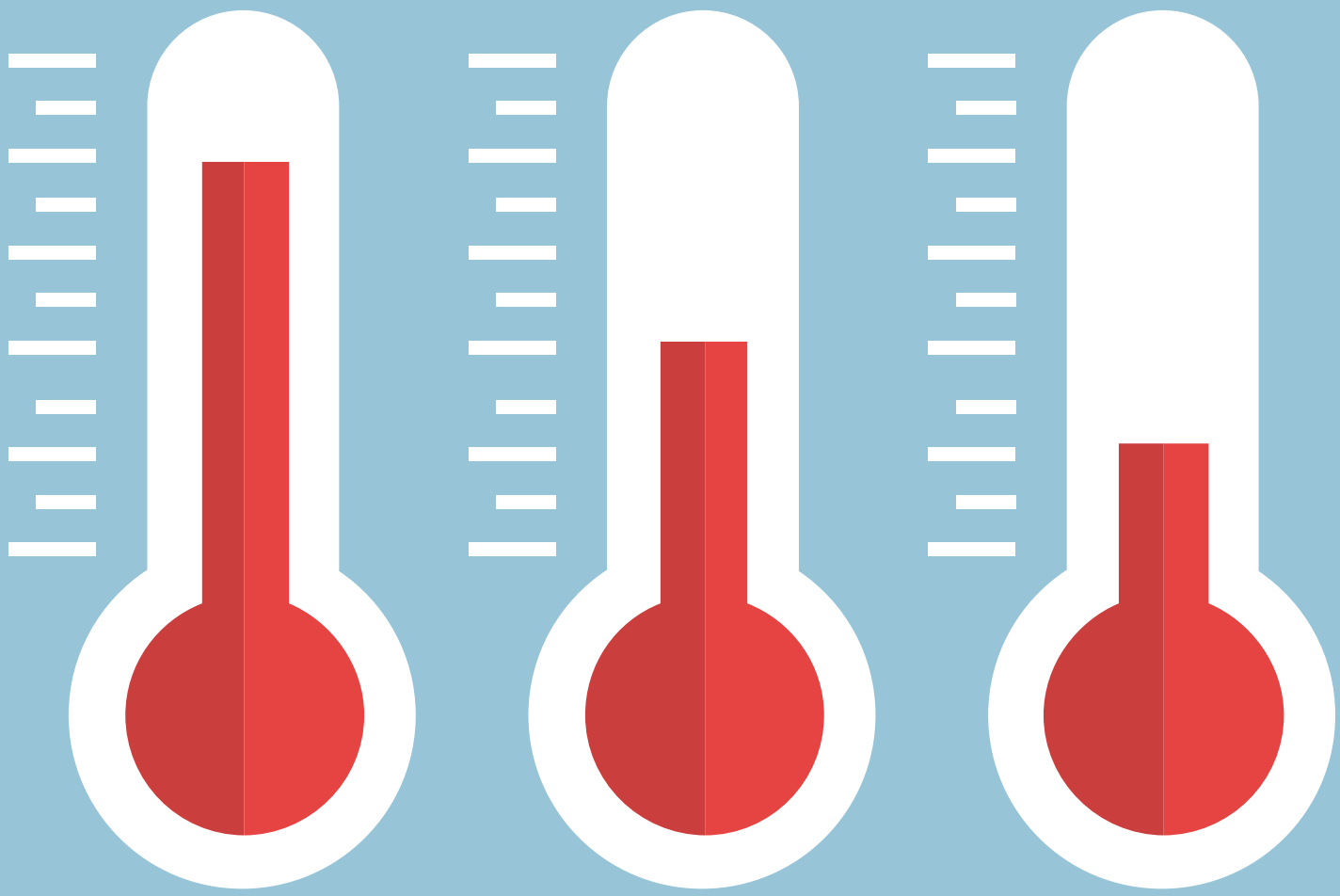
ISSN 2053-7174

compounding WORLD

February 2015



KEEP COOL WITH CONDUCTIVE COMPOUNDS

NPE 2015: NEW MACHINERY AND EQUIPMENT

COMPUTER SIMULATION AND MODELLING

THE LATEST MATERIALS HANDLING SYSTEMS

compounding WORLD

Get the app!

Compounding World magazine is available free-of-charge on iPads, iPhones and a huge range of Android-based tablets and smartphones.

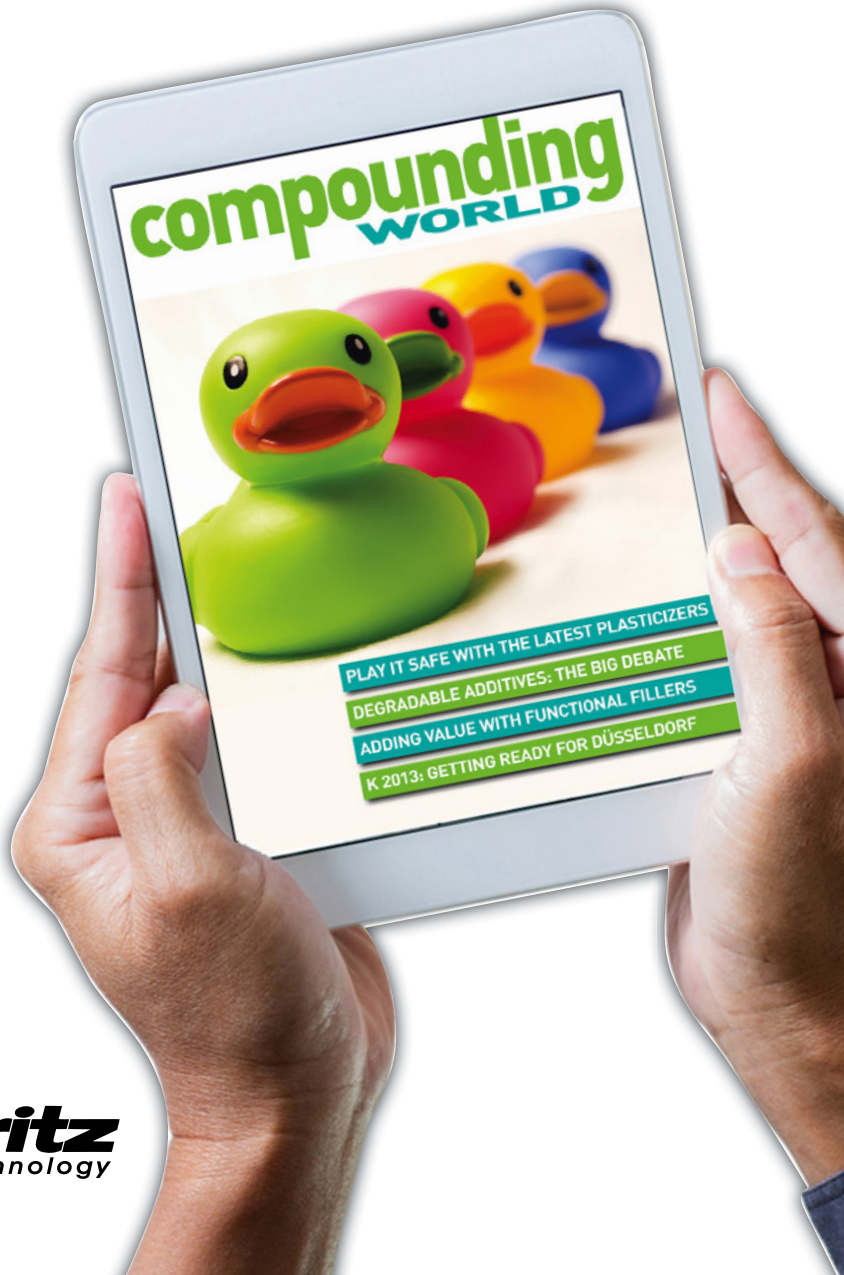
Our dedicated Compounding World app is easy to use and provides completely free access to the latest edition of the magazine plus back issues – more than 25 in total. Once you have downloaded an issue, you can read it offline – there's no need for an internet or data connection.

The Compounding World app has already been downloaded by more than 7,400 readers in over 75 countries. Why not try it yourself? The app is available in Apple's App Store, iTunes, Google Play and on Amazon for the Kindle Fire. Just search for 'AMI Plastics', or simply click on the relevant button below.

Download on the App Store

ANDROID APP ON Google play

amazon apps Available on kindle fire



The Compounding World app is sponsored by

Leistritz
refreshing extrusion technology

compounding WORLD

contents

coming next issue

Special effect pigments | Twin-screw extruders | Natural fibres and fillers | NPE 2015

contact us

Applied Market Information Ltd
AMI House, 6 Pritchard Street,
Bristol, BS2 8RH, United Kingdom
Tel:+44 (0)117 924 9442
Fax:+44 (0)117 311 1534
www.amiplastics.com

Head of business publishing:	Andy Beevers	E-mail: abe@amiplastics.com
Senior editor:	Chris Smith	E-mail: cs@amiplastics.com
Contributing editor:	Jennifer Markarian	E-mail: editorial@compoundingworld.com
Designer:	Nicola Crane	
Advertisement manager:	Claire Bishop	E-mail: claire@amimagazines.com Direct tel: +44 (0) 1732 605976

WORLD TOUR 2015

compounding WORLD Congress 2015

21-23 APRIL
COLOGNE

compounding WORLD Asia 2015

6-8 OCTOBER
SINGAPORE

compounding WORLD Forum 2015

8-9 DECEMBER
PHILADELPHIA

TICKETS ON SALE NOW!

CLICK ON THE LOGOS FOR MORE INFORMATION

WWW.AMICONFERENCES.COM

Compounding World goes global

We've been bowled over by the positive reaction to our Compounding World Forum in Philadelphia. The second event took place in December, attracting over 300 attendees and lots of very enthusiastic feedback.

From a personal point of view, I've really enjoyed the opportunity to connect with a wide range of readers and discuss key market and technology trends in a live forum. So I'm delighted to announce that we will be launching similar events in Europe and Asia this year – Cologne in April and Singapore in October – before returning to Philadelphia in December.

Compounders converge on Cologne: The programme for the Compounding World Congress 2015, which takes place in Cologne, Germany on 21-23 April, was published recently and is generating lots of interest. More than 180 people and 25 exhibitors are already signed up to attend. You can read the second part of our preview of the event starting on page 43 of this issue.

Singapore launch and call-for-papers: We have just confirmed the dates for the first Compounding World Asia event, which will take place in Singapore on 6-8 October. The programme for this conference is currently being compiled and we have issued a call for papers. If you are interested in giving a presentation, then full details of what we are looking for can be found at: **http://bit.ly/CWACFP**.

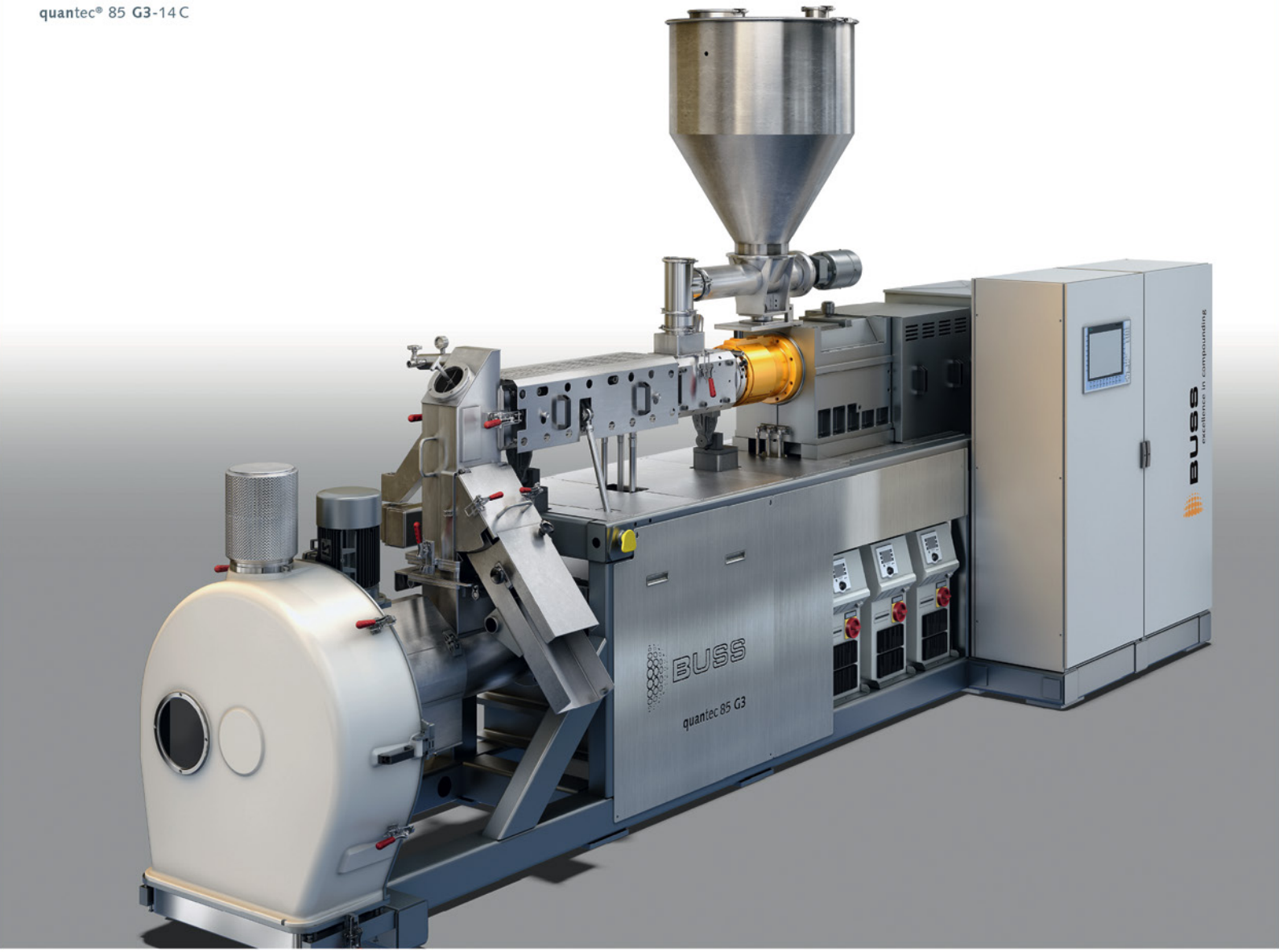
Making plans for Philadelphia: Last but not least, plans are already underway for the third Compounding World Forum, which will take place on 8-9 December in Philadelphia. Places are already selling fast and the exhibition area is starting to fill up. We are also inviting submissions of papers for this event. If you are keen to give a presentation, then the call-for-papers is at: **http://bit.ly/CWFCFP**.

Meet us on our travels: Details of these three events can be found at **www.amiconferences.com**. We hope that you'll be able to join us at one of them. I'll also be out and about next month at the Masterbatch Asia conference in Singapore and at NPE in Florida. Plus there's our new Conductive Plastics conference in Düsseldorf to look forward to this summer.

Now, where did I put my passport?

Andy Beevers
Editor, Compounding World, and
Head of Business Publishing, AMI
abe@amiplastics.com

quantec® 85 G3-14 C



Economical PVC compounding redefined

BUSS Kneader series **quan**tec® **G3**

The specialists in heat and shear sensitive compounding are setting new benchmarks for quality and productivity.

quantec® **G3** – an ongoing success story in the third generation

- More cost effective due to increased throughput
- More flexible due to a larger process window
- Improved plant availability due to minimal product changeover times

NPE2015
produced by spi

West Hall
Stand 5653

Buss AG
Hohenrainstrasse 10
4133 Pratteln
Switzerland

Phone +41 61 825 66 00
Fax +41 61 825 68 58
info@busscorp.com
www.busscorp.com

BUSS
excellence in compounding

Prayag orders 25th Steer compounding extruder

Indian masterbatch maker Prayag has ordered a new Omega compounding line from Steer, the twin-screw extruder manufacturer also based in India. The deal was announced at the PlastIndia 2015 exhibition earlier this month. It will be the 25th line to be commissioned by Steer for Prayag.

Prayag's managing director R.K. Agarwal said: "Since 2007, Steer as a technology partner has contributed significantly to the growth of Prayag. We place our trust in Steer's Omega technology to meet our customer promise and delivery timelines. We are delighted to add the 25th Omega line at our facility in Bhiwadi to manufacture colour masterbatch for exports to over 85 countries."

Prayag has been growing rapidly with a CAGR of more than 50% in the past five years, becoming one of India's leading and most advanced masterbatch makers. It operates three production plants in Bhiwadi with a production capacity of 50,000 tonnes/year.

Steer's Dr Babu Padmanabhan (left) and Prayag's R.K. Agarwal celebrate the deal at PlastIndia

Steer's managing director and chief knowledge officer Dr Babu Padmanabhan said, "We are extremely pleased to work with Prayag, one of world's fastest growing companies in the field of plastics that is led by dynamic leadership that reflects our transformational thought process. We respect Prayag's commitment in the partnership and congratulate them on adopting the Omega platform as their standard."

Steer's Omega co-rotating twin-screw extruders have an OD/ID ratio of 1.71, creating a large amount free volume for compounding masterbatches with high loadings of pigments and/or additives.

www.prayagmb.com
www.steerworld.com

IMCD and Dow extend agreement

IMCD is to distribute Dow's Paraloid impact modifiers and Surecel processing aids in Germany, Austria and Switzerland from 1 March 2015, and in the UK from 1 June 2015.

The new agreement is an extension of a long-established partnership between the two companies in a number of other European countries. It also complements the recent appointment of IMCD as Dow's pan-European distributor for its Tyrin chlorinated polyethylene range.

Paraloid, Tyrin and Surecel additives are used as impact modifiers and processing aids in a wide range of PVC compounds and in engineering plastics applications.

www.imcdgroup.com
www.dow.com/additives

Solvay increases pigment capacity

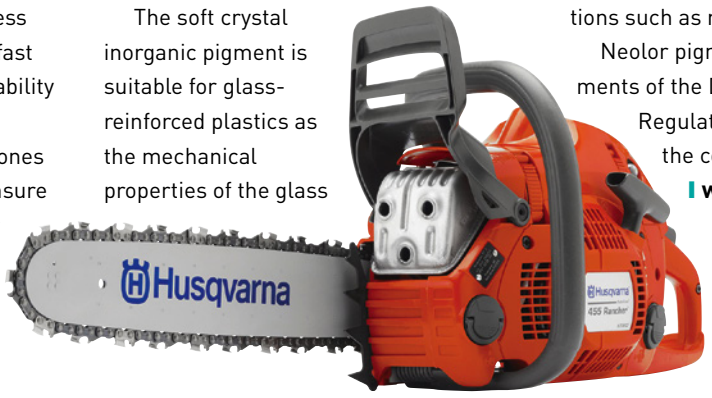
Solvay has increased production capacity for its Neolor rare-earth inorganic pigment by 50% across its three production plants in France. It says that its significant kiln investment and process debottlenecking will help it to meet fast growing market demand for high-stability inorganic pigments for plastics.

Neolor pigments provide colour tones from light orange to red, and they ensure high levels of weather resistance for outdoor applications such as power tools, lawn and gardening equipment, sporting goods and automotive parts. The pigments are also said to offer high thermal stability and can be used in high-performance polymers processed at temperatures up to 320°C.

The soft crystal inorganic pigment is suitable for glass-reinforced plastics as the mechanical properties of the glass fibre remain unchanged. In addition, Neolor is said to have excellent infrared reflection properties, which helps to reduce temperature build-up in applications such as roofing tiles.

Neolor pigments satisfy the requirements of the Directive 94/62-EC, and the Regulation of the ONEG regarding the content of heavy metal.

www.solvay.com



Solvay's Neolor inorganic pigment offers weather resistance for outdoor applications

PolyOne adds new line for LFTs

PolyOne is expanding capacity for its OnForce LFT long-fibre thermoplastics with the addition of a new production line at its manufacturing facility at Avon Lake, Ohio, USA. It will be fully operational by the end of February 2015.

The company says that its LFT formulations based on glass and carbon fibres offer high stiffness and impact strength while retaining good surface finish. They are used in metal replacement and structural parts.

"Demand continues to increase for lighter weight materials and the products made from them," said Craig Nikrant, president, global specialty engineered materials, PolyOne. "This investment is aligned with current megatrends to better serve our customers in North America across several industries, including industrial, transportation, oil and gas, and shooting sports."

● One recent application of PolyOne's OnForce LFT is in the award-winning Vela table made by Resinas Olot of Girona, Spain. The reinforced plastic has been selected to replace aluminium in the table's legs. Resinas Olot is part of the Resol furniture company, which markets the table via its design-focused Barcelona Dd brand. Awards for the Vela table include the German Design Council's Interior Innovation Award 2014, and the International Interior Design Association (IIDA) Best of Category award in its 2014 Product Design Competition.

www.polyone.com

PolyOne is increasing capacity for its OnForce LFT as used in this Vela table from Resol

Citadel opens plant in China

Citadel Plastics officially opened its new plant in Changshu, Jiangsu Province, China on 20 January. The facility, which is part of a joint venture with EMEI Group, is initially producing bulk moulding compound, but can be expanded to compound thermoplastics.

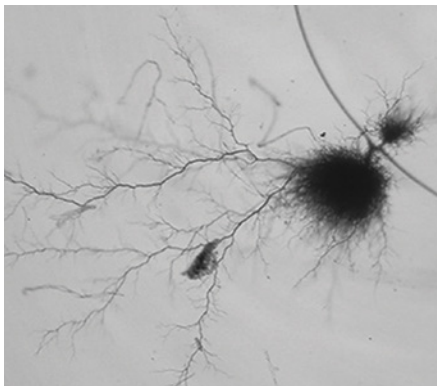
"The new Changshu site is a prime opportunity for Citadel to continue our successful partnership with EMEI, provide improved local customer support and response, and expand our engineered composites footprint in China," said Mike Huff, Citadel's CEO.

Citadel operates 20 plants worldwide including another Chinese facility in Dongguan.

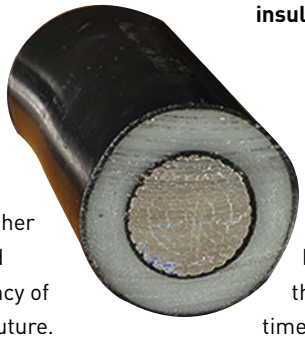
www.citadelplastics.com

Fullerenes shown to protect plastics insulation in cables

Researchers from Borealis and the Chalmers University of Technology in Sweden have demonstrated the use of fullerenes to protect plastics insulation in high-voltage cables. They say that the nanometre-sized carbon balls enable polyethylene to withstand a 26% higher voltage, which could increase the efficiency of power grids in the future.



Fullerenes can help to prevent the formation of electrical trees in high-voltage cable insulation

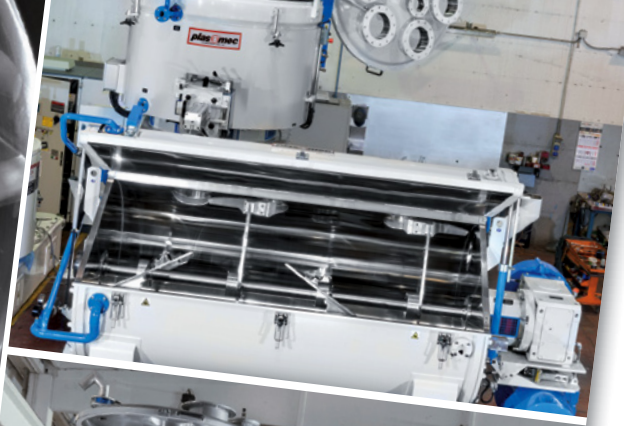


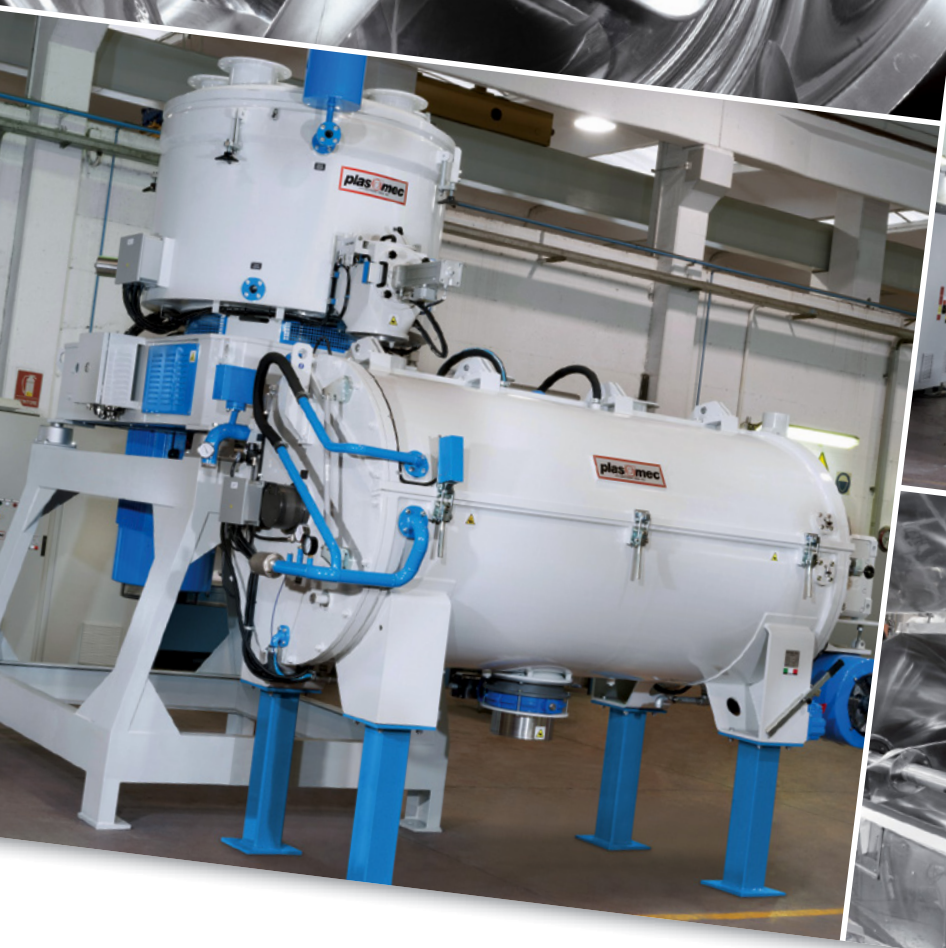
The research work involved the addition of very small amounts of different variants of the C_{60} carbon ball, a nanomaterial in the fullerene molecular group that is also known as a buckminsterfullerene or bucky-ball. Such materials have already been tested in the conductive parts of high-voltage cables, but it is believed that this is the first time that it has been shown they can bring benefits to the insulation material.

The Chalmers researchers say that fullerenes are the best voltage stabilizers identified for insulation plastics thus far. They help to capture electrons, preventing them from destroying other molecules and forming electrical trees within the plastic.

A paper on the initial research, entitled "A new application area for fullerenes: voltage stabilizers for power cable insulation", has recently been published in the *Advanced Materials* journal. The next stage of the project will involve testing the technology on a large scale in complete high-voltage cables with both alternating current and direct current.

www.chalmers.se





PEOPLE

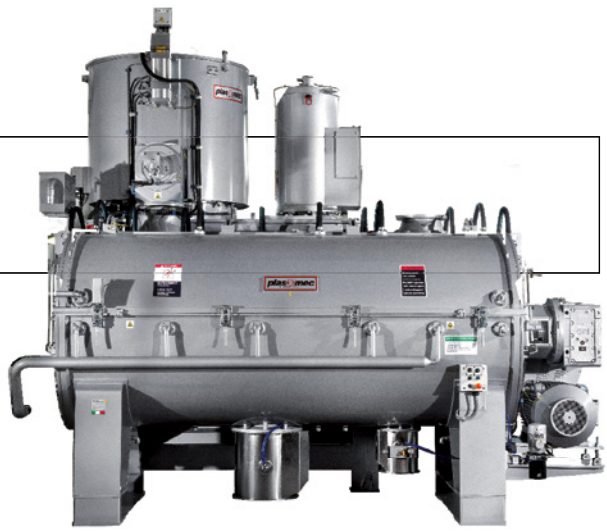
that's where your benefits start

Durable systems and quality products do not happen by chance.

Behind Plasmec's success is the work of a team.

Their goal: manufacture equipment for plastics and powder coating processing.

COMBIMIX-HC combination of heating mixer TRM and High Efficiency Cooler HEC to satisfy the most demanding specifications for productivity and flexibility.



plasmec
Excellence in Mixing

PLAS MEC S.R.L. *Plastic Technology*
Via Europa, 79 - 21015 Lonate Pozzolo (VA) - Italy - Tel. +39.0331.301648 - comm@plasmec.it
plasmec.it

Recovered carbon black leaders plan merger

Europe's two leading producers of recovered carbon black (rCB), Pyrolyx and Carbon Clean Tech (CCT), plan to merge. They have also announced plans to build an rCB plant in Denver, Colorado to convert some of the USA's largest tyre dump into carbon black.

Under the merger deal between the two German companies, CCT Stegelitz will be incorporated in Pyrolyx to create the world's biggest producer of carbon black using post-consumer rubber and tyres instead of crude oil. The transaction is scheduled to be completed by the end of April 2015.

Pyrolyx announced that it plans to invest €10 million into research, development, production and sales. CCT's existing industrial scale plant for rCB in Stegelitz will be expanded with the addition of a complementary production facility using Pyrolyx technology.

The company has also announced the signing of a strategic partnership with CH2E Group, the owner of the largest tyre dump in the USA, which amounts to roughly 600,000 tons and is located in Hudson, Colorado. Under the agreement, Pyrolyx will build a plant at the site to convert high-quality shredded scrap tyres into rCB. Scheduled to be completed in 2016, it is expected to be the world's largest rCB plant.

CCT's rCB plant in Stegelitz will be expanded with a new Pyrolyx plant following the merger

Niels Raeder, CEO of Pyrolyx said "With the acquisition of the established and successful CCT, we are creating the most innovative manufacturer in the field of rCB production. The two companies complement each other perfectly in production, research and development, sales and finance functions. The combined team will be the largest and most experienced team in the field of carbon black recovery."

www.pyrolyx.com

www.carbon-clean-tech.com

BPF names its new compounds chairman

Russell Livesey, managing director of Colloids, has been confirmed as the new chairman of the Masterbatch & Technical Compounds Group of the British Plastics federation (BPF). He takes over from Greg Hammond of Gabriel-Chemie who is retiring from the post.

Hammond was a major force behind the creation of the Group in 2006 and was awarded the BPF's Gold Medal for outstanding services in 2014 after eight years at its helm.

Beginning his duties as the BPF Group's new chairman, Livesey said, "I am looking forward to spearheading the Group's continued efforts to provide a strong platform for UK colour and additives masterbatch manufacturers and suppliers, as well as promoting the integral role of colour in plastic products."

www.bpf.co.uk

www.colloids.co.uk

Conductive Plastics 2015 programme released

AMI has announced the full programme for its new Conductive Plastics conference, which takes place in Düsseldorf, Germany from 29 June to 1 July and is supported by *Compounding World* and our sister magazine *Injection World*.

Conductive Plastics 2015 takes a detailed look at the application, development and processing of electrically and thermally conductive plastics, which are generating a great deal of interest in key developing markets such as LED lighting, electronic devices, automotive electronics and electric vehicles.

Expert speakers at the event include Pentair Thermal Management of the US and Technoform Kunststoffprofile of Germany, both of which currently process conductive plastics. US-based Lux Research will provide insight into some of the key emerging application areas. In addition, technical specialists from compounders and additives suppliers including Premix, Grafe, RTP, Sabic, Ensinger, Lati, Imerys, Nanocyl, Quarzwerke, Cabot and 3M Advanced Materials will explore different technologies for tailoring conductive properties.

The Conductive Plastics conference brochure with the full programme and booking information can be downloaded at: **http://bit.ly/CP15B**

Chinaplas® 2015

NPE2015

CPM EXTRUSION GROUP

CENTURY EXTRUSION • RUIYA EXTRUSION

COMPOUNDING SOLUTIONS AND SERVICES

- FULLY INTEGRATED COMPOUNDING SYSTEMS
- THREE LEVELS OF TWIN SCREW EXTRUDERS FROM HIGHLY ECONOMICAL TO ENGINEERED
- REPLACEMENT PARTS FOR MORE THAN 30 BRANDS OF TWIN SCREW EXTRUDERS
- OVER 3000 COMPOUNDING LINES INSTALLED IN 45 COUNTRIES
- ASK ABOUT THE NEW HO SERIES TWIN SCREW EXTRUDER AT NPE 2015

CENTURY EXTRUSION

Add : Traverse City, USA
Tel : 001-231-947-6400
E-mail : sales@centuryextrusion.com
Website : www.centuryextrusion.com

RUIYA EXTRUSION

Add : Nanjing, P.R.China
Tel : 86-25-52768686
E-mail : sales@njruiya.com
Website : www.ruiyaextrusion.com

BASF boosts pigments production

BASF is to increase production capacity for bismuth vanadate pigments in Besigheim, Germany by 2017 in order to meet growing demand for alternatives to lead chromate products. It is also planning to launch two new bismuth vanadate pigments in 2015, including a temperature-stable one for plastics.

Bismuth vanadate pigments are yellow pigments with a special greenish colour tone that BASF markets under the Sicopal and Paliotan brand names for the formulation of paints, coatings and plastic coatings. They are a high performance inorganic alternative to pigments containing lead chromate, which are classified by the European REACH chemical legislation as CMR substances (carcinogenic, mutagenic or toxic for reproduction).

"Over the next few years we expect our customers' demand for bismuth vanadate pigments to grow faster than the overall pigment market, both in Europe and worldwide," explains Dr Alexander Haunschild, senior vice president of the Pigments & Resins Europe business unit. As of this year, BASF is no longer producing any pigments containing lead chromate.

www.basf.com

Borealis invests in PP compounding in Brazil

Borealis has increased polypropylene compounding capacity at its plant at Itatiba near Sao Paulo in Brazil. It has invested €45 million in two new compounding extruders housed in an additional production building at the facility. The new capacity was commissioned at the end of last year.

The investment also included the addition of new silos, warehouse facilities and a bagging line. In addition, extensive upgrading of the utility and water systems was carried out at the site.

"Our expansion in Itatiba enables us to intensify the development of pioneering, value-added applications in collaboration with customers and partners in South America," said Harald Hammer, who is vice president for engineering applications at Borealis.

Target markets for the high-performance PP compounds produced on the new lines include South American automotive and appliance manufacturers.

Borealis has also announced that it has developed a new PP compound for the front bumper on BMW's i8 electric sports car. Daplen EE112AE is a 12% mineral-filled elastomer-modified PP that meets BMW's stringent paint adhesion quality requirements for primerless paint systems. The grade provides good processability, reduced density and a good impact/stiffness balance, enabling a low part weight.

www.borealisgroup.com

Borealis has developed a new PP compound for the front bumper on BMW's i8

Chemtrusion and Mytex expand

Chemtrusion and Mytex Polymers have announced plans to jointly invest US$7.6 million to expand production capacity by 25% at their compounding plant in Jeffersonville, Indiana. They say that the expansion will help meet growing demand from its automotive customers.

Chemtrusion operates the plant on behalf of Mytex, which was originally formed as a PP compounds joint venture between Exxon and Mitsubishi, but is now owned by Mitsubishi Chemical. The companies constructed the 245,000 sqft (23,000 m^2) Jeffersonville plant in 1996.

Work on installing new equipment and expanding the site's warehouse and rail storage facilities will start in March 2015. More than 100 people are currently employed at the site and up to 11 new jobs are expected to be created.

"We have experienced significant growth in automotive related sales during the last several years and look to capture continued growth in this segment," said Masayuki Arai, president of Mytex Polymers. "A key pillar in our parent company's strategy is capacity expansion in North America, and Jeffersonville remains an attractive location, as it is centrally located amongst many of our automotive customers."

"We are excited about the proposed expansion project and very pleased that Mytex Polymers continues to place its confidence in Chemtrusion," said Scott Owens, president of Chemtrusion.

www.chemtrusion.com

www.mytexpolymers.com

TO DESIGN **LIGHTWEIGHT** SOLUTIONS MADE FOR **FOOD CONTACT** ASK **JOHNS MANVILLE**

ThermoFlow® chopped strands continues JM's innovation in fiber thermoplastics. Through the use of unique JM sizing chemistry, we are able to produce articles developed for food contact applications in PBT, PA and PP with ThermoFlow® 601, 674 and 636, respectively.

This new offering will boost the use of PBT/PET and Polyamides in engineered thermoplastic applications intended to be used in contact with food.

Call our customer service today at **+421 33 5918 249** or email us at **fibers@jm.com** and let us know how we can assist you.

These products are developed as chopped strands for use in plastics for food contact applications in compliance with COMMISSION REGULATION EU Nr. 10/2011 of 14 Jan 2011, as amended.

Johns Manville

Expanding the Capabilities of Thermoplastics

www.jmfibers.com

Polyketone undergoes resurrection

Aliphatic polyketone, the engineering plastic that was launched by Shell under the Carilon brand name in the mid-1990s and then unceremoniously axed in 2000, is back in the news. **Hyosung** of South Korea restarted production of the polymer in 2012. Now it is scaling up production and more international compounders and distributors are signing agreements to help grow its use.

When Shell decided to exit polymer production at the end of the 1990s, it could not find a buyer for its relatively new Carilon aliphatic polyketone business that was taking time to grow. As a result, it donated the technology to the non-profit R&D organisation SRI International in 2002.

Hyosung licensed the technology from SRI in 2003, and it further developed the resin technology, investing KRW50 billion (US$45 million) over 10 years and filing more than 100 patents. It started up its 1,000 tonnes/year pilot plant in Ulsan, South Korea in 2012, and launched the materials onto the market in 2013.

The next major step in the resurrection of polyketone will take place later this year when Hyosung commissions the 50,000 tonnes/year plant that it is constructing in Ulsan. Construction is scheduled to be completed in March with full-scale production expected to start in June/July. It has invested a further KRW125 billion (US$112 million) in this project.

Akro-Plastic and **A. Schulman** were among the first compounders to get their hands on the relaunched polyketone from Hyosung.

Lehmann & Voss is the latest compounder to launch grades based on polyketone

Akro-Plastic of Germany launched its Akrotek PK grade in 2013. This high-performance compound is reinforced with 50% glass fibre and is aimed at demanding applications requiring low creep and good chemical and fuel resistance.

Akro-Plastic said that its Akrotek PK compound offers significantly lower creep under load than many alternative high-performance polymers. It also displays high resistance to zinc chloride solutions and excellent barrier to automotive fuels, while good tribological properties allow it to fill the gap between POM and PEEK in gear applications.

A. Schulman also introduced its Schulaketon polyketone compounds in 2013. The global compounder offers a range of compounds based on the resin, including unreinforced grades with different flow properties, glass fibre reinforced materials, and flame retardant formulations. The company highlights the polymer's excellent resilience and its high tensile strength and elongation at yield.

In October last year, **Lehmann & Voss** of Germany and its US-based subsidiary **Lehvoss North America** both announced that they were launching a new range of Luvocom 70 compounds based on polyketone. The company said that the compounds "fill the gap between compounds based on technical polymers, like PA6, PA66 and POM, and high-performance polymers, such as PPS, PEI and PAEK".

The Luvocom 70 line consists of three grades: 70-9045 reinforced with carbon fibres; 70-9046 lubricated with PTFE; and 70-9113/BK formulated for low wear and friction. Lehmann & Voss will also develop custom polyketone compounds based on customer requirements.

Earlier this month, **PolySource** of Kansas City, Missouri, USA announced that it had entered an agreement with Hyosung to be the authorized distributor for polyketone in North America, further increasing its availability.

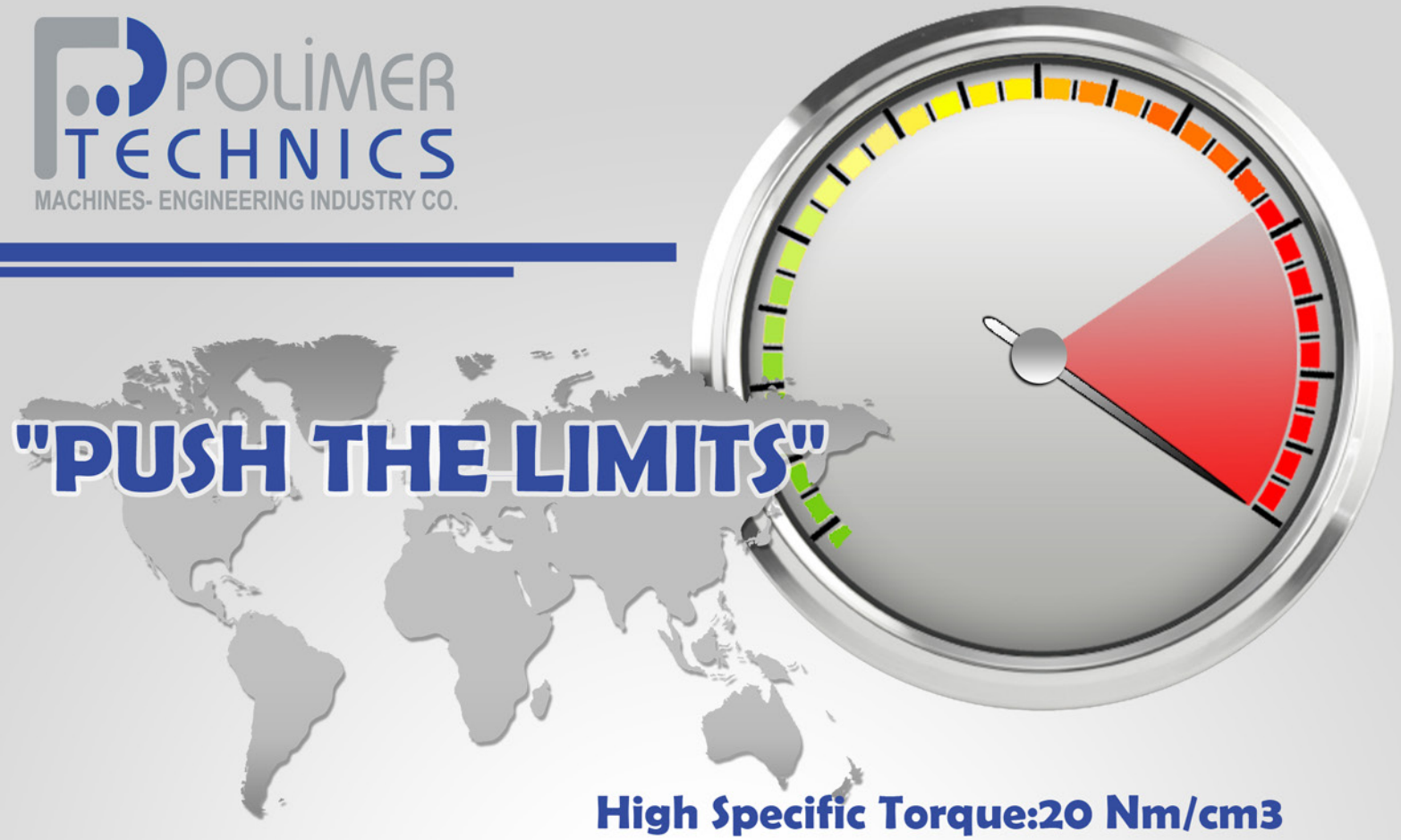
Polyketone is highly crystalline with a compact crystal structure resulting in excellent impact resistance, abrasion resistance, chemical resistance, fuel resistance and gas barrier properties. Bill Feldman, executive vice president of PolySource, said that the material has excellent wear resistance and coefficient of friction performance, plus good hydrolysis resistance. These properties make it a good fit in materials handling, gearing and industrial applications, replacing lubricated nylons and acetals.

Feldman added that polyketone should be viewed as a "true green material" as 50% of the polymer comes from carbon monoxide that would have gone to the atmosphere.

Hyosung is constructing a 50,000 tonnes/year polyketone plant in Ulsan, South Korea

- **www.poly-ketone.com (Hyosung)**
- **www.akro-plastic.com**
- **www.aschulman.com**
- **www.lehvoss.de**
- **www.polysource.net**

POLİMER TECHNICS
MACHINES- ENGINEERING INDUSTRY CO.



"PUSH THE LIMITS"

High Specific Torque:20 Nm/cm3
High Filled Compound %80 CaCO3

poex® Polimer Extruder

ALL YOU NEED IS POEX

Tel: +90 224 241 2443 E-mail: export@polimerteknik.com Web: www.polimerteknik.com

1000 Hess Avenue, Saginaw, Michigan 48601 USA
+1-989-757-1300 sales@bpprocess.com
www.bpprocess.com

LOWER SME HIGHER ROI

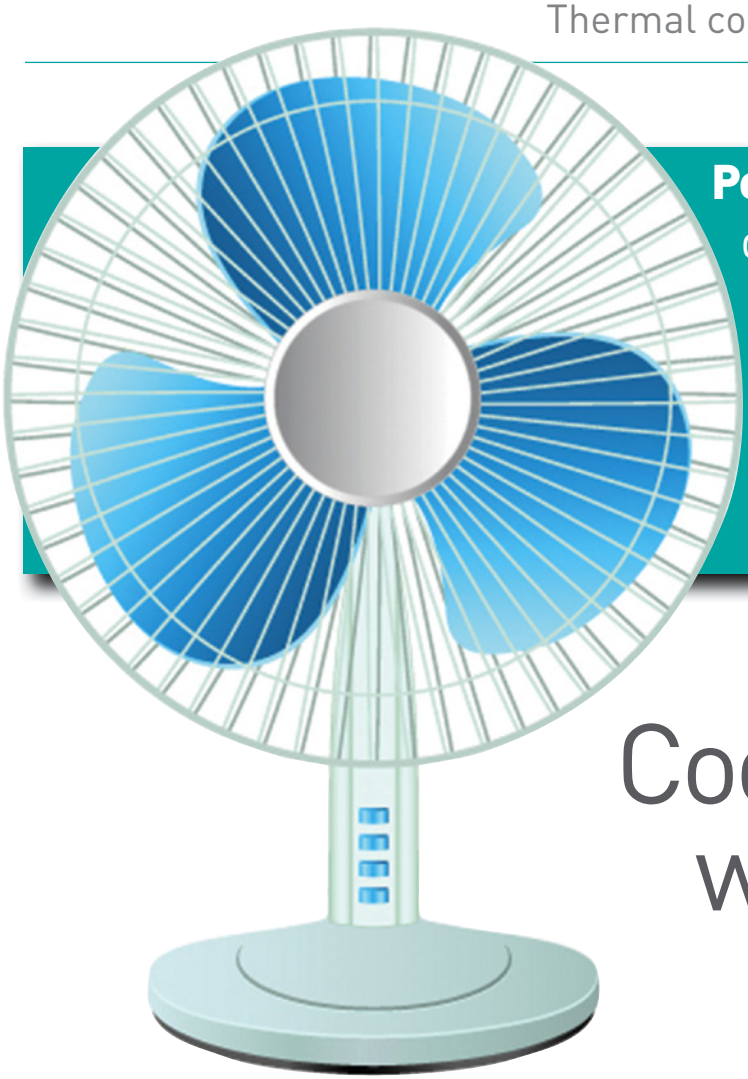
TriVolution is proven to significantly reduce the mechanical energy needed to process high quality compounds.

Expand your process range and lower both CAPEX and OPEX per kg of compound produced.

B&P PROCESS EQUIPMENT

Strong Innovation • Strong Value • Strong Choice

TRIVOLUTION™
NEXT GENERATION COMPOUNDING



Peter Mapleston reviews recent developments in thermally conductive additives and compounds which are improving heat management in LED lamps and a growing range of other applications

Cool things down with conductive compounds

The increasing use of electrical components with high energy density has heightened the need for materials that provide efficient dissipation of the heat produced. LED lighting, which is growing at a dramatic pace, provides the most obvious example of this trend, but numerous other electronic and electrical components can also benefit from thermally conductive plastics that can be moulded cost-effectively into shapes that maximise their potential.

Heat conductive additives differ widely in price and performance, so users need to be sure they know what they need. The use of metallic fibres and powders is quite widespread where a high degree of thermal conductivity is required, but these products also increase electrical conductivity of course, and this may not always be desirable. As a result, a growing number of mineral fillers, which are natural electrical insulators, are gaining a foothold in the market. A potential downside is that they often need to be used at high addition rates – possibly close to 60% – which can have a significant impact on the mechanical properties of finished parts.

Mineral movements

HPF - The Mineral Engineers, a division of **Quarzwerke**, began marketing a range of Silatherm aluminosilicate fillers two years ago. It says that they generate a significant increase in the thermal conductivity of thermoplastics and thermosets.

"The values measured in polyamide show that through the use of our Silatherm aluminosilicate grades thermal conductivities of up to 2.3 W/mK can be achieved and that the mechanical properties remain at a very good level for these high filler proportions," the company claims. By comparison, unfilled PA 6 has a thermal conductivity of 0.3 W/mK.

Market development manager Klaus Berger says that HPF has very flexible production that enables it to obtain precise particle sizes and particle size distribution. The larger the grain size, the higher the abrasion during processing. HPF grades have a Mohs hardness of 5-6, which is similar to that of glass fibres. This compares with 9-10 for aluminium oxide, which is another contender in this market.

HPF applies different surface coatings according to the host polymer. Berger says the strongest demand from compounders is for Silatherm grades compatible with polyamides, but recently there has been a growth in interest from companies producing polypropylene compounds. HPF is currently carrying out trials on grades compatible with PP.

Silatherm provides approximately the same level of

Thermal conductivities of various additives for plastics

Source: HPF/ Quarzwerke

	Mineral	Thermal conductivity λ [W/mK]
Electric insulator	Magnesia	30
	Aluminiumoxide	30
	Boron nitride	30 ⊥; (600 ∥)
	Alumosilicate	**14**
	Polymers	0,2-0,4
	Other Material	
Electric conductivity	Copper	401
	Aluminium	205
	Iron	80
	Graphite	150

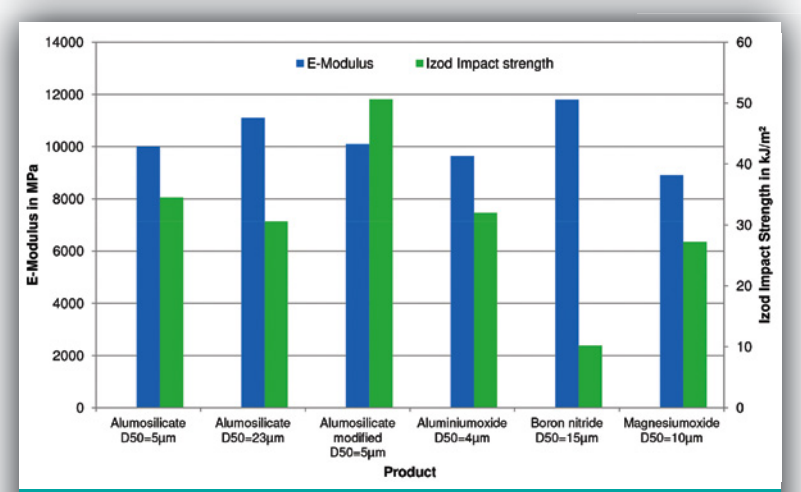


Chart showing the influence of conductive fillers on the mechanical properties of PA6 at 65 wt% loadings (with BN mechanically stable compounds could only be produced up to 55 wt%). Stiffness increases with the degree of filling, while impact strength falls. Finer products show higher impact strength. Modified aluminosilicate provides the best impact strength

Source: HPF/Quarzwerke

thermal conductivity along all three axes; in-plane conductivity is similar to that obtained with boron nitride, but through-plane conductivity is lower. So if higher through-plane conductivity is required, the two additives can be blended together. Compounders will probably want to try and use as little BN as possible, since it can cost upwards of €50/kg, whereas aluminosilicates sell for under €4/kg.

Boron nitride shows the best through-plane thermal conductivity, but is very anisotropic. Aluminosilicate provides in-plane thermal conductivity up to 2.3 W/m*K and up to 1.35 through-plane.

Silatherm is available in different particle size distributions and surface treatments adjusted for different polymer matrices.

Meanwhile, one boron nitride supplier reports good progress with its product, despite the increasing competition. "We have discovered that our new grade PCTP30D works beautifully for a wide range of polymers, and has become our workhorse for plastic compounding applications," says Neelam Kumar, product manager for CarboTherm fillers at **Saint-Gobain Ceramic Materials**. The company markets this grade as a free-flowing loosely agglomerated powder for cost-sensitive, high-volume applications.

Asked how the market is developing, Kumar says that the momentum that was started by the LED market has prompted developers to look at many new and novel applications where a thermally conductive and dielectric polymer can be used. "The range of BN in polymers has spread much beyond LED heat sinks, where it first started," she says.

As to the high price of BN, Kumar replies thus: "BN has always co-existed with competing materials in all the markets it serves. Like any other material, if BN meets the unique challenges of an application with its unique electrical, thermal and mechanical properties, customers will pay for the value proposition it brings."

Carbon keeps it cool

Daniele Bonacchi, a polymer application scientist at **Imerys Graphite and Carbon** (formerly Timcal), says that graphite is the best solution for thermally conductive plastics when electrical insulation is not required. He says that graphite has proven to be more effective and economical than other solutions; it has a very high thermal conductivity and is affordable. "When graphite is added to a compound it gives an anisotropic thermal conductivity that can be maximized for an efficient thermal management," he says.

For products such as heat sinks for LED lamps, where ribs are usually present, high anisotropy can be an advantage as the thermal energy is more efficiently removed away from the heat source. In the case of extruded heat exchangers such as cooling pipes, low aspect ratio graphite grades are preferred.

For weight-saving solutions, Imerys has developed a special graphite called C-Therm that gives high thermal conductivity at low concentration.

An alternative to graphite, when low conductivity is targeted, is conductive carbon black. The high structure of conductive carbon black is important to decrease the number of thermal contacts that are detrimental to the final conductivity, while the higher carbon black crystallinity improves the performance of the final material. "The low thermal conductivity of the final compound compared to the intrinsic conductivity of the filler can be explained as the phonons do not pass as easily through interfaces (particle-particle or particle-

MASTERBATCH ASIA 2015

Growing your business opportunities

CLICK HERE FOR DETAILS

9-11 March 2015
Swissôtel The Stamford, Singapore

Images courtesy of: **Merck KGaA**

FINAL REMINDER – BOOK NOW

Organised by:
Applied Market Information Ltd.

Sponsored by:

Media supporter:

Adele Brown – Conference Manager ab@amiplastics.com Ph: +44(0)117 924 9442 Fax: +44(0)117 311 1534

polymer) as electrons do with tunnelling for electrical conductivity," Bonacchi notes. "The contacts represent a large obstacle for thermal conductivity and if more contacts are present more obstacles have to be passed by phonons that carry thermal energy."

The high structure of the carbon black also increases its dispersion in the polymer matrix, an essential property in pipe applications because carbon black that is not well-dispersed is known to act as a mechanical weak point.

In the end, thermally conductive plastic is gaining increasing attention; new markets means new specifications and understanding the potentialities and pitfalls of new additives is of great importance. Graphite is used when high thermal conductivity is needed, although it has the drawback of decreasing the mechanical properties. Conductive carbon black is used only in applications that require moderate increase of the thermal conductivity, like geothermal pipes, as it is very effective in preserving the mechanical properties of the final material.

Heat sink produced using a thermally conductive PA compound containing HPF's Silatherm

Conductive additives from Imerys are priced between 2 and 20 €/kg, depending on purity and grade.

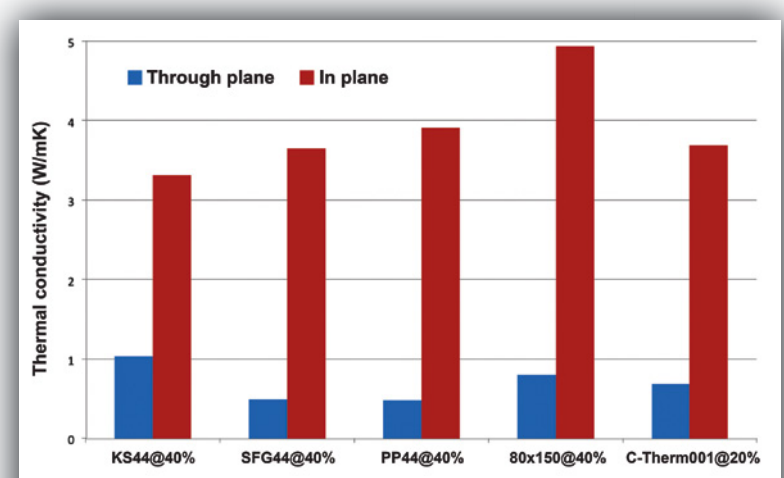
Cabot is also active in the conductive carbon black market and it is exploring the potential for graphenes in plastics. Dr Angelos Kyrlidis, principal scientist at the company, discussed initial findings during his presentation on thermally and electrically conductive additives at the Compounding World Forum 2014 in Philadelphia last December.

He said that "breakthrough" performance – not only in conductivities, but also mechanical properties – is possible with graphenes at loadings of under 1%.

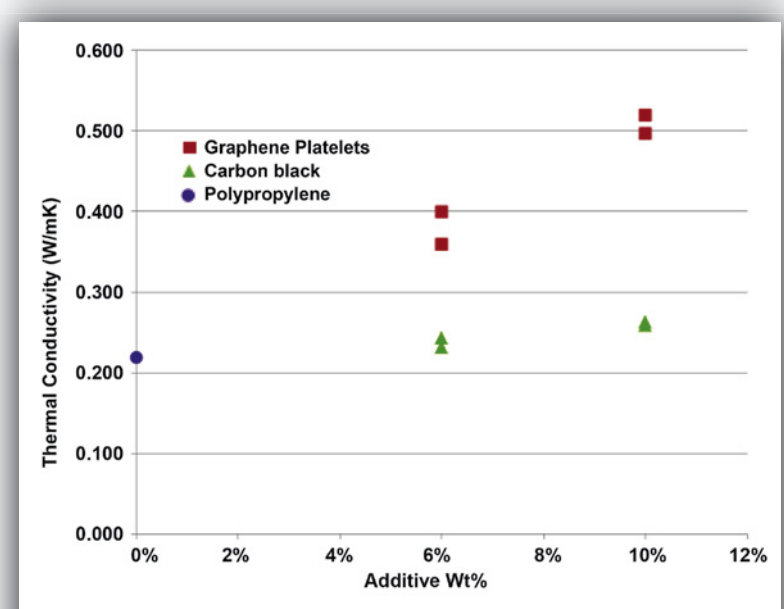
Data was presented that showed graphene increased the thermal conductivity of polypropylene more than carbon black.

"In-house testing has confirmed the performance benefits of graphenes but also identified the importance of delivering them in the appropriate form," he said. Electrical conductivity of compounds is highly dependent on additive morphology and the quality of dispersion. Cabot is developing materials that can be processed easily in conventional equipment.

Many plastics producers and independent compounders are busy advancing and expanding their portfolios of thermally conductive plastics to meet the growing demand from the LED lighting industry and other markets.



Not all graphites are the same; particle size, flake morphology and the intrinsic anisotropic thermal conductivity of graphite introduce a strong anisotropy in the thermal conductivity of a material. Bar chart shows in-plane and through-plane thermal conductivity of injection moulded HDPE plaques loaded with different Imerys graphite grades



Cabot's test results comparing the thermal conductivity of PP containing 6 and 10 wt% of carbon black and graphene. Measurements on compression moulded discs using ASTM E1461 Flash method

Compound growth

The LED lighting market is expected to grow annually at 34% from 2010-2016, according to **PolyOne**. The market will amount to almost US$94 billion by 2020. LED lamp costs are expected to drop by 55%, and luminaires by 30%, by 2017.

In many cases aluminium heat sinks are over-engineered, claims Philippe Chabanne, market manager for electrical & electronics at PolyOne Engineered Materials Europe. "While the thermal conductivity of a specialty plastic is significantly lower than aluminium, with proper design, it can still manage heat just as effectively as aluminium."

Chabanne says that PolyOne continues to see opportunities for manufacturers to replace metal in electronics applications requiring thermal management. "The advantages for the manufacturer include an ability to reduce weight and structural complexity, to control more of the logistics and value chain, to create new designs, and ultimately to lower total cost to manufacture while maintaining application performance," he says.

PolyOne is collaborating with others to develop and test new grades of Therma-Tech thermally conductive plastics to replace thermosets and metal for functional heat sink printed circuit boards. "These specialty plastics must combine flame resistance, dielectric properties and resistance to high temperatures so that they can withstand lead-free reflow soldering in surface mount technology (SMT) during assembly of electronics components," Chabanne says. They also have to effectively manage heat build-up generated by higher-heat producing electronic components, and act as a heat dissipater in assembled systems. Excess temperature is a major cause of failure in electronic systems.

Another major compounder, **RTP** has developed specialty compounds with thermally conductive and EMI shielding properties, also intended for replacement of metal housings used in various E&E applications. "Our newest compounds actually exceed the thermal conductivity of stainless steel," says Neil Hardwick, conductive products marketing manager. He says the company offers compounds with conductivities as high as 35 W/mK; these contain metal filler. Compounds containing mineral fillers have conductivities up to around 12 W/mK.

Hardwick says RTP has been pushing thermally conductive compounds for around two years, but it is only now that significant commercialisation of finished

STEER

PERFECT FOR

BERSTORFF

COPERION

ENTEK

JSW

LEISTRITZ

MARIS

STEER

AND MOST

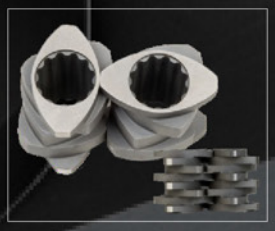
CO-ROTATING

TWIN-SCREW

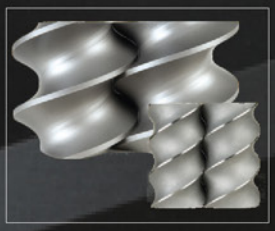
EXTRUDERS.

INTAKE ELEMENTS

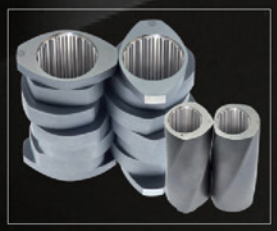
MELTING ELEMENTS



VENTING ELEMENTS



MIXING ELEMENTS



VACUUM ELEMENTS

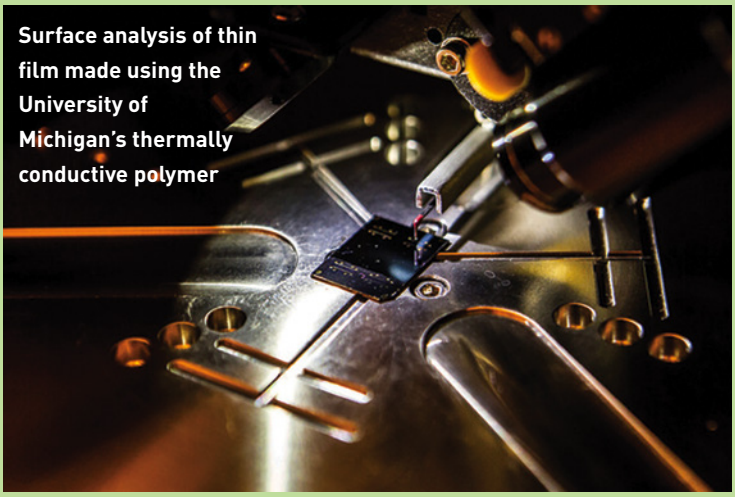
STEER is a global specialist in the design and crafting of screw elements that are at the heart of any co-rotating or counter-rotating twin-screw extruder. Every screw element produced by STEER is made from special steel manufactured in our **state-of- the-art foundry**. Whether it is our proprietary metallurgy, soft-core HIP metallurgy or a combination of speciality metallurgy with crest-welded overlays, our replacement elements are designed to work in perfect unison with the existing system. They deliver superior quality, increase efficiency and ensure a better return on your investment. Trusted by some of the biggest companies in the U.S., Japan, China, the EU and India, STEER is committed to the design, creation and implementation of world-class technology to **steer a new world.**

CHOICE OF METALLURGY - WEAR-RESISTANT (WR) SERIES, CORROSION-RESISTANT (CR) SERIES, HIP POWDER METALLURGY (PM) SERIES AND CREST-WELDED & SPECIAL ALLOYS (AC)

OVER 6000 EXTRUDER LINES CHOOSE STEER REPLACEMENT SCREW ELEMENTS - MOC TO SUIT APPLICATIONS | EXTREMELY QUICK DELIVERY | SUPERIOR ROI

STEER Global Contacts: India: Ganesh Karanam, +(91) 77609 88101, ganesh.karanam@steerworld.com | **China:** S. Prasanna Kumar, +(86) 135 856 05228 | prasanna.kumar@steerworld.com | **Japan:** Kazuhiro Ushirokawa, +(81) 080 3012 9993, k-ushirokawa@steerjapan.com | **USA:** Ed Ford, +(1) 302 745 3319, eFord@steeramerica.com | **Europe:** Sija Kuttan, +(44) 203 290 4949, sija.kuttan@steerworld.com

Log on to **www.steerworld.com** for more information. Do visit us at **The International Plastics Showcase, NPE 2015, Booth W5163.** We will be delighted to take you through some of our work.



Surface analysis of thin film made using the University of Michigan's thermally conductive polymer

Exploring molecular engineering for thermal management

A University of Michigan (U-M) research team has made a plastic blend that is claimed to conduct heat 10 times better than its conventional counterparts. Rather than using additives to increase thermal conductivity, they focused on optimising the molecular structure of the materials.

"Researchers have paid a lot of attention to designing polymers that conduct electricity well for organic LEDs and solar cells, but engineering of thermal properties by molecular design has been largely neglected," says Kevin Pipe, U-M associate professor of mechanical engineering. He led the project with Jinsang Kim, associate professor of materials science and engineering.

Heat energy travels through substances as molecular vibrations. For heat to efficiently move through a material, it needs continuous pathways of strongly bound atoms and molecules. Otherwise, it gets trapped, meaning the substance stays hot.

"The polymer chains in most plastics are long and don't bind well to each other," says Pipe. "When heat is applied to one end of the material, it causes the molecules there to vibrate, but these vibrations, which carry the heat, can't move between the chains well because the chains are so loosely bound together."

The researchers devised a way to strongly link long polymer chains of polyacrylic acid (PAA) with short strands of polyacryloyl piperidine (PAP). The new blend relies on hydrogen bonds that are 10-to-100 times stronger than the forces that loosely hold together the long strands in most other plastics.

"We improved those connections so the heat energy can find continuous pathways through the material," Kim says. "There's still a long way to go, but this is a very important step we made to understand how to engineer plastics in this way. Ten times better is still a lot lower heat conductivity than metals, but we've opened the door to continue improving."

www.umich.edu

products is occurring. "Downstream understanding of how to use these compounds has come a long way in that time," he says. "People are now coming to us with designs that are much more appropriate for thermoplastics, they understand that they can't use them as drop-in replacements for metals."

RTP is also doing increasing business in replacement, not of metals, but of non-conducting thermoplastics where just a moderate level of thermal conductivity is very useful for thermal dissipation. Without going into specifics, he says motor housings are a potential market for this type of materials replacement.

Numerous other independent compounders are also emphasizing thermally conductive compounds. **Ensinger**, for example, offers compounds based on a wide range of polymers and with different additives depending on the level of conductivity required, the processability, and price, and also the level of electrical conductivity required. It says components made of Tecacomp TC provide thermal conductivity of between 1 and 25 W/(mK).

Lehmann & Voss is another active supplier, with its Luvocom range. It cites applications ranging from heat exchanger plates in a polypropylene compound through to heat sinks for hospital operating theatre lights in a compound based on polyetherimide.

Other major polymer suppliers are also making moves in conductive compounds, either through internal development or through acquisitions. Last October, for example, **Celanese** acquired the assets of **Cool Polymers**, which as the name suggests, was a compounder focusing strongly on such materials. Celanese said at the time that Cool Polymers' technical capabilities in the LED market "will allow for immediate customer growth while continuing to advance Celanese's engineered materials business across thermal management and electrical conductivity polymer applications." Cool Polymers' portfolio includes thermally conductive thermoplastics and elastomers with and without electrical conductivity.

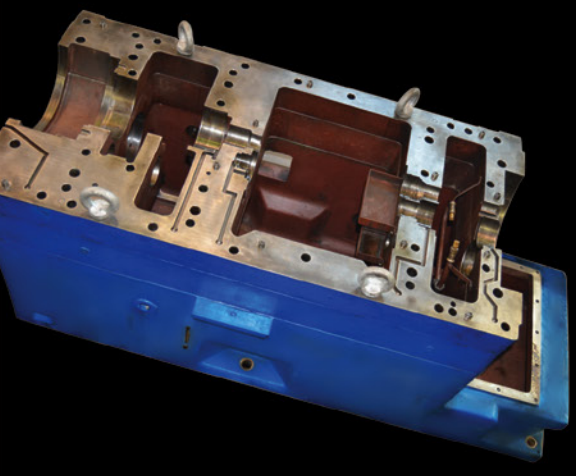
Lanxess added Durethan TC thermally conductive polyamides to its range last year. Its first two grades are easy-flow polyamide 6 variations, Durethan BTC65 H3.0 EF and BTC75 H3.0 EF. Their high thermal conductivity is based on reinforcement with 65% and 75% of a "special" mineral, details of which are not disclosed. "Both materials display a very good balance between high thermal conductivity, outstanding mechanical properties and good processing behaviour," says Detlev Joachimi, head of Durethan product development at the company, adding, "They have been approved by two international automotive suppliers".

The thermal conductivity (determined by the

NFM

EXTRUSION GEARBOX REBUILD

ANY APPLICATION, ANY OEM



ENGINEERED TO PERFORM, BUILT TO LAST

NFM Welding Engineers, Inc. takes great pride in maintaining all of our customers' extrusion equipment, regardless of OEM. With years of experience rebuilding and manufacturing new gearboxes, NFM is capable of supporting any make and model of extruder.

NFM is experienced in a full range of extrusion gearboxes:

- Single- and Twin-Screw Extrusion for Rubber and Plastics
- Single, Double, Triple Reduction
- AGMA 12 Gear Quality
- Roller and Stacked Thrust Bearings
- Forced Lubrication, Lube Tubing, and Splash Type Lube Systems
- Vibration, Noise, and Thermal Imaging Analysis

Whether it's performance concerns or part of a regular pre-maintenance schedule, NFM will inspect, repair, and help you prevent costly downtime and lost production.

NPE2015 produced by spi

BOOTH W5963

330-837-3868

www.nfm.net

compounding WORLD

Asia 2015

The international conference on new technologies and business strategies for plastics compounders

6 - 8 October 2015

Grand Copthorne Waterfront Hotel, Singapore

Organised by:
Applied Market Information Ltd. &
Compounding World

CLICK HERE FOR DETAILS

Adele Brown – Conference Manager Email: ab@amiplastics.com Tel: +44(0)117 924 9442 Web: www.amiplastics.com

Nanoflash test method) of the polyamide with 65% mineral reinforcement is 1.0 W/mK. The material with a 75% mineral content tested at 1.5 W/mK. Lanxess claims that the two materials conduct heat as efficiently as polyamides containing boron nitride or aluminium oxide. "However, aluminium oxide systems have the disadvantage of being very abrasive, which quickly causes damage to the injection mould. Compared to boron nitride systems, our materials are significantly less expensive and have better mechanical properties. Furthermore, their thermal conductivity is virtually the same in all directions," Joachimi says.

The products also have good mechanical properties – on par in some cases with those of Durethan BKV 30 H2.0 – despite a high filler content. For example, Durethan BTC65 H3.0 EF is equally as stiff and displays a similar elongation at break of 3%. Izod impact strength of 35 kJ/m² is more than twice as high as in comparable polyamide compounds with aluminium oxide filler, according to Joachimi.

DSM is another engineering plastics producer that has been actively developing and marketing thermally conductive compounds. One of its most recent applications is in large LED down-lights from market leader **Osram** which feature heat sinks made using its Stanyl TC thermally conductive polyamide 46. Chosen ahead of aluminium, Stanyl TC scores with its ability to be easily and quickly injection moulded into complicated geometries that effectively remove heat from around the LED light source, thus ensuring a long lifetime.

The L and XL versions of Osram's LedvanceCE series

RTP is making compounds with both EMI shielding and thermally conductive properties

PolyOne sees strong potential for its conductive compounds in the growing LED lighting market

are the first LED down-lights (lights that are built into the ceilings of shops, offices, and domestic accommodation) from the company with a heat sink in plastic rather than in aluminium.

Stanyl TC has sufficient thermal conductivity (up to 14 W/mK) to successfully dissipate the heat generated by the LED; DSM says that the compound also has the excellent flow properties common to all polyamides that enable it to be moulded into complicated shapes with high surface-to-volume ratios to enhance heat dispersion.

Osram was able to reduce the weight of the housing by around 50% compared to aluminium. This facilitates the installation of the luminaire and enables the use of spring fixations in the ceiling. The material complies with flammability requirements according to IEC and UL safety standards.

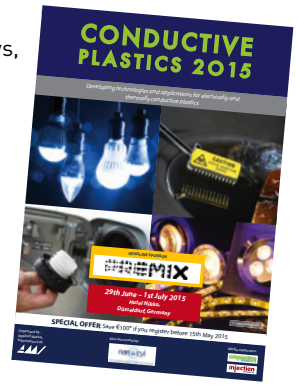
As well as Stanyl TC thermally conductive polyamide 46, DSM offers TC grades of Arnite PET for automotive lighting applications, and it is now also introducing Akulon TC based on polyamide 6. This is aimed in particular at LED lighting producers looking to reduce their costs in what is becoming an increasingly competitive market. It has already been adopted by some companies in China.

According to Wu Rui, application development and technical service manager with DSM in China, Akulon TC's conductivity, which is in the range of 1-2 W/mK, is sufficient for these applications, especially for hybrid designs that use over-moulded metal inserts. "For LED lighting customers, we need a balance between TC value, processability, mechanical properties, reliability and cost," he says.

DSM is supplying thermally conductive PA 46 for this Osram LED down-light which is built into ceilings

More information

AMI's Conductive Plastics 2015 conference takes place on 29 June to 1 July in Düsseldorf, Germany. The programme covers developments in thermally-conductive and electrically-conductive compounds and their applications. It includes speakers from 3M, Bayer, Cabot, Color2Plast, Ensinger, Grafe, HPF/Quarzwerke, Imerys, IonPhasE, Lati, Lux, Nanocyl, Outlast, Pentair Thermal Management, Premix, RTP, Sabic, Technoform, University of Warwick, and Zentrum für Brennstoffzellentechnik. Full details of the programme and booking information can be found at http://bit.ly/CP15B.



Click on the links for more information:

- **www.quarzwerke.com**
- **www.ceramicmaterials.saint-gobain.com**
- **www.imerys-graphite-and-carbon.com**
- **www.cabotcorp.com**
- **www.polyone.com**
- **www.rtpcompany.com**
- **www.ensinger-online.com**
- **www.lehvoss.de**
- **www.celanese.com**
- **www.coolpolymers.com**
- **www.lanxess.com**
- **www.dsm.com**
- **www.osram.com**

Turn page for the full programme ➤

CONDUCTIVE PLASTICS 2015

Developing technologies and applications for electrically and thermally conductive plastics

HEADLINE SPONSOR

PREMIX

29th June – 1st July 2015
Hotel Nikko,
Düsseldorf, Germany

** + 19% German VAT*

SPECIAL OFFER: Save €100* if you register before 15th May 2015

Organised by:
Applied Market Information Ltd.

Also sponsored by:
nanocyl
THE CARBON NANOTUBE SPECIALIST

Media supporters:
compounding WORLD
injection WORLD

CONDUCTIVE PLASTICS 2015

29 June - 1 July 2015, Hotel Nikko Düsseldorf, Germany

AMI is pleased to announce its first Conductive Plastics conference, a brand new event that will examine the development, processing and application of electrically and thermally conductive thermoplastics. This high level international event takes place from the 29th June to the 1st July 2015 at the Hotel Nikko in Düsseldorf, Germany, and will bring together OEMs, engineering designers, processors, compounders and additive producers.

Interest in the use of thermally conductive and electrically conductive thermoplastic compounds to replace metals and ceramics is growing fast across a wide and varied range of demanding applications. These include LED lighting, automotive components, electronics manufacturing, electromagnetic shielding and ATEX applications for reducing the risk of explosion.

However, developing electrically and thermally conductive components is not straightforward. Conductive Plastics 2015 will look at the wide range of additive technologies available to developers of conductive plastic compounds. Expert presentations will examine how to optimise the design and production of electrically and thermally conductive plastics components, and will address the critical influence of processing parameters on the properties of finished parts.

In addition, the conference will provide insight into existing and emerging market opportunities for conductive plastics. In particular, speakers will look at how the design and production flexibility provided by conductive plastics, combined with competitive cost and light weight, are can open up exciting new opportunities for compounders, processors, designers and OEMs.

Conductive Plastics 2015 will provide a unique learning and networking environment where all involved in the development of electrically and thermally conductive plastics, and those designing and manufacturing conductive components, can explore the very latest technology options and identify new opportunities and applications.

EARLY BIRD REGISTRATION OFFER

Register before 15th May 2015 and pay €890* saving €100* on the full price of €990*. There are additional discounts for group bookings. The registration fee includes attendance at all conference sessions, the Welcome Cocktail Reception, lunch and refreshment breaks on both days and a set of conference proceedings.

SPONSOR THIS EVENT

A variety of sponsorship opportunities are available at this conference to help to promote and enhance your company's products and services to this highly targeted international audience. Contact the conference hotline for further information.

*+19% German VAT

CONFERENCE HOTLINE

Contact: Kat Langner, Conference Organiser
Tel: +44 (0) 117 314 8111
Fax: +44 (0) 117 311 1534
Email: kl@amiplastics.com

See the latest programme and confirmed speakers at:
www.amiconferences.com

HEADLINE SPONSOR

CONFERENCE

Monday 29th June 2015

18.00-19.30 Registration and Welcome Cocktail Reception

There are no conference sessions on this day

Tuesday 30th June 2015

08.00 Registration and welcome coffee
09.00 Opening announcements

MARKET OVERVIEW

09.10 **Identifying market opportunities for electrically and thermally conductive plastics**
Ms. Pallavi Madakasira, Analyst,
LUX RESEARCH INC., United States

09.40 **Conductive polymers - Trends and developments**
Dr. J. Carlos Caro, R&D Manager,
GRAFE POLYMER TECHNIK GmbH, Germany

SESSION 1 – PROCESSING AND COMPOUNDING

10.10 **Important variables impacting performance of carbon black filled conductive plastic compounds**
Ing. Christine Van Bellingen, Product Manager,
Carbon Black & Graphite For Polymers,
IMERYS GRAPHITE & CARBON, Belgium

10.40-11.10 Morning coffee sponsored by:

11.10 **Extrusion and injection moulding of semi-conductive compounds**
Mr. Kari Alha, R&D Director,
PREMIX Oy, Finland

11.40 **Key considerations in the selection and application of graphene based plastic masterbatch and compounds**
Mr. Leonardus Jo Peeters, Managing Director,
COLOR2PLAST, Switzerland

SESSION 2 - MANAGING ESD AND EMI

12.10 **Inherently dissipative polymers (IDP) in plastics for static control applications**
Mr. Jukka Hillberg, CTO,
IONPHASE Oy, Finland

12.40-14.10 Lunch

14.10 **Utilising unique fillers and compounding methods to add EMI and thermal conductivity to thermoplastic compounds**
Mr. Neil Hardwick, Marketing Manager,
RTP COMPANY, United States

14.40 **Carbon nanotubes composites: commercially available solutions for automotive and electrical / electronic applications**
Dr. Marie Hurtgen, Technical Services & Development Application Scientist,
NANOCYL, Belgium

SESSION 3– ENHANCING THERMAL CONDUCTIVITY

15.10 **Application of aluminosilicate fillers to improve the thermal conductivity of electrically-insulating plastics**
Dr. Jörg Ulrich Zilles, Head of R&D,
QUARZWERKE GmbH, Germany

15.40-16.10 Afternoon tea

16.10 **High performance boron nitride fillers for polymer-based thermal management solutions in E&E applications**
Mr. Armin Kayser, Manager Product & Application Development,
3M ADVANCED MATERIALS DIVISION, Germany

Turn page for booking details ➤

PREMIX

PROGRAMME

16.40 **The effect of in-plane and through-plane thermal conductivity on LED heatsink performance**
Dr. Frans Mercx, Chief Scientist, T&I, Material Science - Functional Materials,
SABIC INNOVATIVE PLASTICS, Netherlands

17.10 **Opportunities, challenges and applications for thermally conductive plastic compounds**
Mr. Matthias Wuchter, MSc., Development Manager Compounds,
ENSINGER GmbH, Germany

20.00 Conference Dinner

Wednesday 1st July 2015

08.30 Registration and welcome coffee
09.00 Opening announcements

SESSION 4 – ELECTRICALLY CONDUCTIVE APPLICATIONS

09.10 **Development of Raychem self-regulating heat trace cables and other products based on conductive plastics technology**
Dr. Larry Welsh, Materials Scientist,
PENTAIR THERMAL MANAGEMENT, United States

09.40 **3D printing electrically conductive plastic components - technical challenges and material properties**
Dr. Simon Leigh, Assistant Professor,
UNIVERSITY OF WARWICK, United Kingdom

10.10 **Formulation and processing of highly-filled conductive plastic compounds for fuel cell applications**
Mr. Mario Gillmann, Research Associate,
ZENTRUM FÜR BRENNSTOFFZELLENTECHNIK ZBT GmbH, Germany

10.40-11.10 Morning coffee

11.10 **Boosting electrical conductivity of plastics using high performance plastic concentrates**
Mr. Sebastian Heitkamp, Marketing Manager EMEA,
CABOT CORPORATION, Switzerland

SESSION 5 – THERMALLY CONDUCTIVE APPLICATIONS

11.40 **Technical development and market opportunities for thermally conductive extrusion profiles**
Mr. Sebastian Ossadnik, R&D Engineer,
TECHNOFORM KUNSTSTOFFPROFILE GmbH, Germany

12.10-13.40 Lunch

13.40 **Thermally conductive polycarbonates for LED lighting**
Dr. Klaus S. Reinartz, Director Marketing LED EM/LA,
BAYER MATERIAL SCIENCE AG, Germany

14.10 **Speaker to be confirmed**

14.40 **Thermal management of portable electronic devices utilising latent heat sink (LHS) plastics**
Mr. Mark Hartmann, Chief Technology Officer,
OUTLAST TECHNOLOGIES LLC, United States

15.10 Closing comments

15.20 Afternoon tea and conference ends

AMI reserves the right to alter the programme without notice.
The latest programme including any new speakers or changes to schedules can be viewed on our website ***www.amiconferences.com***

HEADLINE SPONSOR

PREMIX

Premix is one of world's leading manufacturers of electrically conductive plastics. Premix offers a comprehensive product portfolio of electrically conductive PRE-ELEC® compounds and concentrates and static dissipative PRE-ELEC® ESD compounds for electrostatic discharge (ESD), explosive atmospheres (ATEX) and metal replacement applications.
Today the products and tailored solutions are used in a wide range of industries, including automotive, electronics, diagnostics, mining and chemical. The profound knowledge in carbon black dispersion and polymer modification, along with strong product development know-how and close partnerships with customers, has led to the creation of innovative and reliable product concepts.
Visit www.premixgroup.com for more information.

CONDUCTIVE PLASTICS 2015: EXHIBITION SPACE

Make it easy for the delegates to find you at this busy event with your own table top exhibition space. Bring your own display stand, or just use the space to have literature and samples available and ensure that you make an impact. The table top exhibition will run throughout the conference in the in the exhibition room next to the main meeting room.

Registration includes 1 delegate place!

Space is limited so to avoid disappointment please register for this service as soon as possible.

HOTEL ACCOMMODATION

Delegates are responsible for booking their own accommodation. AMI has negotiated a limited number of rooms at the rate of €123 for a single room and €153 for a double (breakfast, Wi-Fi and taxes included) at the Hotel Nikko in Düsseldorf until 29th May 2015 only. To reserve a room, please contact the reservation department and state that you are attending "AMI's Conductive Plastics 2015" conference on:
Tel: +49 211 834 2111 Fax: +49 211 834 2109
Email: reservation@nikko-hotel.de

Save €100*

Register before 15th May 2015

*+19% German VAT

FIVE GOOD REASONS WHY YOU SHOULD ATTEND:

1. **Identify new and emerging market opportunities**
2. **Learn how to modify electrical properties**
3. **Explore new thermal management options**
4. **Find out how to overcome processing challenges**
5. **Network with conductive plastics technology experts**

REGISTRATION FORM

Company: _____

Address: _____

_____

Country: _____

Tel: _____ Fax: _____

Email: _____

VAT No.: _____
(Must be completed by all EU Companies)

Company activity: _____

Purchase order No. *(if applicable)*: _____

Invoice address *(if different from above)*: _____

_____

_____

DELEGATE DETAILS

If more than one delegate please photocopy form

Title: _____ First name: _____

Surname: _____

Position: _____

Special dietary requirements: _____

Signature: _____ Date: _____

PAYMENT DETAILS

All payments to be made in Euros

Please tick box and write amount:

❑ Early bird admission fee: *(Until 15th May 2015)*	€890 + €169.10* = €1059.10	_____
❑ Admission fee thereafter:	€990 + €188.10* = €1178.10	_____
❑ Conference Dinner:	€79 + €15.01* = €94.01	_____
Table Top Exhibition Package (includes 1 delegate place)		
❑ German resident companies eur	€1500 + €285 = €1785	_____
❑ Non - German resident companies (***Only admission fee part of package is VAT chargeable at 19%*)	€1500 + €169.10 = €1669.10	_____

** German VAT charged at 19%* **Total:** _____

Please note all delegates have to pay the VAT stated above

METHOD OF PAYMENT

On receipt of this registration form your credit card will be debited.
You will be sent an invoice in 7-14 working days.

❑ **Bank transfer quoting:** 'Applied Market Information Ltd. - Conductive Plastics 2015' to: Commerzbank, Filiale Düsseldorf, Breite Straße 25, 40213 Düsseldorf, Germany
Account number: **1024710** Bank No. **300 400 00**
IBAN: **DE93 3004 0000 0102 4710 00** SWIFT: **COBADEFFXXX**

❑ Visa / Mastercard / Eurocard / JCB

				-					-					-				

If paying by card the following information **must** be given

Name of cardholder: _____

Expiry date: _____ 3-digit security code: _____

Cardholder's signature: _____

Card billing address: _____

Post / zip code: _____

Country: _____

Tel: _____ Fax: _____

Email: _____

CONDUCTIVE PLASTICS 2015
CONFERENCE INFORMATION

Date and location
29 June-1 July 2015
Hotel Nikko Düsseldorf
Immermannstraße 41
40210 Düsseldorf
Germany
Tel: +49 211 834 0
Fax: +49 211 161 216

Registration fee
The registration fee includes attendance at all conference sessions, the Welcome Cocktail Reception, lunch and refreshment breaks on both days and a set of conference proceedings.

- ***Early bird registration:*** Register before 15th May 2015 for only €890*. Thereafter the cost is €990*.
- ***Group rates:*** For companies wishing to register two or more delegates, group discounts are available. Please contact the Conference Organiser for more details. (Please note to qualify for the group discount delegates must be booked at the same time, otherwise additional delegates may be charged at full price.)

Conductive Plastics 2015 table top exhibition
A limited number of table top exhibition spaces are available in the registration area and coffee lounge directly outside the conference room. The table top exhibition fee is excellent value for money and **includes 1 delegate place**. Exhibitors may either use tables provided by the hotel or bring their own stand or display.

Sponsor this event and promote your company
A variety of sponsorship opportunities are available at this event that can help to promote and enhance your company's products and services to this highly targeted international audience. For further information, please contact the Conference Organiser on: +44 (0) 117 314 8111.

Social events
The social events organised for Conductive Plastics 2015 will provide an ideal setting for delegates and speakers to mix business with pleasure.

- ***Welcome Cocktail Reception:*** A welcoming cocktail reception will be held on the first evening. All delegates are invited to attend and it will offer an excellent opportunity to meet speakers and other colleagues. The Welcome Cocktail Reception will run approximately from 18:00 to 19:30 and is included in the delegate fee.
- ***Conference Dinner:*** All delegates are warmly invited to attend the Conference Dinner, which will take place at a local restaurant on the evening of 30th June 2015. The additional cost is €79*.

Hotel accommodation
Delegates are responsible for booking their own accommodation. AMI has negotiated a limited number of rooms at the rate of €123 for a single room and €153 for a double (breakfast, Wi-Fi and taxes included) at the Hotel Nikko in Düsseldorf until 29th May 2015 only. To reserve a room, please contact the reservation department and state that you are attending "AMI's Conductive Plastics 2015" conference on:
Tel: +49 211 834 2111 Fax: +49 211 834 2109
Email: reservation@nikko-hotel.de

Cancellations
Full refunds, less a cancellation charge of €200 will only be made on cancellations received prior to 29th May 2015. Thereafter we regret that no refunds can be made. Delegates may be substituted at any time. Please note that refunds will not be given on table top bookings, sponsorship packages or dinner places.

*+19% German VAT

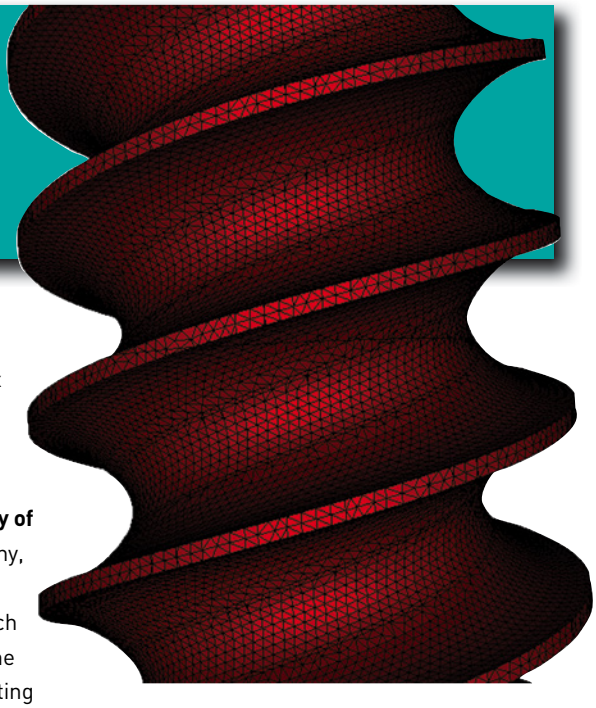
CONFERENCE HOTLINE

KAT LANGNER, CONFERENCE ORGANISER
Applied Market Information Ltd.
6 Pritchard Street, Bristol, BS2 8RH, United Kingdom
Tel: +44 (0) 117 314 8111 Fax: +44 (0) 117 311 1534
Email: kl@amiplastics.com

The latest programme, including any new speakers or changes to the schedule can be viewed on our website: **www.amiconferences.com**

This year's model: advances in computer simulation

Modelling and simulation software is an effective, and underused, way of optimizing twin-screw extrusion, reports **Pat Toensmeier**



Imagine if there was a "silver bullet" that allowed compounders to rapidly tune formulation rheology and machine set-up and thereby achieve cost-effective scale-up to commercial production. Benefits could include sizable savings in materials costs, reductions in scrap, faster time to market, more productive use of labour and machine time, and a much-enhanced bottom line.

Such a "silver bullet" potentially exists in the form of modelling and simulation software. While this technology has been available for some years, its use by compounders is not widespread. Mostly it is the largest companies, including resin producers, that take advantage of the capability.

This is frustrating to the small number of suppliers of such software. They all make the point that modelling and simulation software yields significant benefits to end-users over conventional development processes. The latter typically involve running a machine and experimenting with settings and formulation tweaks until the right balance of formulation composition and machine set-up emerges.

"We have been marketing this software for 15 years but it has limited reach," says Adam Dreiblatt, director of process technology for **Century Extrusion**, a global supplier of twin-screw machines and components. The software Century sells is called WinTXS (Twin-Screw Extruder Simulator), a 1-D system that was developed by **PolyTech** in the US and validated with computational and experimental data by the **Polymer Processing Institute** of Newark, New Jersey.

Modelling software is "not yet widely used in compounding," agrees Eric Chassagnolle of **Sciences Computers Consultants** (**SCC**), a French company that supplies two programs for twin-screw compounding: Ludovic, a 1-D program for the optimization of screw profiles and related hardware, and Ximex 3-D mixing simulation software.

Other developers include the **University of Paderborn** in Germany, which is running Sigma, a joint research project focusing on the simulation of co-rotating twin-screw extruders. This involves the university's KTP plastics technology institute plus a consortium of 11 industrial companies. To maintain a competitive balance, the materials side of the simulation is "intentionally generic," one source says, so no company gains a competitive advantage over another member by using it.

The Polymer Engineering Institute of the **University of Akron** in the US released one of the first software modelling programs for compounding 25 years ago. Called Akro-Co-Twin, the product is marketed by **Temarex**. The latest version is 3A, which features upgraded capabilities including the integrated modelling of solids conveying, melting and melt flow in modular screw configurations.

In Japan, **HASL** (Hyper Advanced Simulation Laboratory) offers a range of flow simulation packages for the 3D visualisation of material behaviour in twin-screw extruder. They can map flow, pressure, temperature and melt rates along the screws.

Ansys offers a very wide range of computer simulation packages for a variety of materials, properties and industries. Its Polyflow software can be used to model various plastics processes including thermoforming, blow moulding and extrusion. The company says that its mesh superposition technique can be used to take into

account complex thermal and mechanical interactions in twin-screw extruders.

Other institutions that are doing related work include the **University of Brunel** in the UK, and **Tomas Bata University** of Zlín, Czech Republic.

The challenge of acceptance

It is surprising that modelling software is not more widely used in the optimisation of compounding processes. As noted, versions have been commercial for at least 25 years, which is almost as long as mould optimization software has been available to injection moulders and mould-makers.

"In moulding, no one cuts metal before running a simulation," says Century's Dreiblatt. "The mould optimization software has been validated and yields substantial cost savings for moulders."

In compounding, though, old ways seem to persist. Most compounders appear comfortable with running materials and tweaking formulations and machine parameters to get the right production balance.

Moreover, the prices quoted to buy or license modelling software range from US$15,000 to US$20,000 (€12,000 to €16,000) on average to as much as US$80,000 (€60,000) for large compounding operations.

That size of investment might be off-putting to many companies. However, vendors explain that the price of acquiring the software is far less than the ongoing cost of tweaking formulations and machine set-up by less-automated means.

"The alternative to simulation is running a machine under what you believe are correct conditions," Dreiblatt says. "A compounder can be lucky and come close to optimum operating conditions without too many adjustments, or not."

What does this mean in per-job expenditures? If a compounding line runs only 5,000 lb per hour, and it takes eight hours for a compounder to fine-tune a formulation and optimize machine settings for maximum process efficiency, 40,000 lb of material could easily be consumed, all or most of it scrap, before the best formulation and machine set-up data is derived. At a material cost of only $1 per pound (including commodity resin, additives, fillers, reinforcements and colorants, if any), this comes to an initial expenditure for one job of US$40,000 (€30,000). Added to this are the costs of machine time for the equivalent of one shift, labour, electricity and related expenses, disposal of scrap, and cleaning and maintenance of the line.

Compounders doing this once a month are looking at an annual investment of almost US$500,000 (€400,000) for material alone. Should a compounder be involved in processing more expensive materials, such as engineering resins, bioplastics, or more expensive additives, then costs would be even higher.

Some vendors claim that the alternative of a one-time investment of say US$20,000 for modelling software means that a compounder could determine the optimum formulation and machine configuration in as little as 30 minutes. Even if it takes far longer to develop the correct compound and machine parameters, no material is consumed by the software, and no compounding lines are diverted to testing until the simulation data needs to be proven in a trial run.

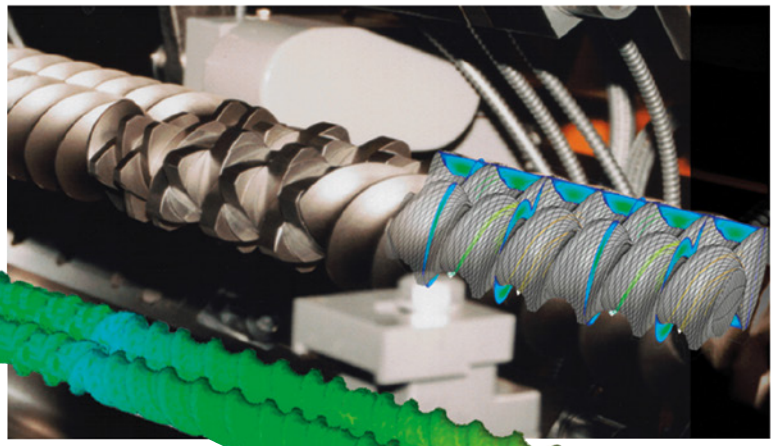
"Both bigger and smaller compounders have a need for this software," Dreiblatt claims. "The value is you can experiment with the processing effect of different screw configurations without running one pellet through the extruder."

While he acknowledges that modelling software is not always 100% accurate, 80 to 85% accuracy is attainable and this is "better than not using it at all."

SCC's Chassagnolle cites additional benefits. One advantage, he says, is the ability of modelling software to reduce a compound's time to market. Compounders must still test every formulation and machine set-up developed with the software, of course, "but they can drastically reduce the number of trials necessary to prove material performance." The simulation software doesn't eliminate the need for physical testing; rather, it complements the process.

Based on customer feedback, Chassagnolle says compounders could run as much as 50% fewer physical trials and see 30 to 50% reductions in time to market with modelling software, though he adds these numbers will vary by end-user.

The different versions of modelling software have features that are unique to each program, of course. In general, though, all require similar input to simulate compounding and generate analytical data. Important components here are material specifications and machine data files. The latter include detailed specifica-



Polyflow software from Ansys can model complex thermal and mechanical interactions in twin-screw extruders

The Maguire Gravimetric Blenders...

It's all about

NUMBERS
NUMBERS
NUMBERS

VIEW ONLINE | VIEW PRODUCT GUIDE | VIEW SHOWREEL

OVER 120 STANDARD MODELS

10kg to 4,000kg using 2 to 12 materials

45,000
BLENDERS WORLDWIDE

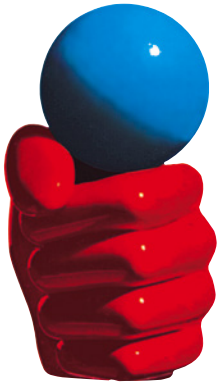
1.9 million
AVERAGE TONNES PER HOUR

9.3 billion
TONNES PER ANNUM

Billions of dollars
PASSING THROUGH MAGUIRE BLENDERS ANNUALLY

Find out more about our products
Email: info@maguire.com
www.maguire.com

MAGUIRE®
The innovative market leader for...
EXTRUSION CONTROL



plast 2015

INTERNATIONAL EXHIBITION FOR PLASTICS AND RUBBER INDUSTRIES

MILAN - May 5/9

Three satellite-shows in the largest exhibition for plastics and rubber in Europe in 2015

Rubber 2015 — rubber

3D plast — 3D printing and related technologies

Start plast — innovative startup companies

plastonline.org

FIERA MILANO

EUROMAP

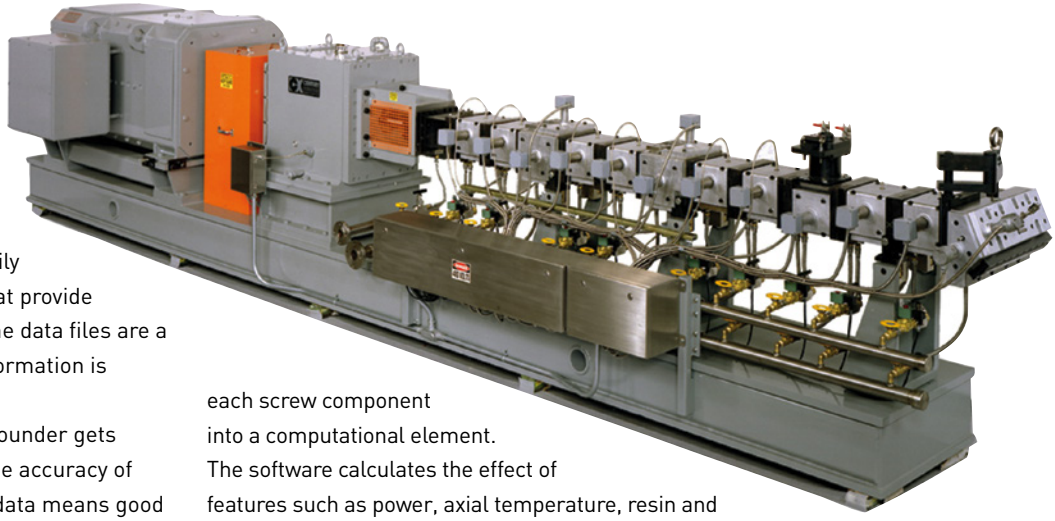
ufi Approved Event

ISF CERT

tions of different compounding machines that cover shapes, clearances, torque and anything else from a hardware, design or power standpoint that affects viscosity, temperature and other rheological aspects of processing.

The material specifications are readily available owing to the many sources that provide them, including manufacturers. Machine data files are a little more difficult to obtain but the information is available and can be accessed.

"The accuracy of the results a compounder gets from modelling software depends on the accuracy of the data in use," says Dreiblatt. "Good data means good results."

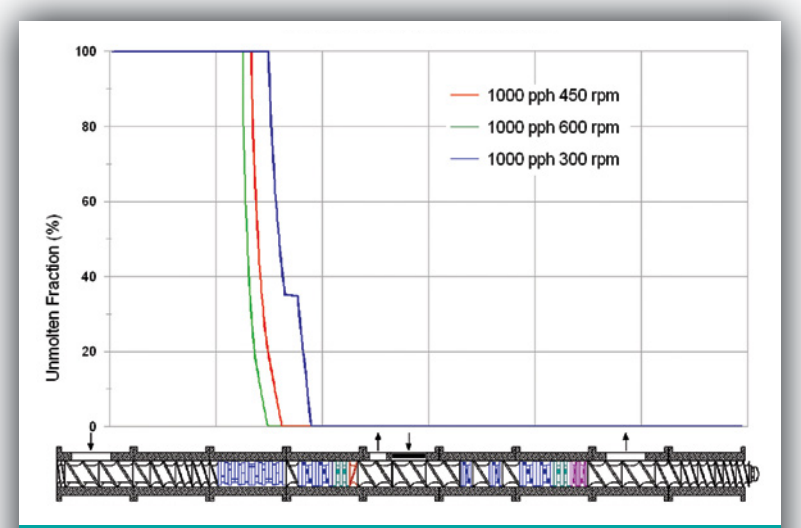


Simulation software can help optimise parameters for extruders such as this Century 70-mm machine

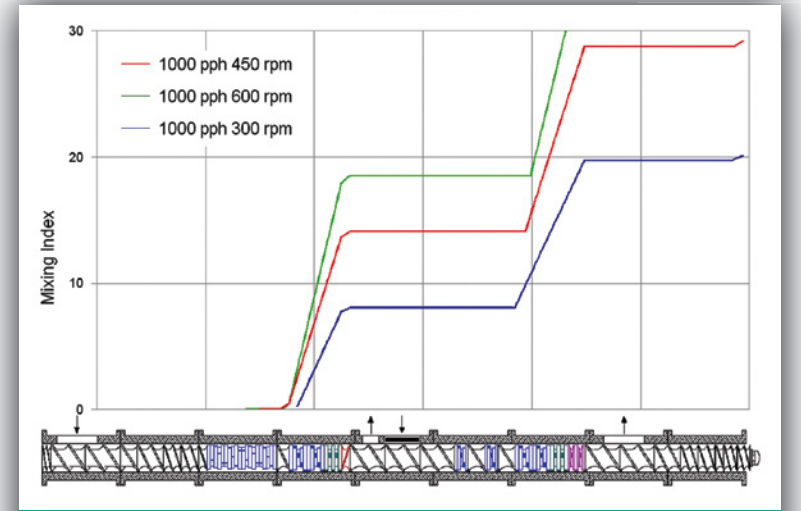
Analyzing screw elements

The **WinTXS** software, developed by Polytech and sold by Century, is for co-rotating, intermeshing, modular, twin-screw extruders. On the machine side, users build a simulated extruder with the software based on axial screw configurations. The program automatically divides each screw component into a computational element. The software calculates the effect of features such as power, axial temperature, resin and additive melting, pressure profiles, extruder geometry, material properties and operating conditions into defined values that, when calibrated, are considered valid for process development.

The software simulates all compounding actions: solids conveying, melting, mixing, melt conveying, pressurization and die flow. It also simulates the compounding of complex materials such as filled



This PolyTech WinTXS analysis shows melt efficiency based on RPM at various points in the extruder



The mixing efficiency of a twin-screw configuration is simulated at three speeds using PolyTech WinTXS software

compounds, reinforced materials, plastomers and elastomers, blends and colour concentrates.

Calibration is an important capability of the WinTXS software, Dreiblatt says. With calibration, a user can validate the simulated processing of a compound based on the accuracy of the material and machine data entered. Once the model is calibrated, the "results are valid", he explains.

The accuracy of input data is especially critical for what it allows the software to calculate. Determining exactly where in a barrel melting begins and ends based on material specifications and screw design, for example, determines a property such as viscous energy dissipation, which has an effect on the simulation's ability to adjust the feeding of low-melt-point additives in the compound. In contrast, predicting, rather than identifying, where and when melting occurs can result in misinterpretations of torque, melt temperature and other crucial process parameters.

A compounder can, by entering all this data, use the simulation to obtain information that is not usually measured by instruments or other machine-side techniques. For example: where in the screw channel polymer is melting; how much mixing takes place in different barrel sections; and why melt reaches a certain temperature at points of the extruder.

Simulations run rapidly, and the software's computational speed lets compounders experiment with a number of different process scenarios and variations. Recent additions to the WinTXS program include a devolatizing module to simulate multi-stage, multi-component operations with volatiles, and availability of a reactive processing module.

There is "not a large learning curve" involved in using the software "if you understand how a compounding machine works," Dreiblatt says. The process is "very intuitive."

Meshing hardware and material

SCC's modelling software for optimizing twin-screw extrusion was originally developed by an industrial consortium and uses algorithms and other calculations updated by the French materials research institute **CEMEF** (Centre de Mise en Forme des Materiaux),

Ludovic, the 1-D version for co-rotating twin-screw extrusion, calculates hundreds of process scenarios from input data so that compounders can determine which configurations based on screw geometry, material characteristics and process conditions provide the most productive results.

The simulation set-up and analysis steps are straightforward and based on Ludovic's so-called "four tabs of technology". This lets users build the twin-screw system they want and run simulations by selecting engineering and process data from four tabs on a computer screen. The data covers screw geometries and components, barrels, feeding zones and die elements, as well as material specifications, some of which can be taken from a Ludovic database, and a definition of operating conditions. Once all this information is assembled, the user hits an execution tab to run simulations.

As the simulations run, Chassagnolle says graphics and numerical data are displayed charting parameters such as pressure, shear, viscosity, residence-time distribution curves and energy consumption. A graphic of the screw shows material flow and the thermo-mechanical history of the compound at various points, along with colour-coded temperature data along the screw. The latter allows a compounder to calculate differences in temperature and pressure as material

You make great things.

We make great things happen.

In March 2015, more than 60,000 professionals from every aspect of the plastics industry and its vertical and end-user markets will assemble in Orlando, Florida for the largest, most influential plastics event of the year.

Expect great things.

Register for free today at www.npeguestpass.org/CW2


Face-To-Face, NPE2012

NPE2015: THE INTERNATIONAL PLASTICS SHOWCASE
March 23-27, 2015
Orange County Convention Center
Orlando, Florida USA

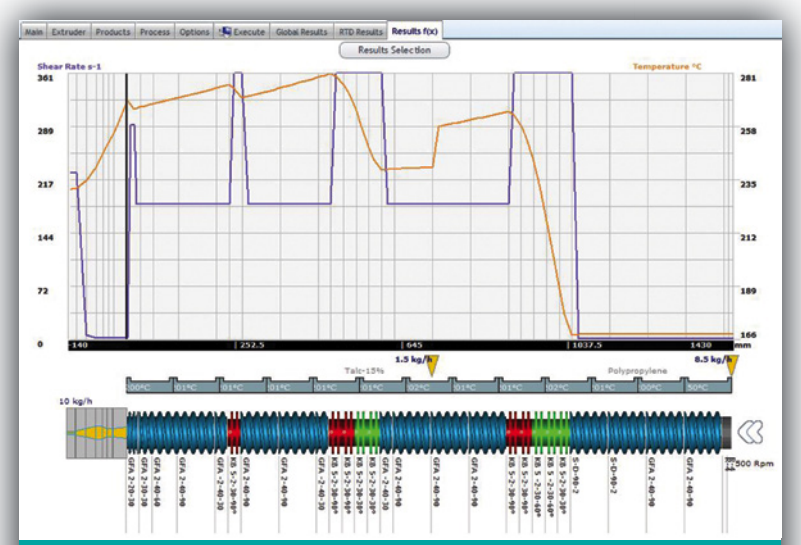
NPE2015®
produced by spi

moves down different screw lengths.

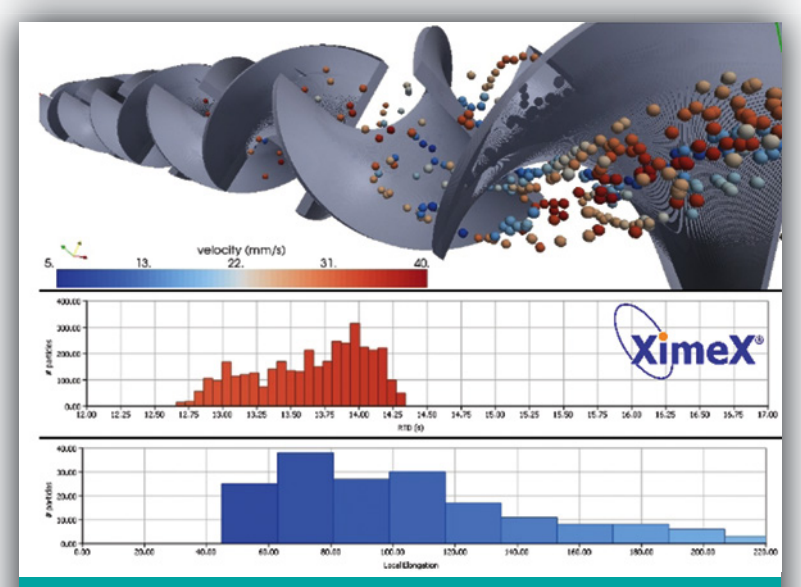
A process trends analysis compares multiple simulations (into the hundreds, if necessary) to evaluate the affect of screw RPM on material viscosity and other machine operations on different material features.

A design of experiment capability tests material or process sensitivity under a range of operating conditions. It can also check the functioning domain of a material for specific screw configurations and operating parameters, such as screw speed, residence time, throughput, torque limit and other features.

SCC's **Ximex** mixing and extrusion simulation software combines computational fluid dynamics (CFD) with 3-D software to produce graphic analyses of material behaviour during compounding and related processes such as continuous mixing, planetary mixing, kneaders, batch and static mixing.



The thermo-mechanical history of a compound is shown on SCC's Ludovic 1-D software at various stages of extrusion



Particle tracking is an SCC Ximex software function that enhances statistical analysis of mixing efficiency

The analysis is "very graphic," says Chassagnolle, and can be displayed as video or in 3D images. The software models material flow only through the mixing section of a twin-screw extruder to extract a CFD analysis and thermo-mechanical data based on the performance characteristics of the materials being compounded.

The objective, Chassagnolle explains, is to measure the mixing efficiency of the process as configured and account for limitations on materials, especially heat-sensitive polymers and additives. One point of interest, for example, is the impact of accumulator heat generated by kneading blocks and mechanical heating on such materials.

The CFD analysis provides initial data on temperature, pressure, viscosity and shear. The graphics then convert the compound into multiple particles, colour-coded according to the accumulation of process heat on them. In particle form, the compound is reportedly easier to follow and analyze during process simulations. The condition of the particles shows how effective distributive mixing is and compares mixing efficiency to material limits. Real-time graphs monitoring particle elongation and other process conditions are displayed to augment data.

Ximex, which also benefits from CEMEF input, can be set up to simulate all screw configurations due to a mesh immersion feature that automatically transfers these geometries from CAD files.

With compounders looking for ways to improve productivity, reduce development and operational expenses, and increase competitiveness, examining the options available in modelling and simulation software should be on their to-do list. The advances in this area of compound and process development provide an impressive technical and business tool for all types of operations, large, small, specialty and commodity.

Click on the links for more information:

- **www.centuryextrusion.com**
- **www.polytech-soft.com**
- **www.polymers-ppi.com (Newark)**
- **www.scconsultants.com**
- **www.uni-paderborn.de/en/**
- **www.uakron.edu/ipspe/ (Akron)**
- **www.temarex.com**
- **www.hasl.co.jp**
- **www.ansys.com**
- **www.brunel.ac.uk**
- **www.utb.cz (Tomas Bata)**
- **www.cemef.mines-paristech.fr**

INCREASE YOUR EXPECTATIONS

CONTAINER MIXERS TRX

- Master-Batch of color pigments
- Compound engineering plastics
- Powder Coating Pre-mixing and Blending
- Powders Pre-mixing
- PVC Dry-Blend

For us, every sector of the industrial mixing industry is an opportunity to show off the best of what we produce.
For over 20 years, we've been designing and developing tailor-made machines that are both high-performance and innovatively functional.
Our objective is to go above and beyond your expectations with systems designed according to specific demands, so as to optimise energy efficiency and production performance.
And in terms of installation and support, we're always on hand to resolve any problems that may arise, **so why not put us to the test?**

NPE2015: THE INTERNATIONAL PLASTICS SHOWCASE
March 23-27, 2015 | Orlando, Florida USA
www.npe.org

STAND S21169 - South Hall.
Join us!

PROMIXON gives you the luxury of being absolutely carefree.

Via A. Manzoni, 18/D - 20020 MAGNAGO (MI) - Italy - Tel. +39 0331 307122 - Fax: +39 0331 309797
info@promixon.com - www.promixon.com

compounding bookshelf WORLD

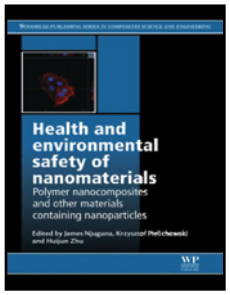
BROUGHT TO YOU BY Plastics Information Direct Online Bookshop

Plastics INFORMATION DIRECT

RECOMMENDED READING

Our selection of the latest titles and essential reference works for the compounding industry

HEALTH AND ENVIRONMENTAL SAFETY OF NANOMATERIALS: POLYMER NANOCOMPOSITES AND OTHER MATERIALS CONTAINING NANOPARTICLES



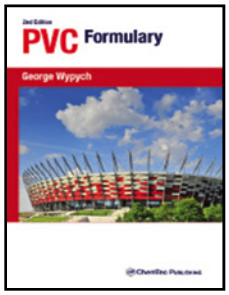
2014, by Njuguna, Pielichowski & Zhu,
€168.00 or £140.00 or $225.00

New. A technical guide to the safe use and handling of nanomaterials, nanofillers, and nanocomposites.

➤ **More info/Buy here**

NEW

PVC FORMULARY, 2ND EDITION



2014, by Wypych,
€215.00 or £175.00 or $285.00

New Edition. Update of a bestseller including materials data and 600 formulations.

➤ **More info/Buy here**

NEW EDITION

HOW TO IMPROVE RUBBER COMPOUNDS: 1800 EXPERIMENTAL IDEAS FOR PROBLEM SOLVING, 2ND EDITION

2014, by Dick,
€180.00 or £150.00 or $240.00

New. How to enhance processability, physical properties, performance and resistance to degradation.

➤ **More info/Buy here**

NEW

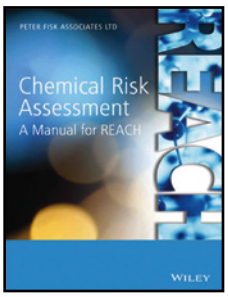
FUNCTIONAL FILLERS FOR PLASTICS, 2ND EDITION

2010, by Xanthos,
€180.00 or £150.00 or $240.00

Covers mineral and organic fillers, mixing, performance and applications.

➤ **More info/Buy here**

CHEMICAL RISK ASSESSMENT: A MANUAL FOR REACH

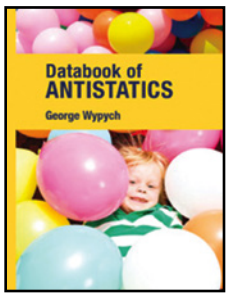


2013, by Fisk,
€78.00 or £65.00 or $105.00

A practical guide to assessment, management and reduction of risk.

➤ **More info/Buy here**

DATABOOK OF ANTISTATICS



2013, by Wypych,
€215.00 or £180.00 or $285.00

Physical properties, health and safety, ecology and performance data for more than 300 materials.

➤ **More info/Buy here**

Visit www.pidbooks.com for hundreds of recent titles, easy online ordering, special offers and clearance bargains!

Order online or by telephone, fax or email. Contact Matt Wherlock,
Tel: +44 (0)117 924 9442 Fax: +44 (0)117 311 1534 email: mjw@amiplastics.com
All prices are correct at the time of publication but may be subject to change.
Please check the Plastics Information Direct website for current prices and shipping charges.

We continue our preview of the Compounding World Congress 2015 with a look at the presentations lined up for the second day of this exciting new European conference for the plastics compounding industry

All roads lead to Cologne

Following the success of our Compounding World Forums in the USA, *Compounding World* magazine and Applied Market Information (AMI) are hosting the first Compounding World Congress in Cologne, Germany on 21-23 April 2015.

Places are selling very fast with over 180 attendees and more than 25 exhibitors already signed up at the time of writing, with over two months to go until the big event.

Compounders that will be represented at the conference include: A. Schulman ● Addiplast ● Akro Plastic ● Albis ● Ascend Performance Materials ● Barlog Plastics ● BASF ● Bayer MaterialScience ● Clariant Masterbatches ● Colloids ● Continental Compounders ● Domo Engineering Plastics ● DuPont ● Elix Polymers ● Ensinger ● Eurotec Engineering Plastics ● Evonik ● Fainplast ● HP Polymer ● Inno-Comp ● Invista ● KEP Korea Engineering Plastics ● Lehmann & Voss ● LyondellBasell ● Melos ● Mepol ● MLPC International ● Nord Color ● Polycompound ● Polykemi ● PolyOne ● Polytechs ● Premix ● Radici ● Romira ● Sirmax ● Sitraplas ● So.F.teR ● Solvay Engineering Plastics ● Styrolution ● Sumika Polymer Compounds ● Total ● Trinseo ● Ube Engineering Plastics ● Victrex ● and Wells Plastics. Plus many more compounding companies are expected to sign up to attend the event over the next two months.

Focusing on the latest market and technology trends for technical compounders, the conference sessions will cover many of *Compounding World* magazine's most popular themes in a live format. They will provide a rare opportunity to learn first-hand about these important developments, as well as discussing them with key players from throughout the plastics supply chain.

The packed conference programme features 22 expert speakers, including senior managers from leading global compounders, as well as innovative raw materials suppliers and machinery manufacturers.

Last month we looked at the presentations lined up for 22 April. These will include a panel discussion on 'strategies for growing a profitable compounding business in an increasingly competitive global market-place'. The panel will feature four of Europe's most influential leaders at international compounding operations:

- **Holger Kronimus**, vice president Europe and general manager of specialty engineered materials at **PolyOne**
- **Heinrich Lingnau**, vice president and general manager for EMEA at **A. Schulman**
- **Bernd Sparenberg**, vice president for technical compounds at **Albis**
- **Dr Stefano Zocca**, managing director of **So.F.teR**

They will be followed by presentations covering regulatory issues, functional fillers, advanced reinforcements, anti-counterfeiting technologies, 3D printing materials, automotive applications, cross-linking for engineering plastics, and the rapid development of new formulations. You can read last month's preview of all the presentations lined up for the first day of conference





The speaker line up for the first day of the Compounding World Congress 2015 includes (from top to bottom): Dr Oliver Frey; Dr Jörg Ulrich Zilles; Eira Kärjä; Frank Lechner; and Michael Thummert

sessions at **http://bit.ly/CWCprev1**.

Here we look ahead to the final day of the conference, which will be chaired by **Andy Beevers**, the publisher and editor of *Compounding World* magazine.

Conductive compounds

The opening session on the final day will focus on technologies for adding electrical and thermal conductivity to plastics. *Compounding World*'s regular articles on such technologies always attract high levels of interest, and the conference sessions on these themes at our two Compounding World Forums in the USA have proved very popular.

Dr Oliver Frey, head of the compounding department at **Ensinger**, will open the session with a presentation on thermally conductive compounds, focusing on the development of customised solutions for new applications.

The German compounder has been working with a variety of thermally conductive additives in recent years, developing compounds based on high performance polymers, such as PEEK. Dr Frey will discuss the progress his company has been making in this field.

Dr Jörg Ulrich Zilles, head of R&D at **HPF The Mineral Engineers**, a division of **Quarzwerke** based in Germany, will then discuss a new filler concept for increasing the thermal conductivity of thermoplastics. The company's Silatherm mineral-based additive has been shown to increase the thermal conductivity of polymers, such as polyamide, while maintaining their good electrical insulation properties.

Dr Zilles will show how the resulting thermally conductive compounds can be used to efficiently dissipate heat and improve the reliability of electronic devices with high energy densities.

Eira Kärjä, marketing director at the Finnish compounder **Premix**, will conclude the conductive compounds session with a presentation on electrical conductivity. She will focus on static dissipative carbon black compounds, discussing the technical challenges, applications and standards associated with such materials.

Premix is a leading specialist in electrically conductive plastics for electrostatic discharge (ESD), explosive atmospheres (ATEX) and metal replacement applications in markets such as the automotive, chemicals, electronics, medical and mining industries. The company has been active in this field since 1983, so has considerable expertise in the development, production and application of such compounds.

Making the most of compounding lines

The next session of the Compounding World Congress will feature presentations from three of Germany's leading suppliers of twin-screw extruders for compounding lines. We have asked the companies to give practical talks on how to get the most from compounding plants.

Frank Lechner, head of process technology at **Coperion**, will start the session with a paper focusing on the compounding of highly filled polymers using co-rotating twin-screw extruders.

There are growing demands for compounders to produce materials with increasingly high loadings of fillers. Such requirements present significant processing challenges, particularly when dealing with hard-to-handle fillers. Lechner will provide practical advice on how to cope with these challenges, drawing on Coperion's development work and its considerable experience in supplying and commissioning compounding lines and materials handling systems.

Michael Thummert, head of corporate communications at **Leistritz** in Germany, will then give a talk on troubleshooting the twin-screw extrusion process.

This will cover practical solutions for identifying and solving problems that can be encountered when operating such machinery. The presentation will draw on Leistritz's extensive knowledge of developing, manufacturing, testing and commissioning compounding lines, and then supporting customers with their optimisation and maintenance.

The session will be concluded by **Thomas Winkelmann**, head of development for plastics technology at **KraussMaffei Berstorff**. His presentation will focus on system engineering and the global rise of turn-key compounding lines.

As we have reported in *Compounding World*, demand for turn-key systems is not only increasing in emerging

Leistritz

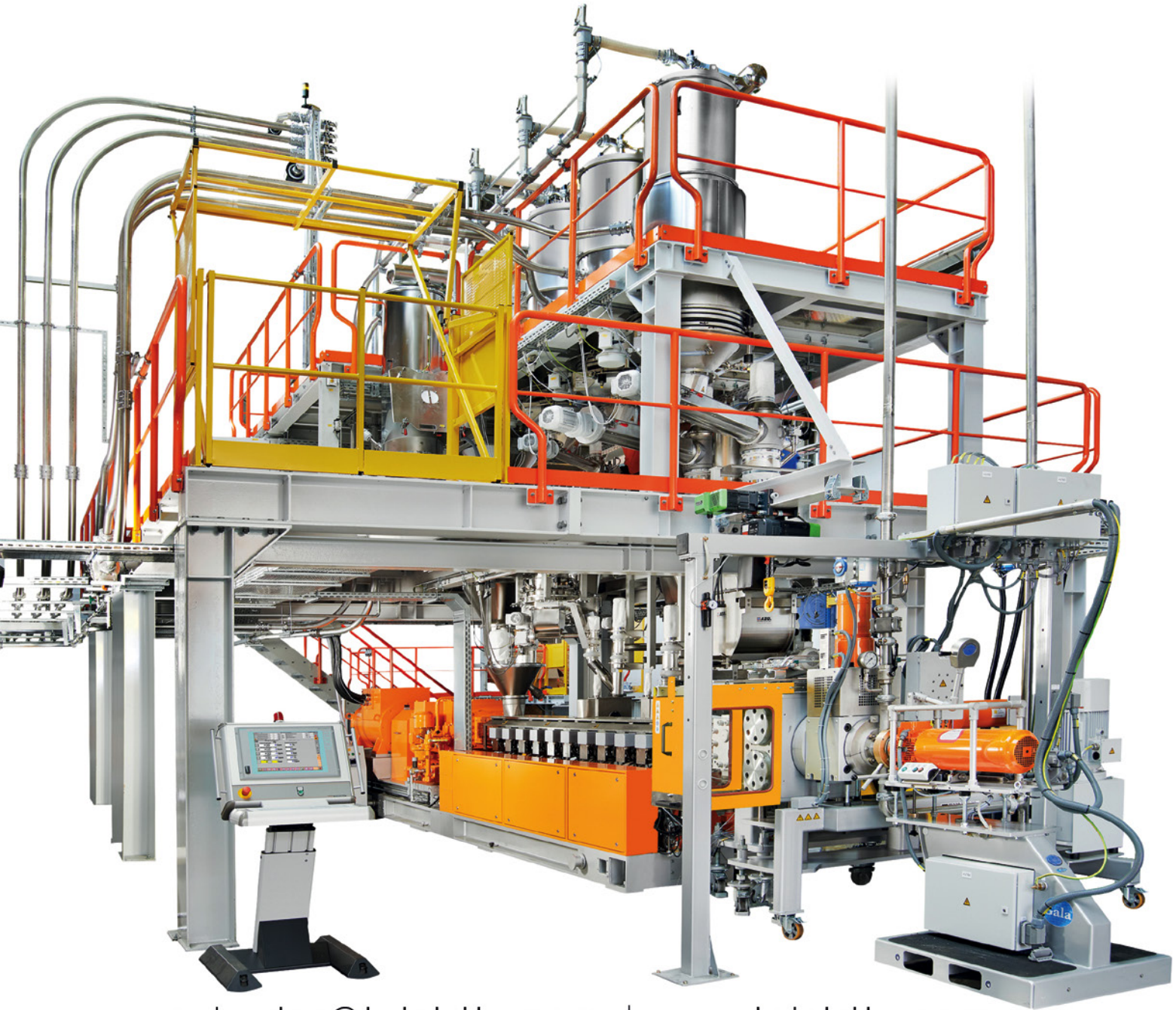
refreshing extrusion technology

XXPERIENCED ENGINEERING

Setting new standards with Leistritz Extrusion Technology!

Experience the advantages of Leistritz high-tech compounding plants:

- Combination of state-of-the-art technology and vast know how
- Optimized operation and process stability
- Well thought-out automation concept



extruder@leistritz.com | www.leistritz.com

The speaker line up for the first day of the Compounding World Congress 2015 includes (from left to right): Thomas Winkelmann; Andrea Altenhein; Dr Christian Frank; Timo Mäkelä; and Jens Dietrich

economies, but also in established markets. Krauss-Maffei Berstorff is an active player in this sector with its "ready to connect" modular compounding lines, including systems that are built within frames to fit in a sea container for ease of shipping.

Improving pellet quality

The final session of the Compounding World Congress will focus on the ultimate product of the compounding process – the plastic pellet – and how to improve its quality.

The first talk on this topic will be given by **Andrea Altenhein**, application engineer with **Automatik Plastics Machinery** and **Maag Pump Systems**. She will discuss how the various processing steps downstream of the extruder can influence product quality.

Her presentation will examine various melt filtration, pressure generation, pelletization, cooling and drying options for different resin types. For example, moisture sensitive resins, abrasive materials or fragile formulations require special treatment after they have left the extruder die.

The next talk will examine an innovative system for detecting impurities inside plastic pellets or on their surface. **Sikora**'s Purity Scanner combines X-ray technology with an optical system to identify pellets with metallic and organic impurities as small as 50 µm and then separate the contaminated pellets.

Dr Christian Frank, member of the executive board at Sikora, will discuss the development of the scanner, which handles throughputs up to 2,000 kg/hour and can be integrated into existing feeding systems. The system was originally developed for **Maillefer Extrusion** and this company's process specialist **Timo Mäkelä** will discuss its application.

The conference will conclude with a presentation by **Jens Dietrich**, the managing director of **ROC Optical Control**. He will discuss novel technologies for the online colour measurement of plastics pellets as they leave the compounding line without the need to produce test plaques. The presentation will also examine techniques for the automatic sorting of plastics pellets to ensure high levels of quality control.

More information

The **Compounding World Congress 2015** is sponsored by HPF The Mineral Engineers, ICMA San Giorgio and Imerys Graphite & Carbon. In addition to the high-level conference sessions, the event will feature an exhibition area that will host displays from more than 25 exhibitors and will be used for networking during the registration periods, refreshment breaks, and the evening cocktail reception (please note that the exhibition will only be open to conference delegates and speakers).

Exhibitors that have already booked places at the Compounding World Congress 2015 include: 3M / ESK ● Automatik Plastics Machinery ● Brabender ● Buss ● C.H. Erbslöh ● Colloids ● DuPont ● Feddem ● Gala ● Georg H. Luh ● Glunz ● Grolman ● HPF / Quarzwerke ● ICMA San Giorgio ● IMCD ● Imerys Graphite & Carbon ● JSW Japan Steel Works ● Mayr ● Nordson BKG ● PolyAd Services ● Polycompound ● Polytechs ● Reduction Engineering ● Total Cray Valley ● Velox.

For more information about participating in the Compounding World Congress as a delegate, exhibitor or sponsor, please contact the conference organiser Kat Langner at **kl@amiplastics.com**, tel: +44 (0)117 314 8111. You can view the complete conference programme along with booking details at: **http://bit.ly/CWC15B**

Site visit to HPF / Quarzwerke

Conference attendees will have the opportunity to visit HPF The Mineral Engineers, a division of Quarzwerke, on the afternoon of Tuesday 21 April, before welcome cocktail reception and registration session that take place that evening.

Coaches will take participants from Cologne to the HPF facility in nearby Frechen. There will be opportunities to tour the R&D laboratories, hear a company presentation, and attend a networking break.

HPF produces a range of high-performance mineral fillers including cristobalite, kaolin, wollastonite and mica. One of its latest launches is Silatherm, a mineral additive for heat-conductive compounds.

Turn page for the full programme ➤

compounding WORLD Congress 2015

The international conference on business strategies, innovative additives and process optimisation for thermoplastics compounders

HEADLINE SPONSOR

HPF The Mineral Engineers
A DIVISION OF QUARZWERKE GROUP

21-23 April 2015
Maritim Hotel,
Cologne, Germany

** + 19% German VAT*

PLACES SELLING FAST

Organised by:
Applied Market Information Ltd. & Compounding World

Also sponsored by:

ICMA SAN GIORGIO
Advanced Compounding and Extrusion Systems

IMERYS
Graphite & Carbon

compounding WORLD Congress 2015

21-23 April 2015, Maritim Hotel, Cologne, Germany

The Compounding World Congress 2015 is being organised by AMI and *Compounding World* magazine, building on the considerable success of their Compounding World Forum that is held in the USA. The Cologne event will be a vibrant new meeting place for thermoplastics compounders from throughout Europe and beyond.

The high-level programme, which has been brought together by the editorial team of *Compounding World*, will explore and develop many of the magazine's most popular themes in a live event.

The conference will cover business strategies and new materials technologies, as well as providing practical advice on getting the most from compounding lines.

The primary focus will be on the production of technical compounds based on engineering thermoplastics, thermoplastic elastomers and performance polyolefins for demanding applications in markets such as the automotive, electrical/electronic, medical and industrial sectors.

Dedicated sessions will focus on the latest additives and formulations for adding value and new functionality to thermoplastics. In addition, there will be analysis of key market trends in the compounding industry, plus discussions on how to grow business in an increasingly competitive global arena. Experts will also cover new developments in processing technology and provide tips on how to optimise compounding operations.

EARLY BIRD REGISTRATION OFFER

Register before 30th January 2015 and pay €890* saving €200* on the full price of €1090*. There are additional discounts for group bookings. The registration fee includes attendance at all conference sessions, the Welcome Cocktail Reception, lunch and refreshment breaks on both days and a set of conference proceedings.

SPONSOR THIS EVENT

A variety of sponsorship opportunities are available at this conference to help to promote and enhance your company's products and services to this highly targeted international audience. Contact the conference hotline for further information.

CONFERENCE VENUE

Cologne is a vibrant historic city that presents excellent choices for sightseeing, dining, entertainment and shopping. The conference will take place at the Maritim Hotel, which is on the banks of the Rhine within walking distance of the old town and ancient cathedral.

*+19% German VAT

CONFERENCE HOTLINE

Contact: Kat Langner, Conference Organiser
Tel: +44 (0) 117 314 8111
Fax: +44 (0) 117 311 1534
Email: kl@amiplastics.com

AMI reserves the right to alter the programme without notice. The latest programme including any new speakers or changes to schedules can be viewed on our website www.amiconferences.com

HEADLINE SPONSOR

CONFERENCE

Tuesday 21st April 2015

13.00-17.00 **Site visit to HPF The Mineral Engineers, a division of Quarzwerke Group**

Delegates will be taken by coaches to and from the HPF facility in nearby Frechen. There will be a tour of the R&D laboratories and a company presentation followed by a networking break.

18.00-19.30 Registration and Welcome Cocktail Reception

There are no conference sessions on this day

Wednesday 22nd April 2015

08.00 Registration and welcome coffee
09.00 Opening announcements

SESSION 1 – UNDERSTANDING MARKET TRENDS AND DEVELOPING SUCCESSFUL BUSINESS STRATEGIES

09.10 **Analysing the current and future status of the world compounding industry**
Mr. Andy Beevers, Publisher/Editor, *Compounding World* Magazine, APPLIED MARKET INFORMATION Ltd., United Kingdom

09.40 **Strategies for growing a profitable compounding business in an increasingly competitive global marketplace – panel discussion with:**

Mr. Holger Kronimus, Vice President Europe and General Manager, Specialty Engineered Materials, Europe for PolyOne, POLYONE, Germany

Mr. Heinrich Lingnau, Vice President & General Manager EMEA, A. SCHULMAN EUROPE GmbH & Co. KG, Germany

Mr. Bernd Sparenberg, Vice President Technical Compounds, ALBIS PLASTIC GmbH, Germany

Dr. Stefano Zocca, Managing Director, SO.F.TER. GROUP, Italy

10.40-11.10 Morning coffee

11.10 **Regulatory challenges: how REACH will shape plastics formulations in Europe**
Dr. Anna Gergely, Director, EHS Regulatory, STEPTOE & JOHNSON LLP, Belgium

SESSION 2 – SPECIFYING FILLERS AND REINFORCEMENTS FOR ADDED STRENGTH

11.40 **Glass fiber reinforced plastics – influence of glass fiber sizings in polyamides and important parameters for high glass content PA66**
Dr. Jaap van der Woude, Associate Director, PPG INDUSTRIES FIBER GLASS BV, Netherlands

12.10 **Latest developments in talcs and mineral blends for high performance, lightweight, polyolefin compounds**
Mr. Jérôme Crepin-Leblond, Development Manager Polymer, IMERYS TALC EUROPE, France

12.40-14.10 Lunch

SESSION 3 – INCREASING THE VALUE OF THERMOPLASTICS

14.10 **Material markers against counterfeiting and more**
Mr. Jochen Moesslein, Managing Director, POLYSECURE GmbH, Germany

14.40 **New cross-linking technologies for enhancing the performance of engineering plastics**
Dr. Daniel Röme, Director of Business Development & Innovation, NEXAM CHEMICAL HOLDING AB, Sweden

15.10 **High throughput screening for thermoplastic compounds: a new tool for accelerated discovery and optimisation**
Dr. Gerhard Maier, Board Member and Chief Technology Officer, POLYMATERIALS AG, Germany

15.40-16.10 Afternoon tea by sponsored by: IMERYS Graphite & Carbon

Turn page for booking details ➤

HPF The Mineral Engineers
A DIVISION OF QUARZWERKE GROUP

PROGRAMME

SESSION 4 – OPENING UP NEW MARKETS FOR PLASTICS COMPOUNDS

16.10 **Developing innovative automotive applications with advanced thermoplastic compounds**
Mr. Anis Tebib, Marketing Manager Automotive, TRINSEO / STYRON, Germany

16.40 **Plastics for 3D printing applications: technology trends and market opportunities**
Mr. Michael Anton, Materials Business Manager EMEA, STRATASYS GmbH, Germany

20.00 Conference Dinner

Thursday 23rd April 2015

08.30 Registration and welcome coffee
09.00 Opening announcements

SESSION 5 – ADDING ELECTRICAL AND THERMAL CONDUCTIVITY TO COMPOUNDS

09.10 **Thermally conductive compounds – customised solutions for new applications**
Dr. Oliver Frey, Head of Compounding Department, ENSINGER GmbH, Germany

09.40 **New filler concepts for increasing the thermal conductivity of thermoplastics**
Dr. Jörg Ulrich Zilles, Head of R&D, QUARZWERKE GmbH, Germany

10.10 **Static dissipative carbon black compounds: the technical challenge, applications and standards**
Mrs. Eira Kärjä, Marketing Director, PREMIX Oy, Finland

10.40-11.10 Morning coffee

SESSION 6 – GETTING THE MOST FROM YOUR COMPOUNDING LINES

11.10 **Compounding of highly filled polymers with the co-rotating twin-screw extruder**
Mr. Frank Lechner, Head of Process Technology Compounding & Extrusion, COPERION GmbH, Germany

11.40 **Troubleshooting the twin-screw extrusion process**
Mr. Michael Thummert, Head of Corporate Communications, LEISTRITZ, Germany

12.10 **System engineering: the global rise of turn-key compounding lines**
Dr.-Ing. Thomas Winkelmann, Head of Development Plastics Technology, KRAUSSMAFFEI BERSTORFF, Germany

12.40-14.10 Lunch

SESSION 7 – PRODUCING PERFECT PELLETS

14.10 **Melt handling and pelletising of plastics compounds – matched to material properties**
Dipl.-Ing. Andrea Altenhein, Application Engineer, AUTOMATIK PLASTICS MACHINERY/ MAAG PUMP SYSTEMS, Germany

14.40 **The development and application of an innovative pellet inspection and sorting system**
Dr. Christian Frank, Member of the Executive Board, SIKORA AG, Germany and
Mr. Timo Mäkelä, Process Specialist, MAILLEFER EXTRUSION Oy, Finland

15.10 **Efficient colour compounding**
Mr. Jens P. Dietrich, Managing Director, ROC RAPID OPTICAL CONTROL GmbH, Germany

15.40 Closing announcements

15.50 Afternoon tea and conference ends

Conference lanyards sponsored by: ICMA SAN GIORGIO

HEADLINE SPONSOR

HPF The Mineral Engineers
A DIVISION OF QUARZWERKE GROUP

HPF The Mineral Engineers, a division of Quarzwerke Group

Quarzwerke Group is a globally active family-owned company with a leading market position in the field of mining and processing of various mineral raw materials. 130 years of experience and tradition are combined with innovative and pioneer developments. In plastics, paints & coatings as well as adhesives, minerals have always been used as classic fillers. The expertise of the division HPF The Mineral Engineers in developing High Performance Fillers enables solutions that help to improve the efficiency of the customer systems. Quarzwerke is a company with a highly convincing quality philosophy.

COMPOUNDING WORLD CONGRESS 2015: EXHIBITION SPACE

Make it easy for the delegates to find you at this busy event with your own table top exhibition space. Bring your own display stand, or just use the space to have literature and samples available and ensure that you make an impact. The table top exhibition will run throughout the conference in the spacious lobby outside the main meeting room.

Registration includes 1 delegate place!

Space is limited so to avoid disappointment please register for this service as soon as possible.

HOTEL ACCOMMODATION

Delegates are responsible for booking their own accommodation. AMI has negotiated a limited number of rooms at a rate of €154.50 for a single room and €192.50 for a double (breakfast and Wi-Fi included) at the Maritim Hotel in Cologne for a limited time only. To reserve a room, please contact the reservation department and state that you are attending "AMI's Compounding World Congress 2015" conference on:
Tel: +49 221 2027 849 Fax: +49 221 2027 826
Email: reservierung.kol@maritim.de

Save €200*

Register before 30th January 2015

*+19% German VAT

FIVE GOOD REASONS WHY YOU SHOULD ATTEND:

1. Hear leading experts discuss key trends in technical compounding
2. Discover new additive and materials technologies
3. Learn practical tips for getting the most from compounding lines
4. Gain insights into global market trends and business strategies
5. Network with other professionals in the compounding industry

REGISTRATION FORM

Company: _____

Address: _____

_____

Country: _____

Tel: _____ Fax: _____

Email: _____

VAT No.: _____

(Must be completed by all EU Companies)

Company activity: _____

Purchase order No. *(if applicable)*: _____

Invoice address *(if different from above)*: _____

_____

_____

DELEGATE DETAILS

If more than one delegate please photocopy form

Title: _____ First name: _____

Surname: _____

Position: _____

Special dietary requirements: _____

Signature: _____ Date: _____

PAYMENT DETAILS

All payments to be made in Euros

Please tick box and write amount:

❑ Early bird admission fee: *(Until 30th January 2015)*	€890 + €169.10* = €1059.10	_____
❑ Admission fee thereafter:	€1090 + €207.10* = €1297.10	_____
❑ Conference Dinner:	€75 + €14.25* = €89.25	_____
Table Top Exhibition Package (includes 1 delegate place)		
❑ German resident companies	€1850 + €351.50* = €2201.50	_____
❑ Non - German resident companies (**Only admission fee part of package is VAT chargeable at 19%)	€1850 + €169.10** = €2019.10	_____
	Total:	_____

❑ Site visit to **HPF The Mineral Engineers, a division of Quarzwerke Group** on Tuesday 21st April 2015

Please note all delegates have to pay the VAT stated above

METHOD OF PAYMENT

On receipt of this registration form your credit card will be debited.
You will be sent an invoice in 7-14 working days.

❑ **Bank transfer quoting:** 'Applied Market Information Ltd. - Compounding World Congress 2015' to: Commerzbank, Filiale Düsseldorf, Breite Straße 25, 40213 Düsseldorf, Germany
Account number: **1024710** Bank No. **300 400 00**
IBAN: **DE93 3004 0000 0102 4710 00** SWIFT: **COBADEFFXXX**

❑ Visa / Mastercard / Eurocard / JCB

				-					-					-				

If paying by card the following information **must** be given

Name of cardholder: _____

Expiry date: _____ 3-digit security code: _____

Cardholder's signature: _____

Card billing address: _____

Post / zip code: _____

Country: _____

Tel: _____ Fax: _____

Email: _____

COMPOUNDING WORLD CONGRESS 2015

CONFERENCE INFORMATION

Date and location
21-23 April 2015
Maritim Hotel
Heumarkt 20
50667 Cologne
Germany
Tel: +49 221 2027 0
Fax: +49 221 2027 835

Registration fee
The registration fee includes attendance at all conference sessions, the Welcome Cocktail Reception, lunch and refreshment breaks on both days and a set of conference proceedings.

- ***Early bird registration:*** Register before 30th January 2015 for only €890*. Thereafter the cost is €1090*.
- ***Group rates:*** For companies wishing to register two or more delegates, group discounts may be available. Please contact the Conference Organiser for more details. (Please note to qualify for the group discount delegates must be booked at the same time, otherwise additional delegates may be charged at full price.)

Compounding World Congress 2015 table top exhibition
A limited number of table top exhibition spaces are available in in the spacious lobby outside the main meeting room. The table top exhibition fee is excellent value for money and **includes 1 delegate place**. Exhibitors may either use tables provided by the hotel or bring their own stand or display.

Sponsor this event and promote your company
A variety of sponsorship opportunities are available at this event that can help to promote and enhance your company's products and services to this highly targeted international audience. For further information, please contact the Conference Organiser on: +44 (0) 117 314 8111.

Social events
The social events organised for Compounding World Congress 2015 will provide an ideal setting for delegates and speakers to mix business with pleasure.

- ***Welcome Cocktail Reception:*** A welcoming cocktail reception will be held on the first evening. All delegates are invited to attend and it will offer an excellent opportunity to meet speakers and other colleagues. The Welcome Cocktail Reception will run approximately from 18:00 to 19:30 and is included in the delegate fee.
- ***Conference Dinner:*** All delegates are warmly invited to attend the Conference Dinner, which will take place at a local restaurant on the evening of 22nd April 2015. The additional cost is €75*.

Hotel accommodation
Delegates are responsible for booking their own accommodation. AMI has negotiated a limited number of rooms at a rate of €154.50 for a single room and €192.50 for a double (breakfast and Wi-Fi included) at the Maritim Hotel in Cologne for a limited time only. To reserve a room, please contact the reservation department and state that you are attending "AMI's Compounding World Congress 2015" conference on:
Tel: +49 221 2027 849 Fax: +49 221 2027 826
Email: reservierung.kol@maritim.de

Cancellations
Full refunds, less a cancellation charge of €200 will only be made on cancellations received prior to 20th March 2015. Thereafter we regret that no refunds can be made. Delegates may be substituted at any time. Please note that refunds will not be given on table top bookings, sponsorship packages or dinner places.

*+19% German VAT

CONFERENCE HOTLINE

KAT LANGNER, CONFERENCE ORGANISER
Applied Market Information Ltd.
6 Pritchard Street, Bristol, BS2 8RH, United Kingdom
Tel: +44 (0) 117 314 8111 Fax: +44 (0) 117 311 1534
Email: kl@amiplastics.com

The latest programme, including any new speakers or changes to the schedule can be viewed on our website: **www.amiconferences.com**

NPE: New Products Everywhere!

The leading US plastics exhibition returns to Orlando next month. We look at why NPE 2015 is shaping up to be a huge success, and preview a selection of new machinery and equipment that will be on show

NPE 2015 takes place on 23-27 March in Orlando, Florida, and it is likely to be the largest US plastics exhibition ever. More than 60,000 visitors are expected to view displays by some 2,000 exhibitors over more than 106,000m^2 of exhibition space. And according to show organiser, the US Society of the Plastics Industry (SPI), more than 400 of those exhibitors will have equipment running on their stands. "With so many exhibitors operating equipment, the show floor will be a dynamic panorama of manufacturing in action," says Gene Sanders, SPI's senior vice president of trade shows and conferences.

The five-day event will be the 28th NPE, but only the second to be held in its new home at the Orange County Convention Centre in Orlando. Expectations for the show are high – and with good reason. The relocation after 40 years from Chicago to Orlando in 2012 – principally to control escalating exhibitor costs – was a risky move on the SPI's part, but one that paid off well. The Orlando exhibition centre together with the city authorities pulled out all the stops to make NPE 2012 a success. There's no reason to assume Orlando will be any less welcoming this time around.

NPE 2012 took place as the US economy began its recovery from the downturn. Exhibitor mood was optimistic then and is, perhaps, even better now as the US economy is performing well. While the IMF recently downgraded its forecast for global growth for 2015 to 3.5%, the US was the sole major world economy to see its economic performance expectation lifted (from 3.1% to 3.6%).

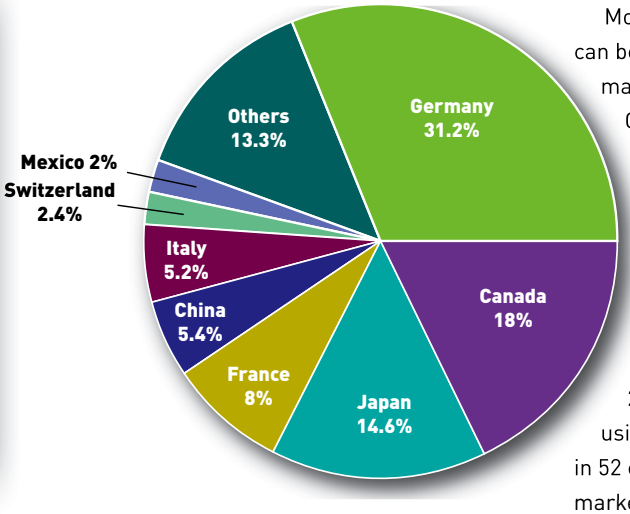
US Bureau of Economic Analysis (BEA) data released last month showed real US GDP increased at an annual rate of 5% during the third quarter of last year. In addition, the BEA data showed industry's contribution to GDP increased by more than 21% during the quarter, following a 6% increase in the second quarter.

US manufacturers are also investing to support future growth. BEA's data shows that investment in industrial equipment was up 16% in the third quarter of last year compared to the same period in 2013. And data from the US Census Bureau shows that the value of industrial machinery orders for the first nine months of 2014 to be 34% ahead of the 2013 period.

This year's NPE show is expected to build on the success of the 2012 exhibition

Plastics and rubber machinery exports to the USA in 2013 analysed by country – total value €2.0 billion

Source: the VDMA and export figures from the national statistical offices of 52 reporting countries



If you take the view that visitors go to plastics trade shows primarily to see and buy machinery and equipment, then the scene is set for a great NPE. The most recent data from the SPI's Committee on Equipment Statistics (CES) shows that US quarterly plastics machinery shipments have been running at near record levels now for close to three years.

In the third quarter of last year, shipments of primary processing equipment (injection moulding, extrusion and blow moulding equipment) totalled US$304.1 million. That was only 2% below the 10-year record result for the same period in 2013 and 6% ahead of the second quarter 2014 figures. Sales of twin-screw extruders in the US grew particularly strongly last year – they were 35% higher during the first three quarters of 2014 compared to the same period in 2013.

More evidence of growth in the US plastics market can be found in the latest data from Germany's machinery association, the VDMA. It reports that German exports of plastics and rubber processing machinery to the US grew 15.5% in 2013 to reach €630.4 million. This was the fourth consecutive year of strong growth since the downturn of 2009.

Total world exports of plastics and rubber processing machinery to the US reached €2,020.4 million in 2013, up 8.6% compared to 2012, according to statistics compiled by the VDMA using export figures from national statistical offices in 52 countries. Germany had the largest share of this market at 31.2%, followed by Canada (18.0%), Japan (14.6%), France (8.0%), China (5.4%), and Italy (5.2%).

Over the following pages, we take a look at some of the compounding machinery and equipment that will be on show in Orlando. Don't miss next month's 'NPE Show Issue' of *Compounding World* for details of new polymers, compounds and additives being launched at the show, plus more machinery announcements.

And if you are going to the exhibition yourself, please visit us at the Applied Market Information stand (W8283). We will also be touring the halls and tweeting news live from the show via our **@PlasticsWorld** Twitter feed.

More details about visiting NPE 2015, including opening times, advanced registration, travel information and accommodation booking, can be found on the exhibition website:

www.npe.org

Compounding and recycling lines

Coperion will be showing its redesigned ZSK 26 Mc18 twin-screw laboratory extruder

Coperion will be using NPE for the US debut of its recently redesigned ZSK 26 Mc^{18} twin-screw laboratory extruder, which replicates the advantages of production-scale models in the ZSK Mc^{18} range. The machine has an increased torque of 15 Nm/cm^3 and is capable of higher throughputs.

The mobile unit requires very little floor space as the control cabinet is integrated into its base frame. Heating and cooling systems are also pre-installed ready for 'plug and play' operation. In addition, the ZSK 26 Mc^{18} features a simple design that is operator-friendly and easy to clean.

With a throughput range from 20 to 400 lb/hr, the extruder is also suitable for the compounding of small production batches. It can be used with ZSB-FET side feeders for hard-to-handle ingredients, as well as ZS-EG side vent stuffers.

www.coperion.com

NPE2015®

produced by spi

See Us at Booth No W6486

QC³ 43MM

TWIN-SCREW EXTRUDER

IT TAKES A GREAT TEAM TO MAKE A GREAT TWIN-SCREW EXTRUDER

INTRODUCING THE QC³ 43MM

QC³™

- Quick Change
- Quick Clean
- Quality Control

Benefits to YOU:

- Easier to use
- Higher throughput
- Wider compounding range

ENTEK

RAISING EXPECTATIONS.
KEEPING THEM THERE.

200 Hansard Avenue, Lebanon, Oregon, USA, 97355
Tel: 541-259-1068 • www.entek.com

Twin-Screw Extruders | Replacement Wear Parts | In-House Development Lab Services
Complete Extrusion Systems | Turnkey Manufacturing Plants

Entek's completely new QC³-43MM twin-screw extruder is set to be a highlight of NPE 2015

Entek has something completely new to attract compounders to its stand at NPE 2015. Its QC³-43MM twin-screw extruder, which has been developed for quick cleaning and fast product changes, will be making its world debut at the event.

The company says that the machine is the product of several years of development work, which involved collaborating closely with compounding customers and using lean principles to drive the evolution of its design. The resulting extruder is particularly suitable for the compounding of small to medium lot sizes.

One priority of the new development was speeding up and simplifying screw-set changeovers. This has been achieved with a new self-alignment feature that is said to take the worry out of installing the screws into their couplings. The new design only allows the screws to be fitted in the correct way. All the necessary tools for changeovers and maintenance are mounted at the point of use on the extruder, while guards are designed for easy removal and replacement.

Another key goal for the development of the QC³-43MM extruder was easy cleaning. The extruder frame has been designed to deflect dust and keep the machine clean beneath its hood. In addition, stainless steel and powder-coated surfaces have been specified to retain a smart appearance over time. Entek is also offering an optional device for fast and easy barrel cleaning.

The new QC³ offers increased production rates thanks to its higher output shaft torque, which has been increased by 33%, and its higher OD/ID ratio of 1.61. Entek is offering the machine with L/D ratios from 40 to 52.

The new features are currently only available on the 43-mm diameter machine, which is a new size for Entek. However, the design changes will now be phased in for other machines in the Entek range, which covers diameters from 27 to 133 mm.

www.entek.com

Erema will be exhibiting an Intarema 1108 TVEplus line for recycling post-consumer plastics waste

Erema North America, the US-based subsidiary of Austrian recycling line manufacturer Erema, will be at NPE to show two different machines and highlight its recent expansion.

One of the recycling lines on show will be an Intarema 1108 TVEplus fitted with a Laserfilter. This combination is designed for handling post-consumer plastics waste – Erema reports fast growth in such applications in the USA. The line is particularly suitable for handling the high levels of contaminants that can be found in post-consumer material, including wood, paper, aluminium or copper.

The other line on show at NPE will be an Intarema 605 K for the in-house recycling of edge-trim. This fully automated system features direct feeding of the continuous edge-trim, eliminating the need to pre-cut the scrap material.

Erema North America is expanding its trial centre at Ipswich, Massachusetts, from 1,000 m² to 2,400 m² and adding a new Intarema 1108 TVEplus post-consumer line alongside its existing three demonstration machines. The expansion is due to be completed this summer.

Erema has also recently announced that it is forming a sister company called Pure Loop. This will focus on ISEC (Integrated Shredder Extruder Combination) lines for the in-house recycling of clean production scrap.

www.erema.at

Farrel Pomini will be showing a CP1000 mid-sized compounding line from its CP Series II Compact Processor range. These machines combine an independently controlled continuous mixer with an extruder system. The company says that this arrangement ensures excellent levels of dispersion and provides high intensity mixing, while maintaining low processing temperatures.

The Compact Processors are particularly suited to the production of highly filled polyolefin compounds and the manufacture of masterbatches with high loadings of pigments and/or additives. In addition, the machines are capable of handling polymer-elastomer blends and abrasive materials.

The CP1000 on show at Orlando will include several new features that are available on new machines or as

EVERYTHING YOU EVER KNEW ABOUT EFFICIENCY IS NOW OLD NEWS.

The plastics industry is driven by efficiency. And your success depends on it. Now you can depend on a new paradigm of efficiency in plastics compounding. FARREL POMINI brings together the two most respected names in highly efficient compounding equipment to help you reduce energy consumption, improve process flexibility and decrease maintenance costs. Learn what else is new with FARREL POMINI at NPE 2015. Booth W6444. **farrel-pomini.com**

LET OUR EFFICIENCY DRIVE YOUR SUCCESS.

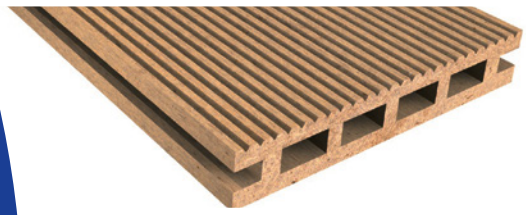
FARREL POMINI
continuous compounding systems

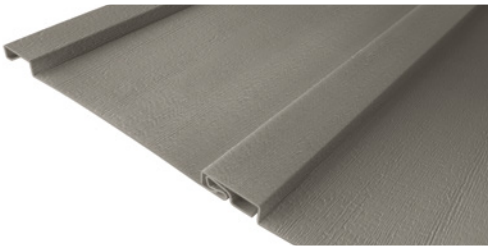
Profiles 2015

International business and technology conference for the window, door, decking, fence and siding profile industry

CLICK HERE FOR DETAILS

Housing image courtesy of: **CertainTeed Corporation**





June 9-10, 2015

Hilton Philadelphia City Avenue, Philadelphia, Pennsylvania, USA

SPECIAL OFFER: Save $300 if you register before March 6, 2015

Organized by:
Applied Market Information LLC

Media supporter:
pipe and profile EXTRUSION

Kelly Cressman, Conference Coordinator kc@amiplastics-na.com Ph: +1 610 478 0800 Fax: +1 610 478 0900

retrofits on existing lines. They include: self-aligning seals for faster installation; a Synergy control system for the seamless integration of upstream and downstream equipment plus real-time data monitoring; and a new vent assembly design that improves venting performance and minimises vent discharges.

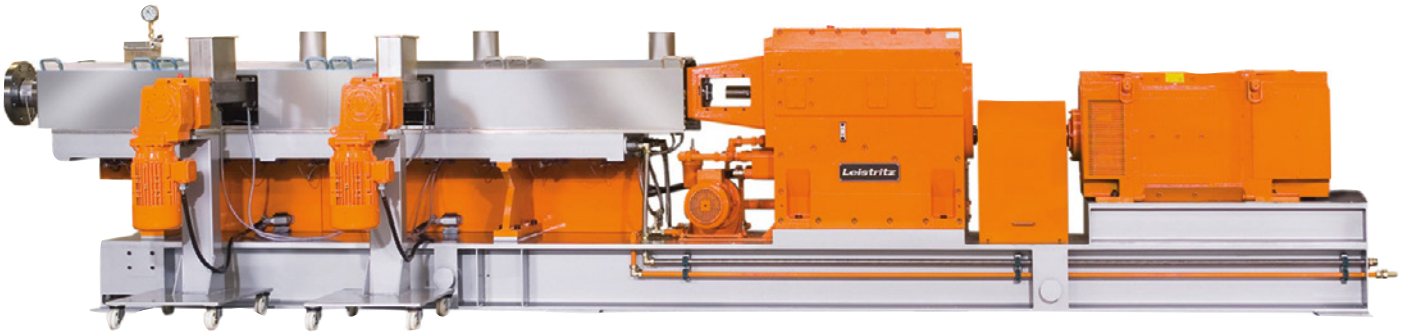
www.farrel-pomini.com

Gneuss will exhibit the biggest Multi Rotation System (MRS) extruder it has shown at an NPE show. The latest generation MRS 160 machine will be part of a complete line incorporating a Gneuss RSFgenius 175 fully automatic filtration system and an online viscometer. After the show, it will be delivered to a customer in Florida for processing 3,000 lbs/hour (1,400 kg/hour) of recycled PET into thermoforming sheet.

Featuring a single-screw extruder with a multiple-screw section for high devolatilizing performance, the MRS was originally developed for processing PET reclaim without the need for pre-drying. However, the machine is now also being used for polyolefin and polyamide processing, and Gneuss is testing it with other materials. Gneuss says that more than 50 MRS extruders are in operation around the world with capacities ranging from 35 to 2,000 kg/hour. They are mainly used for sheet, fibre and repelletizing applications.

Gneuss will also be showing a couple of new melt filtration systems for handling highly contaminated materials such as recycled resins. The RSFgenius M rotary filtration system is a fully-automatic self-cleaning machine that provides pressure-constant operation,

Gneuss will feature an MRS 160, the largest Multi Rotation System extruder it has shown at an NPE



The largest of three Leistritz extruders on show at NPE will be a ZSE-90 Maxx

while the SFpvc has been specifically developed for handling recycled PVC.

www.gneuss.com

Leistritz will have a strong display at NPE 2015 with three different twin-screw extruders plus an interactive "Twin Screw Challenge" game.

The largest of its machines on show will be a ZSE-90 Maxx heavy-duty extruder with 52 L/D and 1.66 OD/ID. It will feature abrasion-resistant screw elements and barrels, plus two LSB side stuffers for the processing of highly-filled compounds. In addition, it will have a totally-sealed water-cooled motor for improved cleanliness.

Also on show will be a direct-to-sheet line built around a Leistritz ZSE-27 Maxx for in-line compounding. The line will also feature a gear pump and 14-inch die followed by a three-roll sheet/film system. Its PLC-based distributive processing control system allows integration of the feed system, extruder, gear pump and downstream equipment.

The third extruder on the Leistritz booth will be a ZSE-18 GMP-class machine for use in medical and pharmaceutical applications. It features a sealed brushless AC servo-motor drive, and its screw elements, barrels and base frame are all made from stainless steel.

Visitors looking to test their extrusion knowledge at NPE can take part in Leistritz's "Twin-Screw Challenge", an interactive trivia game with instant prizes for anyone answering all three of their questions correctly.

www.leistritz.com

NFM will be showing several of its TEM Series twin-screw extruders at NPE 2015, including a TEM-75SS machine that has been built for PlayPower and will be installed at its plant in Monett, Missouri, USA after the show.

PlayPower is a leading producer of recreational equipment, including playground equipment and floating boat docks, which are sold under various company brand names, such as Miracle Recreation, Little Tikes and EZ Dock. It has recently decided to produce custom-coloured compounds in-house for rotational moulding applications. Using pre-coloured compounds for this process will eliminate the pre-blending step of its operations and it will improve the appearance quality and consistency of the final parts.

The NFM TEM-75SS turn-key compounding system will allow PlayPower to produce higher volume colours in large quantities for bulk silo storage, as well as making smaller batches of short-run colours. The line includes raw material conveying and feeding systems, plus a pelletizer.

NFM will also be promoting its new DSF Deaerating Side Feeder for improved handling of low bulk density fillers. We will have more details on this development in our special feature on twin-screw extruders in next month's *Compounding World*.

www.nfm.net

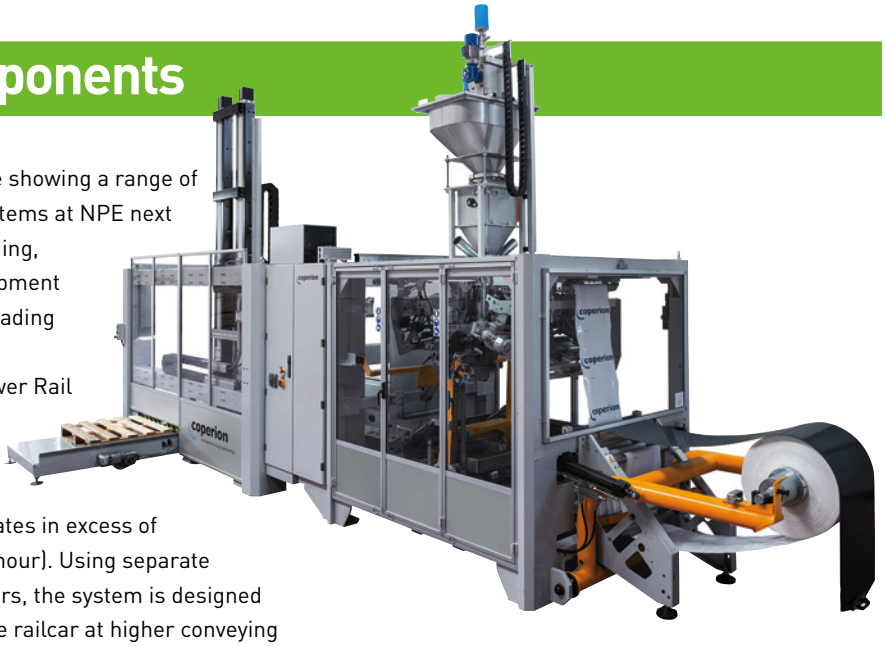
Steer will be at NPE to promote its latest developments in twin-screw extruders. These include the Mega Special Plus, which has been developed to handle multiple melt viscosities through the use of four different speed configurations. The machine can efficiently process various polymers and applications which can be torque-limited, feed-limited, shear-thinning or shear-thickening. More details on this machine were included in the PlastIndia preview in last month's *Compounding World*.

In addition, the company will be highlighting the use of its Omega platform to process "continuous medium glass fibre thermoplastics". This development will be covered in the special feature on twin-screw extruders in next month's *Compounding World*.

Experts will also be on hand to discuss Steer's innovative screw designs including wave elements which have been developed for improved wetting and distribution of fibres while minimizing attrition. The company has also designed new fractional lobed screw elements which are said to offer improved reliability, reduced wear and increased uniformity of melting and mixing.

www.steerworld.com

Auxiliaries and components



Coperion K-Tron's IBP 250 FFS provides accurate and hygienic weighing, dosing and packaging

Coperion K-Tron will be showing a range of bulk materials handling systems at NPE next month, ranging from unloading, feeding and pelletizing equipment through to packaging and loading systems.

The company's dual-blower Rail Unload System pneumatically transfers pellets, powders and granular materials from railcars at rates in excess of 120,000 lb/hour (54,000 kg/hour). Using separate vacuum and pressure blowers, the system is designed to unload materials from the railcar at higher conveying rates and for longer conveying distances.

Coperion K-Tron's modular loss-in-weight (LIW) feeders are designed for materials with varying bulk density and for automated materials handling. The S100 single-screw LIW feeder offers feed rates from 0.4 to 560 ft³/hour (10 to 15,800 dm³/hour) and can handle free-flowing powders, granules, and pellets. The T35 twin-screw LIW Feeder offers feed rates from 0.04 to 88.0 ft³/hour (1.25 to 2,500 dm³/hour) and is designed to cope with floodable powders and more difficult, sticky or hard-to-flow materials.

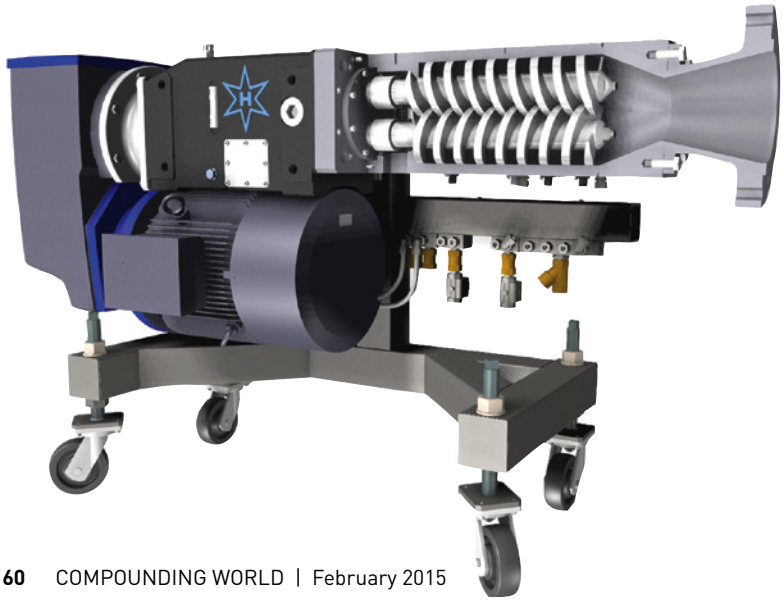
On the pelletizing front, the company will be showing an SP 100 EN strand pelletizer, which has a working width of 3.9 inch (100 mm) and reaches throughput rates up to 1,400 lb/hour (650 kg/hr) with 20 strands. The cutting head cover swings wide open to give full access inside, while the intake chute can be quickly removed by simply loosening two screws. All inside surfaces are flat and smooth to minimize the accumulation of residues.

The IBP 250 FFS packaging machine provides accurate and hygienic weighing, dosing and packaging for crystalline, granular, beaded or flaked goods. The system features a small footprint and the controls can be navigated intuitively by using a touch-screen. Optional extras include a check weigher, metal detection, bag marking and automatic cleaning.

For the final stage of the materials flow, Coperion K-Tron will be highlighting its new high-rate railcar loading technology for polymer pellets. This uses proven product spreading technology developed by Erhard Muhr of Germany to ensure high loading efficiency and capacity. It uses recoil forces to gently propel the pellets into the far corners of railcar compartments.

www.ktron.com

Henschel's Xtreamor melt pump for compounding applications will be making its US debut at NPE



Henschel will be showing its Xtreamor melt pump for the first time at a US exhibition. The pump has been developed specifically to increase the output performance of compounding lines while also reducing energy consumption. The design features specially developed twin-screws that can work with very low pre-pressure from the main extruder (0-2 bar). The screws gradually build up a high output pressure with the lowest possible stress and strain on the melt.

The process-optimised conveying geometry is claimed to provide energy reductions of up to 50% compared to traditional melt pumps. This is also reflected in the lower melt temperatures measured in the process. Henschel claims that the Xtreamor delivers near constant temperature and pressure levels and can improve compound quality as well as raising output levels.

Henschel says that its new pump has been designed to eliminate leaks and minimize maintenance requirements. Cleaning is said to be simple, and the screws can be easily switched for product changeovers.

www.henschel.de

Make sure that your 2015 marketing campaign is:

Accessible

Targeted

Effective

Global

Our high quality digital magazines can help you achieve these goals. They deliver focused audiences, international coverage and unrivalled value for money. For more information, download our 2015 media packs, which include features lists, circulation details and our highly competitive advertisement rates

Download the compounding WORLD media pack here

Download the injection WORLD media pack here

Download the pipe and profile EXTRUSION media pack here

Download the film and sheet EXTRUSION media pack here

Download the pipeline COATING media pack here

For more information, contact our advertisement manager
Claire Bishop – claire@amimagazines.com
Tel: +44 (0) 1732 605976

NEW UPDATED MEDIA PACKS WITH OUR 2015 FEATURES LISTS

compounding WORLD Forum 2015

The international conference on business strategies and new technologies for compounders









December 8-9, 2015
Philadelphia, Pennsylvania, USA

CLICK HERE FOR DETAILS

Organized by:
Applied Market Information LLC & Compounding World

Secure your sponsorship package now!

Contact Ms Kelly Cressman:
kc@amiplastics-na.com, tel: +1 610 478 0800

Knife-xpress will be exhibiting at NPE, showcasing a wide range of Zenith Cutter replacement machine knives, including pelletizer blades, shredder blocks and granulator knives. It sells these products online, with free ground shipping to continental US addresses on orders over US$1,500. The company also offers knife regrind services.

www.knife-xpress.com

Maag will be showing a range of gear pumps, melt filtration systems and pelletizers from its Maag Pump Systems and Automatik divisions.

For example, a Maag Extrex 90 extrusion pump will be shown in conjunction with a Maag CSC 116-RS screen-changer and a new Automatik Sphero S underwater pelletizing system. All three components have been designed for improved energy efficiency.

Automatik's Primo 200E pelletizer is particularly suitable for the production of masterbatches

The pump also optimised flow channels and very good self cleaning properties, while the screen-changer uses arched cavities to increase the screen surface area for higher production rates. The compact Sphero S is also designed for high productivity and ease of operation.

In addition, Automatik will be showing a Primo 200E single-side-mounted dry-cut strand pelletizer with an extra large cutting width of 200 mm. It is particularly suitable for the production of masterbatches at throughputs up to 1.5 tonnes/hour. Its special cutting geometry ensures the shortest, unguided length between the feed rollers and cut, which permits optimal straight cutting of hard, abrasive and very soft plastic strands.

www.maag.com

National Bulk Equipment will be showing its latest flexible screw conveyors and hoppers

National Bulk Equipment will be showing its latest flexible screw conveyors and hoppers built for harsh applications and demanding environments. The gear drives and motors are specified for maximum power and conveying efficiency, while the conveyor discharge head is made from high-quality stainless steel. It is assembled and hand-finished to eliminate any gaps, joints or bolts that could accumulate material.

Stainless steel is also used for the hoppers which feature steep-slope sidewalls, sheer-drop material feed guides and flangeless conveyor intakes. These help to eliminate bridging and rat-holing, while also improving access for cleaning.

www.nbe-inc.com

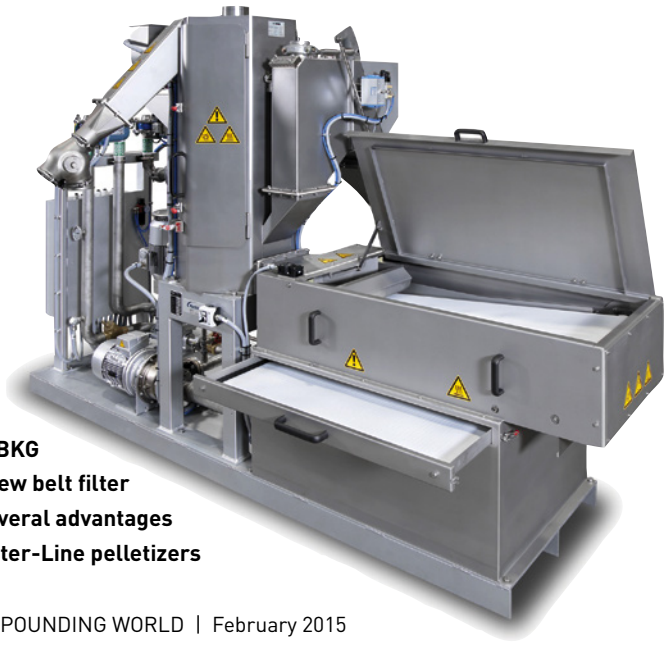
Nordson BKG will be introducing a new belt filter for the temperature-controlled water system of its Master-Line underwater pelletizers. The optional unit has been developed to reduce downtime and operator intervention by providing continuous, automated filtration of fines.

The new filtration system also has a finer filter mesh – 150 µm versus the 200 µm capability of the standard system available with Master-Line pelletizers. It is a modular system that can be used to upgrade existing Master-Line equipment.

The continuously rotating filter screen is constantly cleaned by spray nozzles at one end and a scraper at the other, allowing fines to be collected in a catch basin beneath the belt. In the standard system, fines are collected on a large woven wire-mesh screen that periodically must be removed and cleaned, a process that requires stopping production.

BKG's Master-Line pelletizer is a compact, entry-level system for compounding and recycling at throughputs up to 2,000 kg/hour. Nordson BKG says that the new belt filtration option provides the machine with the finer filtration and self-cleaning features found on its higher-cost Combi-Line and Opti-Line pelletizers.

www.nordson-k.com



Nordson BKG says its new belt filter brings several advantages to its Master-Line pelletizers

Nordson Kreyenborg will be highlighting a new screen-changer filter cartridge that is designed to resist deformation and enhance polymer flow. It is already being successfully used by a European company on a high-throughput PET recycling line supplied by Starlinger, where it is reducing the frequency of filter replacement and improving pellet quality.

The bottle-to-bottle line features a Starlinger RecoStar PET 165 HC iV+ recycling machine and a Nordson Kreyenborg K-SWE-4K-75/RS screen-changer between the extruder and the underwater pelletizer. When the company replaced a standard filter medium in the screen-changer with the new filter cartridge, the filter life was extended from eight to 72 hours.

Nordson Kreyenborg's new filter cartridge is already proving its worth on a PET recycling line

Besides prolonging filter life, the innovative design of the new filter cartridge also handles the requirements of high-throughput systems such as the 1,400-1,600 kg/hour (3,000 to 3,500 lb/hour) Starlinger line. Its larger filter area and the elimination of stagnation zones help to reduce pressure variations that can detract from pellet quality.

www.nordson-k.com

Pelletron will be showing its XP-360 DeDuster with a new automated inlet device which eliminates the need for expensive and heavy rotary valves that are typically used to feed materials into the units. The automated inlet deflectors adjust the product flow to the desired rate. They also evenly distribute product over the wash decks of the DeDuster and can shut down product flow completely.

This DeDuster model is designed for cleaning plastics at polymer production plants at rates of 40,000 to 330,000 lb/hour (18 to 150 tonnes/hour) prior to bagging or loading into truck or railcars.

www.pelletroncorp.com

Polymers in Cables 2015

The international conference and exhibition for polymers in cable applications

CLICK HERE FOR DETAILS

June 23-24, 2015
Hilton Philadelphia City Avenue,
Philadelphia, Pennsylvania, USA

SPECIAL OFFER: Save $300 if you register before March 20, 2015

Organized by:
Applied Market Information LLC

Sponsored by:
Nabaltec
OMYA
MCA TECHNOLOGIES GmbH (Switzerland)

Media supporter:
compounding WORLD

Kelly Cressman, Conference Coordinator kc@amiplastics-na.com Ph: +1 610 478 0800 Fax: +1 610 478 0900

Pelletron is now offering its XP DeDuster with an automated inlet device to control material flow

R&B Plastics Machinery will use next month's NPE show as the launchpad for its new cost-effective Max extrusion control system. This uses an economical Windows CE-based human machine interface (HMI) system that provides performance similar to SCADA software systems, according to R&B.

Featuring Allen Bradley and Ifix systems, the Max control platform can provide integrated line control for a wide range of extrusion applications, including compounding and recycling. It provides control of temperature, speed and pressure with the touch of a screen. Integration of upstream and downstream equipment is also available.

The system is customised to meet end-user requirements, including the selection of hardware suppliers. It can be retrofitted to all makes of extruders and can also be used with R&B's own Max extruder product line.

www.rbplasticsmachinery.com

Reduction Engineering's new RE series pulverizers feature a compact design and faster clean-out

Reduction Engineering Scheer will be discussing its new investment in rotor grinding and measuring equipment, including a state-of-the-art CNC grinding centre and a 3D coordinate measuring machine. It says that the investment is in response to strong sales growth worldwide and a record year for its rotor resharpening business.

The company will also introduce its next-generation RE series pulverizers at the show. These feature a compact design, faster clean-out and more efficient production. The four new models – RE 500, RE 1000, RE1500 and RE Pass – feature RE Scheer's patented disposable disk system plus a new air flow management system to increase cooling of the mill chamber. Their orbital classification system occupies less space than conventional systems and boasts a larger screen

www.reductionengineering.com

Schenck Process will be highlighting its Mechatron dry material feeders that can handle a wide range of bulk solid materials such as titanium dioxide, wood flour or carbon black. They are available for volumetric or gravimetric feeding applications, and can be specified with flexible or stainless steel hoppers. Complete disassembly for the non-process side of the feeder simplifies cleaning and maintenance.

The company will also be showing its E-finity low-pressure continuous dense-phase conveyor system for handling fragile materials. The company says that precise pressure monitoring and airflow corrections allow the system to efficiently and gently move granular and pelleted materials through the conveying line in slug form.

www.schenckprocess.com

The Mechatron feeder from Schenck Process can handle a wide range of bulk solid materials

Syncro will be showing a Definitive International DSG powder feeder for delivering hard-to-handle additives at rates of 350-2,000 g/hour. It features a stainless steel 30-litre hopper, a co-rotating twin-screw feeder, and brushless technology to ensure high accuracy at low feed rates. The machine also has dual motors – one for feeding and one for the homogenizer/bridge breaker.

The feeder is designed to be easy to clean with quick and easy disassembly. It uses an off-the-shelf PLC controller with a touch-screen interface.

www.syncrousa.net

More information

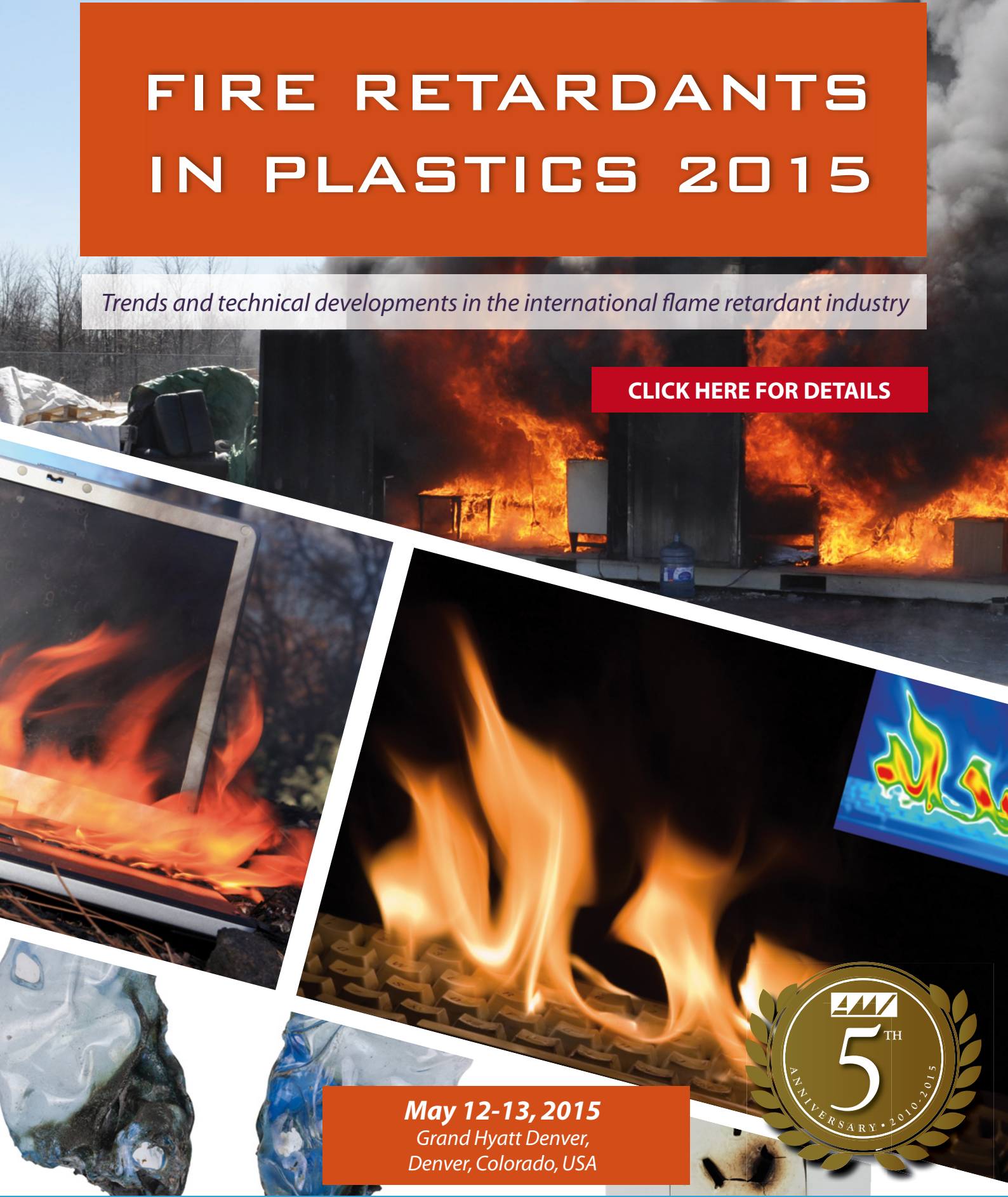
In next month's edition of *Compounding World*, we will be continuing our NPE preview with a look at a selection of the new polymers, compounds, masterbatches and additives being introduced at the exhibition.

www.npe.org

FIRE RETARDANTS IN PLASTICS 2015

Trends and technical developments in the international flame retardant industry

CLICK HERE FOR DETAILS



5TH ANNIVERSARY • 2010-2015

May 12-13, 2015
Grand Hyatt Denver,
Denver, Colorado, USA

FINAL REMINDER – BOOK NOW

Organized by:
Applied Market Information LLC

Sponsored by:
Great Lakes Solutions, a Chemtura business
OMYA
Nabaltec
FARREL POMINI continuous compounding systems

Media supporter:
compounding WORLD

Kelly Cressman, Conference Coordinator kc@amiplastics-na.com Ph: +1 610 478 0800 Fax: +1 610 478 0900

Plastic Pipes 2015 in Infrastructure

Trends & developments in design, production, installation and exploitation of plastic pipes systems for infrastructure

CLICK HERE FOR DETAILS

14-16 April 2015
Millennium Gloucester Hotel, London, United Kingdom

Images courtesy of: **Company name in bold**

** + 20% UK VAT*

SPECIAL OFFER: Save €100* if you register before 6th March 2015

Organised by:
Applied Market Information Ltd.

Sponsored by:
TECNOMATIC
TECHNOLOGIES FOR PLASTIC MATERIALS PROCESSING

Media supporter:
pipe and profile EXTRUSION

Giulia Esposito, Conference Organiser ge@amiplastics.com Ph: +44 117 924 9442 Fax: +44(0)117 311 1534

PHOTO: POLYONE

Jennifer Markarian reports on developments in materials handling technologies, including plans for a major new research facility backed by industry

Materials on the move

Materials handling is a crucial element of every compounding line. Research and development work continues both at equipment suppliers and within academia to gain a better understanding of how materials can be stored, conveyed and dosed efficiently and effectively.

Equipment that can be easily cleaned is particularly important for compounding lines that have frequent changeovers. Designs that allow quick and easy access for cleaning help to reduce downtime, facilitate good housekeeping, improve product quality by excluding contamination, and improve safety for operators, notes Manfred Wiedmann, general manager of the Modular Turnkey Systems business unit at **Coperion**.

He explains, "Coperion has developed a consistent cleaning concept for the entire compounding line. This comprises the handling, conveying and dosing of the raw materials, hoppers and silos, the compounder and its accessories, the handling of the finished product and the bagging equipment. Along the entire process chain all major elements have been reviewed and optimized to avoid deposits and contamination and to facilitate cleaning and inspection after cleaning. When possible, cleaning processes have been automated."

Some customers look for smaller-sized feeding equipment to expedite cleaning and smaller hoppers for a more "just-in-time" process, adds Matt Burt, general sales manager of **Coperion K-Tron**'s Equipment & Systems business unit. He notes that control systems that integrate equipment are also essential.

Coperion K-Tron is backing a new research facility that is aiming to provide an improved understanding of materials handling. The new **Bulk Solids Innovation Center** (BSIC) is being constructed by **Kansas State University** in Salina, Kansas, USA, and is expected to open in April 2015. Coperion K-Tron Salina donated land and equipment for the project, while many other suppliers provided equipment as well, says Todd Smith, general manager of Coperion K-Tron Salina. Funding is also coming from the local, state, and federal governments.

The 13,000-sqft (1,200 m^2) facility will include bulk solids laboratories, a materials testing lab, a 30-ft (9-m) tall open bay for full-scale testing, offices for researchers, and a classroom for continuing-education and university-level courses about bulk solids. Experiments will be possible from small-scale tests (a few pounds/hour) up to large-scale operations (hundreds of tons/hour). The BSIC will be the only such university-level research centre for bulk solids in North America.

The facility will be a place where the university and industry can work together on collaborative and proprietary projects. Companies such as Exxon Mobil, Dow and DuPont have committed to engage in research projects with the university once the BSIC opens.

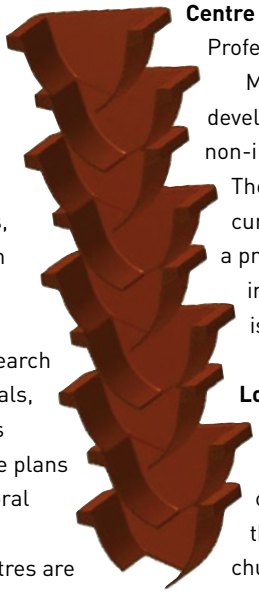
In addition to Kansas State, Coperion K-Tron Salina and **Vortex Valves** will have space in the building. "The

Coperion has developed a consistent cleaning concept for the entire compounding line

industry technical directors have been excited to hear about the BSIC because they all have issues with their bulk solids plants. They would use this facility since there is no independent research being done in North America. Kansas State has a rigorous research programme that is needed to provide a long-term benefit to the industry," says Smith. Equipment needs such as lower energy costs, improved reliability, and reduced dust explosion risk have been improved incrementally over the years, but research at the BSIC may be the key to push ahead to next-generation bulk-solids material handling technology, he explains.

Kansas State currently offers an engineering technology degree, and plans to offer an applied engineering degree that could have bulk solids handling as an area of concentration, notes Mark Jackson, head of the engineering technology department at K-State Salina. "Students will have the opportunity to be a part of applied research projects at the centre focused on the mechanics of material movement and the development of new processes and equipment. Programme graduates will then be immediately productive in the processing industries associated with bulk solids," says Jackson.

LoadFast and Glasgow Caledonian University won an award for their GraviLoad controlled-flow chute system



The University's Department of Grain Science in the College of Agriculture has already done much research in bulk solids, and the BSIC researchers will partner with the Grain Science researchers to see how this knowledge can be transferred to the handling of non-food materials. Initial research is expected to focus not on specific materials, but on the shape of materials and how this affects flow during transport. Kansas State plans to have a full-time director and post-doctoral student located at BSIC.

The Bulk Solids Innovation Center is due to open in Salina, Kansas, USA in April 2015

Several other bulk-solids research centres are established in other parts of the world. For example, **Tunra Bulk Solids** is a research facility in Australia associated with the University of Newcastle and the University of Wollongong. In the UK, the **Wolfson Centre for Bulk Solids Handling Technology** is located on the University of Greenwich's Medway Campus, where it is part of the School of Engineering. The Glasgow Caledonian University (GCU) in Scotland hosts the **Centre for Industrial Bulk Solids Handling**, led by Professor Don McGlinchey.

McGlinchey and researchers at the Centre are developing an instrument for online, continuous, non-invasive measurement of solid mass flowrate. The patented Thermal Solids Mass Flowmeter is currently a prototype device that is being tested in a pneumatic conveying system, but further investment and development is needed before it is ready for commercial use, says McGlinchey.

GCU's McGlinchey and Perthshire-based **LoadFast Systems** recently won an innovation award at the Interface Excellence Awards in Edinburgh, Scotland, for a new type of cascade-chute materials handling system developed by their partnership. The GraviLoad controlled-flow chute system can be used in various industries, including the plastics sector, where it is necessary to minimize dust and damage to the product, notes John Fuller, president of LoadFast. The system uses spoon-based elements with a geometry designed using discrete element modelling to prevent the damage and dust that can be created in conventional cascade chutes.

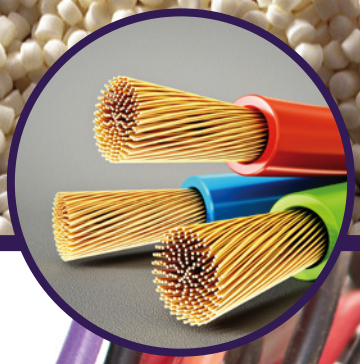
Another company that has been focusing on reducing damage to materials is **Flexicon** of the USA. Its Flexi-Disc tubular cable conveyor provides gentle, low-power transfer of friable materials. The conveyor uses low-friction, polymer discs to slide materials through smooth, stainless-steel tubing that can be routed horizontally, vertically or at any angle. The cable-disc assembly is pulled through the tubing circuit by a drive wheel at one end of the circuit and kept taut by an automatic cable tensioner at the opposite end of

Cables 2015

The international conference and exhibition for polymers in wire & cable

CLICK HERE FOR DETAILS





HEADLINE SPONSOR

ALBEMARLE®

3-5 March 2015
Maritim Hotel, Cologne, Germany

Images courtesy of: **ExxonMobil**

** + 19% German VAT*

FINAL REMINDER – BOOK NOW

Organised by:
Applied Market Information Ltd.

Also sponsored by:
LKAB Minerals, Nabaltec, Borealis Keep Discovering, Euro Piren, Sikora Technology To Perfection, Eupen, DVE, Dow, melos

Media supporter:
compounding WORLD

Becca Utteridge – Conference Organiser rju@amiplastics.com Ph: +44 117 924 9442 Fax: +44(0)117 311 1534

Motan-Colortronic's Metrolink materials selection system sets up and monitors material paths

the circuit. The conveyor is available in both 15-cm (6-inch) and 10-cm (4-inch) diameter discs.

Flexicon is doubling the size of its US headquarters and manufacturing facility in Bethlehem, Pennsylvania, in an expansion project that is expected to be completed in the first quarter of 2015. The expansion will increase the company's ability to respond to marketplace demands and accelerate product development, says president and CEO David Gill. The company also opened a new office in Singapore last year to service South East Asia.

Another recent development in conveyors is a line of flexible screw conveyor systems that have been introduced by **National Bulk Equipment** for use in demanding environments. The conveyor discharge head is 12-gauge 304-stainless steel, formed and welded with continuous-weld seams that are ground and hand-burnished to eliminate gaps, joints and bolts. This avoids the materials accumulation that can occur with bolt-together, sheet-metal designs. Typical plastics that would be handled in these systems include reinforced polypropylene, high-impact polystyrene, acrylonitrile butadiene styrene (ABS), and recycled-content polyolefins, says the company.

Loading and feeding

Motan-Colortronic's new Metro G range of material loaders are designed for granular materials and combine the best of Motan's and Colortronic's designs, enhanced with new features, says Carl Litherland, group marketing vice-president at the company. The modular, building-block system can be configured for specific applications with, for example, various types of vacuum valves and filters. Material inlets are available with different materials of construction, and the material inlets are now exchangeable so that the most appropriate inlet can be used, for example for handling more abrasive materials.

At Fakuma 2014, the company also exhibited its Metrolink materials selection system, an automatic coupling system that sets up and monitors the material path to eliminate errors. Each Metrolink unit allows a maximum of 32 processing machines to be fed with up

MASTERBATCH 2015

Connecting with downstream customers

CLICK HERE FOR MORE DETAILS

9-11 June 2015
Maritim Hotel,
Cologne, Germany

Organised by:
Applied Market Information Ltd.

Sponsored by:
STEER

Media supporter:
compounding WORLD

Maud Lassara - Senior Conference Organiser ml@amiplastics.com Ph: +44(0)117 924 9442 Fax: +44(0)117 311 1534

Schenck has found a way to reduce batch feeding errors using its VKD software in its Disocont Tersus controller

to 16 different materials.

Brabender Technologie is well known for its FlexWall feeders which feature a polyurethane hopper massaged by external paddles to ensure the accurate metering of hard to handle materials. Its latest addition to this range is the FlexWall 20 which is the smallest model in the line-up. It can deliver low feed rates of just a few kilograms per hour.

For bulk ingredient metering at laboratory rates, Brabender also offers the **RotoTube Feeder**, a miniature rotary tube feeder for pellets and granular ingredients, and the **Brabender MiniTwin Feeder**, one of the smallest twin screw metering feeders in the world. They can both feature new brushless DC motors with integrated speed controllers that help them to accurately meter ingredients rates of a few grams per hour. The two feeders are available as volumetric units or as scale-mounted gravimetric feeders.

Maguire's PeriStep liquid-colour pump has been developed to provide greater accuracy

Schenck Process has developed a new method to reduce batch feeding error rates by 50% using its VKD Software in its Disocont Tersus feeder controller. The process is known as bumping and it involves running a dry material feeder at full speed, stopping it prior to the batch set point and then having the controller bump the helix motor in a range anywhere from 100 millisecond to 100 second intervals until the batch is within the specified tolerance.

Following this method of batching requires the disabling of the automatic adaption on the controller, which prevents it from changing the correction amount. By doing so, the controller can be stopped short of the batch set point and then bumped to the tolerance specified in the parameter. Lab testing has proven this method to reduce batch feeding errors by up to 50% depending on the material and helix type.

Liquid colour is increasingly being used by compounders as well as by extruders and moulders of final parts. **Maguire Products**' new liquid-colour pump, the patent-pending PeriStep, is claimed to provide 20% greater accuracy compared with standard volumetric pumps in dosing liquid colour directly into the main flow of natural resin. It includes a self-adjusting automatic speed control that maintains dosing consistency.

For colour changes, the operator retracts the top cover of the pump and lays a new tube over the rollers inside, without the requirement to work the tube into a compression zone. Tubing is reusable for up to six months and is available in three sizes to accommodate a range of dosing outputs. Instead of a standard motor, the drive system is a stepper motor with a shaft that rotates in discrete, minute increments that delivers precision and repeatability of movement.

The motor drives a central "sun" roller and its motion transfers to the "planetary" rollers that provide the compression-relaxation cycle of a peristaltic pump. Maguire has reduced the number of planetary rollers to four from the conventional six. The sun roller drives the planetary rollers by means of friction contact, providing a 5-to-1 speed reduction without a gear box.

"The compact, streamlined design of the PeriStep pump lends itself to minimal maintenance, since there are no gears or bearings to wear out," says Steve Maguire, president of Maguire Products. "If it does become necessary to disassemble the pump, access to the roller set involves simply removing three screws in the cover."

Click on the links for more information:

- **www.coperion.com**
- **www.ktron.com**
- **www.bulk-solids.k-state.edu**
- **www.vortexvalves.com**
- **www.bulksolids.com.au (Tunra)**
- **www.gre.ac.uk/wolfsoncentre**
- **www.particulatesolidshandling.com (GCU)**
- **www.loadfastsystems.com**
- **www.flexicon.com**
- **www.nbe-inc.com**
- **www.motan-colortronic.com**
- **www.brabender-technologie.com**
- **www.schenckprocess.com**
- **www.maguire.com**

This month's free brochure downloads

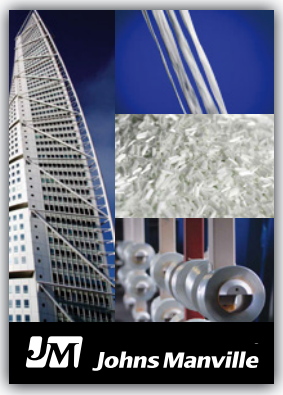
Simply click on the brochure cover or link to download a PDF of the full publication

Coperion K-Tron: product overview

This new 16-page brochure from Coperion K-Tron covers the company's broad range of process feeding and pneumatic conveying equipment as well as its complete materials handling systems.

➤ Click here to download

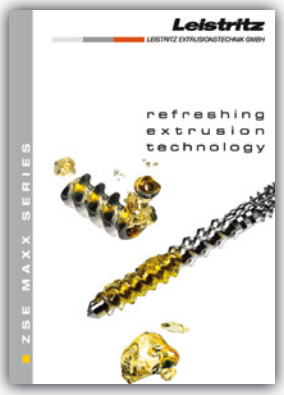
Johns Manville: glass fibres



This brochure from Johns Manville Fibers division examines its offerings in ThermoFlow chopped strands and StaRov LFT^{Plus} rovings for thermoplastics compounders and the different markets it serves.

➤ Click here to download

Leistritz: ZSE Maxx extruders



This 12-page brochure covers Leistritz's state-of-the-art ZSE MAXX twin-screw extruders in great detail. These high-torque, high-volume machines have been developed to deliver improvements in productivity, throughput and quality.

➤ Click here to download

PlasMec: PVC mixing/cooling

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

➤ Click here to download

RE Scheer: Bullet pelletizer

This brochure from Reduction Engineering Scheer has full details of its Bullet range of strand pelletizers. These are designed to be easy and fast to clean and service, making them ideal for rapid changeovers.

➤ Click here to download

Maguire: gravimetric blenders

This interactive product guide covers Maguire's full range of WSB gravimetric blenders. It explains how the blenders operate and includes technical specifications, key benefits, plus options and accessories.

➤ Click here to download

If you would like your brochure to be included on this page, please contact Claire Bishop. claire@amimagazines.com. Tel: +44 (0) 1732 605976

PSA Peugeot Citroën worked with Rehau and a team of polymer specialists to develop its striking – and functional – Airbump technology. **Chris Smith** finds out more

Citroën aims to take the knocks

Main image: Citroën's new Airbump is likened to bubble-wrap for cars – an impact resistant polymer skin designed to protect from bumps and scrapes

Below: Airbump is also used as a multifunctional design feature on the Cactus C4

PSA Peugeot Citroen's new C4 Cactus crossover car packs quite a number of novel design and engineering features but the most immediately striking must be its huge Airbump side panels – large areas of injection moulded thermoplastic cladding designed to ensure this new small family urban vehicle is able to shrug off the bumps and scrapes of modern city living.

The Airbump system has been developed by Citroën's engineers together with technical specialists at plastics automotive component group Rehau. Designed to cover much of the side surface of the vehicle, each Airbump panel is comprised of a series of air-filled cushioning 'capsules' designed to deform by up to 20mm as they absorb unwanted impacts from carelessly-opened car doors as well as the minor collisions with shopping trolleys in car parks that result in unsightly dents in conventional steel door skins.

Citroën claims the Airbump technology will allow the factory finish of the vehicle to be maintained for longer and could reduce ongoing servicing and repair costs for C4 Cactus owners. The company says this improvement relates both to impact and scratch resistance – it claims the Airbump panels are much more resistant to scratches than painted steel.

The flexible Airbump cushions are injection moulded in a newly-developed Elastollan thermoplastic polyurethane (TPU) grade developed by BASF. This UV-stabilised grade is said to have made it possible to specify a TPU for use in a large exterior automotive application for the first time – the materials have, until now, been used in the engine compartment or in interior applications such as door handles and control knobs.

According to BASF, the new Elastollan AC55D10 HPM grade combines the good tensile strength, abrasion resistance, elasticity and low temperature impact performance characteristics expected of a conventional TPU together with outstanding surface finish, easy cleaning, and resistance to scratching and UV exposure.

BASF also says that processing has been improved with the AC55D10 HPM product. The company claims the new grade can be injection moulded on cycle times 50% shorter than typical for a conventional TPU material. The processing window is also said to be broader, while significantly improved flow performance means the 1.5-1.8mm wall thicknesses required for the Airbump capsules can be easily produced without sacrificing the final quality of the surface.

"Because of the high demands on surface

PVC Formulation 2015

Global conference on the PVC industry, compounding, recipes and market trends

CLICK HERE FOR DETAILS

Images courtesy of: **EVCM**

HEADLINE SPONSOR

Perstorp
WINNING FORMULAS

16-18 March 2015
Maritim Hotel,
Cologne, Germany

** + 19% German VAT*

FINAL REMINDER – BOOK NOW

Organised by:
Applied Market Information Ltd.

Also sponsored by:

BASF The Chemical Company · NYNAS · EASTMAN · Emerald Kalama Chemical · heubach COMPETENCE IN COLOR

Media supporters:

compounding WORLD · AGPU

Giulia Esposito, Conference Organiser ge@amiplastics.com Ph: +44 117 924 9442 Fax: +44(0)117 311 1534

POLYMER SOURCING & DISTRIBUTION 2015

A new era for the polymer supply chain

CLICK HERE FOR DETAILS

HEADLINE SPONSOR

Biesterfeld
Biesterfeld Plastic GmbH

18-20 May 2015
Marriott Hotel,
Hamburg, Germany

** + 19% German VAT*

SPECIAL OFFER: Save €150* if you register before 17th April 2015

Organised by:
Applied Market Information Ltd.

Media supporter:
compounding WORLD

Maud Lassara – Senior Conference Organiser ml@amiplastics.com Ph: +44 117 924 9442 Fax: +44(0)117 311 1534

and colour, hardness and flexibility, the close cooperation with BASF in material formulation and application development was a decisive factor for us", says Bernard Delles, who headed up the Airbump project at Rehau.

Development of the Airbump concept was initiated at Rehau's French operation at Morhange, near Metz. However, series production is carried out at the company's production site at Tortosa in Spain, with finished Airbump panels delivered directly to the PSA assembly line in Madrid.

Each injection-moulded capsule is mounted on a rigid injection moulded support shell that is fixed to the metal door (the shell moulding is produced in a Pulse PC/ABS blend supplied by Styron). The ability of the Elastollan HPM grade to form a tight assembly is said to be key to creating the resulting impact-absorbing flexible cavities.

Aside from the mechanical performance, the Airbump capsules are also used as a styling feature. The Airbump panels are produced in four colours – black, grey, dun(grey-brown) and chocolate – which can be paired up with the 10 different body colours, allowing the owner to personalise their car.

The engineering team worked with PolyOne to develop a specialty colour and additive system that allows the panels to meet the stringent UV stability, appearance and durability requirements laid down by Citroën, which says the Airbump panels will not require any special maintenance. The additive system was developed from PolyOne's OnColor Smartbatch product line.

"By working with Citroën and its Tier One suppliers, we were able to develop an advanced solution that provides the panels with uniform, attractive, and durable colour despite exposure to sunlight, heat, and detergents," says Christopher Palm, general manager for PolyOne's colour and additives business in EMEA and India. "TPU materials are rarely selected for a vehicle's exterior, but by working together, we were able to overcome several material-related challenges."

Although much less obvious visually than the side impact panels, Citroën also uses the Airbump technology in the more highly exposed areas of the C4 Cactus front and rear bumpers (fenders) and in the spoiler system, all of which are manufactured by Faurecia. The automotive components group developed new assembly techniques to handle the Airbump TPU sections, which are incorporated in the exposed corner sections of the components.

"The innovation lay not only in the material but also in the mounting," says Sébastien Bret, Development Manager at Faurecia. "BASF has developed a plastic that required a new assembly technology. We worked closely to meet the requirements for the industrial

Left: The Cactus Airbump system is said to be the first large exterior automotive application for a TPU. The Airbump side panels are produced by Rehau for Citroën using a new BASF Elastollan TPU

mass production of these unusual parts."

Citroën says the goal for the Airbump development team was to help produce a car that is "as good as new after three years on the road." It says the system has been extensively tested in the laboratory and on the road to establish its resistance to key scratching, impact, thermal cycling, UV exposure, hand and jet-washing, and the car maker claims an improvement of at least 2.5 times over conventional construction materials. Despite the additional protection, the C4 Cactus weighs some 200kg less than the previous C4 model.

However, Airbump is not simply a practical addition to the vehicle. "With their characteristic Elastollan surface, Airbumps embody the philosophy of the Citroen C4 Cactus perfectly – they have style and are multifunctional," says Jérôme Vinot Préfontaine, purchasing general manager for the C4 Cactus programme at PSA Peugeout Citroën.

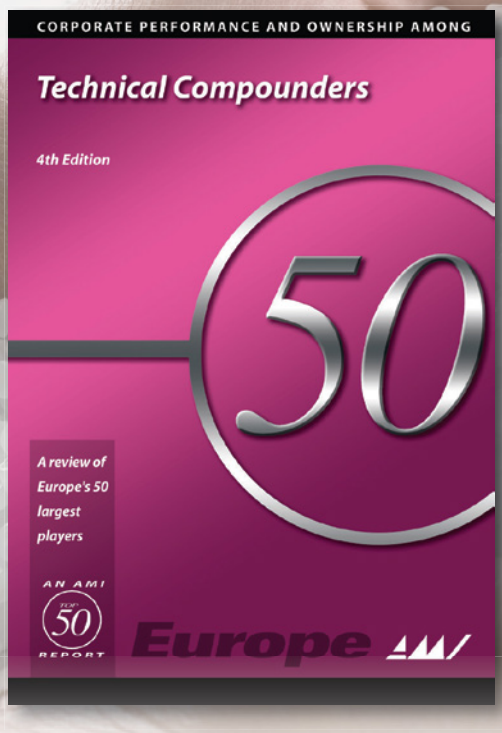
"Together with BASF and the suppliers of the Airbump parts, we have shaped the material development and manufacturing process in such a way that the two have resulted in models offering the optimum combination of quality, aesthetics and costs," he said.

Click on the links for more information:

- **www.basf.com**
- **www.faurecia.com**
- **www.polyone.com**
- **www.rehau.com**

The Technical Compounding Industry in Europe is Changing Shape

Consolidation in Western Europe
Capacities building up in Eastern Europe
Asian groups emerging amongst the leading players



The business strategy of companies such as Ravago, A Schulman and Polyone as well as independent technical compounders is revealed in this unique report.

Click here for more details

Save time and effort

The information is at your fingertips.

For each of the 50 leading producers on technical compounds in Europe you will see:

- ✓ Business overview including recent acquisitions and investments
- ✓ Financial results
- ✓ List of plants operated in Europe and their compound production

For more information contact us on **sales@amiplastics.com** or Tel: **+44 117 314 8114**

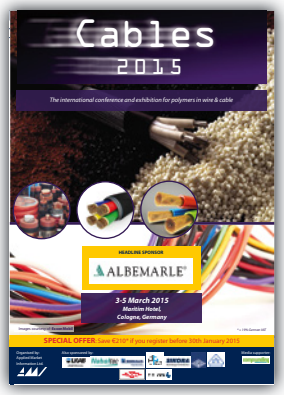
APPLIED MARKET INFORMATION LTD.

www.ami-publishing.com

Download the programmes for these forthcoming conferences

Simply click on the brochure cover or link to download a PDF of the full publication

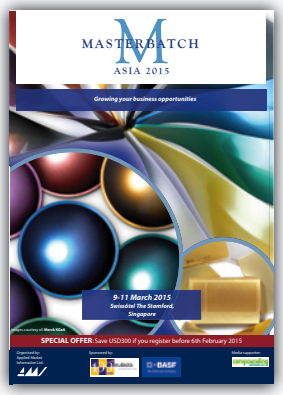
Cables



The 15th edition of AMI's international conference and exhibition for polymers in wire and cable will take place on 3-5 March in Cologne, Germany. Download the event's brochure to see the full line-up of speakers, along with booking details.

➤ **Click here to download**

Masterbatch Asia



AMI's 11th Masterbatch Asia conference returns to Singapore on 9-11 March. Download the programme which includes an impressive line-up of speakers including representatives from Sony and PolyOne.

➤ **Click here to download**

PVC Formulation

PVC Formulation 2015 is taking place on 16-18 March in Cologne, Germany. This global conference on the PVC industry, compounding, recipes and market trends always attracts a large and influential audience.

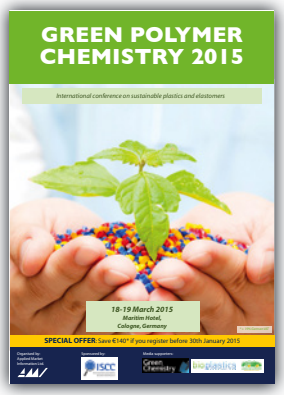
➤ **Click here to download**

Specialty Packaging Films Asia

AMI is holding the second Specialty Packaging Films Asia conference in Singapore on 17-19 March 2015. The programme covers market and technology trends in flexible barrier packaging for retail and industrial applications.

➤ **Click here to download**

Green Polymer Chemistry



The next international conference on sustainable plastics and elastomers is being held on 18-19 March 2015 in Cologne, Germany. Download the programme which covers leading edge biobased materials and their applications.

➤ **Click here to download**

AMI Strategy Seminars

AMI's research director Andrew Reynolds is running eight one-day Global Plastics Industry Seminars in 2015 with dates set for Europe, America, Asia and the Middle East. This brochure has all the details.

➤ **Click here to download**

To see our full line-up of more than 30 plastics industry events over the next 12 months, please visit www.amiconferences.com

The Global Plastics Industry Seminar

A strategic review of the prospects for the global plastics industry

2015 seminar dates and locations

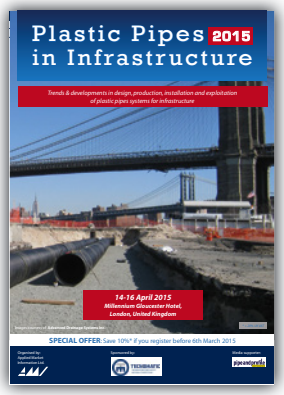
9th	April	2015	Bristol	UK
14th	April	2015	Cologne	Germany
30th	April	2015	Philadelphia	USA
21st	May	2015	Hamburg	Germany
9th	June	2015	Cologne	Germany
29th	October	2015	Cologne	Germany
3rd	December	2015	Singapore	Singapore
7th	December	2015	Dubai	United Arab Emirates

Organised by:
Applied Market Information Ltd.

Download the programmes for these forthcoming conferences

Simply click on the brochure cover or link to download a PDF of the full publication

Plastic Pipes in Infrastructure



AMI's third international conference on plastics pipes for infrastructure applications will be held in London on 14-16 April 2015. Download the programme which covers the latest design, production and installation developments.

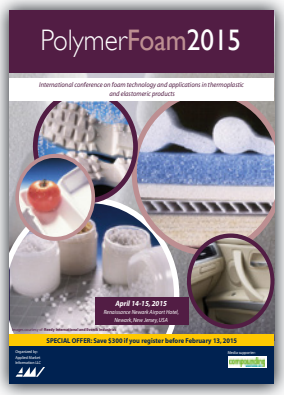
➤ **Click here to download**

Stretch & Shrink Film

Stretch & Shrink Film 2015 is the international conference for the stretch & shrink film industry. This will be 12th time that AMI has held the event in Europe and it has assembled another strong programme that you can download here.

➤ **Click here to download**

Polymer Foam



AMI's international conference on thermoplastic and elastomeric foam technologies and applications is being held on 14-15 April in Newark, New Jersey, USA. Check out the Polymer Foam 2015 programme here.

➤ **Click here to download**

Compounding World Congress

Following the considerable success of the Compounding World Forum in the USA, *Compounding World* magazine and AMI are launching this new event in Europe. The programme features a selection of the industry's most influential leaders.

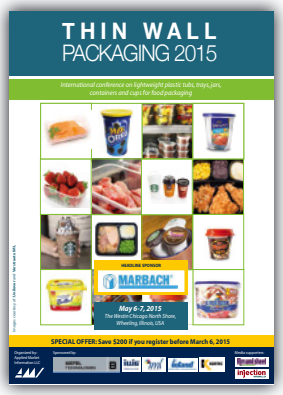
➤ **Click here to download**

Plastic Pouches

Taking place in Vienna on 27-29 April, this international conference will examine the latest market, technical and commercial developments in plastic pouch formats. Download the brochure for full details.

➤ **Click here to download**

Thin Wall Packaging



The American version of AMI's very popular Thin Wall Packaging conferences returns to Chicago on 6-7 May. Download the four-page brochure to check out the impressive line-up of expert speakers at this year's event.

➤ **Click here to download**

To see our full line-up of more than 30 plastics industry events over the next 12 months, please visit www.amiconferences.com

PolymerFoam2015

International conference on foam technology and applications in thermoplastic and elastomeric products

CLICK HERE FOR DETAILS

April 14-15, 2015

Renaissance Newark Airport Hotel, Newark, New Jersey, USA

Images courtesy of: **Reedy Chemical Foam & Specialty Additives and Evonik Industries**

FINAL REMINDER – BOOK NOW

Organized by:
Applied Market Information LLC

Media supporter:
compounding WORLD

Stephanie Berchem – Conference Coordinator sb@amiplastics-na.com Ph: +1 610 478 0800 Fx: +1 610 478 0900

Download the programmes for these forthcoming conferences

Simply click on the brochure cover or link to download a PDF of the full publication

Fire Retardants in Plastics

Covering market trends and technical developments in the international flame retardant industry, AMI's Fire Retardants in Plastics conference returns to Denver, Colorado, USA on 12-13 May. Download the programme here.

➤ Click here to download

Polymer Sourcing & Distribution

AMI's 11th conference on the polymer supply chain returns to Hamburg, Germany on 18-20 May 2015. The programme covers developments in polymer distribution and includes analysis of polymer supply and demand trends.

➤ Click here to download

Multilayer Packaging Films

Taking place on 2-3 June in Chicago, Illinois, USA, the sixth Multilayer Packaging Films conference will cover the latest business and technology trends in the specialty flexible packaging industry. This brochure has all the details.

➤ Click here to download

Plastic Closure Innovations

AMI's 3rd international conference on Plastic Closure Innovations will take place on 9-11 June 2015 in Berlin, Germany. Download the brochure to see the high-level programme that covers market and technical developments in caps and closures.

➤ Click here to download

Oil & Gas Polymer Engineering

Taking place on 9-10 June 2015 in Houston, Texas, this new conference will focus on qualifying and utilising elastomers, thermoplastics, composites and coating materials in oilfield applications. Download the brochure to see the full programme.

➤ Click here to download

Profiles

AMI's 14th international Profiles conference returns to Philadelphia, PA, USA on 9-10 June 2015. Download the programme which features presentations on materials developments plus advances in extrusion technology and materials testing.

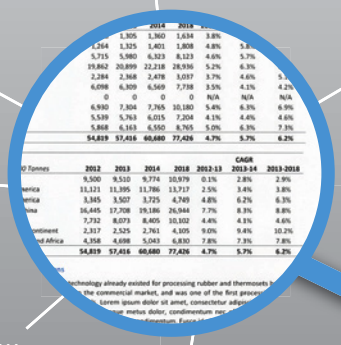
➤ Click here to download

To see our full line-up of more than 30 plastics industry events over the next 12 months, please visit www.amiconferences.com

GLOBAL POLYMER DEMAND

An AMI Consulting Data Report

NEW



Fibre Extrusion

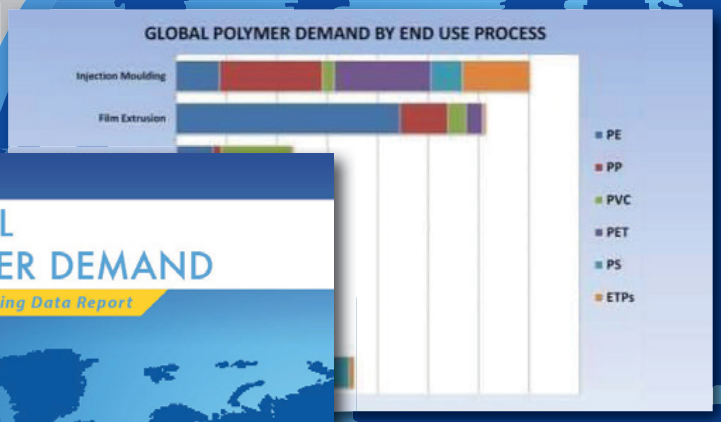
Film Extrusion

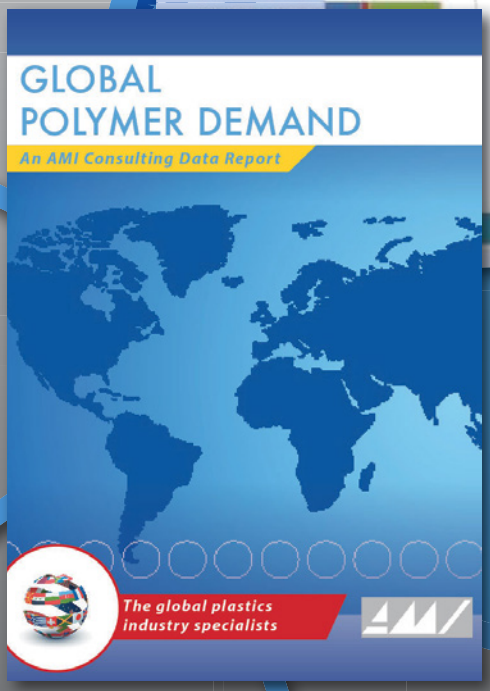
Pipe/ profile Extrusion

Injection Moulding

Blow Moulding

Sheet Extrusion





Click here to view sample pages or to order

Engineering Polymers

PET

LDPE

ABS

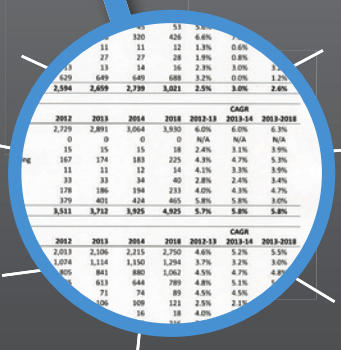
LLDPE

PS/EPS

HDPE

PP

PVC



Asia - Pacific

South America

Europe

Middle East and Africa

Greater China

North America

Indian Sub Continent

Included in this report:

- Detailed demand analysis by polymer and by region
- The nature of processing carried out in each region
- Regional profiles with key facts, trends and stastics
- Identification of where the best growth opportunities are

Download the programmes for these forthcoming conferences

Simply click on the brochure cover or link to download a PDF of the full publication

Masterbatch

The 28th edition of AMI's Masterbatch conference is being held on 9-11 June 2015 in Cologne, Germany. This year's programme features speakers from Lego, PepsiCo and Microsoft. Download the 12-page brochure to see the full line-up.

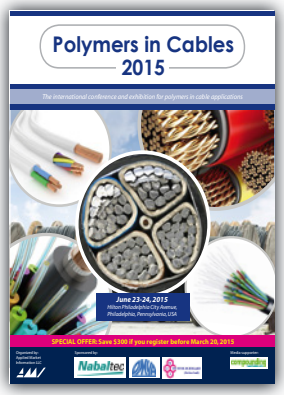
➤ **Click here to download**

BOPP Film

AMI's 9th international conference for the bi-oriented polypropylene film industry is taking place on 23-25 June 2015 in Berlin, Germany. The speaker line-up includes representatives from PepsiCo, HJ Heinz, Nestlé and leading film producers.

➤ **Click here to download**

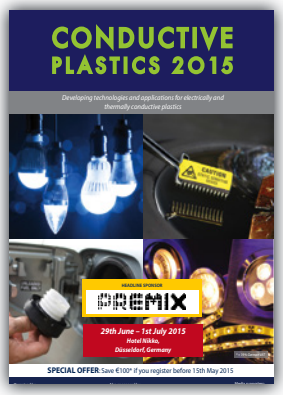
Polymers in Cables



The American version of AMI's conference on Polymers in Cables applications is being held in Philadelphia, PA, USA on 23-24 June. Check out the programme which covers interesting materials and application developments.

➤ **Click here to download**

Conductive Plastics



This new conference from AMI covers thermally- and electrically-conductive thermoplastics, examining materials technology developments as well as emerging market opportunities. It takes place in Düsseldorf, Germany on 29 June to 1 July.

➤ **Click here to download**

Conference sponsorship

Sponsoring AMI conferences is a great way to promote your company to influential audiences from specific sectors of the global plastics industry. Find out more about the cost-effective packages on offer in this brochure.

➤ **Click here to download**

Advertise in this magazine

Download the brand new Compounding World 2015 media pack which includes our latest global circulation figures, our comprehensive features line-up for 2015, and our very competitive advertisement rates.

➤ **Click here to download**

To see our full line-up of more than 30 plastics industry events over the next 12 months, please visit www.amiconferences.com

Luxus

Head office location:	Louth, Lincolnshire, UK
Date founded:	1965
Managing director:	Peter Atterby
Ownership:	Privately owned
No. of employees:	150
Sales 2014:	£25 million (€32 million)
Plant locations:	Louth, Lincolnshire, UK
Production 2014:	30,000 tonnes

Profile:	Luxus is one of the UK's leading independent technical plastics recycling and compounding companies. For the past 50 years, it has been developing highly specified thermoplastics compounds based on prime and recycled feedstock. It recently secured a £600,000 EU grant to commercialise its Hycolene range of lightweight recycled PP compounds in the European automotive trim market. A new Coperion twin-screw line is being commissioned this month to facilitate additional production volumes.
Product line:	Luxus engineers technical thermoplastic compounds based on prime and recycled polymers combinations including PE, PP, ABS, PC, PBT, PS and PA. The company is the only UK approved supplier of recycled grades (with up to 60% recycled content) for the use in car interior trim. Luxus serves injection moulders, blow moulders, rotomoulders and extruders operating in many sectors including the automotive, civil engineering, construction safety, rigid packaging, waste containers, domestic products and horticulture industries.
Product strengths:	Hycolene has been formulated to offer excellent tensile properties, weight reductions of 12% and improved scratch resistance.

To be considered for 'Compounder of the Month' contact Karla Vittova at kv@amiplastics.com

compounding WORLD

Forthcoming features

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

March
Special effect pigments
Twin-screw extruders
Natural fibres & fillers
NPE 2015 show issue

April
Electrically conductive compounds
Additives for recycled plastics
Reactive compounding
Plast 2015 preview

Editorial submissions should be sent to Andy Beevers: abe@amiplastics.com

For information on advertising in these issues, please contact
Claire Bishop: claire@amimagazines.com Tel: +44 (0) 1732 605976

Catch up on our recent issues for FREE

Simply click on the cover to see the full magazine, or download the issue in the relevant Apple or Android app

Compounding World – Jan
The January edition of Compounding World contains special reports on chemical foaming agents, pelletizing systems, and additives for films. Plus there's coverage of industry events in India, the USA and Germany.

➤ Click here to view

Compounding World – Dec
Compounding World's December edition is packed with articles on the latest developments in flame retardants, lab-scale compounding lines, bio-based plastics and materials for laser marking and welding.

➤ Click here to view

Injection World – Jan/Feb
This edition of Injection World magazine is packed full of features on thin-wall moulding, thermoplastic composites, modelling software, smart factories and European market trends. Plus there's a focused preview of NPE.

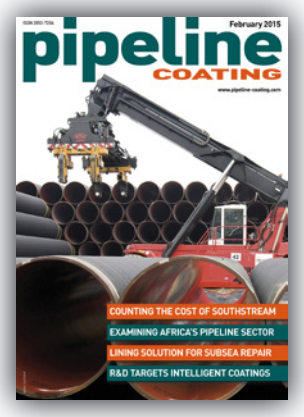
➤ Click here to view

Film and Sheet – Jan/Feb
This edition of Film and Sheet Extrusion includes reports on developments in bioplastics, materials testing technologies, and new polyolefin grades and applications. Plus there is a preview of the NPE 2015 exhibition.

➤ Click here to view

Pipe and Profile - Jan/Feb
The January/February 2015 edition of Pipe and Profile Extrusion looks at the latest developments in screenchangers, trends in the titanium dioxide market, and innovation in ETP and composite pipe.

➤ Click here to view



Pipeline Coating – Feb
The February edition of Pipeline Coating takes an in depth look at investment in the African pipeline industry. Plus the latest oil and gas market outlook, offshore lining technology and smart coating developments.

➤ Click here to view

Take out your own FREE subscriptions to any of the magazines. Click on the logos below to simply register on-line.

compounding WORLD injection WORLD pipe and profile EXTRUSION film and sheet EXTRUSION

Global exhibition guide

10-12 March	JEC Composites, Paris, France	www.jeccomposites.com
10-14 March	Koplas, Seoul, South Korea	www.koplas.com
12-14 March	3P Plas Print Pack, Lahore, Pakistan	www.plasprintpack.com.pk
23-27 March	NPE, Orlando, FL, USA	www.npe.org
26-28 March	Eurostampi & Plastixexpo, Parma, Italy	www.mecspe.com
8-10 April	Plastic Japan, Tokyo, Japan	www.plas.jp/en
21-24 April	Elmia Polymer, Jönköping, Sweden	www.elmia.se/en/polymer
28-30 April	PlastPrinkPack Nigeria, Lagos, Nigeria	www.ppp-nigeria.com
4-8 May	Feiplastic, Sao Paulo, Brazil	www.feiplastic.com.br
5-9 May	Plast, Milan, Italy	www.plastonline.org/en
13-16 May	Plastic Expo, Tunis, Tunisia	www.plasticexpo.com.tn
20-22 May	Afriplast Expo, Johannesburg, South Africa	www.exhibitionsafrica.com
20-23 May	Chinaplas, Guangzhou, China	www.chinaplasonline.com
26-29 May	Plastpol, Kielce, Poland	www.targikielce.pl/en
16-17 June	PDM/PRE/PPS, Telford, UK	www.pdmevent.com
16-18 June	Plast-Ex, Toronto, Canada	www.plast-ex.org
9-12 July	InterPlas Thailand, Bangkok, Thailand	www.interplasthailand.com

AMI conferences

3-5 March	Cables, Cologne, Germany
9-11 March	Masterbatch Asia, Singapore
16-18 March	PVC Formulation, Cologne, Germany
18-19 March	Green Polymer Chemistry, Cologne, Germany
14-15 April	Polymer Foam, Newark, NJ, USA
21-23 April	Compounding World Congress, Cologne, Germany
12-13 May	Fire Retardants in Plastics, Denver, CO, USA
9-10 June	Profiles, Philadelphia, PA, USA
9-11 June	Masterbatch, Cologne, Germany
23-24 June	Polymers in Cables, Philadelphia, PA, USA
29 June – 1 July	Conductive Plastics, Düsseldorf, Germany
6-8 October	Compounding World Asia, Singapore

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

www.amiplastics.com

NPE 2015 SPECIAL EDITION

Extrusion Solutions

produced by spi

THE LATEST EXTRUDING NEWS FROM ENTEK

americhem® CHOOSES ENTEK

Leading Global Compounder Uses ENTEK Extruders for Color Compounding . . . and Much More

Americhem's Liberty, North Carolina plant was designed and built through the ENTEK/ Americhem partnership. It employs industry-best practices to produce high quality color concentrates and compounds.

It started with a successful lab trial several years ago that proved out a customer concept. Today, it is a partnership between ENTEK and one of the largest custom color concentrates manufacturers in the world.

Based in Cuyahoga Falls, Ohio, Americhem Inc. recently celebrated its 73rd year in business as a leader in color and additive solutions. The company is a global leader with 12 facilities and nine manufacturing plants worldwide. Americhem is in the midst of a multi-year plan to move their manufacturing platform to state-of-the-art high speed, high efficiency equipment in order to drive their service, quality and cost position to optimum levels. ENTEK is proud to be partnering with Americhem to help them succeed with this initiative, and is a key supplier to the company for twin-screw extruders, replacement wear parts and plant engineering services.

First, A Successful Lab Trial

Like most ENTEK customer relationships, this one began in the ENTEK in-house development lab. Americhem first approached ENTEK in 2007 with a need to run lab trials to successfully increase processing rates for their compounds. The success of that trial led to Americhem's purchase of their first ENTEK twin-screw extruder.

"We were successful in helping Americhem produce their color concentrates to their specifications," said John Effmann, ENTEK Director of Sales and Marketing. "Our twin-screw extruders provided them with higher speeds, better mixing capabilities and better output than what they were achieving with their existing lines." The successful trials led to Americhem purchasing two ENTEK 53mm twin-screw extruders; today, the company operates a number of ENTEK twin-screw extruders across the globe in sizes ranging from 27mm to 103mm, servicing specific market and customer needs.

Beyond Machinery – to State-of-the-Art Manufacturing Operations

As time went on, ENTEK's relationship with Americhem grew. "We worked hard at building a technical processing relationship by listening to what Americhem wanted to accomplish, and working with them to meet and exceed those needs," said Effmann.

(continues on page 6)

A Work of Art

Welcome to the latest issue of *Extrusion Solutions*.

January 22 was a special day here at ENTEK. On that day, we held a press conference here at our headquarters in Lebanon, Oregon, and introduced our all-new QC³ 43MM twin-screw extruder. In addition, we gave numerous presentations to educate our guests on the full range of ENTEK's capabilities and showed off our facilities, including a complete tour of our machine shop and a walk through our new Line 11 battery separator facility.

It Takes a Great Team

The introduction of the QC³ 43MM was a big deal for all of us, but especially for the team that spent many hours over the past couple of years researching, designing, and building this new machine. I can personally say it was an honor working with this dedicated group of professionals (see their photo in our new ad, which appears on p. 8). They were challenged many times to find what our customers wanted and needed in a twin-screw extruder, and then build a machine that will truly improve their operations.

But it went further than that; they were also challenged to design and build a *work of art,* a beautiful machine that stands out among the rest. We feel with the QC³ 43MM, we've done just that. This is an extruder that a materials compounder will be proud to have, a showpiece in their plant and a workhorse that is easier to maintain, easier to run, and will provide higher productivity and better quality end product.

> *"But it went further than that; they were also challenged to design and build a work of art, a beautiful machine that stands out among the rest. We feel with the QC³ 43MM, we've done just that."*

We Hope to See You at NPE 2015

Another NPE show is upon us, and we are excited to introduce our new QC³ 43MM twin-screw extruder to the world. Come by our booth (W6486) and meet the team that designed and built our new work of art!

In addition to the new machine launch, we will also feature displays and information on our turnkey plant services, complete extrusion systems, replacement wear parts and aftermarket programs, and in-house lab services.

Stay tuned for more news in future issues of *Extrusion Solutions* on how ENTEK can better serve you and help you improve your operations.

As always, I encourage you to contact me anytime at khanawalt@entek.com.

Sincerely,

Kirk R. Hanawalt

Dr. Kirk Hanawalt
President, ENTEK Extruders

ENTEK Introduces New QC^3 43MM Twin-Screw Extruder – Providing Enhanced Quick-Change, Quick-Clean, and Quality Control Capabilities to Compounders

At a press conference at its Lebanon, Oregon headquarters on January 22, ENTEK introduced its new QC^3 43MM twin-screw extruder – an all-new, highly engineered machine that represents the culmination of several years of design and development. ENTEK will display the new machine at NPE 2015 in Orlando, FL, March 23-27 at the Orange County Convention Center.

ENTEK worked closely with its compounding customers and used lean principles to drive the development of the QC^3 43MM. The result is a new co-rotating twin-screw extruder that provides important benefits to compounders, especially "QC^{3TM}":

• **Quick Change:** allows for fast, easy screw-set changeovers. New self-alignment feature takes the worry out of installing the screws into couplings, and new design allows screws to only be installed one way – the correct way. Guards come off quickly, and go back on the same way. All necessary tools for changeover and maintenance are mounted at point-of-use on the extruder.

• **Quick Clean:** New extruder frame design deflects dust and keeps machine clean under the hood, and Stainless Steel and powder-coated surfaces look great today and 10 years from now. Optional device allows for fast, easy barrel cleaning.

• **Quality Control:** All QC^{3TM} twin-screw extruders are engineeredand built at ENTEK's headquartersin Lebanon, Oregon U.S.A. Top-quality components manufactured in ENTEK's shop give years of top-quality performance.

• **Better Compounding:** Increased production rates (33% higher output shaft torque) with 200HP/1,200rpm motor and increased screw OD/ID for compounding the most challenging formulations.

• **Ease of Use:** SMART controls feature enhanced graphics, recipe library, trending software, and web-based connectivity for remote troubleshooting.

"All of these benefits were things that our customers communicated to us that they wanted," said John Effmann, ENTEK Extruders' Director of Sales & Marketing. "Their challenge to us was to design and build a twin-screw extruder that solved these problems, made their lives easier and increased their productivity. This machine answers those needs. This is a machine designed for customers looking for the highest productivity, versatility, utilization and quality."

The QC^3 43MM twin-screw extruder features a 43mm barrel bore diameter, which is a new size for ENTEK machines. "Our research has shown that this size is the most common for general material compounding applications," said Effmann. "We will continue to provide the industry with our complete range of machines, which run from 27-133mm sizes. For now, the QC^3 43MM is the only ENTEK twin-screw extruder with these new features, but we will phase in these design changes to our other machines as well."

Booth #6486

produced by spi

1. Reception Area
2. QC³ 43 Twin-Screw Extruder with Live Screw Set Quick Change Demonstrations
3. Replacement Wear Parts and Aftermarket Services Display
4. Turnkey Plant Services, Extrusion Solutions and Partnerships Kiosk
5. Conference Room
6. 'A Taste of Oregon' Hospitality Area

NPE 2015


IT TAKES A
GREAT TEAM
TO MAKE A
GREAT
TWIN-SCREW
EXTRUDER
ENTEK
RAISING EXPECTATIONS. KEEPING THEM THERE.
Turnkey Plant Services
Complete Extrusion Systems
Twin Screw Extruders
Replacement Wear Parts
In-House Lab Services
• COMPLETE EXTRUSION SYSTEMS • TURNKEY PLANT SERVICES • IN HOUSE LAB SERVICES
WHY ENTEK EXTRUDERS?
TWIN-SCREW
EXTRUDERS
OUR SOLUTIONS
Made In Oregon
• TWIN SCREW EXTRUDERS • REPLACEMENT WEAR PARTS
AMERICAN MADE
WEAR PARTS
2
3
4
5
6

Americhem Chooses ENTEK

(continued from p. 1)

In 2009, in the midst of the recession, ENTEK's lean manufacturing journey was underway. After sharing some of its findings with Americhem, ENTEK was invited to send a multi-faceted team to help 'jump start' an internal improvement project in one plant. This sharing of resources and information led to tangible improvements for both companies.

When Americhem approached ENTEK about a new plant they were considering, both companies worked to define a process of helping each other to get the plant, its processes and the tasks defined in such a way to maximize resources in a cost effective manner. The result was the opening of Americhem's Liberty, NC facility in 2011. This plant was designed and built through the ENTEK/Americhem partnership. It employs the industry's best practices to produce high quality color concentrates and compounds.

"The Liberty plant is only one example of how our partnership with ENTEK has benefited Americhem," said Doug Rich, Americhem's Director of Global Manufacturing. "It's a state-of-the-art plant, but there's more to it than that. It represents how we've partnered with ENTEK to drive our company's values, which include providing better service to our customers through worldwide upgrading and improvement of our plants and services."

A Winning Relationship

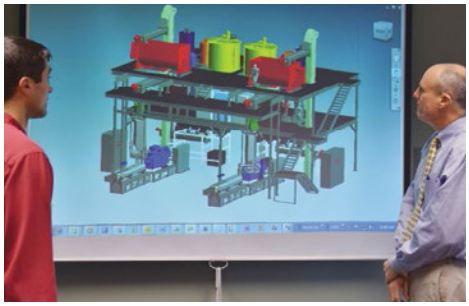
"Our companies are a great fit," said Effmann. "We work together at all levels – management, technical support, and customer service."

Some examples of ENTEK's services in helping Americhem include:

- Proving out new compound formulae in ENTEK's lab so that extrusion equipment could be specified correctly, early in the process
- Employing project management techniques to keep communication channels open, so both companies can track each project from the same data points
- Complex integration of plant systems
- Regular reports showing quotes, orders, and delivery status for all plants worldwide
- Spare parts manufacturing and stocking, and control system upgrade programs for both ENTEK and non ENTEK machinery

The partnership between ENTEK and Americhem has led to some impressive accomplishments for both companies. Americhem's Rich stated: "We value our relationship with ENTEK. Our companies have worked together very well and we plan on continuing to work with ENTEK for the foreseeable future."

Working Together to Provide QC^3 for Compounders



It is common for ENTEK's compounding customers to look to ENTEK for more than twin-screw extruders or replacement wear parts. Oftentimes, customers want ENTEK to provide complete extrusion systems that include feeders, dies, pelletizers, and other auxiliary equipment.

In cases like these, ENTEK takes single-source responsibility for the project and sources the auxiliary equipment from preferred suppliers that include:

Brabender - precision metering equipment targeted to specific needs along with innovative solutions for the plastics, chemical and food industries

Gala - underwater pelletizing systems

Bay - manual strand and water slide pelletizing systems

QC$^{3™}$ – A Common Theme

"We have a great relationship with these companies, and in fact they all have worked with ENTEK to create products that feature Quick Clean and Quick Change features," said John Effmann, ENTEK Director of Sales & Marketing. "We come together to create the best system we can to make our customers' lives easier."

At NPE, ENTEK and its partners will all show new equipment designed to simplify maintenance and improve operations for compounders. If you're attending NPE be sure to visit them at the following locations:

ENTEK	Brabender	Gala	Bay
Booth No. W6486	Booth No. W1177	Booth No. W5882	Booth No. W8146

ENTEK Adds Additional Aftermarket Capabilities for All Leading Twin-Screw Extruder Brands

To keep up with customer demand, ENTEK has recently added additional aftermarket capabilities for supplying replacement wear parts and other services for all leading twin-screw extruder brands.

Replacement Wear Parts

ENTEK has recently expanded its replacement wear parts offerings for twin-screw extruders to include large-size screws and barrels, at sizes up to 250mm. Common sizes include 133mm, 160mm and 250mm parts. While ENTEK does not currently build twin-screw extruders at these sizes (ENTEK's largest machine is 133mm), market demand for ENTEK-built parts for other brands of extruders led to this recent expansion.

All parts are designed using the best metallurgy options for running all types of materials. ENTEK's history of supplying twin-screw extruders for challenging material formulations gives processors the advantage of using the company's wealth of processing expertise.

"For years now, ENTEK has been providing replacement twin-screw extruder wear parts for both ENTEK and non-ENTEK brands," said Tammy Straw, ENTEK's Business Development Coordinator. "We make all our parts here in Oregon and we often can ship them faster than they can get them for their machinery suppliers. We keep many ENTEK and non-ENTEK replacement parts in stock, and some are available for next day shipment."

Gearbox Rebuilding Services

Another recently added service provided by ENTEK, for its own machinery, is its gearbox rebuilding program. The gearbox is the 'heart' of any twin-screw extruder, and a major part of the machine's success. Traditionally, a worn or damaged gearbox meant significant downtime for the extruder, as most gearbox suppliers are overseas and repairs or even new orders could take months. ENTEK can now repair the gearboxes on its extruders in much less time.

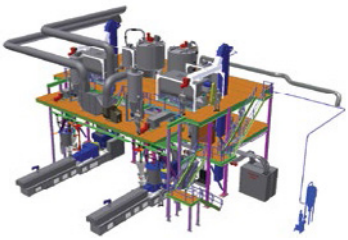
In addition to supplying replacement wear parts, ENTEK provides numerous other value-added aftermarket services to processors including:

- barrel and screw measurement
- parts stocking programs
- in-plant process training
- screw layout review and optimization
- machine rebuild services
- control system upgrades
- remote troubleshooting
- maintenance check-ups

To learn more about ENTEK's aftermarket services, contact Tammy Straw, ENTEK Business Development Coordinator, at (541) 259-1068 or tstraw@entek.com.

ENTEK Turnkey Plant Services Capabilities

At the recent Applied Market Information (AMI) Compounding World Forum, held December 9-10, 2014 in Philadelphia, Al Bailey, ENTEK's Controls Manager, gave a presentation outlining the company's recommendations on how to approach and carry out major compounding plant expansions.



Titled "Putting a Compounding Extrusion System Together – An Extruder Manufacturer's Perspective", Al's presentation drew upon ENTEK's many years of experience helping customers expand their plant operations. Some of these plant expansions involved the addition of new compounding processing lines; others involved the design and construction of completely new manufacturing facilities.

"ENTEK began as a processor, and we know what it takes to plan, design, build, and maintain a world-class manufacturing plant," said John Gillespie, ENTEK's Director of Engineering. "We did the majority of the planning and construction of our battery separator production facility here in Oregon, and continue to help numerous compounding customers with their facilities."

If you are considering expanding your compounding plant operations, contact John Effmann, ENTEK's Director of Sales & Marketing at (541) 259-1068, or jeffmann@entek.com, to discuss your plans. If you would like to receive a copy of Al Bailey's presentation from the Compounding World Forum, e-mail Tammy Straw at tstraw@entek.com.

Have You Seen Our Latest Ad?

"It Takes a Great Team to Make a Great Twin-Screw Extruder" – that's the message of ENTEK's latest ad, now running in print and online in leading industry publications.

The ad features the actual ENTEK design team that worked for years researching, designing, and manufacturing the new QC³ 43MM twin-screw extruder that is being introduced at NPE 2015.

"For years now we have focused on ENTEK's people in our ad campaigns," said John Effmann, ENTEK Director of Sales & Marketing. "So it was only natural that we put our people front and center in this new ad as well. They are a great team and they did indeed create a great new twin-screw extruder."

ENTEK's design team, left to right: Dr. Kirk Hanawalt, Dean Elliott, Tammy Straw, Craig Benjamin, Al Bailey, John Gillespie, Melissa Jensen-Morgan, John Effmann, and Steve Gates

Who to Contact

ENTEK
PO Box 39, 200 Hansard Avenue
Lebanon, OR 97355
Tel. 541-259-1068
FAX 541-259-8018
http://www.entek.com

Dr. Kirk Hanawalt
President
E-mail: khanawalt@entek.com

John Effmann
Director of Sales & Marketing
E-mail: jeffmann@entek.com

Tammy Straw
Business Development Coordinator
E-mail: tstraw@entek.com

Stephanie Bell
Sales Project Engineer
E-mail: sbell@entek.com

North America

Bill Petrozelli
Regional Sales Manager
Tel. 541-259-1068 ext. 8117
FAX 541-259-8018
E-mail: bpetrozelli@entek.com

Linda Campbell
Regional Sales Manager
Tel. 541-259-1068
FAX 541-259-8018
E-mail: lcampbell@entek.com

Europe

John Effmann
Director of Sales and Marketing
E-mai l: jeffmann@entek.com

Asia

Tay Hwa Beng
Asian Sales Manager
Tel. +65-997579621
E-mail: hbtay@entek.com

ENTEK
RAISING EXPECTATIONS.
KEEPING THEM THERE.

EXTRUSION SOLUTIONS is an ENTEK publication.
Visit us at www.entek.com