JULY/AUGUST 2019

Injection WORLD





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Hillenbrand buys Milacron

US-based industrial group Hillenbrand has agreed to acquire Milacron in a cash and stock transaction valued at about \$2bn, including \$686m net debt. Hillenbrand also owns Coperion and the Milacron takeover means its plastics machinery portfolio now encompasses injection moulding, hot runners, mould components, materials handling, compounding and extrusion. (Milacron completed the disposal of its Uniloy blow moulding machinery business on 1 July, selling it to Osgood Capital Group and Cyprium Investment Partners for \$51m).

Tom Goeke, CEO at Milacron, said: "After careful



Milacron will be demonstrating its Elektron all-electric injection moulding machines at K2019

review, our Board unanimously concluded that a combination with Hillenbrand represents a unique opportunity to provide Milacron stockholders with significant and immediate value and the ability to benefit from the upside potential of the combined company. Hillenbrand has a tremendous track record of growing and driving value across its portfolio of highly

engineered products.
Together, we will continue
to provide customers with
breakthrough products and
customized systems."

Milacron will benefit from the Hillenbrand Operating Model (HOM), and Hillenbrand expects to leverage Milacron's global shared services centre to drive operational efficiency, the companies said. The deal is expected to generate annual cost synergies of about \$50m three years after the close.

Other benefits include enhanced growth opportunities, according to the companies. The combined company will aim to leverage its technologies and broadened product offerings to reach additional customer segments. Its expanded reach in end markets will include construction, consumer packaging, automotive, electronics, medical, and recycling.

The transaction is expected to close in the first quarter of 2020, subject to closing conditions and regulatory approvals.

- > www.hillenbrand.com
- > www.milacron.com

Arkema invests in Carbon

Arkema, whose product line-up includes Sartomer liquid resins, is to make an investment of \$20m in 3D printing technology company Carbon, as part of the latter's latest funding round. This follows six years of work between them to scale up process technology and resin manufacturing to make parts that are manufactured by Carbon's Digital Light Synthesis technology.

- > www.arkema.com
- > www.carbon3d.com

DSM starts new Arnitel TPC line at Emmen facility

DSM has started a new production line for its Arnitel range of thermoplastic copolyesters (TPCs) at Emmen in the Netherlands. The new line will up capacity by 20% and will enable greater supply flexibility and security, the company said.

"We see increasing demand of Arnitel in various application areas including automotive, consumer and industrial. This capacity expansion shows DSM's commitment to our customers and industries we serve," said Lu Zhang, Global Business Director at DSM

Engineering Plastics.

TPCs provide a good combination of elasticity, high temperature resistance, mechanical performance and processing. They are also seen as a "lighter, greener alternative to conventional rubbers in automotive applications", according to the company.

> www.dsm.com



DSM has upped Arnitel capacity at Emmen by 20%

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Absolute Haitian adds large new US facility

Haitian International's sales and service partner, Absolute Haitian, has opened a new facility at Moncks Corner, near Charleston in South Carolina.

The 116,000 sq ft facility provides additional capacity and capabilities to support Haitian International's product lines for injection moulders in the US and Canada. The new facility complements other facilities for the US and Canada in Worcester, Massachusetts; Cleveland, Ohio; and Batavia, Illinois; plus warehousing in southern California.

About 100,000 sq ft feet of the new Moncks Corner facility is dedicated to manufacturing, warehouse and demonstration space with the capacity to assemble and test large tonnage machines and store stock machines and aftermarket parts. High ceilings, three



Absolute Haitian's new facility, near Charleston in South Carolina

cranes, multi-level docks and reinforced concrete flooring all help support assembly of high tonnage machines. The facility's office space houses a training centre, applications engineering offices and sales functions.

Glenn Frohring, co-owner of Absolute Haitian, said most large tonnage machines sold in the US are delivered to customers in the southeastern US, the upper Midwest states of Michigan, Ohio and Indiana, and Canada; the deepwater port of Charleston

enhances Absolute Haitian's capabilities for fast delivery to customers.

■ Haitian International has started construction of a 92,000m² facility in Acatlan de Juarez, Guadalajara, Mexico. The location offers fast access to the industrial zones in Central Mexico, as well as efficient transport means to the rest of the country, said the company.

The site aims to manufacture 1,000 injection moulding machines a year, within a period of five to ten years.

- > www.absolutehaitian.com
- > www.haitian.com/en

New Wacker silicone line

Wacker has opened a new line for silicone elastomers at its site at Zhangjiagang, in China's Jiangsu province. This is said to have a capacity of "several thousand" tonnes per year and will supply high consistency silicone rubber (HCR) in China - the world's largest market for silicone elastomers - and the wider Asia-Pacific region.

HCR is cross-linked at temperatures over 100°C to give a silicone elastomer with high-temperature resistance and a high degree of elasticity.
Grades of HCR are used in the automotive, medical, electrical and electronics industries, among others.

The new production line will enable shorter lead times for customers, said Wacker.

> www.wacker.com

Motan opens Austria innovation centre

Material handling machinery group Motan Colortronic of Germany has inaugurated its new 8,000m² LIT open innovation centre and factory in Linz, Austria.

The company said that the aim of the centre "is to bring research, business and industry closer together". It is a member of a consortium which will jointly promote process engineering innovations in the field of plastics technology and digitalisation.

The factory, meanwhile, will be a centre for education and training, as well as a showroom and testing centre for basic research. Features there include a Motan drying, conveying and gravimetric dosing system to supply two Engel injection moulding machines, and other parts for drying, conveying, controls, dosing and mixing.

> www.motan-colortronic.de



Above: The opening was attended by executives from Motan and its partner Engel

PHOTO: MOTA



Going further with Passion.

At ENGEL, we embrace responsibility – both for our own products and for those made using our machines. We are committed to working with plastics responsibly and to increase the use of recycled materials. We support our customers in developing their production processes with the expertise gained over the course of seventy-plus years in the plastics industry. Together we strive to use plastics sustainably, meeting the requirements of the circular economy.

Along with over 350 companies, universities and organisations, we have signed the Ellen MacArthur Foundation's New Plastics Economy Global Commitment – helping to show that together, we can achieve greater things.





Ford remodels itself in Europe

Ford has launched a new business model and a fresh vehicle line-up "as part of the most comprehensive redesign in the history of its business in Europe". This will have far-reaching implications for suppliers and sub-suppliers of all kinds.

Under this, three new business groups will be established: Commercial Vehicles (CV). Passenger Vehicles (PV) and Imports. Each will have a dedicated management organisation, including leaders responsible for marketing, manufacturing and product development, and will have wider scope for decision-making than under the present set-up.

Ford Europe's efficiency improvement programme includes the proposed or



confirmed closure or sale of six assembly and component manufacturing plants by the end of 2020, bringing the total footprint down to 18 sites. The affected facilities include an engine plant at Bridgend, South Wales, and the Ford Aquitaine Industries transmission plant in France. Shifts will be reduced at the assembly plants in Saarlouis, Germany, and Valencia,

Spain. About 12,000 jobs will go as a result.

Within the PV business, cross-functional project teams will be "dedicated to running each vehicle nameplate, empowered to adjust design and manufacturing to focus on customer needs", according to Ford. All European development in this business, including electric vehicles, will be centred in Cologne-Merk-

enich, Germany.

Specific aims of the restructuring include doubling the profitability of the CV business in Europe over the next five years, supported by its strategic alliance with Volkswagen, the Ford Otosan joint venture in Turkey and a restructured Ford Sollers joint venture in Russia. This business group will be based in the UK.

There will also be at least three new vehicle name-plates in Europe in the next five years. These cars will include an electrified option. Fuel economy improvements and CO_2 reductions will be sought through improvements in conventional powertrains.

> www.ford.eu

New unit for Chen Hsong

Hong Kong-based injection moulding machine manufacturer Chen Hsong has created a new German subsidiary, based in Kempen.

The plans are for the Kempen location to stock fully functional injection moulding machines for demonstrations, tests and training. Chen Hsong said its large central warehouse in The Netherlands is also well stocked with many new machines to ensure rapid delivery to the German market.

> http://en.chenhsongeurope.eu

ARRK Europe opens UK facility

ARRK Europe has opened a 40,000 sq ft facility in Kings Norton, Birmingham, UK, adding to its network of European sites, including Petersfield in the UK, as well as plants in France and Poland.

The company's investment in this site has involved installation of six Krauss Maffei injection machines - ranging from 80 to 1,600 tonnes - robotic arms, material handling systems and CMM technology. The new site has created around 45 jobs in quality, programme management, production and logistics.

The investment was made to support ARRK's UK growth, involving a strategic alliance with its neighbour in King's Norton, Paintbox, which supplies painted exterior parts to automotive OEMs.

ARRK European MD, Tony Lowe, said: "With this geographical advantage close to the heart of the UK automotive industry, ARRK are well placed to support customers. In addition our partnership with Paintbox offers a very competitive 'one stop shop', with moulding, fully automated robotic painting, assembly, EDI and logistics... one we feel our customers have been looking for."

> www.arrkeurope.com



ARRK's 40,000 sq ft facility in Kings Norton, UK



BASF cuts back central functions

BASF has announced plans for an "organisational realignment" that aims to streamline its administration and accentuate the role of the regions and services. The programme is expected to see 6,000 jobs go worldwide with the first changes taking effect on 1 January 2020, the company said in a statement.

The process is intended to generate savings of €300m and is part of BASF's ongoing excellence programme, which is targeting annual savings of €2bn in additional earnings from 2022.

The job cuts will be focused on central functions such as finance, HR, communications and supply chain, with the corporate centre slimming down to about 1,000 people. BASF officials told Compounding World that there will be no job cuts in customer-facing or

operational areas and that there may, in time, be additional jobs in fields such as production or digitalisation.

Management and employee representatives are currently renegotiating the site agreement at the Ludwigshafen plant in Germany. The current agreement expires at the end of the year.

> www.basf.com

Green light for US PE production

ExxonMobil and Sabic have agreed to go ahead with the construction of a joint venture chemical facility and a 1.8m tpa ethane steam cracker in San Patricio County, Texas, US. Construction will begin in Q3 and start-up is anticipated by 2022.

Gulf Coast Growth Ventures, as it is known, received final environmental regulatory approval in June. As well as the cracker, the two companies will build two PE units and a monoethylene glycol unit. In all, it will create 600 jobs.

- > www.exxonmobil.com
- > www.sabic.com

Canada follows EU and bans some single-use plastics

Following the lead set by the EU, Canada has announced a ban on single-use plastics by 2021 where supported by scientific evidence and warranted. Prime Minister Justin Trudeau said, when announcing the move: "We owe it to our kids to keep the environment clean and safe for generations to come".

Canada will also "take other steps to reduce pollution from plastic products and packaging", while working with the provinces and territories that constitute the nation as a whole to introduce standards and targets for companies that manufacture plastic products or sell items with plastic packaging, in order



Canadian Prime Minister Justin Trudeau

for them to take responsibility for the plastic waste their activities generate.

The government said that the measures it is taking "will be grounded in scientific evidence and will align, where appropriate, with similar actions being

taken in the European Union and other countries". They will also support the ongoing development of an action plan to implement the Canada-wide Strategy on Zero Plastic Waste.

It is estimated that Canada currently recycles less than 10% of its plastics and that, without any change, the value of materials being discarded will reach C\$11bn per year by 2030. By taking these measures and investing in new technologies, the government hopes to reduce 1.8m tonnes of carbon pollution, generate billions in revenue and create some 42,000 jobs.

> www.canada.ca

Borealis and Erema expand their work

Borealis has signed a letter of intent to step up its long-standing partnership in the field of mechanical recycling with Austrian recycling technology group Erema. The stated shared goal is "to advance mechanical recycling technologies in order to accelerate the transition to a circular economy of

plastics", while also enhancing recycling processes to meet market demand for higher quality recyclate.

The two will specifically collaborate on: developing improved technologies and processes in mechanical recycling by leveraging each other's respective areas of expertise, including joint tests,

trial runs and pilot projects; standardising and harmonising input feedstock and recyclate output; and scaling up the mechanical recycling industry by increasing plant sizes and total production volumes.

- > www.borealisgroup.com
- > www.erema.com

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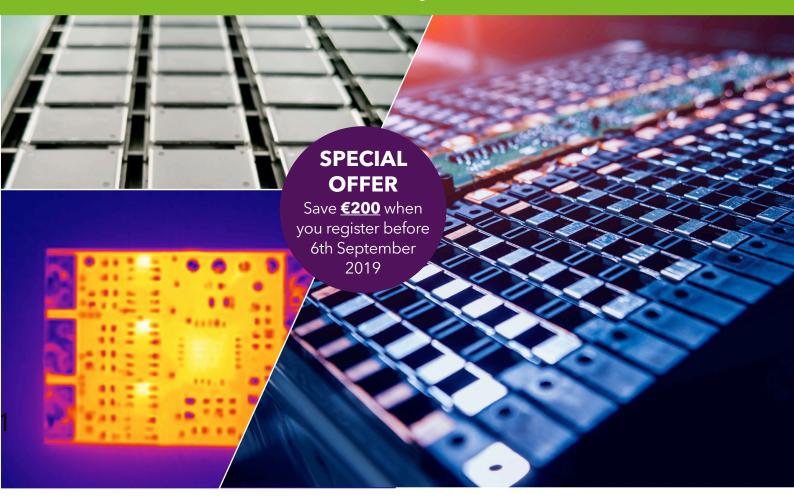


Conductive **Plastics**

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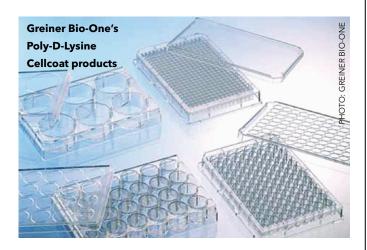












Greiner Bio-One expands plant

Greiner Bio-One has started construction of a new production facility and offices in Frickenhausen, Germany. The production area is being expanded by more than 1,700m² - a 30% increase. The medical and biosciences product manufacturer said it is investing €20m at the Frickenhausen site in optimised plant infrastructure, material supply and logistics, as well as the production area expansion.

The company's infrastructure project began in 2017

with the construction of a new high-bay warehouse. This has allowed it to convert the old logistics areas for production use.

Over two levels in the expanded facility, Greiner Bio-One will make plastic products for the cultivation and analysis of cell and tissue cultures. In addition, an integrated ISO5 clean room cell for Cellcoat production and a state-of-the-art roller bottle and tube system will also be created.

> www.gbo.com

Berry's new structure

Berry Global has announced a new business structure following its recent acquisition of RPC Group.

Berry's business structure will now be comprised of four divisions: Consumer Packaging - International; Consumer Packaging -North America; Engineered Materials; and Health, Hygiene, and Specialties.

The group has appointed Jean-Marc Galvez President of its Consumer Packaging
- International Division, and
Bill Norman President of its
Consumer Packaging North America Division.

"Our acquisition of RPC and new business structure will allow us to further develop our presence and best serve our customers in key geographic regions," said Tom Salmon, Berry's Chairman and CEO.

> www.berryglobal.com

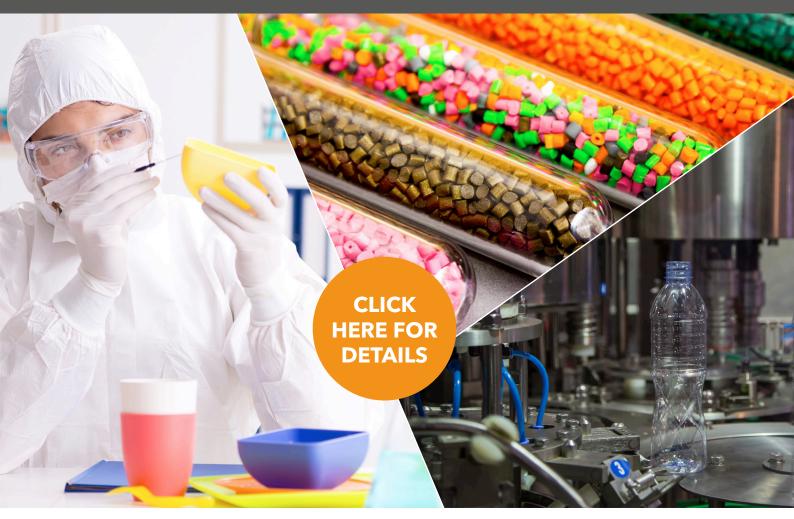


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The challenge of tethered caps

The impact of tethered caps regulation on the European caps and closures industry is explored by Martyna Fong, author of a new AMI Consulting report

Sustainability is the key driver in the European plastic caps and closures industry: market development initiatives have so far been supported by the three pillars of sustainability, whereby environmental gains are commercially viable and socially accepted. The current regulatory context concerning the Single Use Plastics directive creates shifts and the pillars are out of balance, creating uncertainty in the value chain.

A new report from industry consultants, AMI Consulting published in June 2019 contextualises the new industry challenges and quantifies the impact of the changing regulations on demand.

The European closures industry has been proactive for well over a decade in reducing the use of virgin material in both neck finish and closures. Lightweighting has been the most important driver of change. The last industry step-change within beverage closures was the shift towards one-piece beverage caps and away from two-piece caps, coinciding with the adoption of the PCO1881 bottle neck standard. Concomitant with raw material reduction are savings in energy, lower CO2 emissions in logistics and consequently cost savings.

Now the focus of the European sustainability agenda is single use plastics (SUP), which includes the handling of caps in a circular economy and promoting anti-littering solutions. As a result, the Single Use Plastics directive drafted in 2018 (2018/0172 COD), in which Article 6 dictates a new

norm to enforce closures to be connected/tethered with the bottle, was voted in by the European Parliament in March 2019. The European plastic caps and closures industry is about to undergo another major step-change. The tethered cap regulation will impact plastic beverage bottles under 3 litres, including composite containers (i.e. cartons). By 2024 all beverage closures will have to be tethered by law.

Ahead of the formal tethered cap standard, the industry is reviewing solutions to offer early compliance. There a number of technical variables to consider, including opening angle, torque, rotation of band, lock-in position etc, all of which may result in a different concept. Not to reduce the consumer's drinking experience, the tethered cap should allow for wide opening, locking-in position, no rotation and re-closeability.

The new regulation is intended to reduce littering; however, it will likely stir the demand for virgin polymers, thus compromising the industry's committed efforts towards lightweighting. In the short-term, the new closure designs are likely to be heavier than those on the market today. The industry will need to accommodate significant costs required for regulatory compliance. This creates a conceivable clash between environmental and economic pillars of sustainability and uncertainty over consumer acceptance of changes (social impact).

Main image: The European Commission's Single Use **Plastics** directive requires all beverage closures to remain connected to the bottle by a deadline of 2024

The industry needs to work collectively to reduce the economic impact of the coming step-change and search for value creating opportunities to maximise the gains - environmental, commercial and consumer focussed.

Key market drivers

The caps and closures industry is technology-driven and higher levels of R&D investment and technical expertise are required. Technology developments often allow added value and premium products to be produced at lower cost. Time-to-market for new product launches has shortened, particularly in personal care, with some products reaching market within eight weeks. This helps increase competitive forces on the one hand and ultimately drives market growth and creates opportunities for well organised plastic closure manufacturers.

The closure is an added value component of consumer packaging and performance is paramount to improve consumer experience. Key functional requirements of closures depend on application and include:

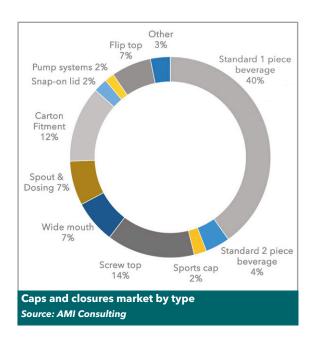
- Ease of opening and re-sealability
- Convenience of drinking, dispensing and pouring
- Containment/leakproofness and effective tamper evidence
- Age suitability child resistance and elderly
- Product life delivery (preservation/extension)
- Environmental proposition (recyclable/lightweight/tethered).

Plastic closures types

The plastic closure market is complex in terms of the product segmentation, as there are numerous definitions depending on the end-use application and some can be segmented in more than one way. Some, such as screw top caps, are used across all applications but with different custom designs,

Plastic Caps and Closures The European Market 2019

The fifth edition of AMI Consulting's report on plastic caps and closures, published in June, covers EU-28+3 countries and provides a comprehensive analysis of the market by end use application and closure types for 2007-18, plus a five-year forecast. The datasets and market context explained in this study will help industry participants in building strategies, exploit business opportunities and manage threats. For more information, contact Martyna Fong, Business Unit Manager - Packaging martyna.fong@ami.international. To buy the report email: sales@ami.international



diameters and mechanical properties.

Standard beverage caps accounted for 44% of plastic closures demand in Europe in 2018. The shift towards one-piece beverage caps and away from two-piece caps was near completion in 2018, with only a small number of local operators not able to raise the investment in production line adjustments.

Growth of sports closures is slowing down, but increasing on-the-go consumption combined with expanding multi-active lifestyles will fuel demand. There is an increasing demand for added value sports closures by brand owners such as one-action tamper-evidence and silicone valves for a non-drip feature.

Wide mouth caps for beverages are forecast to increase their penetration in the future, driven by increased use of PET bottles in chilled juices and non-carbonated beverages. Screw top caps are the second largest category and are growing fast, particularly in solid food applications.

Carton fitments accounted for 12% of the overall demand in 2018, with the majority used in milk and dairy based drinks. Carton fitments will continue to offer opportunities in milk and dairy based drinks, juices and nectars, particularly in the context of the tethered caps regulations, which will impact closure design. All beverage closures will be affected by the tethered caps regulations and face design adjustments by 2024.

Dosing caps is a diverse category due to the wide range of dosing mechanisms including spout, non-drip pourer, valve and roll-on mechanism. Pump systems will grow particularly in cosmetics and toiletries and household care applications. Dispensing closures will continue to see a strong growth potential.



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Saving energy in plastics processing

Opportunities for plastics processing continue to grow across a range of industries. Despite the current demonisation of plastics, there are still many advantages that plastics possess over more traditional materials. Automotive, construction, medical and many other industries are all keen to take advantage of the latest innovations in plastics processing.

However, the industry also faces challenges to profitability; plastics processing is not only highly competitive, it is also energy intensive.

Today, one of the biggest opportunities is reducing energy consumption. Plastics machines are highly energy intensive, so reducing energy consumption by even a small amount can have a meaningful impact on reducing costs and growing the business in order to gain a competitive advantage.

The right hydraulic fluid offers a range of benefits, from improved energy efficiency to enhanced operational performance, which can help plastics processors reduce costs

and increase productivity.

This is an easy topic to overlook as the cost of hydraulic fluid is typically less than 1% of operating costs. This is made even worse if the processor has a 'fit and forget' attitude to hydraulic fluids.

All this ignores the fact that the hydraulic fluid is literally the 'lifeblood' of any hydraulic injection moulding machine.

Choosing a high performance fluid will not only protect the hydraulic system, it can also reduce energy use and help advance efforts towards Industry 4.0.

The benefits of high performance fluids are not limited to enabling the smart factory and improving operations. The importance of environmental and energy management is growing rapidly and nobody can have failed to notice the increasing

frequency of criticism of the plastics processing industry. As an industry we need to prove that we are doing the best we can to reduce our environmental impact at both the input (raw materials and energy) and output phases (product and process waste disposal).

High performance hydraulic fluids that are maintained correctly will have a longer operating life, which reduces oil consumption and waste oil disposal. When the oil finally reaches the end-of-life phase and must be disposed of, then high performance oils can be formulated to have a reduced environmental impact., such as ExxonMobil's Mobil DTE 10 Excel hydraulic oil.

ExxonMobil will be attending K Fair this year in Düsseldorf. To learn more about the many opportunities to reduce energy usage

throughout a plastics operation, while ensuring protection, visit the ExxonMobil stand to meet with one of our experts.

We'll also be sharing some big news at the show, so don't miss out and join us at K.

Join us at K2019 – OA Hall 10 / 10.1













Polymers in Footwear

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Compounding





Plastics recycling must be made to work

With the public eye focused firmly on plastics' sustainability, the plastics industry has become very busy with projects and new technology to enable injection moulders to increase their use of recyclate. By Peter Mapleston

The plastics industry is in the courtroom of public opinion. It has an urgent need to demonstrate that plastics and environmental protection are compatible. Yes, plastics are often a solution to problems such as automobile emissions and food waste, but issues like plastics waste reduction (if not prevention), collection, recovery, and recycling are in

desperate need of resolving.

The circular economy will be one of the key topics at the K 2019 plastics and rubber exhibition in Düsseldorf in October. Of all the issues mentioned above, the one that the plastics industry has the most control over is recycling. Recycling rates are on the rise - post-industrial and post-consumer - but more clearly needs to be done.

In recent weeks, several equipment makers operating in the injection moulding field have been drawing back the curtains on developments to be unveiled at the show which they hope will go some way to addressing the recycling problem. Injection World looks at some of them here.

Upcycling

Many packaging products have relatively short lifetimes. So, asks KraussMaffei, why not reuse them as raw material for new high-performance articles? At K 2019 in October, the company will show how recyclate derived from polypropylene buckets can be used to make a premium-quality

automobile A-pillar cover with an over-moulded fabric surface. The company is taking a shortcut at K by recycling the buckets immediately after they are moulded, but the concept appears solid.

The buckets will be produced on one of KM's latest injection moulding machines, an 11,000 kN GX 1100 (see p37). They will then be shredded externally and "upcycled" into a new "recompound" in a ZE 28 BluePower twin-screw compounding extruder from what used to be Krauss-Maffei Berstorff (which was recently fully merged into KraussMaffei). KM uses the brand name Edelweiss-Compounding for its solution for direct conversion of reclaim material into high-quality compounds. Pigments and talc are added to the flakes to create a compound with properties suitable for the new application.

After underwater pelletising and drying, the recompound is ready for processing. A material feeder will convey the pellets to an all-electric PX 320 injection moulding machine, which will mould the A-pillar cover over-moulded with a fabric layer.

> "Edelweiss-Compounding is intended to make on-site compounding more attractive to recycling companies and

plastics manufacturers," says Matthias Sieverding, President of the Extrusion Technology Segment at KraussMaffei. "KraussMaffei is aware of its responsibility and, as one of the world market leaders, wants to

Images above and below left: Engel will be showing products containing recyclate at K2019



INNOVATION | SUSTAINABILITY

Right: At K 2019, an Engel Duo 3660H/ 1560W/450 combi injection moulding machine will make transport boxes containing high levels of recyclate using the **Skinmelt** coinjection process

occupy a leading role in the areas of recycling, upcycling and recompounding of plastics. KraussMaffei is enhancing its joint effort with partners and customers to develop new business units regarding the reuse of plastics."

The circular economy will also feature strongly on the **Engel** stand at K 2019. Stefan Engleder, CEO of Engel Group, says: "It is my personal concern to contribute to establishing a circular economy for the plastics industry, which bears a global responsibility that can only be met by companies working together. I therefore welcome the focus on circular economy at the most important international industry event. K will give this subject even more impetus... Circular economy is an innovation driver."

At the show, Engel will have a strong focus on processing recycled material, improving process stability, and also on the trend towards design for recycling.

Process stability

"The stability of the injection moulding processes is key to being able to use recycled materials, also for higher quality products," says Günther Klammer, head of the Plasticising Systems division and Circular Economy expert at Engel Austria. Noting that recycled material is naturally subject to greater batch variations than virgin material, he says Engel's intelligent iQ weight control assistance system, which will be used on the company's stand to process recycled ABS, can significantly reduce this variation on the process.

The software, part of Engel's Inject 4.0 program, ensures a constant melt volume during injection and thus a consistently high product quality, "even with strongly fluctuating raw material quality," Klammer says. "Intelligent assistance opens the door for recycled materials to a far broader range

of applications. Industry 4.0 is an important enabler for the circular economy."

PHOTO: ENGEL

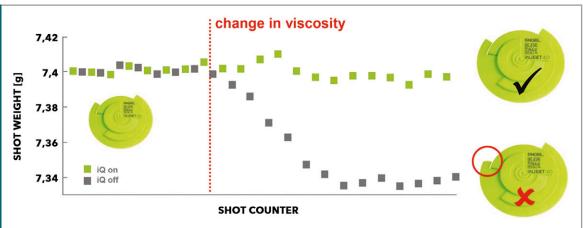
Another approach to using recycled materials more widely is sandwich components with a core of recycled material inside a skin of virgin material. This concept is quite old of course, but injection moulding technology improvements are helping to make the skin thinner and the core fatter. Engel points out though that more products need to be designed for sandwich moulding.

The proportion of recycled material that can be used in the core is essentially determined by the geometry of the moulded part and the flow pattern in the cavity, the company notes. It says that transport boxes that it will be producing at its stand using its Skinmelt process pose a particular challenge in this respect. Even so, recycled content is more than 50%. Engel says Skinmelt makes it possible to achieve high recycled content levels, even when working with complex component geometries.

Unlike classic coinjection, the Skinmelt process involves fusing the two melts prior to injection, with a small extruder for each shot pushing virgin material into the front of an injection unit processing recyclate. This means that when the plasticating screw advances, the virgin material is first to reach the cavity, with the recyclate coming along behind to push it against the cavity walls to form the skin of the part.

"Excellent reproducibility in the moulding





lmage: Engel

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The mould comes from Haidlmair, an Austrian firm specialising in manufacturing moulds for the production of storage and logistics containers, which will use the transport boxes produced at the K show for its own in-house logistics.

What is also important is the grade purity "ensuring that the sandwich-moulded products can also be easily recycled at the end of their service life," Klammer emphasises. The boxes will use post-consumer recycled polypropylene, obtained in collaboration with Der Grüne Punkt (The Green Dot), Duales System Deutschland (DSD) in Germany.

Net gains

As is well known, the European Union is adopting measures proposed by the European Commission to tackle marine litter coming from the ten singleuse plastic products most often found on European beaches. Also included in the scope of the so-called Single-Use Plastics Directive is abandoned fishing gear. It is no coincidence that at K 2019, Engel will be teaming up with recycling technology specialist Erema to demonstrate how old nets made from polyamide can be converted into boxes.

The recycled material comes from Chile, where several collection points have been set up for end-of-life nets that until now have often been dumped at sea. In Chile, nets are already being recycled on an Erema system and processed into skateboards and sunglasses on Engel injection moulding machines.



A highlight of the two-day Arburg Packaging Summit 2019 was the podium discussion, featuring (from right): Gerhard Böhm (Arburg), Thorsten Kühmann (VDMA), Manfred Hackl (Erema), Prof. Dr Hans-Josef Endres (IfBB, Hannover University of Applied Sciences and Arts), Philip Knapen (Borealis) and moderator Guido Marschall (Plas.TV)



Arburg addressed the circular economy at a Packaging Summit it held at its headquarters in Lossburg, Germany, in June, attended by around 120 guests from all over the world. The second such event organised by the company, it was conceived to bring together leading experts from industry, research and professional associations, "providing a platform for sharing knowledge on trends, resource efficiency and the circular economy in the packaging sector," Arburg says.

Arburg and two of its partners in injection moulding tooling, Stackteck and Foboha, presented innovative processes, trends and machine technology designed specifically for the packaging sector. IML expert Verstraete demonstrated how invisible watermarks can be used to label plastics packaging with a "Digital Recycling Pass" so that it can be accurately sorted for recycling (see p34).

In a talk, Reiner Schmid, Application Manager Packaging at Arburg, explained how high-performance machines and the appropriate mould technology can be used to establish sustainable processes in injection moulding. He said machinery was increasingly moving towards direct measurement of internal pressure and temperature and mould breathing via inductive position sensors, which will optimise the filling process and product quality - factors that are of particular importance for new as well as recycled materials.

Bertram Stern, Sales Manager of Packaging at Arburg, says the event demonstrated both the challenges and the new opportunities for the plastics packaging industry: "Manufacturers of injection moulding machines, moulds and materials, as well as recycling experts, must all work together along the entire value chain," he says. "At this event, it was clear for all to see that the spirit and will to do so exists. Only by working together will it be possible to develop new solutions and ensure that valuable used plastics can be recycled



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Above: The steps from lump to chip to quality regrind with Rapid's Raptor Duo concept and efficiently re-purposed in the manufacture of new products."

Early in July, several European trade associations, **EuPC**, German and Italian machinery associations **VDMA** and **Amaplast**, as well as **Euromap**, the pan-European association for plastics and rubber machinery manufacturers, organised what they say was the first joint workshop intended to establish new ways to promote the use of recycled polymers. "All four associations aim to enhance the dialogue between plastics machinery manufacturers and plastics converters," said EuPC in a statement.

"The image of plastics has suffered substantially, and it is not expected to improve again in the near future," says EuPC. Meanwhile, the EU has initiated regulations and declarations supported by pledges from brands and OEMs which are stipulating an increased use of recycled polymers in plastics products. This can be seen especially in the field of packaging, but also in construction, automotive and electrical applications. By 2025, 10 million tonnes of recycled polymers need to find their way into products and new applications in the EU. Additional workshops will take place next year.

MORE, a digital platform developed by EuPC to monitor the uptake of recycled polymers into products, went live for use by converters in April. Its objective is to monitor and register the plastics converting industry's efforts to reach the EU target of 10 million tonnes of recycled polymers used annually between 2025 and 2030. The platform is available across the EU.

Alexandre Dangis, EuPC Managing Director, says the industry "now has the opportunity to showcase its efforts towards a circular plastics economy and be more transparent on the volumes of recycled polymers they use in converting infrastructures. With this new European platform, we will also be able to monitor the evolution of the recycled polymers' performances in order to use potentially

more recycled material in our applications."

Dangis says strong participation of companies will be vital for the good functioning and credibility of MORE among the public and legislators. "EuPC will therefore work closely with its members to guarantee a good promotion and distribution of MORE within the plastics converting industry," he says.

Granulation

Meanwhile, producers of equipment that lies at the heart of many plastics recycling operations - granulators - continue to refine their products in line with the demands of the circular economy as well as the more immediate needs of processors.

Bengt Rimark, CEO and Global Sales & Marketing Director at **Rapid Granulator**, says: "The plastics market has dramatically changed in recent years on how to look at granulation, in automotive in particular. In the past, the automotive industry has looked at regrind as a potential risk to process and product quality and has in many cases demanded only virgin material. Today, this has completely changed, and many automotive companies demand that their suppliers guarantee that they are using recycled material in their products. Volvo is openly communicating that by 2025 all the plastic components in their cars should contain a minimum of 25% recycled material.

"This has led to Rapid becoming involved already in the initial stage when new production lines are discussed in order to make sure the recycling part is correctly taken care of. This means that we can make sure that the granulator solution is tailored for the production both in terms of production efficiency and regrind quality."

All Rapid products are modular and so can be fully adapted to the application, Rimark says. "This maximizes the utilisation of the used material and makes sure the quality of regrind is such that it does not affect the production negatively.

"This gives the best of all worlds: trouble-free and sustainable operation, as 100% of the material is utilised; and a positive effect on the profit margin as good quality regrind has the same value as the virgin raw material."

Rimark also highlights the trend towards taking care of all the plastics production waste, including large start-up lumps, which in the past have often been either thrown away or sold or even given away to external recyclers. Rapid developed its Raptor shredder line for this application.

Injection moulders seeking to boost their contribution to sustainability by maximizing in-house re-use/recycling must have a reliable way to produce consistent, clean granulate, free of dust

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Above: Granulator cutting chamber with **U&G** blades from CMG

and fines, from scrap parts, says Dave Miller, General Manager, Size Reduction, at Conair.

"If you already own size reduction equipment, the single best way to ensure the quality of regrind material is a well-maintained granulator, which entails periodic inspection, sharpening, and re-gapping of the rotating and stationary knives," Miller notes. "Worn or misaligned knives and worn-out screens are the top causes of poor granulator performance and poor-quality regrind.

"If you are considering new size reduction equipment, you can maximize the return on your investment by making sure to consider all the variables in a scrap-reclaim system. These include material characteristics, part dimensions, part density, throughput needs, and regrind sizing."

Miller also advises considering questions about future applications for the same equipment, such as: What if I need to relocate the equipment to another line? What if part size or density were to change? What if materials are especially abrasive? What if scrap volume increases?

"Be sure to conduct tests to validate performance with actual production scrap," Miller says. "Based on the results, you can modify equipment configurations before the purchase."

Giorgio Santella, General Manager of another granulator and shredder manufacturer, CMG, says: "Manufacturing systems have profoundly changed, and we can also see this in the recycling field, which if yesterday was essentially aimed at the disposal of waste, is today assimilated within a circuit linked to the circular economy, aimed at re-use, with treatment methods that are therefore very different from those of a decade ago."

The company has just launched U&G disposable blades. Made of a special steel, they are very light, and last longer than traditional blades. "They can be disassembled and replaced easily and quickly, with maximum operator safety," says Santella. By contrast,

disassembly of heavy traditional blades takes a lot of time, is difficult and not without safety risks. The characteristics of the U&G blades represent a great advantage for users who may have to sharpen the blades of the granulators very frequently, he says.

"CMG disposable blades are not applicable to a typical design of the traditional cutting chamber, but only ours with its proprietary geometry," Santella says. They can be used on large granulators (with outputs of over 1,000 kg/h), "where they find the right place in terms of productivity and cost reduction."

"Our U&G disposable blades, with their very small dimensions, installed on the N60-100, S60-160, EV616 and EV916 models, each weigh 300 g, with a clear reduction in weight and an increase in the operating period between the replacement of the blades - which takes less than an hour," Santella says. The worn blades are then recycled.

Piovan Group says it has been investing in developing complete turn-key systems to recover plastics, in line with its concentration on sustainability concepts. A representative says: "A great contribution that Piovan Group is giving to a more sustainable use of plastics is putting customers in the position to be able to process recycled materials with the same performance, the same quality of the final product and the same reliability as when they are using virgin granules.

"This can be done only with deep understanding of the characteristics of regrind and recycled materials. There are many details in the configuration of the feeding, dosing and drying systems that at the end of the day can really make the difference, in terms of profitability and reliability of customers production process."

Dealing with dust

It almost goes without saying that regrind materials have a much greater dust content. This has several implications. For example, special filtering devices have to be included to keep under control the need of cleaning and periodic maintenance; the generation of further dust has to be avoided using feeding systems that allow the control of the material speed inside the conveying lines, like Piovan's Varyo series of vacuum conveying units; de-dusting units have to be included as a preliminary step in the process.

Materials in flake form are also critical in terms of handling. Piovan Group provides a complete range of equipment for this specific purpose. Special slide gates, pneumatic bridge breakers, suction boxes pneumatically operated that works by batch are just few examples of these dedicated solutions.

"We are lucky to work in a sector with a high innovation rate and it's our duty to respond effectively to ecological problems for the wellbeing of future generations," says Silvia Moretto, Head of Marketing at auxiliaries specialist **Moretto**. "The entire supply chain cannot avoid devoting itself to this new and urgent challenge.

"Our customers are increasingly sensitive to environmental issues. To balance the needs of competitiveness with those of sustainability, for us today the priority is to continue investing in research, to develop new technologies that guarantee efficient and low-energy production."

Highlighting Eureka Plus, which she says is "the most advanced low consumption drying system available on the market, particularly suitable for PET drying", Moretto notes that the company participates in the recycling chain by providing solutions for PET recrystallisation, often a necessary step to treat post-consumer recycled material.

Materials handling leader **Motan** takes a similar line. Digitalisation and production process networking plays an important role in successful recycling, says CMO Carl Litherland. "The data from dryers, dosing and mixing systems, and from

crystallisation has already been made available and can be used within the individual processes. In future, more data will follow, for example the composition of the material and its moisture content, recipes, material constants, and production data from the processing machine.

"Properties of recycled materials can change after repeated processing. This is where Motan knowhow comes into play, for example when precisely dosing additives for the making of regenerate."

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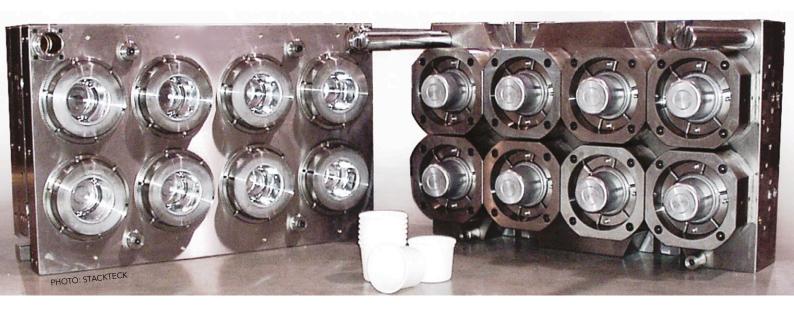




Compounding







Closing the material cycle in packaging

Materials suppliers and injection moulding machine manufacturers are collaborating to make the circular economy in plastics packaging a reality, writes Mark Holmes

A wide variety of industry-wide initiatives are underway to help meet circular economy targets in plastics packaging. These include advances in microcellular foaming technology to further reduce the weight of thin wall packaging, to greater use of recycled and biomaterials, as well as initial product design with recycling in mind.

Sustainability and environmental considerations are top of the agenda at **Trexel**, specialist in microcellular foaming technology for injection moulding applications. "Brand owners and converters are developing lighter products and converting to more energy efficient processes to reduce resource consumption in support of a circular economy," says Leo Devellian, Business Development Manager. "The potential to light weight packaging products provides a tremendous untapped opportunity to lower greenhouse gas emissions. Reducing a plastic injection moulded part weight results in almost an equivalent proportionate deduction in carbon footprint. For example, a 10% reduction in part weight typically translates into an 8-9% lower carbon footprint. The positive impact is due to both a reduction in the feedstock that the thermoplastic is derived from, usually natural gas, oil or bio-based alternatives, and the

energy savings as a result of less polymerisation, transportation to the converter, melting, cooling and transportation again to the end market. Environmental impact is further improved due to the reduction of mass to be recycled back into the circular economy," he says.

"In addition to light weighting, adoption of highly efficient moulding processes remains another underutilised opportunity to reduce carbon footprint. Conventional thin-wall injection moulding is inherently energy intensive due to the ultra-high injection pressures and clamp forces. The industry's embrace of energy efficient hybrid and all-electric machines has been an important step in the right direction. Further progress can be achieved through the implementation of more efficient processes including injection-compression and microcellular foam moulding. These processes eliminate the fundamental inefficiency of filling and packing a thin-wall component with a 'remote' screw through a small gate. Injection-compression and microcellular foam moulding pack the cavity at a low uniform pressure from within the mould, instead of by a remote screw, thereby lowering injection pressure, clamping force and energy consumption."

Trexel recently introduced two products to

Main image: This 1 × 8 container mould was built for a customer by StackTeck Systems in 11 weeks

PHOTO: TREXEL Rama, oose

> Above: Margarine tub produced using Trexel's thin wall moulding technology

decrease part weight and reduce energy consumption. The company says that TecoCell is a new generation of patented, eco-friendly, chemical foaming agents that excels with packaging applications. TecoCell's chemistry yields the smallest cell size and finest surface appearance achievable

through chemical foaming. Unlike traditional endothermic chemical foaming agents which have two reaction temperatures, TecoCell's single reaction temperature takes place in a narrower region of the barrel and allows for a more consistent foaming process with a wider process window, it says. All ingredients and by-products are inert, benign and FDA approved for food contact. Greenhouse gas emissions are reduced through a combination of density reduction (lower part weight) and less energy consumption (lower viscosity and clamp force). Additional benefits include warp, sink, void reduction and up to 30% faster cycle times. TecoCell can be easily adopted on most existing packaging products without changes to the equipment or tooling.

MuCell P-Series, introduced in 2018, provides lighter, lower-cost and more sustainable thin wall packaging. The MuCell physical foam process has mainly been used by automotive, technical and consumer product injection moulders. The challenge of expanding MuCell's use into thin-wall packaging centred on the need to precisely dose N₂ as a super critical fluid at fast cycle times. For the same reasons that thin-wall packaging applications require specialised high speed injection moulding machines, they also necessitate fast MuCell gas dosing systems.

Since its introduction, the company says that MuCell P-Series has demonstrated its abilities in demanding thin-wall applications with L/Ts exceeding 300 and wall thickness as thin as 0.20 mm (0.008 inches). It has been validated that the use of MuCell P-Series on existing packaging products provides 30% reduced clamp tonnage, 12% lower injection pressure, 14% weight reduction and 7% cycle reduction. These improvements not only reduce the cost of existing products but also provide opportunities to enable new packaging designs with greater L/T and geometries not possible using conventional moulding. Use of smaller presses and reduced wear and tear on the mould are additional benefits resulting from the 30% reduction in clamp force.

Trexel adds that the MuCell P-Series can now be combined and enhanced with its Screw

Tip Dosing Module (TDM). This was introduced in 2019 to lower the cost of retrofitting MuCell onto existing injection moulding machines and increase throughput. The TDM module can be applied as a bolt-on addition to an existing barrel in place of the standard end cap. The bolt-on module includes the MuCell gas injector and a wiper/mixing section. The design of the wiper/mixing section is optimised to generate a homogenous solution of dissolved N₂ and melt which is critical to the formation of uniform cell distribution and high quality foam structure in the moulded part.

"Trexel is the first to offer both chemical and physical foaming solutions," says Devellian. "Decades of experience provide the knowledge base to recommend the optimal foaming process to maximise sustainability objectives. On-going developments are focused on introducing new grades of TecoCell chemical foaming agents including a low cost, high performance, agent that provides 'Class A' surfaces for packaging applications and a new satellite system product option for MuCell physical foaming that lowers capital investment cost for multi-machine MuCell operation."

As a direct result of ever-changing consumer demands, Husky Injection Molding Systems sees a number of trends in packaging. "These include the need for more flexibility and easier changeover of tooling, and the ability to get to market faster in order to satisfy the demand for more stock keeping units [SKUs - distinct products on store shelves]," says Henry Zhang, Director, Marketing and Market Intelligence. "We also see increasing need for the better protection of sensitive products and smaller packages, due to the growing health and wellness focus of the market. The industry is always looking for ways to produce more premium packages that stand out on store shelves and that have an improved user experience due to the increasing choices available today," he says.

"The market has changed and continues to change. We see how dynamic the consumer goods sector has become and there are a variety of trends that directly affect the plastics industry. These include a greater focus on sustainability, an aging population and the desire for healthier options, more urbanisation and a new generation of shoppers, who are

> **Left: Isometric view** of Trexel's new screw tip dosing module (TDM) technology

doing more

online shopping. These general megatrends create new needs for packaging producers - they require unique, personalised applications, more SKUs and smaller packages, and faster speed-to-market."

Husky adds that the main technical areas of interest at present are packages that promote sustainability - increased recyclability, recycled content, tethered closures, and more energy efficient injection moulding systems, lighter weight packages and closures. Other technical needs include increased flexibility in tooling, allowing for both higher volume and lower volume production as well as the ability to change tooling quickly for more variety in SKUs.

For high-volume, single-SKU products, Husky has recently launched the HyPET HPP5e system, which is an evolution of the HyPET system that provides the best productivity, quality and consistency to drive total cost of ownership down with adaptive system intelligence for increased energy efficiency. "We are also introducing our NexPET tooling," says Zhang. "With the increase of SKUs in the market, package producers are now changing moulds two to three times a week - sometimes even daily - whereas previously it was only once or twice a month. Our NexPET system allows for faster changeover, providing more flexibility and better return on investment, while maintaining excellent quality," he says.

"We are always looking at ways that the industry is changing and how we can best anticipate the needs of our customers so they can better respond to consumer demands. The increasing need for sustainable packages is important to us, our customers and of course, end consumers. We have a variety of technology solutions that can help our customers achieve their sustainability goals and are constantly looking at ways that we can further evolve those solutions - one such example is our range of tethered closure solutions to meet



PHOTO: WITTMANN BATTENFELD

recyclability legislation in certain regions, which still ensure superior protection of content and a satisfying consumer experience."

In injection moulding for the packaging sector, Wittmann Battenfeld observes a trend towards compact, energy efficient machines with high reliability, as well as an increased demand for digitalisation. "As a result, the main technical areas of interest at present are energy efficiency and Industry 4.0 solutions," says Richard Schnabel, Manager - Project Engineering. "We have developed the all-electric fast-running EcoPower Xpress, designed primarily for the requirements of the packaging industry and for thin-walled applications. The EcoPower Xpress has highly dynamic drive axes for injection, closing and opening that are laid out for fast acceleration and deceleration movements, as well as extreme control accuracy. The injection process is handled by a rack-andpinion gear unit driven via a dual motor system. This technology enables energy savings of up to 40% compared with hydraulic machines with accumulator injection. The low energy consumption is further reduced by KERS, the kinetic energy recovery system patented by Wittmann Battenfeld, which transforms deceleration energy into electrical energy and uses it within the machine," he says.

"We have also developed Wittmann 4.0 for Industry 4.0 solutions. Through the B8 machine control system, machines as well as the robots and peripherals connected with them can be linked with each other and operated via the uniform Windows

Above: Wittmann Battenfeld's all-electric fast-running **EcoPower Xpress** machine



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Above: In June 2019, Managing Director **Sales Gerhard** Böhm welcomed around 120 participants to the second Arburg **Packaging Summit**

user interface. This enables interaction between the individual appliances, and the entire production process becomes optimally coordinated, as well as transparent. Moreover, an electronic data sheet integrated into the Unilog B8 control serves to configure a production cell integrated via the Wittmann 4.0 router in accordance with the selected mould dataset, including all necessary appliances such as robots, temperature controllers, metering devices, dryers and electronic flow controllers. Via the 'plug & produce mode', the production cell is ready for start-up quickly. All required data for quality management from the machine and the peripherals are available for documentation via Wittmann 4.0. In addition, the Wittmann 4.0 router allows secure access by a single IP address (single point entry) to all modules of the production cell for servicing by the web service."

Arburg recently hosted its second Packaging Summit, which was attended by around 120 guests from all over the world.

The 2019 Packaging Summit focused on the currently discussed topic of sustainability. "At Arburg, we've been looking closely at the topics of resource efficiency and the circular economy for some time now. We have understood the problem and acknowledged its scale, and are doing everything we can to contribute to the solution," says Gerhard Böhm, Arburg's Managing Director Sales. He concluded with a positive outlook for the future. "At the two-day event, we collaborated with well-known experts to explain and discuss how the circular economy can be put into practice in the packaging sector. We demonstrated how the plastic industry is tackling the challenges it faces and showcased some of the resource-efficient solutions and innovations we are planning, both now and in the future, to help the industry on its journey towards a circular economy."

In live demonstrations, an electric Allrounder 520 A with 1,500 kN of clamping force produced standard PP coffee capsules with a 0.02 mm barrier layer, while a hybrid Allrounder 920 H with 5,000 kN of clamping force and a 48-cavity mould manufactured coffee capsules from an organic material. Two hybrid machines in packaging versions demonstrated high-performance packaging technology applications. An Allrounder 820 H with 3,700 kN of clamping force and the optional 'thin-walled part' specification produced four IML cups in a cycle time of just 4s.

A hybrid Allrounder 630 H with 2,300 kN of clamping force and the optional 'closures' package produced 48 drinks container closures in a cycle time of 3.3s.

Engel reports that it is actively supporting its customers to increase sustainability and close material loops. The focus is on processing recycled material, improving process stability, and the trend towards design for recycling. Designing for recycling means that the subsequent recycling process is taken into account as early as in the development of a new product, and that the requirements of the circular economy and sustainability are taken into account in the product design. An example where this is already working well can be found in the packaging industry. In the production of thin-walled packaging in the in-mould-labelling (IML) process there is a trend towards monomaterial systems in which the label and pellets are made of the same material.

In April, the group held the 2019 Engel Packaging Day in Shanghai, China. "In China, there are increasingly high standards expected for the quality of products and, in turn, packaging - especially in the food industry," says Kurt Hell, Director of Engel's packaging business unit in Asia. "Special designs and functional properties are in demand, as is high-quality decoration with IML. Multi-coloured and multi-component applications for food and non-food closures are also becoming increas-



Right: In Shanghai, Engel demonstrated how a twocompartment yoghurt cup including IML decoration can be produced economically and efficiently on an all-electric E-mac 180 injection moulding machine

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ingly popular." The packaging sector in China is a stable market experiencing constant growth and evolution. "Within the Chinese plastics industry, the production of packaging parts is an important segment with highly specific needs," says Hell.

There were presentations by Engel and its partner companies Pass Card, Wetec, Borouge and Verstraete, as well as long-standing customer Menshen. Live demonstrations showed how a two-compartment yoghurt cup with IML decoration from Verstraete can be produced economically and efficiently on an all-electric E-mac 180 injection moulding machine. Pass Card's two-cavity hot runner precision mould and Wetec's high-speed automation were both the work of Taiwan-based companies and the product of European-Asian cooperation. In a second live demonstration, Engel showcased closures production on a tie-bar-less Victory machine, showing how the barrier-free clamping unit ensures particularly efficient production processes.

KraussMaffei is launching the GX 1100 for larger packaging and logistics applications at K2019. The new model extends the clamping force range of the GX series upwards, with 4,000-11,000 kN now available. "With the new clamping force size of 11,000 kN, we are expanding the range of our successful GX series with a specific target. We see great opportunities particularly in the areas of packaging and logistics," says Hans-Ulrich Golz, President of the Injection Molding Machinery segment of KraussMaffei. The most recent member of the GX series has the space-saving two-platen design, the GearX and GuideX clamping elements, the modular configuration and a wide variety of equipment options, for example the particularly energy-saving BluePower servo drive.

At K2019, the GX 1100-12000 will demonstrate production of polypropylene buckets with a capacity of 20l each, injected in two cavities and decorated by IML. The shot weight is about 1.5kg with a cycle time of just 14s. The available speed option ensures fast injection speeds (up to 700

mm/s depending on the injection unit) as well as

fast clamping movements.

The HPS barrier screw for polyolefins allows for particularly fast melting and high shot weights due to a high L/D ratio of 26. The HPS barrier screws deliver a plasticising performance up to 40% higher than the conventional high-performance screws from KraussMaffei. The company adds that digital services control and monitor the entire manufacturing process of the

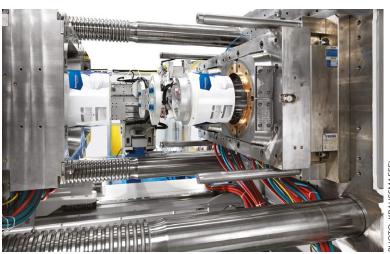
IML buckets. The APC Plus machine function ensures extreme consistency in component weight and thus high product quality by controlling the changeover point from injection pressure to holding pressure, as well as the holding pressure level, from shot to shot. Additionally, the dwell time of the polypropylene in the plasticising unit is monitored for the first time, which ensures a high material quality.

KraussMaffei and Netstal are combining their expertise in injection moulding machinery under the new KraussMaffei umbrella brand. With the common portfolio, the company wants to present itself even more effectively, firstly in the medical technology and packaging industries.

"Under the single, strong KraussMaffei brand, we are combining our injection moulding expertise from all application areas. We will be pushing ahead the world of injection moulding more than ever, in keeping with our new, shared motto, 'Pioneering Plastics'," says Golz. "The medical technology and packaging industries are the first and foremost common target. The familiar machine series (PX, CX, GX, MX from KraussMaffei and Elion, Elios, PET-Line from Netstal) and the production locations will remain as they are. The new sales organisation is arranged by economic regions so that each customer will have only one contact, who will provide comprehensive support. Regional subsidiaries and trade partners create more proximity to customers

Left: At K2019, KraussMaffei is extending its **GX** series upwards by adding the clamping force size of 11,000 kN

Below: Twenty litre buckets with an IMI decor will be produced at the K2019 show with the new Krauss-Maffei GX 1100



Thin Wall Packaging

Chicago / 2019

Identifying opportunities and maximizing returns in light-weight plastic tubs, pots and trays industry

June 18-19, 2019 The Westin Chicago North Shore, Wheeling, Illinois, USA



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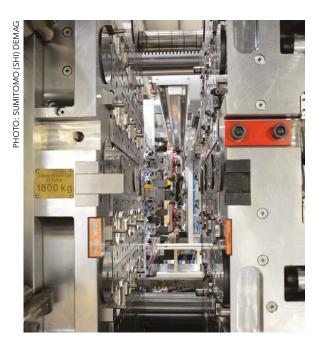




Injection Film and Sheet







and increase the response speed in urgent cases."

Sumitomo (SHI) Demag, Waldorf Technik and Roth Werkzeugbau have collaborated to provide a fully automated IML production line for UK injection moulder Amaray that is repeatedly manufacturing, stacking and wrapping over 7,500 easy open, fully decorated rigid wipe lids per hour. The push button lids, designed for a major blue chip personal care client, are manufactured on a Sumitomo (SHI) Demag ultra-high speed 580-tonne El-Exis SP, fitted with a multi-cavity 12 + 12 stack mould. An integrated high speed IML Waldorf Technik robot places each label into the mould, and then removes and closes each of the 24-hinged lids as soon as they are extracted from the mould. This has to be done swiftly while the polypropylene is still malleable. Each lid is then placed on the conveyor where they are each quality checked by a camera. A robot then stacks 38 lids, passing to a binder, at which point nine stacks are fed into an automated wrapper to create a brick of 342 lids for loading onto a pallet.

In order to maximise post-consumer recycling efforts, Amaray made the decision to use polypropylene, so that that the entire component - lid and label - can be recycled after use. The design required the lid to be moulded as a single component and decorated and assembled in a seamless process. From an injection moulding perspective, using a 12 + 12 stack mould - although more productive - presented a tooling and processing challenge. Sumitomo (SHI) Demag's UK packaging expert Kevin Heap says: "To create the flip-like hinge was challenging in itself, as the tooling needed to accommodate varying depths of raw material. Unlike a single face tool, the polymer is

injected in the centre between the two plates and has to be evenly distributed in all 24 cavities."

Additionally, using a two-face 12 + 12 stack mould in conjunction with the IML system means that 24 cavities are opening at the same time, with a Waldorf Technik side-entry robot placing labels accurately within fractions of a second. "Typically, packaging moulders use a single face mould with a maximum of 12 cavities when integrating an IML system, so Amaray's installation doubled the complexity. To insert labels on both tool faces required a much larger robotic system," says Heap.

StackTeck Systems has a new approach to fast mould deliveries, using automated design capabilities that work with a pre-set, optimised set of mould design rules. FastTrack projects compress engineering and manufacturing stages, using automated design and product standardisation. As compared with custom designed moulds, the engineering phase of every project will be reduced from 3-4 weeks to just a few days. The first phase that StackTeck is now offering, will cover single face moulds for round lids and round air eject containers, with 2, 4, 6 or 8 cavities. Future development of this technology will cover a broader range of part types, as well as bigger cavitations and stack moulds.

Left: Amaray's packaging line comprises a 12 + 12 stack mould, producing 7,500 fully decorated rigid wipe lids per hour for a leading blue chip personal care customer

CLICK ON THE LINKS FOR MORE INFORMATION:

- > www.trexel.com
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- > www.waldorf-technik.de
- > www.roth-werkzeugbau.de
- > www.amaray.com
- > www.stackteck.com

Below: The ultra-high speed 580 tonne El-Exis SP from Sumitomo (SHI) **Demag**



Consultancy and Research Opportunities

We are expanding our consultancy and research capabilities in Bristol, UK. We are looking to fill several posts in the team at various levels of seniority and experience.



UNIT MANAGER Recycling & Sustainability

You will set the direction for the business unit and be at the forefront of AMI's value proposition development for recycling & sustainability.

You will build on and develop a series of regular research reports, single client engagements and proactively support the development of our events business in relation to recycling & sustainability.

You will be an experienced (10+ years) consultant, research professional or industry expert.

Previous experience within recycling and sustainability focussed research or consultancy is highly desirable and strongly preferred.

You will be educated to degree level (or higher) with preferably a chemistry/technical or engineering qualification.

These roles offer competitive remuneration packages and opportunities for long term career progression within a high calibre and highly respected consultancy and research team.

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You will build on and develop a series of regular research reports, single client engagements and develop conference programmes for specific sectors of the plastics industry.

The process of delivering a series of client reports will involve:

- Primary and secondary research through personal and telephone interviews and desk research
- Development of data and statistics to understand market trends
- Insight and analysis through written reports and visualisations as well as conference presentations

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You will be an experienced (5+ years) consultant, research professional or industry expert.

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You will carry out market research and writing for multi-client reports, provide support on consulting projects and contribute towards conference programmes for specific sectors of the plastics industry.

Working under the guidance of experienced consultants and unit manager(s) you will work as part of a project team to deliver a range of client solutions and undertake business travel to attend conferences and exhibitions as required.

You will be educated to degree or equivalent level with strong data handling skills to collate and develop statistical data to support research.

For more information or to apply contact Richard Walker, Head of Market Intelligence richard.walker@ami.international



Let the countdown to K2019 begin! Here, and on the following pages, we take a look ahead to the global plastics industry's essential event - and provide useful links to help you get the most from your visit

Getting ready for K2019

The world's largest plastics trade fair is now less than three months away; K2019 will take place at the Messe Dusseldorf show ground in Germany on 16-23 October 2019.

The show will fill all 18 halls of the venue - where more than 3.000 exhibitors from more than 60 countries will promote their raw materials, additives, semi-finished products, machinery, ancillary equipment and services to the plastics industry.

Regular K visitors may wonder about the 18 halls, which is one less than in 2016. The explanation is that Hall 2 has disappeared, subsumed into a new and much larger Hall 1 that now covers 12,000m². The southern entrance is also being updated but will not be quite ready for K.

Attendance in 2016 was slightly up on the previous event in 2013 - by around 14,000 visitors to 232,053. Messe Dusseldorf will be hoping for further growth although the plastics market is certainly less buoyant than three years ago.

One of the big challenges facing the sector is sustainability, so expect to see much around recycling, waste management and the Circular Economy throughout the exhibition. Other key themes will include digitalisation in the form of Industry 4.0 smart technologies and additive manufacturing.

The Science Campus, designed to allow business to exchange ideas and information with academia, will also make a return to this year's event.

Injection World magazine at the K2019 show

Injection World will be exhibiting at K2019 on stand C11 in Hall 7. By paying a visit, you can find out more about all of our digital plastics magazines and apps.

The stand is run by our parent company AMI, which will be showcasing its latest industry directories and market reports, as well as providing information on our many conferences and the new Plastics Extrusion World Expo 2020.

In the run up to the K2019 event, Injection World will be publishing detailed previews of the innovations that will be on show.

Look out for the K Preview Issue in September and the K Show Special in October. You can follow the news as it happens on our Twitter feed @Plasticsworld and we will also be reviewing the event in detail in our November/ December edition.

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

Send your press releases to the editor, David Eldridge at david.eldridge@ami.international. Full details of our special coverage of K can be found in our media pack.

Dates: 16-23 October 2019 Venue: Dusseldorf Fairground, Dusseldorf, Germany Hours: 10:00 to 18:30 daily Organiser: Messe Dusseldorf Website: www.k-online.de



Click for information

Use our hand-picked selection of weblinks to make sure you have a productive and enjoyable visit to K2019



BUY YOUR TICKETS

Purchasing your tickets online in advance can save you up to €47. A three-day ticket bought online costs €108 instead of €155 when purchased at the exhibition. One-day tickets are €49 in advance or €75 at the show. Order your tickets now by clicking here

GET K ON YOUR SMARTPHONE

Lots of useful K 2019 data is now available on your smartphone or tablet, including exhibitor and product databases, exhibition plans, travel information, hotel listings, city guides and restaurant reviews. To download the app, visit the page here, which has links to either the AppStore (for iPads and iPhones) or Google Play (for Android devices). There are also instructions for users of BlackBerry mobile devices.



BOOK YOUR HOTEL

Dusseldorf's hotels quickly fill up for the eight days of K and the best options go early. Find out what's still available and make your reservation as soon as possible at the official website





MAKE THE MOST OF DUSSELDORF

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

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

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

And if the Altstadt and its 260 pubs get too crowded, try heading to the Media Harbour, for its modern architecture and venues, which include restaurants, bars and clubs. Find out more about the area's attractions here: http://bit.ly/K2019mediaharbour



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

CHECK OUT THE EXHIBITORS

With more than 3,000 exhibitors to choose from and a total exhibition area of more than 170,000m², it makes sense to plan your time at the show before you head off. The good news is that you can search for participating companies by name and by product using the daily-updated online K2019 database.

To search by company, click here To search by products, click here You can also locate companies using the interactive floorplan which can be found here





SOAK UP SOME CULTURE

There is more to Dusseldorf than K - it is the capital of North Rhine-Westphalia, after all. The city is home to more than 100 galleries and museums but the biggest is the Museum Kunstpalast, located in the centre of the city near Königsallee. During the fair, the Kunstpalast's special events include: a retrospective of Dortmund-born artist Norbert Tadeusz, including around 40 paintings and works on paper; and an exhibition of art created in the former East Germany.

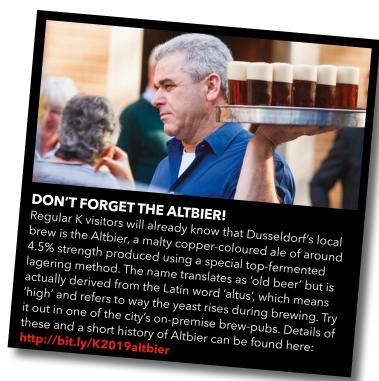
Find out more here

TRY THE RETAIL EXPERIENCE

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

http://bit.ly/K2019konigsallee





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Hamburg / 2019

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Compounding







We preview speakers presenting at the 2019 edition of AMI's successful Single-Serve Capsules conference in Berlin

From a niche market, single-serve beverage capsules have grown to be one of the most important sub-applications of the ambient thin wall packaging segment in the past five years. This dynamic market segment has a complex value chain. There are a variety of coffee brewing systems available with proprietary capsule designs, with a number of brands competing to achieve the highest machine instalment rates globally.

The third edition of AMI's international Single-Serve Capsules conference returns to the Sofitel Berlin hotel in Germany from 24 to 25 September 2019. The conference brings together industry-elite speakers from the entire supply chain to evaluate and discuss the trends, challenges and opportunities facing the single-serve capsules industry.

Single-Serve Capsules 2019 provides a unique forum to explore the global trends, receive insights into future applications, evaluate end-of-life options, explore sustainability and materials as well as looking at innovations in capsule design and production technology. The audience includes capsule fillers, coffee roasters, capsule moulders, material suppliers, technology and machinery suppliers.

In addition to the busy two-day speaker program, Single-Serve Capsules 2019 offers high-level networking opportunities in a focused exhibition

area featuring displays from a range of suppliers.

Here we preview the event, with a closer look at the line-up of expert speakers.

Market overview

The opening session of Single-Serve Capsules 2019 kicks-off with Martyna Fong, Unit Manager - Packaging from AMI's plastics consultancy in the UK who gives a global single-serve capsules market overview. Veith Behrmann, Group Packaging Manager, and Pierre-Oliver Azzouz, Manufacturing Services & Packaging Manager, both from **Nestle Nespresso** in Switzerland, discuss the dual challenge of sustainability and food contact legislation compliance, a challenge facing capsule manufacturers across the globe. A roaster's perspective of the evolution of the coffee capsules market is then shared by Luca Cioffi, Managing Director from **COIND** in Italy. After the refreshment break, Peter Grainger, Founder of Cafe Pod in the UK, talks about the ever-changing consumer needs and the implications for capsule technology and manufacturing.

The next session provides a sneak peak into the future of single-serve applications. Carlos Ruiz, Founder, CEO & Chairman from Flatev, in Switzerland showcases his work with regards to the future of snacking with single-serves. This is followed by a

Oil & Gas **Non-Metallics**

London / 2019

Identifying and exploiting opportunities for polymer materials in onshore and offshore oil and gas engineering

> 4-5 December 2019 Amba Hotel Marble Arch, London, UK



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talk focusing on the single-serve ice cream revolution, where food tradition meets technology, presented by **Alessandra Gaudio**, Chief Product Officer from **Fwip** in the UK. The third paper of the session is given by Andy Wang, President of Eastsign in Hong Kong, which explores the smart brewing technology that is making single-serve capsules portable.

The conference's third session opens with Sophie Kieselbach, Senior Consultant / Solution Manager from **Thinkstep** in Germany, who provides a comparison of various capsule packages and questions whether to recycle or not. A case study on recycling of compostable bioplastics at composting and biogas facilities in Italy is then given by Marco Ricci, Senior Project Manager from the Italian Composting and Biogas Association (CIC) in Italy. After the refreshment break, Julien Tremblin, Head of Brand Partnerships & Marketing - Europe from **Terracycle** in the UK, questions whether single-serve capsules and sustainability should be viewed as a threat or an opportunity.

Panel discussion

The final session of day one takes the form of a panel discussion that evaluates sustainability within the single-serve capsule landscape, starting with material selection through to end-of-life choices. Members of the panel include Flavio Di Marcotullio, Business Development Manager from Natureworks in Spain, Laurent Lombart, Managing Director of Capsul'In Pro in Luxembourg, Julien Tremblin from Terracycle and Zouhair Yahia, Sales Director from **Belmoca** in Belgium. The panel is moderated by Martyna Fong from AMI.

Day two of Single-Serve Capsules 2019 is opened by Tazio Zerbini, R&D Manager from FLO in Italy, and Flavio Di Marcotullio from Natureworks in Spain. Their joint presentation looks at sustainability and performance and how we can rethink single use packaging. A paper on new developments in compostable applications for the single-serve







Speakers at the conference include (from left to right) Iacopo Bianconcini and Cristian Spadoni, both from Sacmi, and Martin Bussmann from BASF

market is then given by Martin Bussmann, Team Leader Segment Biodegradable Packaging and Technical Marketing from **BASF** in Germany. This is followed by Giorgio Dini, Marketing Manager Coffee, and Remy Teuscher, Sustainability Specialist, both from Amcor Flexibles in Switzerland, who discuss sustainability and capsules with a focus on their compostable lidding with barrier.

Dave Morton, Vice President, Multi-Layer Technology Solutions from **Husky Injection** Molding Systems in Canada, begins the final session of the conference with a look at multi-layer technology and how to unlock sustainable packaging possibilities for single-serve capsules. This is followed by Iacopo Bianconcini, Marketing and Business Development Manager, and Cristian **Spadoni**, Technological Lab Specialist, both from Sacmi in Italy, who provide an industry case study on multi-layer compression moulding, highlighting the benefits of this innovative technology.

After the lunch break, the session is continued by Chris Law, Sales and Marketing Manager from Union Papertech in the UK, who discusses biodegradable filtration paper with a focus on clarity and the consumer. Closing the conference is a paper exploring technology advances in ultrasonic sealing and how this is preserving the aroma in single-serve capsules, presented by Michael **Zimbleraikis**, Area Sales Manager Packaging from Herrmann Ultraschalltechnik in Germany.

About Single-Serve Capsules 2019



Single-Serve Capsules 2019 takes place on 24-25 September in Sofitel Berlin Kurfürstendamm hotel in Berlin, Germany. The conference provides an international forum bringing together the entire value chain of plastic and metal capsules.

In addition to the formal conference sessions, the event provides extensive networking opportunities throughout the informal breaks, including access to the table top exhibition area and complementary cocktail reception at the end of the first day. To find out more about attending the conference, taking a table-top exhibition space, or becoming a conference sponsor, visit the conference website or contact Conference Organiser Thom Crawley: thom.crawley@ami.international, Tel: +44 (0) 117 314 8111.

SPECIAL DEAL FOR INJECTION WORLD READERS: QUOTE CODE CAPS 2019 TO RECEIVE THE PRE-PROGRAMME RATE



Exploring new ways to add functionality and value to plastics

After six successful years, AMI's Compounding World Forum is returning with a new name and a new location. Technical Compounds Forum 2019 will take place on December 3-4, 2019 in Tampa, FL!

This new identity more accurately reflects the focus of the conference program, which has always been about adding functionality and value to high-performance polymers, including engineering plastics, TPOs and TPEs. Target end-use markets include the transport, electrical & electronic, medical, industrial and consumer goods sectors.

Dedicated sessions will feature hot topics such as wear-resistant plastics, conductive compounds, light-weight solutions for metal replacement, polymers for the car of the future, and materials for 3D printing.

You can expect the same excellent networking opportunities in the dedicated exhibition area. Extended breaks, lunches and an evening drinks reception all provide plenty of opportunities to build new contacts and reinforce old friendships over two days in a relaxing but focused business environment.

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Compounding

Join us and be part of the event!

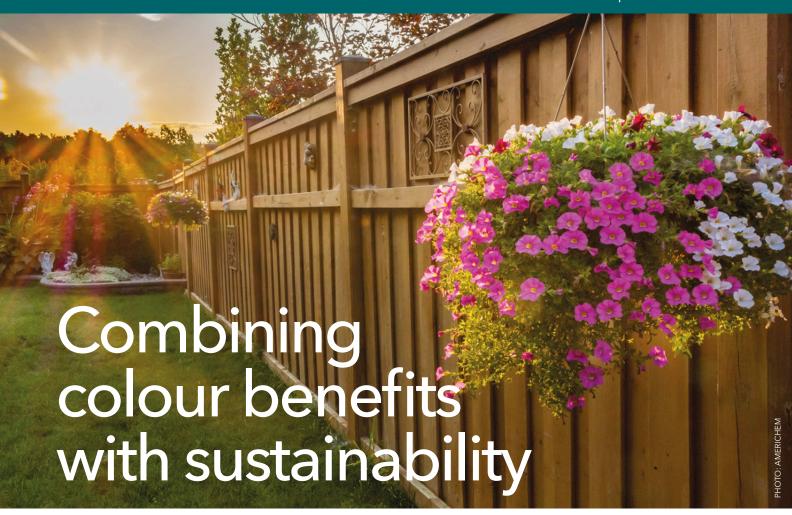
To register as an exhibitor or delegate and to get more information on sponsorship packages, please contact the Conference Team Manager USA, Kelly DeFino on

Tel: +1 610 478 0800

Email: kelly.defino@ami.international







Injection moulders continue to want new and exciting colours for their brand owner customers. However, masterbatch suppliers are also having to help achieve rising sustainability targets, writes **Mark Holmes**

Masterbatch manufacturers are increasingly being requested to supply more sustainable solutions for plastics injection moulders, while continuing to meet market needs for innovative new colours and reliable global colour consistency. With increased use of recycled polymers and biomaterials, new colour and masterbatch technology is needed to meet these industry challenges.

According to Matthew Hellstern, Chief Executive Officer of **Americhem**, the current market needs for colouring technologies have shifted due to the discussion on the environmental impact of the plastics industry. "Today, there is a significant focus on single-use plastics and how we can make them more sustainable for our future so they do not end up in landfills and our oceans," he says. "Customers are already beginning to demand not only high performing masterbatches, but these products must also be environmentally conscious. As masterbatch manufacturers, it is our duty to meet the customers' needs and take on our own responsibility to make

our products more environmentally sustainable through formulations and processing. The entire value chain needs to come together to understand the carbon footprint of the entire process for continued environmental improvement."

Hellstern highlights a number of opportunities for the plastics industry to create a more sustainable future. These include continued light weighting or metal replacement with plastics in the automotive and aerospace industries, as well as increased use of recycled resins in the production of colours and masterbatches for sustainability across industries. He adds that surgical and medical devices continue to rapidly change with the trends and the plastics industry has and will continue to make monumental impacts that change the way we think of modern healthcare.

Material replacement across a multitude of industries will continue. In the building and construction industry, for example, using polymer products for outdoor applications such as fencing

Main image:
Americhem
supplied a dark
coloured
masterbatch
for a fencing
application

Right: Building and construction masterbatch pellets from Americhem that could last more than 50 years is much more sustainable than a wooden fence that quickly weathers, deteriorates, and must be painted with harmful chemicals that give off VOCs.

The role of the colour and masterbatch supplier to the injection moulding industry is also changing. "The days of being just a colour house are quickly fading as customers' demands increase and they lean more towards multifunctional masterbatches and companies that can offer a full spectrum of solutions," says Hellstern. "These include custom solutions and mass customisation. Speed to market and automation are also key factors. Other reasons why customers want a solution provider instead of a colour house include greater cost efficiency, efficient manufacturing and a reduction in value chain responsibilities that allows them to focus on their speciality.

"Sustainability has become such a huge disruptor in the plastics industry that emerging technologies in materials science, 3D printing, and biomaterials have started to turn the industry upside down. The faster these technologies emerge, the faster manufacturers have to adapt and continue the descent to the bottom to have the least amount of environmental impact possible."

A recent addition to the company's range of masterbatches is InLube PCECO130, a wear resistant alloy based on a polycarbonate that provides good lubrication for optimum wear and friction performance without the use of PTFE. Americhem was able to eliminate the use of PTFE in the product and create an alloy that has good wear resistance in plastic-on-metal and plastic-on-plastic applications. Americhem says that there are applications across many industries, including medical devices, data storage and business equipment. InLube PCECO130 is available in standard and high



High impact PP copolymer stadium seating at the Orlando City Soccer Club, where Americhem supplied highly chromatic colours developed to withstand harsh exterior environments and long term exposure



flow grades dependent on customer needs. FR grades are under development.

Americhem has also worked with a large North American seating partner to provide high impact PP copolymer stadium seating at the Orlando City Soccer Club. The customer wanted highly chromatic colours developed that would withstand harsh exterior environments and long term exposure. They also wanted a section of 49 rainbow coloured seats to honour the victims of the Pulse nightclub shooting. Americhem says that it designed a stabilised product able to stand up to the rigorous weathering testing required.

In another recent case study, a fencing producer was having trouble getting good weathering performance in dark colour spaces due to low quality weathering capabilities that led to excessive colour fade of the product. Americhem changed the customer's material from a blend to 100% Americhem eCap technology that was colour matched to what they were currently selling. Changing over to this grade material with added weathering benefits offered far superior performance.

Environmental issues will also continue to influence developments, says Hellstern. "We have invested in R&D in many environmentally-friendly projects such as biomaterials and colouring sustainable materials to be used in a variety of end applications and those are the types of developments we will continue pursuing. Examples include rice hulls, cellulose, coconut, flax, wood flour, pecan shells, wheat straw and sisal, which have been used to make a variety of base resins that we coloured for automotive interiors. We are also producing building and construction products that last 30-50 years compared with non-sustainable materials."

RTP Company reports that injection moulders and their customers continue to be concerned with consistent colour and global availability. "In addition, they are seeking more guidance with

colour selection, and they are using unique special effects that provide product differentiation," says Tim Duncan, Global Business Manager - Color Products. "Last but not least, there is a lot of focus on colouring technologies for consumable, one-time-use plastics and how they impact the end-of-life cycle for these products.

"Often, new developments are driven by problems that need to be solved. For example, when manufacturers and moulders discovered that some plastics suffer from colour fade when exposed to sunlight, compounders like RTP Company responded with compounds formulated with UV protection. Today, there is much more focus on the entire life cycle of plastic products, particularly end-of-life for consumables. As such, the plastics industry is looking for more environmentally-friendly solutions."

In addition, Duncan adds that in today's political environment, compounders are forced to be aware of potential supply disruption and dramatically increased costs. "For example, shortages in Asian market supply are creating challenges for materials that have previously been readily available; this drives new development of replacement products," he says. "Furthermore, greater regulatory controls are limiting global availability, so a more regional approach to inventory management and relationship building is required. Plastic injection moulders are also looking for more all-in-one solutions that solve multiple issues. Because RTP Company engineers understand the chemical make-up of base resins, additives, and the interaction between them, they are able to formulate compounds that serve multiple purposes. For example, they can develop one compound that provides structural integrity, internal lubrication and low warpage, in whatever colour the moulder requests.

"Another area of interest is biopolymers, as plastic injection moulders look for more environmentally-conscious solutions for consumable or single-use plastics. Historically, biopolymers can be challenging because of their physical performance limitations, such as low impact resistance, thermal resistance and strength. However, RTP Company engineers have improved the performance of biopolymers like PLA by compounding them with impact modifiers, mineral fillers and glass fibres, resulting in materials that can compete with popular fibre reinforced petroleum-based resins."

RTP Company says that it is focused on all-inone thermoplastic compounds that provide colour and physical property enhancements that are fine-tuned to the application requirements. In addition, it is continuing to develop colour and



Although carbon fibre compounds are typically used for their strength and light weight advantages, they also have an interesting natural colour and texture that can be used in new ways for aesthetic purposes

masterbatch materials that provide special effects, such as pearlescent and metallic finishes. Most recently, the company released Hueforia 2020, a collection of thermoplastic colour palettes to spark imagination and design ideas for the future.

In future developments, Duncan says that RTP Company will continue to release thermoplastic compounds designed for multiple functionality, such as colour plus another functional property, to meet the increased demand for these materials. "In addition, we use traditional materials that we fully understand mechanically to explore how colour can enhance them, thereby exploiting attributes beyond those that were originally intended," he says. "For example, carbon fibre compounds have particular performance advantages - and also an unusual look. With our guidance, our customers have successfully used traditional materials in new and exciting ways for purposes of aesthetics rather than simply functionality."

Cabot Corporation cites the most obvious market needs in colour and masterbatch at present to be flexibility in colouration and reducing impact on mechanical properties when adding specific colour additives such as carbon black. "The market is also seeking the ability to mix and over-colour various polymer and additive types with the increasing use of recycled polymer," says Sebastian Heitkamp, Global Segment Marketing Manager. "The industry is being influenced by a shift to higher use of recycled materials, as well as the challenge to improve colouristic properties with less colourants. The challenge with recycled material is that most are not pure in their colour, and therefore require additional effort to cover possible defects on the surface. It is also important that colours have a minimal impact on the effect of the desired func**Right: Black** masterbatch pellets from Cabot

tionality, such as haptics and odour.

"The industry is also seeking colour solutions that reduce the impact on the mechanical properties of the final product, while minimising downtime when switching colourants by improving the efficiency of colour changes. In terms of colouration, it remains key to improve dispersion of colourants, which can influence quality control, production speed and durability of the final product. The industry is still working on new techniques and solutions to address these challenges from both the raw material and machine manufacturer sides."

Cabot adds that its latest product innovations include a range of masterbatches specifically tailored for the need to cover mixed coloured plastics. PlasBlak 628 masterbatch series is designed to encompass a range of formulations to tailor to low and high end plastic applications, and provide unique cover power and high dispersion. The company says that it is successfully applied where there is a need for overcolouring grey/mixed coloured recycled polymers. With growing use of recycled polymer material these masterbatch formulations have demonstrated success in both packaging and consumer goods applications. In addition, there is a new range for PET used in the packaging industry. Future developments may also include custom made black masterbatch formulations with higher dispersion to enhance the durability of the final product.

Modern Dispersions has developed several blue-toned black masterbatches for extrusion applications, where there is now a demand for similar colour matches for injection moulding applications for automotive interior applications. The company says that the market is demanding very specific blue tone black colour matches for particular vehicle models. This requires continuous colour matching efforts from the colour development team.

Below: Irrigation pipes manufactured with black masterbatch from Cabot





Typical automotive applications require strong dispersion of pigments into various interior surfaces to match the overall colour scheme. "Modern automotive interiors demand higher jetness along with different undertones from a pigment masterbatch to match the overall interior scheme," says Jan Kozma, Vice President of Sales and Marketing for Modern Dispersions. Carbon black is used in auto interiors not only as a pigment but as a functional filler due to its ability to increase UV stability. Colour levels are carefully controlled to ensure consistency since variables during processing can affect the colour performance of the masterbatch, according to Kozma.

The blue-tone carbon black masterbatch can be used in a wide range of resin systems including polyethylene, polypropylene, and thermoplastic olefin elastomers. Typical usage levels range from 5-8% by weight depending on the total polymer system in the final product. The new blue-tone masterbatches have found commercial use in a range of interior applications at leading US automakers.

Ampacet has introduced Odor Scavenger 1000258-E, a powerful wide spectrum odour-absorbing masterbatch designed for use with recycled polyethylene to neutralise odours of post-consumer recycled material and keep them enclosed inside the polymer. Specially formulated for injection and blow moulding, film and some extruded applications, such as geomembranes, Odor Scavenger 1000258-E minimises odours, which allow processors to improve their circular economy targets by boosting the content of post-consumer recycled resin. Suggested uses include bottles, garbage bags and geomembrane liners. Ampacet says that Odor Scavenger



Left: Gabriel Chemie and
BeLaser have developed
new laser marking
masterbatches to
provide new
looks, including
wood effects

1000258-E does not significantly affect the production process or physical properties of polymers.

Gabriel Chemie, in collaboration with partner BeLaser, has developed new laser marking masterbatches to provide new looks, including wood effects. The companies say that there are many possible applications in cosmetics and food packaging. In addition, the laser marking masterbatches are suitable for barcodes, safety seals, interior and exterior automotive accessories, security tags or marking of medical products and laboratory equipment. Product safety through long-lasting and forgery-proof labelling is an additional advantage. The product range consists of laser additives and combination masterbatches - colour and additive which are suitable for all thermoplastics. The masterbatch is suitable for processing in injection moulding and hollow body injection moulding.

Plastic Jewels is a another Gabriel-Chemie collaboration with **BASF** for a new series of polymer colours, developed and realised by Gabriel-Chemie and styled with colour and effect pigments from BASF. There are 18 colour creations demonstrated in a total of 36 glossy and matt flip-top closures. The colours are designed to give impressions of jewels such as garnet, ruby, tourmaline, sapphire, turquoise, emeralds and citrine in plastics.

Gabriel-Chemie has also introduced a colour range based on post-consumer recycled (PCR) polypropylene. Suppliers collect polymer from post-consumer waste such as the Yellow Bag system in Germany, which serves as base material. The creation of a large variety of colours is already possible. Lighter and effect colours, as well as combinations with laser marking additives, can also be realised depending on customer requirements and demands. The first customer projects in the packaging area are currently in progress and further projects to use PCR PET and HDPE as the carrier base are in development.

PolyOne Corporation and **3M** have launched an on-site polymer colour matching and dosing system that is claimed to accelerate the process of designing and colouring injection moulded parts. The Pinpoint Express Color and Dosing System allows users to create, match, and mix colours

onsite, dramatically reducing lead times for short-run colour development from weeks to hours.

Pinpoint combines proprietary software and liquid colourant technology from PolyOne's ColorMatrix Select system with proprietary dispensing and dosing technology from 3M. The companies say that customer trials have resulted in significant colour development lead time reductions, collapsing a typical four-week process to just a few hours. At the same time, trials have shown that Pinpoint maintains good colour consistency.

"The Pinpoint system is a targeted complement to our full ColorMatrix product line," says Will Nordloh, General Manager, ColorMatrix for PolyOne. "Pinpoint enables short-run injection moulders to make a step change in their ability to serve their customers and grow revenue by significantly reducing the time needed to design and create colours. The system also helps reduce operating costs by eliminating the need to carry excess or expired colourant inventory. In testing, customers gave high praise to the efficiency and simplicity of the system – it's as easy as design-dispense-dose."

"Bringing the innovation of 3M together with the colourant and plastic injection moulding expertise of PolyOne, the Pinpoint system is a revolution for the manufacturing of moulded-in-colour parts," says Dave Gunderson, Vice President & General Manager of 3M Automotive Aftermarket Division.

Teknor Apex Company has introduced a new



Left: The
Pinpoint
Express Color
and Dosing
System
combines
software and
colourants
from PolyOne
with the power
of 3M dosing
technology



Above: Teknor
Apex has
introduced the
StarDust series
of colour
concentrates
that yield a
sparkling
effect produced by
glinting flakes
within the
colour itself

series of colour concentrates for injection and rotational moulding that yield a sparkling effect produced by glinting flakes within the colour itself, providing merchandisers with a new option for product differentiation that is distinctive and enhances consumer appeal. StarDust concentrates are available in all standard colours and are supplied in pellet form for injection moulding and as powdered dry colour for rotational moulding. The powder form is the first sparkle-effect rotomoulding colourant. Teknor Apex recommends StarDust concentrates for consumer products such as toys, housewares, dust bins, waste bins, storage bins, and other items where shelf appeal or visual enjoyment are key values. Rotomoulding applications include kayaks, outdoor furniture, coolers, and sporting equipment.

"StarDust concentrates provide an enjoyable sparkle that helps manufacturers strengthen brand identity, enhance shelf appeal, or simply add aesthetic value to otherwise utilitarian objects," says John Wood, Technical Director of the Color Division of Teknor Apex.

Clariant Masterbatches has established a Regional Packaging Centre (RPC) at its Phanthong manufacturing facility in Thailand to support packaging industry customers in the Asia-Pacific region. The RPC is part of a Clariant programme to provide a higher level of service to the packaging industry in the region. The company says that the centre is home to formulation, process and analytical experts who also have in-depth knowledge of market trends and customer needs. They have access to analytical equipment, a wide array of processing machines, and Clariant's regional network of application-development laboratories in Singapore, Malaysia, Vietnam, Indonesia, India, New Zealand and Australia. The RPC is operational now, and upgrades and equipment additions will continue to be added through Q1 of 2020.

"With the RPC, we want to engage deeper with customers in a co-creation process to develop breakthrough concepts and solutions in masterbatch products and processes tailored to their aesthetic and functional needs," says Chris Hansen, Head of Clariant Masterbatches Asia Pacific. "We are doing this in partnership with other suppliers, leading institutes and universities so that Clariant can provide comprehensive solutions to packaging convertors and brand owners."

The RPC also houses a wide range of analytical equipment used for determining the chemical, mechanical, environmental

stress cracking, anti-static and coefficient of friction properties of packaging materials. Production-scale processing machines include mono- and multilayer blown film, blow moulding, cast film and injection moulding lines.

Clariant has also opened a new masterbatch production facility in Guangzhou, China, dedicated to the manufacturing and supply of speciality black masterbatches that are in high demand in a great number of consumer goods sectors, to specially address the fast-growing Chinese market. With black PET/PA masterbatches for fibre already developing into a sizable business in China and some other Asian countries, the new production facility in Guangzhou will supplement existing supply from Clariant's facility in Taiwan, which has been already fully utilised, to deliver product and service excellence jointly in its Greater China Region.

"Since 2016, we've been increasing our investments in equipment upgrade and facilities expansion to boost capacities and capabilities of the Clariant plants in China, Singapore and the US," says Bernd Hoegemann, Clariant's Head of Masterbatches. "The expanded new production line in Guangzhou, with a CHF5m investment volume, will enhance our full range service in supplying speciality black masterbatches products for the markets of packaging, consumer goods, fibre, automotive and E&E. It also allows us to better serve local expectations and continue our commitment to main local customers in the segments."

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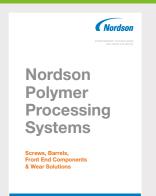
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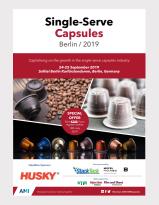
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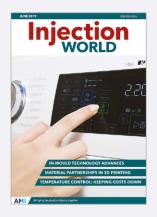
The 3rd edition of AMI's international Single-Serve Capsules conference will take place on 24-25 September 2019 in Berlin, Germany. The urgent need to review the materials used for capsules in search of sustainable options will be a key topic of discussion.

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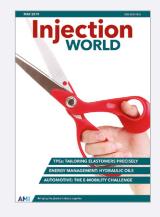
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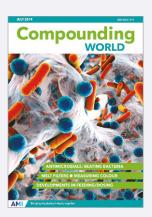
The June edition of Injection World magazine looks at the latest innovations in decorative and functional IML technologies. It also explores developments in additive manufacturing and temperature control.



Injection World May 2019

The May edition of Injection World magazine examines some of the ways moulders can reduce their energy bills. It also looks at lightweight solutions for e-mobility applications and developments in high performance TPEs.

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Compounding World July 2019

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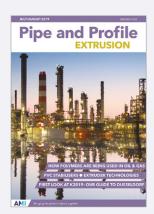
The July edition of Compounding World takes a look at the development and application of antimicrobial additives. It also reviews the latest innovations in melt filters, colour measurement and feeding technology.



Plastics Recycling World May/June 2019

The May-June edition of Plastics Recycling World looks at how additives suppliers and machinery makers are tackling the issue of odours in postconsumer recyclate. Other features cover new shredder technology and processing rPET fines, plus Plastics Recycling World Expo.

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Film and Sheet

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The July-August edition of Film and Sheet Extrusion looks at the accelerating research into bioplastics applications, plus stretch and shrink film, masterbatches, bag-making machinery and a Visitor Guide to K2019.

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27-29 November

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24-25 September 2019 Single-Serve Capsules, Berlin, Germany
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