MARCH 2020

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Injection WORLD

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Plastic Omnium said its 2019 revenues increased. Photo: Plastic Omnium

Bumpy year for auto injection moulders

Major injection moulding processors in the automotive sector had a challenging year in 2019 due to a slowdown in car production. But Tier 1 suppliers nonetheless showed resilience when reporting their financial results.

Magna International reported group sales were 3% down in 2019 at $39.4bn, but were 2% up if excluding the impact of foreign currency translation and divestitures, net of acquisitions. Income from operations before income taxes was $2.22bn, a fall of $728m, while net income was $531m lower at $1.77bn.

Don Walker, Magna's CEO, said: "2019 was a challenging year on a number of fronts, however we continued to make significant investments in new technologies to support customer plans to produce lighter, safer, and cleaner vehicles. I believe we are as well-positioned as ever to continue to grow."

Plastic Omnium said its revenue grew by 11.4% to €9.18bn in 2019, although this was largely the result of acquisitions as like-for-like revenues were only 1.1% higher. The company achieved EBITDA of €1bn and net profit of €258m.

For 2020, Plastic Omnium is projecting it will outperform worldwide automotive production, as well as grow its operating profit and EBITDA, with an enhanced cost-reduction programme. Last year's results, Plastic Omnium said, gave it "the means to pursue a strategy of profitable and sustainable growth in a complex environment".

Faurecia is also expecting to outperform the global auto production rate, but Patrick Koller, CEO, acknowledged 2020 would be tough. "We expect, at this stage, a drop of about 3% in worldwide automotive production. We have the appropriate plans in place to improve our performance."

In 2019, Faurecia's sales rose by 1.4% to €17.8bn but were down by 3.0% at constant currencies and excluding its acquisition of Clarion. It increased operating income by 0.7% to €1.28bn.

› **www.magna.com**
› **www.plasticomnium.com**
› **www.faurecia.com**

Engel opens Japanese subsidiary

Austrian injection moulding machinery giant Engel has opened a new sales and service subsidiary in Tokyo to strengthen its market presence in Japan. This replaces a collaboration with trading firm Correns.

"The Japanese market continues to gain importance for us," said Gero Willmeroth, Engel's regional president in East Asia & Oceania. Having its own company there, he added, would help Engel support customers better in such "consulting-intensive" matters as new processing technologies and the digitalisation of injection moulding.

Yuji Takeda, who has previous experience of Engel machines and technologies, has been named managing director of the new subsidiary. He also has an assistant and a service technician working alongside him, with another moving to Japan from Austria to support its development in the first few years.

› **www.engelglobal.com**

IKV to build smart factory in Germany

The Institute for Plastics Processing (IKV) at RWTH Aachen University has been granted permission to build its Plastics Innovation Centre 4.0 on a 4,200 m² site at Seffenter Weg in Aachen, Germany. The state of North Rhine-Westphalia and the European Regional Development Fund are providing finance towards the centre's €19.5m cost.

This is described as "a completely interconnected R&D environment", which will enable IKV to carry out training in the digitisation of plastics processing. It will also be a testing environment for future developments within RWTH's Internet of Production cluster of excellence.

› **www.ikv-aachen.de**

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AMI announces free expo conference programmes

Injection World publisher AMI is holding free conference programmes at the four exhibitions it is organising at Messe Essen in Germany on 3-4 June 2020. Injection moulders are welcome to attend free sessions on plastics recycling, compounding and testing where they will hear updates on materials.

At the Plastics Recycling World Expo, the keynote address will be given by Elizabeth Carroll, Consultant for Recycling and Sustainability at AMI, who will present key findings from a new AMI global recycling study. A special workshop will be run by recycling expert Edward Kosior from Nextek on the benefits of mechanical and chemical plastics recycling. Three debates will be held to discuss issues including the impact of regulation on recycled content in plastics products.

The programme for the Compounding World Expo includes three business debates focused on technical compounds, masterbatch and cable compounds. These will feature senior representatives from ACI, ACOME, Albis, Eurotec, Lifocolor Farben, PolyOne, Prysmian, Sirmax and Washington Penn. There will also be a discussion of REACH legislation hosted by European Masterbatchers and Compounders (EuMBC) and featuring speakers from LyondellBasell and Mixer.

This event has been postponed to 7-8 October 2020. More details HERE

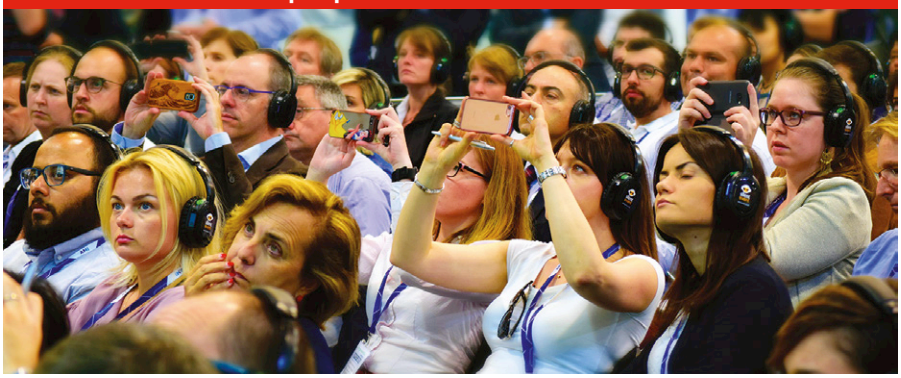

IMAGE: AMI

The free conferences proved highly popular when the expos took place in 2018

Each day of the expo will begin with a keynote address. On the first day, Andrew Reynolds, director of Advance Bidco (AMI's parent company), will provide insight into global trends in plastics compounding markets. The second day will start with a presentation by *Compounding World*'s editor-in-chief, Chris Smith, highlighting some key compounding technology innovations.

The recycling and compounding conferences, along with programmes on polymer testing and extrusion, will also feature leading companies discussing new product developments and technical advances.

Register **HERE** to guarantee your free ticket to the Plastics Recycling World Expo, Compounding World Expo, Polymer Testing World Expo and Plastics Extrusion World Expo. In total, there will be more than 300 exhibitors throughout the four shows and more than 120 speakers across the five free conference theatres.

› **https://www.ami.international/exhibitions**

Ineos caps recycling with Forever deal

IMAGE: INEOS OLEFINS & POLYMERS

Ineos aims to recycle 6.5bn caps over five years

Ineos Olefins & Polymers has established a partnership with Italian recycling firm Forever Plast under which it will take post-consumer PE from used bottle caps and blend it with virgin polymer to create new cap grades. They expect to recycle 6.5bn caps over the next five years.

The products, branded Recycl-IN, are said to offer the same mechanical properties as virgin types and will be processible in existing injection moulding and compression moulding machines, the company said.

Ineos said the project is "part of its ongoing drive to support a more circular economy and significantly increase plastics recycling." This includes offering a range of polyolefins for packaging applications in Europe containing 50% or more recycled content and incorporating at least 325,000 tonnes/yr of recycled material into products by 2025.

› **www.ineos.com**

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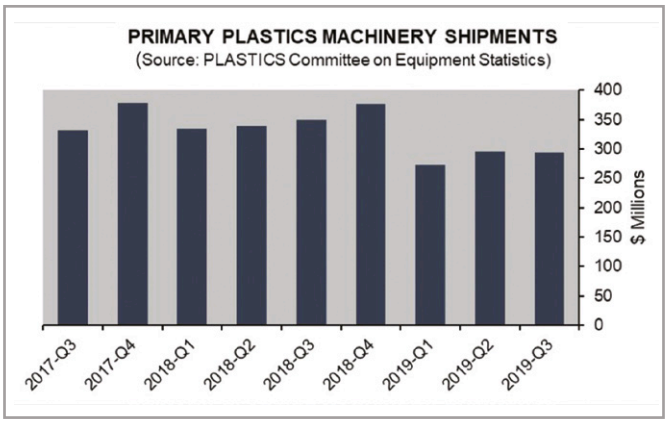
US machine shipments down 16%

US primary plastics machinery shipments in the final quarter of 2019 totalled $316m, up on the previous quarter but down by 16% on the same period in 2018, according to data from the Plastics Industry Association's Committee on Equipment Statistics (CES).

CES has not published full-year figures, but compiling previously published quarterly release numbers shows that shipments for the whole of 2019 were about 16% down on 2018 at $1.18bn.

Injection moulding machinery shipments in Q4 2019 were down 14.9% (by value) from Q4 2018. The shipments value of twin-screw extruders fell significantly by 35.2% and 12.3% for single-screw extruders.



The association's Chief Economist Dr Perc Pineda attributed the weaker figures to "uncertainties from trade and tariffs, and overall weaker manufacturing activity".

Both exports and imports of primary machinery also fell in Q4. He said that moderate growth is expected for the coming year but, if recent positive developments on trade and tariffs translate into improved confidence and interest rates stay low "we could see better numbers for plastics machinery shipments".

CES also conducts a quarterly survey of plastics machinery suppliers that asks about present market conditions. In the coming quarter, almost 70% of respondents expect conditions to either improve or hold steady – a reversal of the 39% that felt similarly in the previous quarter. As for the next 12 months, 74% expect market conditions to be steady-to-better, which is up from 63% in the previous quarter's survey.

› **www.plasticsindustry.org**

RJG opens German training lab

Training firm RJG, headquartered in the US, officially opened a new training lab in Karlstein, Germany, at the start of the year. This consists of a classroom for up to 20 students and a fully-equipped lab and technical centre, with a 60-tonne injection moulding machine from Yizumi, temperature control units and a material drying system from Moretto.

The lab is set up for a total of four injection moulding machines and will teach a variety of courses.

› **https://rjginc.com**

Arburg invests in training centre

Arburg has opened a new training centre at its headquarters in Lossburg, Germany. The new building, which was opened in a ceremony attended by 170 guests, is 13,700 m² and increases the total usable space at the facility by just under 5% to approximately 180,000 m².

"The fact that we have invested a double-digit million euro sum in a new Training Centre is testament to just how important our customers and employees are to us," said Michael Hehl, Managing Partner.

The ground-floor machine hall in the centre covers 1,160 m² and houses 15 electric, hybrid, hydraulic and vertical Allrounder injection moulding machines in sizes 270 to 820 tonnes. Each machine is equipped with a robotic system plus an IIoT (Industrial Internet of Things) gateway, and is linked to the Arburg ALS host computer system. There is also a Freeformer available for training in additive manufacturing.

IMAGE: ARBURG

The new training centre at Arburg's Lossburg HQ in Germany

■ Concerns over coronavirus caused Arburg to cancel the Technology Days 2020 event in Lossburg. The decision to cancel the annual gathering of 6,000 guests from all over the world was "purely preventative" and there are no known cases near the company, it said. The event was due to take place on 11-14 March.

› **www.arburg.com**

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Berry responds to shareholder's criticism

IMAGE: BERRY

Left: Berry's Verdant packaging includes injection moulded jars which can include up to 100% PCR

Rigid and flexible packaging major Berry Global in the US has issued an official response to a call from one of its shareholders to implement changes. It has defended its current strategy while not necessarily ruling out alternatives.

On 23 February, Los Angeles-based Canyon Capital Advisors, which is the fourth largest shareholder in Berry, with a 7% stake, wrote to CEO Thomas Salmon. In this letter, Canyon said that the company's shares are undervalued and that more needs to be done to improve shareholder returns.

Canyon called for Berry to sell non-core businesses and use the proceeds to pay down debts. It also advised the firm to hire bankers to develop a plan, with the aim of paying off more debt, achieving an investment grade rating and working out ways to improve perceptions of its products, because of growing popular concern about plastic packaging waste.

In response, Berry said that it remains focused on three key strategic initiatives: to generate sustainable profitable organic growth, to integrate the newly acquired RPC Group business "with an intense focus on cost synergy realisation", and to continue deleveraging its balance sheet.

"Our board and management team regularly review our operational portfolio and capital allocation to ensure that we are best positioned to drive shareholder value, including through divestitures, in order to maintain our strong balance sheet and proven track record of free cash flow growth," Berry stated.

It also confirmed that it was "deeply focused on sustainability, and effectively communicating that commitment to our investors and other stakeholders, and their advisory firms", including working with customers to reduce waste, improve recyclability and increase recycled content.

› **www.berryglobal.com**

New Lindal site in Brazil

Hamburg-based aerosol dispensing company Lindal Group has held a ground-breaking ceremony for its new facility at the Industrial Park in Jundiaí, São Paulo, Brazil. Local dignitaries and senior company representatives were present.

The facility will cost $25m over three years, making it the firm's largest ever investment to date. The building will be approximately 1,160 m², with an extension option of about 465 m². When complete, it will employ about 130 people.

Lindal claims to be the market leader in critical components for the aerosol industry in Brazil, where it has been present for over 20 years. The Brazilian Aerosol Association estimated the market size was 1.2 billion units in 2017 with a compound annual growth rate of 11%. About 75% of the aerosol packs consumed in Brazil are made there.

› **www.lindalgroup.com**

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Engel hosts Med.Con event

Engel hosted its 11th Med. Con medical technology conference in Stuttgart, Germany, in mid-February, with about 100 people present. Speakers from Engel and medical device manufacturers discussed advanced technology, notably artificial intelligence (AI) and Big Data.

Uwe Herbert, IT manager with Ypsomed, said that "the volume of data generated is increasing, but the use of the data is not". He called for linking the IT systems of individual departments in companies and giving employees the necessary freedom to experiment, in order to improve product quality and reduce costs. "We are passing up opportunities here," he said.

Christian Pommereau, principal engineer with pharmaceutical firm Sanofi-Aventis Deutschland, stressed the need "to shift up a gear when it comes to AI". Pharma is far ahead of plastics processing in this respect.

Another keynote presentation came from Christoph Lhota, VP of Engel Medical, who gave his perspective on many areas of medical technology in which the company is working. These included injection moulding of liquid silicone rubber in the cleanroom, efficient injection moulding of very small batch sizes and sterile injection moulding.

› **www.engelglobal.com**

Lifetime award for Arburg's Eugen Hehl

The Department of Plastics Engineering of the Association of German Engineers (VDI) awarded the Richard Vieweg Medal of Honour, its highest honour, to Arburg co-founder Eugen Hehl at Baden-Baden on 11 February "in recognition of his outstanding lifetime achievement". Hehl's daughter Juliane accepted the award on his behalf.

"Eugen Hehl has worked with great dedication to advance the development of injection moulding technology and at the same time has promoted new technologies outside his industry," said Kurt Gebert, chairman of the department, who also praised Arburg's support in VDI committees.

› **www.arburg.com**

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IMAGE: BMB

Technology groups are enhancing thin-wall applications by means of multi-cavity tooling, speed and quality improvements, automation and foaming. By Peter Mapleston

Packaging: less material and more market

The global market for thin-walled plastics containers continues to increase ahead of overall economic growth. One unconfirmed estimate puts annual expansion between 2018 and 2026 at around 6.5%. Light-weighting scores in terms of consumer convenience, production economics and, of course, sustainability. Developers of injection moulding equipment, moulds, plastics materials and processing technologies are all helping drive the ongoing success of thin-wall moulding.

StackTeck Systems, which produces multi-cavity, high-volume production moulds for various types of packaging, used the K2019 exhibition in Düsseldorf, Germany last October to showcase a 1x4 TRIM IML 500g rectangular container running with Trexel's MuCell foaming process in a 4,500-kN BMB hybrid machine. The mould was optimised with StackTeck's KoolTrack technology, built with conformal cooling channels in gate pad/insert and core cap.

"This IML container features a three-sided label [from Verstraete, manipulated by IML automation from Machine Pagès] and it is 20% lighter than a conventional thin-wall container, combining two very effective ultra-light-weighting technologies for thin-wall applications," said StackTeck. Wall thickness was 0.25mm; cycle time was 4.5 s.

"We've used our considerable engineering resources to develop a toolbox of practical, effective, light weighting technologies for our customers, to help them with their sustainability challenges," says Vince Travaglini, CEO and President of StackTeck Systems.

The **BMB** machine was an eKW 45HP/2200, one of the company's new range of HP Series machines. BMB says it was "totally customised for the production of rectangular thin-walled containers, with IML and MuCell technologies."

BMB says new HP machines are faster and more precise than before and have also been designed with particular attention to integration/interconnection from an Industry 4.0 perspective. The eKW45HP/2200 features electric plasticisation and

Main image: Collaboration is aiding further development of thin-wall packaging, such as a project involving BMB machinery, a StackTeck mould and Trexel's foaming technology demonstrated at K2019

IMAGE: BMB

Right: BMB eKW 45HP/2200, one of the company's new range of HP Series machines, suited to production of thin-walled containers

injection under accumulator, controlled by a double servo Moog valve. Direct torque motors are used on the clamping and plasticisation units, directly coupled to the toggle and screw rotation movements, without the use of belts or gear reducers.

Trexel says its new P-300 SCF system for thin-wall packaging applications supplies nitrogen into the plastic melt on its new TDM (Tip Dosing Module) design MuCell screw. This allows high plasticising capacity with good melt quality. The system uses a high pressure SCF injector which allows elimination of the traditional burst disc. The MuCell system is integrated into the machine controller via VNC (Virtual Network Computing) protocol which allows users to change input via the machine controller.

Trexel's MuCell physical foaming was also featured at K2019 by Engel, KraussMaffei, and Nissei. Nissei, for example, was making champagne glass cups from polylactic acid. Trexel notes that in standard PLA moulding processes, it is common to have short shots in thin-wall parts since the fluidity of PLA is very poor. It says Nissei developed a new technology to mix supercritical carbon dioxide into molten PLA to improve the fluidity of the material. "It makes injection moulding of the world's thinnest level (0.65mm) thin-wall container possible while achieving super-high transparency," it claims.

Discussing sustainability issues being targeted by **KraussMaffei HighPerformance** (which uses the Netstal brand), Christina Härter, Head of Applications Technology, says: "One of our main goals is the concentration on thin wall thickness. Together with our toolmaker partners, we have been pursuing this goal for years. Initially, the focus was on greater performance and therefore higher injection dynamics. This was followed by developments towards lower-viscosity materials by the material manufacturers. And, in recent years, we have focused on the injection-compression moulding of packaging in order to arrive at even thinner walls, like we showed on the [mould maker] Glaroform booth at K2019. An injection moulding process paired with IML is no problem for us with the high-performance machines of the Netstal Elion and Elios series."

She adds: "We are also paving the way in the direction of bio-based and biodegradable materials. Our trade fair application uses a material based on tall oil, a waste material from the manufacture of paper. We also regularly test biodegradable plastics on our Netstal machines, but the market is still cautious in this regard."

The Glaroform stand featured a Netstal machine producing a packaging cup for cream cheese in a six-cavity mould. The part was IML-decorated and removed by a handling system from Beck Automation. "With a 1:190 wall thickness to flow path ratio, the part does not have the ultimate thin wall thickness because a certain stiffness is required for the product," says Härter. "What is sustainable is the polypropylene [from SABIC], which is based on tall oil."

Another hybrid machine designed specifically for packaging that debuted at K 2019 was **Arburg's** Allrounder 1020 H. This had a 6,000-kN electric clamp and a tiebar distance of 1,020mm, while the new size-7000 hydraulic injection unit provides shot weights up to 4.2kg (PS). At the show, Arburg had the machine making thin-walled round cups in an 8+8-cavity stack mould. ❯

Below: Thin-wall cup production on an Allrounder 1020 H in Packaging version

IMAGE: ARBURG

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Arburg says the Allrounder 1020 H in Packaging version is "ready for digitalisation. It comes equipped as standard with Arburg's four assistance packages 4.set-up, 4.start-stop, 4.production and 4.monitoring, which get the injection moulding process up and running quickly and reliably."

The exhibit on the Arburg stand processed a mix of virgin polypropylene in combination with 30% recyclate, provided during the show by post-consumer recycling technology specialist Erema.

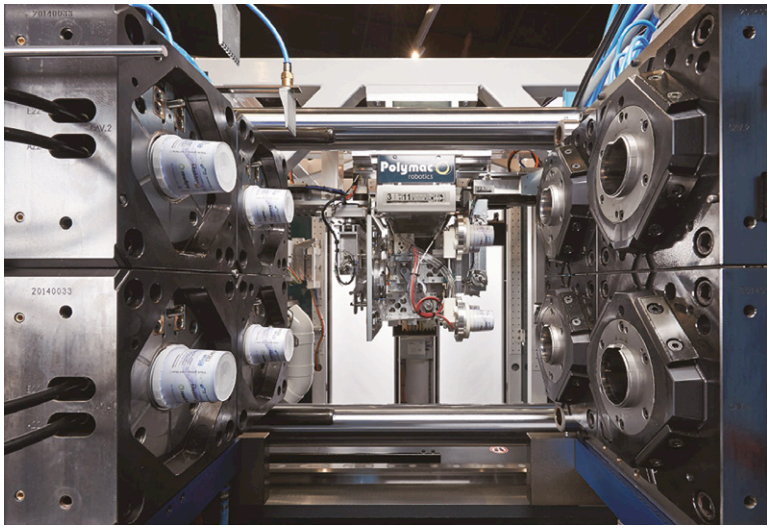
This was not the only Arburg machine carrying out thin-wall moulding at the show. On the Roboplas stand, a thin-walled IML application was presented on a hybrid Allrounder 630 H in Packaging version with 2,300 kN of clamping force. This exhibit used a mould from Erkoc, Turkey, to produce four rectangular cups, each with a capacity of 280ml, in a cycle time of around 3.5 s.

Another hybrid Allrounder 630 H in Packaging version produced four thin-walled PP cups in a cycle time of around 3.5 s on the Ilsemann Automation stand. The system was automated with Ilsemann's own robot, which featured a low-weight carbon fibre composite gripper.

Sumitomo (SHI) Demag came to the show with two "energy-enhanced" high-speed El-Exis SP units for packaging applications. With the introduction of a new control valve regulating the hydraulic pressure during the loading of the accumulator, the machines consume up to 15% less energy than previous generations of El-Exis machines. This saving is dependent upon the packaging application, moulding cycle time and process parameters.

"Capable of delivering the lowest dry cycle times [under 2 s], the machines in the latest series have high process consistency and high energy efficiency," says Arnaud Nomblot, Director Business Development, Packaging, at the company. The hydraulic accumulator enables them to achieve injection speeds of up to 1,000 mm/s. Being able to adjust the accumulator charging to the injection pressure required for the exact moulding process not only lowers energy usage, but also reduces wear and tear on parts.

IMAGE: SUMITOMO (SHI) DEMAG UK



Above: View inside a Sumitomo (SHI) Demag El-Exis SP 200/920 machine. Injection-compression moulding reduces clamp force requirement by 30%, saves energy and allows processors to opt for smaller machines

The El-Exis SP range, available globally, now comprises 10 machines, with a clamp force range of between 1,500 and 10,000 kN. The range is aimed squarely at high volume manufacturers of polymer products, including caps and closures, thin-wall containers and lids.

Kevin Heap is a packaging specialist with Sumitomo (SHI) Demag UK. He says: "To succeed in the thin walling arena, injection moulders need to examine every potential application to ensure that the selection of materials, machine and tooling give the optimum blend of speed, quality and consistency."

Heap also points to the advantages of combining injection and compression moulding for production of thin-walled parts. Injection-compression is now increasingly being applied to the mass-production of PP packaging applications, he says.

"By applying injection compression techniques to stack moulds, packaging moulders can now reduce the wall thickness of containers and lids from 0.45mm to 0.35mm. This saves around 25% in raw PP materials compared to the standard injection moulding process, while maintaining comparable mechanical properties. Again, El-Exis SP machines are used for this technique."

Heap highlights one example of the technique in use. Last year, major UK-headquartered rigid packaging specialist Amaray unveiled what he describes as a pioneering IML production line featuring technology from Sumitomo (SHI) Demag, Waldorf Technik and Roth Werkzeugbau. The line features an ultra-high speed 580-tonne El-Exis SP, fitted with a multi-cavity 12+12 stack mould.

"Although there are several examples in Europe of moulders using 8+8 stack moulds for producing IML margarine lids in high volumes, using a 12+12 stack mould means that Amaray is really pushing the packaging boundaries in thin walling," he says.

Milacron, meanwhile, highlights its ThinPAK-Series Mold-Masters thin-wall packaging hot runner system. This was first seen at Fakuma 2018. The company says it has been rapidly adopted by many thin-wall moulders since. "The secret to this system's success is Mold-Masters' patent-pending MasterShield Technology, which offers superior leakage protection," it says. This protection

includes cold start-ups and in the event of accidental overheating of the system.

The technology involves the use of innovative spring design that pre-loads the nozzle to the manifold. The spring also absorbs any excess loads from thermal expansion for a highly consistent sealing force, which minimises the effect of plate deflection/bowing that would normally cause leakage in traditional systems.

Mold-Masters has continued to introduce enhancements that expand the system's application capabilities and enhance productivity. At K2019, these new ThinPAK releases included a Centi Size nozzle, which gives the hot runner system the ability to mould parts ranging from 15 to 500g. This includes everything from small IML containers to large pails. Also new was the Bi-Metallic C-Valve gate option, introduced primarily with Europe in mind and featuring an industry standard cut-out. The standard version has no Vespel gate insulator, and so eliminates a common wear item that can cause downtime, Mold-Masters says; however a version with the insulator is available for those customers who prefer to have it.

A way to use thin-wall moulding to produce relatively thick-walled cups and containers with excellent insulating properties and outstanding stiffness is moving from the prototype stage into commercial production. EcoCore, which is a derivative of the Coralfoam process originally developed by Peter Clarke, and which is available under licence from **Bockatech** (a company that he co-founded), is in fact already being used by Amaray to make 430ml multiple-use hot and cold drinks cups; and at the time of writing, two more companies, one in Europe and one in the USA, had also taken licences. Negotiations with more

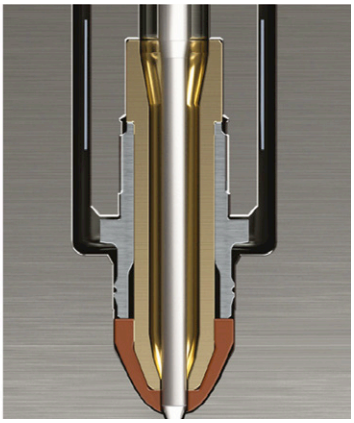


IMAGE: MOLD-MASTERS

Above: Mold-Masters' BiM-C Valves with and without gate insulators

IMAGE: BOCKATECH

Above: Cups made with Bockatech's EcoCore process start off with very thin walls and then expand with very fine foam as soon as the mould opens

potential licensees around the world are continuing (see also *Injection World's* foam injection moulding feature, March 2019).

Amaray is making its cups on a four-cavity mould, built by FSG Tool & Die in Wales, which is a long-term collaborator with Bockatech. The next-generation moulds will have higher cavitation, possibly going up to eight including stack moulds.

The process runs using PP with relatively high melt strength, and which contains a chemical blowing agent (EcoCore is also developing a variant with a physical blowing agent). In 2018, Bockatech announced a strategic alliance on materials with Borealis, which is a leader in PP production and development. A similar strategic alliance with Verstraete, which provides PP in-mould labels, was announced at K2019.

"The patented EcoCore solution, in combination with Borealis grades BH381MO and Daploy WB140HMS [a high melt strength PP with long chain branching originally developed for foam extrusion], is an eco-friendly way to produce high-performance packaging that is reusable and recyclable," said Borealis at the time. Foamed mouldings that use EcoCore require less material and have faster cycle times to reduce material costs, energy use and environmental impact. EcoCore runs on standard packaging grade injection moulding machines but requires investment in new moulds specially designed for the process.

Right: Bockatech worked with Borealis to show cups were reuseable and recyclable

IMAGE: BOCKATECH

The trick with the process is in the opening of the mould immediately after injection. So, a part is originally moulded with a wall thickness of around 0.65-0.7mm, but when the mould opens, with the part still on the core (without the need for any core movements, unlike in the original version), this immediately increases in a highly controlled manner (partially due to the part's external geometry) to over 2mm as the blowing agent does its work, with controlled expansion leading to production of a very fine cell structure. The result is a container that is light but very strong, and with excellent thermal insulation properties.

Martin Blacher, in Marketing & Product Design, says EcoCore scores on several sustainability fronts. It uses less energy, less material, and less machine time than alternative processes. It can run on any high-end injection moulding machine set up for thin-wall packaging.

"The innovative foaming technology produces skin-foam-skin walls in an instant," says Blacher. "Cycle times for mouldings using EcoCore are the same as those made from solid plastic – up to 80% less than other foam core products. EcoCore mouldings also have a very high strength to weight ratio. Packaging produced with EcoCore is up to five times stiffer than solid mouldings of the same weight. Or, the amount of plastic required can be reduced by up to 70%."

Bockatech is aiming EcoCore at a variety of packaging applications including beverages (e.g. take-out cups), food (e.g. noodle pots and microwave meals), industrial (e.g. pails, tubs and paint containers) and healthcare (e.g. medicine and sharps containers).

Injection moulding using a chemical blowing agent (which is the current practice for foaming) enables a minimum pre-foam wall thickness of 0.65-0.70mm, which expands to around 2.1mm. Moulding with a nitrogen blowing agent is currently under development and will allow a minimum pre-foam wall thickness of 0.45-0.50mm, with a targeted final thickness of around 1.4mm.

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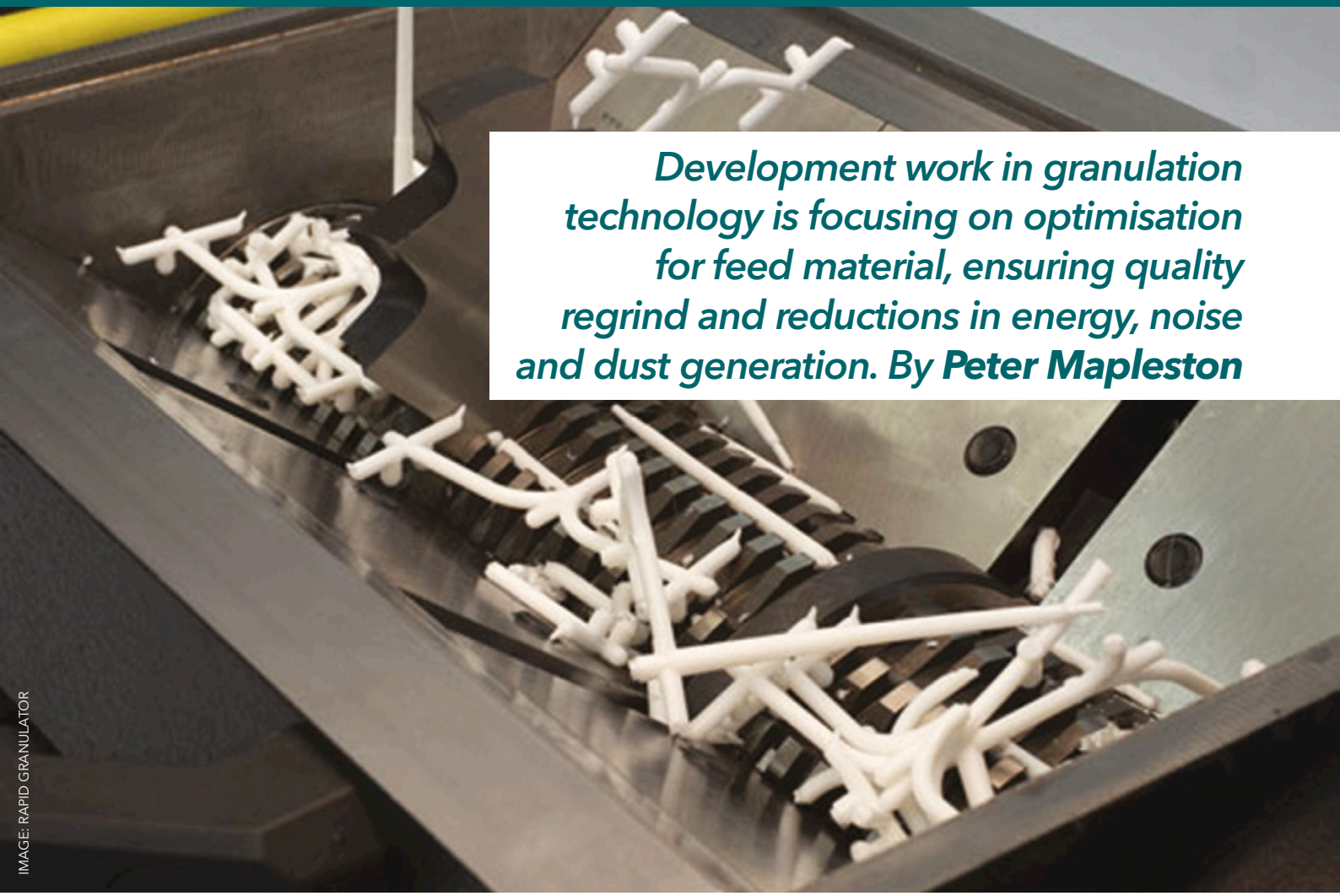


IMAGE: RAPID GRANULATOR

Development work in granulation technology is focusing on optimisation for feed material, ensuring quality regrind and reductions in energy, noise and dust generation. By Peter Mapleston

Granulators get smarter and quieter

Manufacturers of beside-the-press granulators are taking measures to make equipment perform better and more energy-efficiently while being easier on the ear. They are improving insulation, for example, and they are also equipping machines with smarter controls so that they cut in a way that is gentler and also more appropriate for the type of material they are treating. In several examples on new models, this means running more slowly. Smart controls are also enabling granulators to be incorporated into factory-wide networks for improved supervision.

K2019 saw **Rapid Granulator** unveil what it said was the biggest innovation in slow speed granulation in almost two decades. "Rapid OneCut Pro means less dust, less noise, less energy consumption and significant operational benefits," the company said.

OneCut Pro allows injection moulders to adjust the RPM range when granulating at a slow speed from the standard 25 RPM to a bandwidth of 15-35 RPM (+/-40% rotor speed), for optimal quality regrind.

Rapid says: "The new machine, which uses the new Rapid FlexiSpeed system, means less dust, less noise and significantly less energy consumption. For processors facing capacity limitations, operating at a higher speed level will allow them to overcome capacity constraints, boosting operational output. The torque level of the machine is maintained, regardless of the speed at which it is running."

The new machine features Rapid's operator-friendly Open Hearted design, a patent pending QRR (Quick Rotor Release) system and the use of an innovative energy saving technology. Rapid says that while knife granulators are conventionally used for granulating softer materials and run at a speed

Main image: At K2019, Rapid Granulator launched the OneCut Pro system with adjustable speed for recycling injection moulding production waste

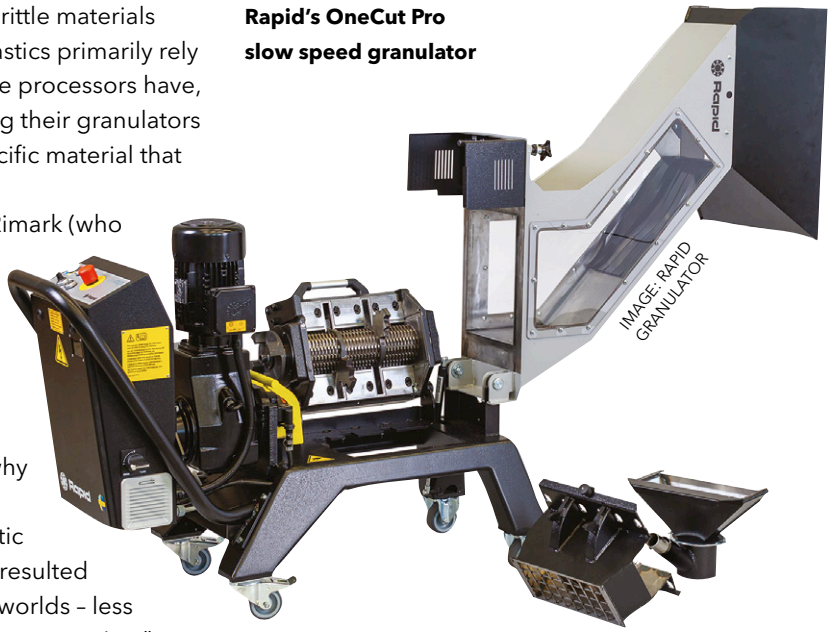
of 200-250 RPM, processors of brittle materials such as glass-fibre reinforced plastics primarily rely on low-speed granulators. "These processors have, until now, been limited to running their granulators at 25 RPM, regardless of the specific material that they are processing," it says.

At K2019, Rapid CEO Bengt Rimark (who left the company after the show to pursue new opportunities) said: "Rapid is the leader in granulation and we wanted to know why the standard 25 RPM for slow speed granulators had never been questioned. This is why we started tests to optimise the speed according to specific plastic material characteristics. This has resulted in OneCut Pro, the best of three worlds – less noise, less dust and less energy consumption."

There is an almost 100% percent correlation between speed and energy consumption, Rimark noted. "If we reduce the speed by 40%, we have also reduced the energy consumption by up to 30%."

Running the new machine at a lower speed of 15 RPM helps to improve the quality of ground, highly brittle materials through minimising dust generation. But there are noise reduction advantages too, as noise levels correlate closely with cutting speed. By reducing rotation speeds from 25 RPM to 15 RPM, noise levels can be reduced in many applications by 3-5 dB, Rapid says. This means about a 50% reduction in actual noise pressure on the ears.

Rapid's OneCut Pro slow speed granulator



Rimark also highlighted the advantages of the QRR system. "One of the biggest disadvantages of slow speed granulators when compared to knife granulators is the gearbox design, which makes the rotor very difficult to turn by hand," he said. "Quick Rotor Release allows the operator to easily disconnect the whole gearbox from the rotor so they can easily clean the machine for the next feed. When the gearbox is disconnected the whole cutter house can be opened up."

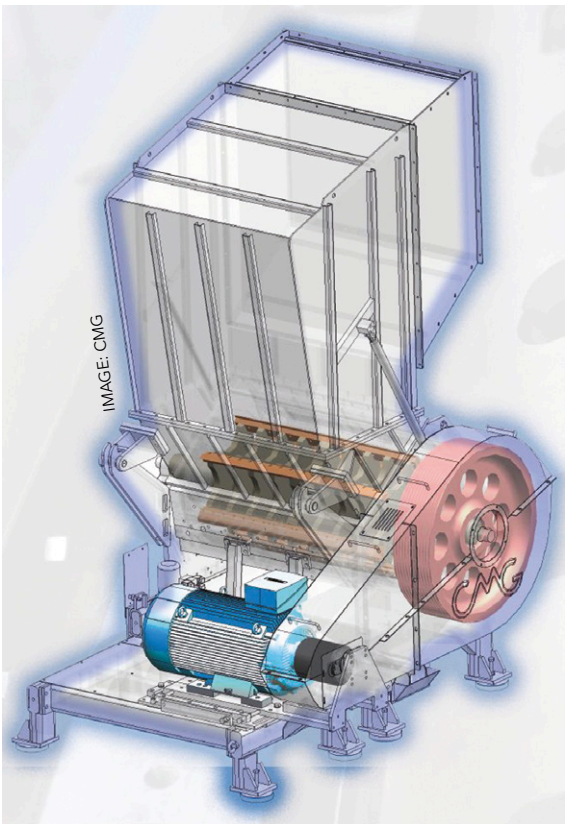
The OneCut Pro also has a feature called EnergySmart, which allows the operator to stop the machine when accumulating materials, rather than having it run continuously.

Adaptive motor

At **CMG**, Giorgio Santella, General Manager Sales & Marketing, points out that all the company's recycling equipment features the new Adaptive Motor Power function, which he says is unique in the size reduction sector. (AMP also features on some Piovan granulators, but this is because they are built by CMG; Piovan has a 20% holding in CMG). AMP is claimed to provide energy efficiency, dimensional homogeneity of the regrind particle, absence of dust, longer blade life, overall wear reduced to a minimum.

Santella explains that the granulator constantly monitors the torque applied to the rotor shaft and is able to independently determine which level of power to adopt to carry out its work, based on quantity of material to be ground, size, shape,

Right: CMG's new AMP function constantly monitors the torque applied to the rotor shaft enabling the level of power that is suited to the work



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weight, thickness, type of polymer and even temperature of the piece.

The variability of the operating conditions of a granulator used in such applications is very high and normally the granulator is sized according to the most demanding condition, Santella notes. "The consequence is that of using an oversized machine, which produces very high operating costs and exaggerated maintenance costs. The AMP instead automatically adjusts the operating conditions of the granulator with its self-adaptive function."

The AMP allows the quality of the regrind to be optimised (dimensional homogeneity of the particles and absence of dust) and to reduce the use of energy to a minimum. "20 to 25Wh/kg is the amount of energy used by a CMG granulator, compared to the 40Wh/kg and beyond that a conventional unit consumes," says Santella. The ROI time for the AMP is said to be very short. "The AMP guarantees an optimised TCO that is far lower than the conventional granulation solutions available today."

"Equally innovative are the advanced controls used to obtain a high level of process management, all rigorously equipped with the OPC-UA communication protocol," says Santella.

CMG is headquartered near Bologna, Italy. Around a year ago, Piovan's Universal Dynamics bought CMG America in Clio, Michigan, which had been a wholly owned subsidiary. Universal Dynamics (Una-Dyn) has been part of Piovan for around 12 years.

Hellweg Maschinenbau debuted granulators at K2019 with a new smart control system. This allows the granulators to be networked with upstream and downstream components, according to Industry 4.0 principles.

The system measures and stores power consumption, rotation speed and bearing temperatures, as well as the service life of various components. "Evaluation of the data enables conclusions to be drawn about the energy consumption used in granulation of various plastics down to defined particle sizes and about the related service lives, for example of bearings, blades, V-belts, etc," says the company. "The efficiency of the granulation process can be assessed by comparison with stored reference values, enabling potential malfunction and damage to be predicted at an early stage and then avoided."

The granulators now also feature a "boost" operation, which enables a short-term increase in grinding performance, in order to compensate for production-related fluctuations. In addition, specific rotation speed ranges have been defined for various plastics, so that, for example, granulation of materials with low melting temperatures can be performed in continuous operation without the need for water-cooling.

Smart Control evaluates measured power consumption over longer periods of time. The operator can use a digital Ampere meter in real-time operation and access detailed statistics that have been created over long-term operation.

Standardised soft starting of the motor and a new motor brake are said to save energy and improve operational safety. Power consumption can also be reduced with a new "eco" operating mode, which adapts rotation speed according to input quantity.

Hellweg says improved spare parts management is possible with the new granulators, since the smart control enables monitoring of the state of cutting blades and sieves. A visible alarm informs the operator of the necessity to replace a worn part, while a V-belt monitoring system automatically switches off the granulator in the event of a deviation from the nominal value.

Also integrated within the smart control is an automated enquiry system that issues requests for quotations for spare parts such as blades, sieves and V-belts directly from the manufacturers.

Wittmann says its new G-Max 9 granulator is suitable for inline recycling of soft to medium-hard rejects and sprues consisting of TPU, PP or PE – to

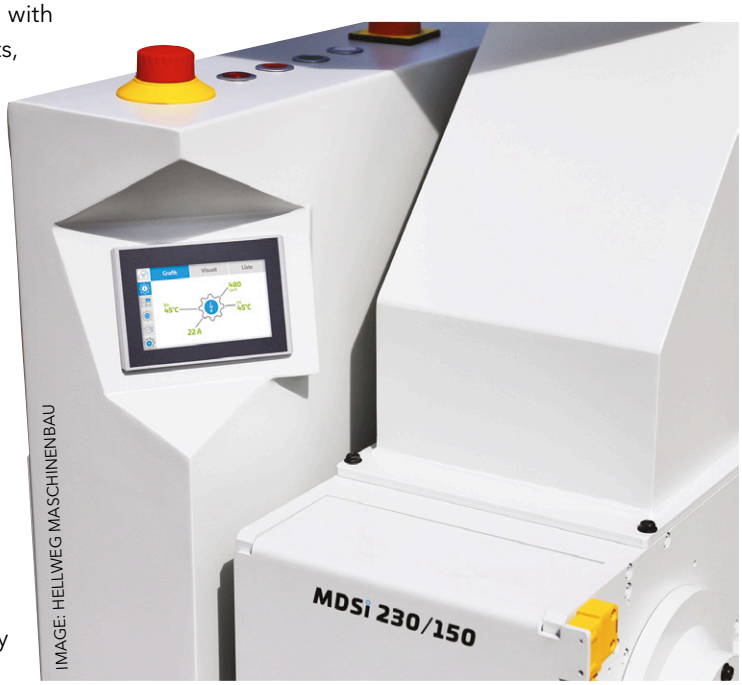

IMAGE: HELLWEG MASCHINENBAU

Right: New MDSi Smart Control version of Hellweg's MDS 150 machine-side granulator

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Right: Wittmann's G-Max 9 granulator with medium-height material hopper

be used on injection moulding machines with clamping forces of up to 900kN. Depending on the type of application, there are three material hoppers of different heights to choose from.

The low material hopper is for use below a chute connected to the machine. The granulator is fed directly from the machine; no further handling is required. The medium-height material hopper is for use below a conveyor belt or drum separator, and is for small to medium-sized sprues. The standard-height material hopper is for a beside-the-press application with a sprue picker or robot.

For optimal cutting performance and maximum efficiency, the cutting rotor of the G-Max 9 comes with 3 × 3 knives arranged in a staggered position, which are said to produce a clean, uniform granulate. Changing knives is apparently very easy.

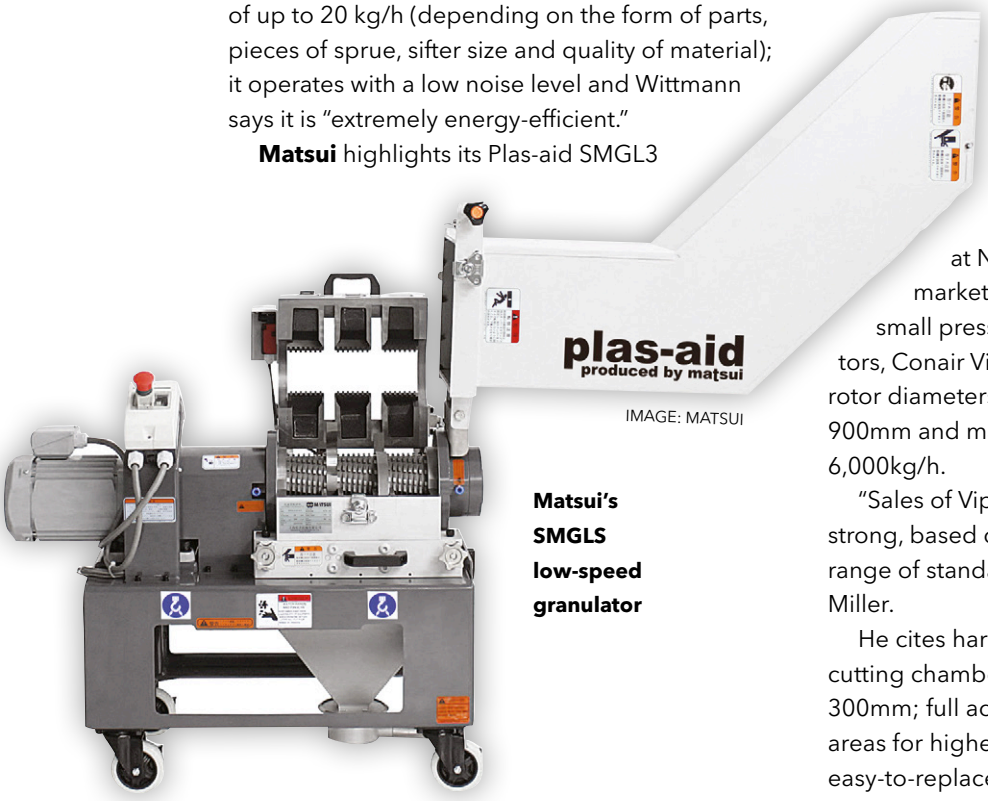
The material sifters of the G-Max 9 are available with holes in different sizes, with diameters of 4, 5, 6 or 8 mm, to accommodate different materials and throughput rates. The tiltable material hopper facilitates cleaning and servicing of the appliance. Changing a sifter can be carried out without tools.

The G-Max 9 can handle a material throughput of up to 20 kg/h (depending on the form of parts, pieces of sprue, sifter size and quality of material); it operates with a low noise level and Wittmann says it is "extremely energy-efficient."

Matsui highlights its Plas-aid SMGL3 low-speed granulators. Major features include improved ease of cleaning; greater ease of use, thanks to a newly designed hose connection system and lower receiving tanks design.

The granulators incorporate cutters with a new design that Matsui says ensures a stable granulating process and relief of granulating load. It says the stainless-steel rotating blades produce uniformed grain size and minimize powder formation. The feeding hopper has extra sound-proofing.

"While our standard model SMGL3 is known for its reliability, ease of maintenance, safety and environmental friendliness at a very reasonable price, our SMGL3 G3 series boasts also various additional innovative features, such as an improved controller; OSR (Overload Stop Retry), which detects reduced pulverisation performance due to overload and automatically reverses the rotation to re-start the grinding process; a power saving function, which adapts the rotation speed automatically to the load condition to avoid unnecessary energy consumption; and a metal detector that stops the operation automatically if contamination is detected," says a representative.



Matsui's SMGLS low-speed granulator

More standard features

At **Conair**, Dave Miller, VP Size-Reduction, says the biggest news on size reduction products at his company continues to be the ongoing success of its Viper granulator line. This was announced at NPE 2018 but only came onto the market at the beginning of last year. From small press-side units to large, central granulators, Conair Viper granulators are available with rotor diameters of 140, 200, 300, 420, 570, 810 and 900mm and maximum throughputs from 36 to 6,000kg/h.

"Sales of Viper granulators have been very strong, based on customer response to the wide range of standard features built into them," says Miller.

He cites hardened steel (hardened to 550HV) cutting chambers; water cooling on all rotors over 300mm; full acoustic insulation; larger screen areas for higher throughputs; easy-to-sharpen, easy-to-replace "pre-gapped" cutting knives;

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IMAGE: PLASMAC

Above: Plasmac's Alpha 70 granulator

tool-less access to the cutting chamber for maintenance and cleaning; and great flexibility to adapt the core of most machines to various infeed systems, cutting-chamber geometries, and evacuation requirements.

Growing understanding

"I believe that the great innovation in the Viper line was to combine and build in many smaller innovations and improvements that might have been added-cost options before," Miller says.

"We've found that there are a growing minority of customers who really understand and appreciate the integral role of size reduction equipment to their operations. To them, a granulator or shredder isn't just a machine that you run until it quits. And these are the customers who have been pushing us to take the basic configuration of the Viper granulators – the motors, rotors, and boxes – then customise them with various manual or conveyor infeeds, special hoppers, different evacuation schemes, and a range of custom controls."

Customers are also considering options for different motor drives, seeking additional improvements in power consumption and efficiency, and evaluating improvements in cutting hardware, cutting angles, and other aspects, Miller says.

Looking to the future, he says: "I believe that among the areas for further progress are in the development and use of preventive maintenance programs and strategies, including software and systems that better track size-reduction equipment usage, efficiency, and wear, as well as how it integrates with other auxiliary equipment."

Driving down defects

Depending on the amount of material going through the granulator, it may not always make sense for it to be fed straight back into the injection moulding process. **Maguire** and its partner **Plasmac** recently supplied a recycling line to a large UK automotive parts supplier, which had been experiencing moulding defects due in part to incorporation of regranulated material.

"They were caught in a vicious circle, they needed to reduce costs by reusing their scrap material, but by doing this, they were causing more moulding issues and therefore driving up their own scrap levels," says Plasmac Sales Director Simon Jay.

What was causing these issues? Firstly there was inconsistent feeding from the screw of the injection machine due to differing bulk densities of the virgin material and the granulated scrap material, leading to cavity defects; then there were issues caused by dust from the granulation process leading to imperfections in the finished goods; finally, there were contamination issues where metal clips would go through the granulator and end up in the finished product.

"We ran trials on their material which they in turn tested themselves and they found by repelletising the scrap material they improved their output, their consistency and their quality and they reduced their scrap levels," says Jay. "Payback was less than a year."

Plasmac supplied an Alpha 70 recycling system with a water-cooled pelletiser and a flake feeder. The customer achieves an output of over 130 kg/h, repelletising all the scrap material from one department of its business. It has immediately seen improvements in productivity, improvements that Jay says are so impressive that the customer is already looking at investing in two more machines for two more moulding departments.

The Alpha 70 is based on Plasmac's short screw technology, which the company claims has the lowest levels of energy consumption in the industry, minimal heat history in the recycled material and "absolutely no material degradation." Plasmac, previously based in Aylesbury, UK, but now headquartered in Busto Arsizio, Italy, is (since January 2019) 60% owned by recycling systems specialist Erema. The other 40% is owned by Syncro, which makes various components for blown film lines in Busto, and which is partly owned by Maguire.

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IMAGE: DRI-AIR

Be in control of your drying process

*Preparing materials for the injection moulding process is now asking a lot more of the drying operation. **Mark Holmes** finds out how dryer manufacturers are rising to the challenge*

Preparing materials for injection moulding no longer just requires a dryer to operate at an accurate temperature and meet dew point requirements. Dryers are now required to be even more energy-efficient and facilitate rapid changeovers, have sophisticated control systems that are Industry 4.0-compliant and interact with all other areas of the manufacturing process. They are also increasingly required to allow the collection of data to meet higher levels of certification. Manufacturers of drying equipment are meeting these needs and many others. For example, **Dri-Air Industries** has introduced its new Industry 4.0-compliant SmartTouch Control. The new control gathers data from the dryer and shares it with various pieces of equipment, such as the injection moulding machine, while maintaining maximum efficiency. It is compatible with most Dri-Air dryers.

"The new control is based on an open platform and will consist of an HMI, PLC and a thermocouple monitoring system," says Jason Sears, Dri-Air Industries President. "We want to stay on the leading edge of technology for customers who want to gather data and monitor their processes. The open platform will allow users to add new sensors, communications devices or protocols that may become available in the future."

Sears adds that SmartTouch Control will gather data about the dryer and communicate with other machines equipped with similar controls. For example, the PLC, which is OPC-UA-compliant, would be the gateway to an injection moulding machine or to a manufacturing execution system (MES), which tracks and monitors the transformation of raw materials into finished goods. Equipment utilising OPC-UA, the agreed-upon standard

Main image: The Dri-Air Industry 4.0-compliant SmartTouch control

IMAGE: WITTMANN

Right: Wittmann's ATON H1000 battery dryer with ECO drying wheel

protocol for Industry 4.0 communications, can be networked with the dryer to provide customers with even more information, all designed to help users monitor, control, and improve the injection moulding process.

"Customers who use this control want the ability to gather and monitor more data about their drying and production process," Sears says. "The control is user-friendly and able to communicate with other sensors used on dryers and on other auxiliary equipment. With a touch of the screen, an operator will be able to access, through the HMI, the drying parameters such as drying temperature and dew point for the last week of production. They can then download the data to an SD card if the data is necessary for reporting. These control features will help injection moulders that need to be certified."

He says: "If you are a medical moulder, this is prime for monitoring the temperature set point, the actual temperature and the dew point. Monitoring that information and sending it back to a central monitoring system is important if you have to be certified to produce the part. It's about gathering information to improve the resin, to achieve a better process and to make a better product more consistently. The control is plug-and-play and will be able to adapt to future technology."

In order to manage all the data, Sears suggests that users might need a MES. Customers of the new control will be able to use the data it generates for predictive maintenance. "Many companies are operating with fewer maintenance people on the production floor," Sears says. "The more information they can get about motors being imbalanced, filters being plugged or sensors approaching the end of their lifespan, the sooner they can do that predictive maintenance before it becomes an emergency. It's hard to keep track of maintenance on 20 dryers and all the other equipment. This will help them do that."

Sears adds that Dri-Air decided to move forward with the new control even though Industry 4.0 guidelines for dryers have not yet been developed by Euromap, the organisation that is leading information-protocol development for the plastics industry in Europe. "They are taking the lead on developing the information that will be exchanged between all the different pieces of equipment," he says. "When Euromap comes up with the exact data tags for dryers, we will have our new control in place, and it will accommodate those data tags. Data tags allow similar machines in the same network to share information more efficiently. Customers who already have the new control will be able to update their software with the Euromap data tags."

Below: Maguire Ultra dryers at Jasplastik's injection moulding facility in Slovakia

IMAGE: MAGUIRE

Two of the reasons why plastics processors are switching from desiccant dryers to the Ultra vacuum dryer from **Maguire** are speed and energy efficiency, according to Paul Edmondson, Managing Director, Maguire Europe. "Speed is a critical advantage in start-ups and product changeovers," he says. "A case in point is that of **Jasplastik**, the largest injection moulder in Slovakia, with more than 100 presses producing automotive components and television panels. In recent years the company began purchasing Ultra dryers and now operates 20 of them, including the Ultra 150 and Ultra 300 models. Jasplastik uses the machines to dry polyamide, polycarbonate, ABS and PC/ABS resins. It reports that the dryers need only 30 minutes to reach proper drying temperature and dry the materials in cycles of only 10-20 minutes. In general, the drying cycle of an Ultra dryer is only one-sixth as long as that of a typical desiccant dryer."

He continues: "Another advantage of Ultra dryers cited by Jasplastik is energy savings. Although the Ultra dryer uses about the same

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amount of energy as a comparable desiccant dryer to bring resin up to drying temperature, it uses much less energy to actually dry the material. While the Ultra dryer would run at 19 watts per pound in the drying cycle, a late-model, energy-efficient desiccant dryer would typically run at 60 watts per pound of material, and a new desiccant dryer with only standard energy performance could run at 100 watts per pound. As for a 10- or 15-year old desiccant dryer that a new Ultra dryer would replace, the energy use might run as high as 150 watts per pound. On the basis of energy savings alone, a new Ultra dryer could pay for itself in a matter of months."

Founded in 2001, Jasplastik has two injection moulding facilities, the main one being in Galanta, Slovakia; a new and growing facility is located in nearby Nitra. The company is a Tier One moulder for Jaguar Land Rover and a sub-supplier to Audi, General Motors, Porsche, Volkswagen, and other automotive OEMs. Jasplastik produces television panels for LG, Samsung and Sony.

Wittmann has extended its ATON segmented wheel dryer series. The company says that while the original overriding goal was to achieve constant dew point behaviour even under the most difficult conditions, users soon started to demand particularly energy-efficient solutions. In order to cater for the increasing trend towards production equipment integration, an interface solution was created for Wittmann 4.0, and the Wittmann dryers were also equipped with larger touch screens. Wittmann ATON segmented wheel dryers are compact beside-the-press appliances that can handle a dry air volume ranging from 30-120 m³/h.

The company has also developed a battery dryer model with a segmented wheel that was presented for the first time at K2019. The ATON H1000 battery dryer, already frequency-controlled in the standard version, is the first segmented wheel dryer for central plants. It can handle a dry air volume of 1,000 m³/h, which is capable of drying 500-600 kg of plastic granulate per hour. The ECO drying wheel, consisting of numerous segments, is loosely filled with a desiccant. Similar to compact appliances, it is rotated via a low-maintenance chain drive. In this way, a molecular sieve which is always fresh is available for the air to be dried, in order to maintain a constant, low dew point.

Left: The ATON H1000 battery dryer from Wittmann

The ATON H1000 comes with several different adjustment options, including dew point-controlled drying. The different ambiLED light colours inform operators at a glance about the current status of the dryer. The appliance is claimed to be easy to operate via its plain text touch screen user interface, where the temperatures and the dew point are displayed clearly.

Conair has upgraded the GasTrac process air heaters, allowing plastics processors to replace electricity with natural gas as a heat source for dehumidifying dryers and realise energy cost savings of up to 70%. Available in three sizes (350,000, 500,000 and 700,000 BTUH input), GasTrac heaters can be paired with Conair Carousel Plus central drying systems or used to retrofit a wide range of existing electrically heated dryers.

Upgrades to the heaters include a new 4-inch colour touchscreen, linked to an advanced control system that enables users to operate and monitor both burner and process controls without opening the GasTrac enclosure. The new control package automatically interprets and displays all operating, alarm and warning information in plain text, eliminating the need for error-code look-ups and making this gas-fired process heater as easy to operate as an electric unit.

When GasTrac units are used to provide process heat for Conair Carousel Plus central dryers, the company says that the new control package makes integration seamless. "When you connect a GasTrac unit to a large central dryer equipped with a Premium control, you can manage the GasTrac heater in three different ways," says A.J. Zambanini, Conair's Drying Products Manager. "Locally through the integrated HMI, through the HMI on the dryer, or remotely using Conair's SmartServices cloud-based monitoring

Right: Upgrades to GasTrac process heaters from Conair include a 4-inch touchscreen HMI, an advanced control system, and plain-text operating, diagnostic, and alarm messages


IMAGE: CONAIR

Right: The D Series large desiccant dryer from Conair

and control system. Any of these methods enables you to control drying temperatures, watch energy usage or trend data, set automatic starts and stops, monitor alarms or manage equipment maintenance information."

Engineered for efficiency and durability, Conair says that all GasTrac heaters are built around a ceramic gas burner with a variable frequency blower drive that precisely regulates combustion air flow to minimise emissions and boost fuel efficiency above 85%. A stainless-steel heat exchanger isolates process air flow from combustion gases, assuring a continuous, contamination-free flow of drying air. GasTrac process heaters meet or exceed key industry requirements, including UL, AGA, CGA, FM, NFPA, and IAS.

In addition, through the launch of its new D Series large desiccant dryers with nominal throughputs from 600-5,000 lb/h (272-2,268 kg/h), Conair is simplifying its large dryer offering. The company says that every model is built around proven desiccant-wheel drying technology, a common touchscreen control, an expanded set of standard features, and a focus on value.

"Every one of our new large D series dryers provides a far wider array of high-demand features as standard equipment, not options, and delivers them through a common control interface," says Zambanini. "The result is a full-featured line of large dryers that are intuitively easy to understand and use, even without a significant amount of operator training. Conair believes that our standard D Series feature package will meet the needs of 90% of our drying customers. For those who need additional capabilities, the advanced options that remain have been pre-engineered to simplify ordering and speed delivery."

Conair's large-dryer launch follows its 2018 introduction of re-designed small and medium-sized portable dryers that offer throughputs from 15-400 lb/h (6.8-181 kg/h). The smaller dryers are available in the dX Series of mobile drying/conveying systems and the stand-alone portable dryers were the first to get the D Series designation.

"With this introduction of large D Series dryers configured for central systems, our D Series line now extends from the Model D15 all the way through the Model D5000," says Zambanini. "We've done everything we can to provide continuity across the board so that buying, installing and using them will be very much the same no matter what size dryer we're talking about."

Like the smaller models, the latest, largest dryers in the D Series feature the DC-C programmable electronic control, software and interface developed specifically by Conair for drying applications. The standard DC-C Premium control system offers a 7-inch colour touchscreen user interface. Other features include: temperature setback; dew-point monitoring and control; real-time trending; 7-day auto-start/stop; library of customisable resin-drying recipes; energy usage metering; audible and visual alarms; and Industry 4.0-enabled with remote control capability.

An energy-saving Optimizer package adds a variable frequency blower drive, Drying Monitor probe, return-air dew point monitor, volatile trap, and process filter monitor to D Series dryers, says Conair. These models get the DC-C Optimizer control, an augmented version of the Premium control that uses the same interface and 7-inch colour screen. "The Optimizer drying package is ideal for PET processors who need to manage high-throughput, high-temperature drying operations where its energy-management features really pay off," says Zambanini.

Also new in the D Series, Conair says that it has enhanced the desiccant wheel system, adding more precise rotational control to ensure optimal desiccant heating, cooling and drying performance. Conair says its desiccant-wheel technology eliminates the instability and maintenance headaches associated with loose-desiccant dryers

IMAGE: CONAIR

Below: The large D Series line can also be used with new, cost-saving control options from Conair's ResinWorks centralised resin-handling and pre-conditioning system

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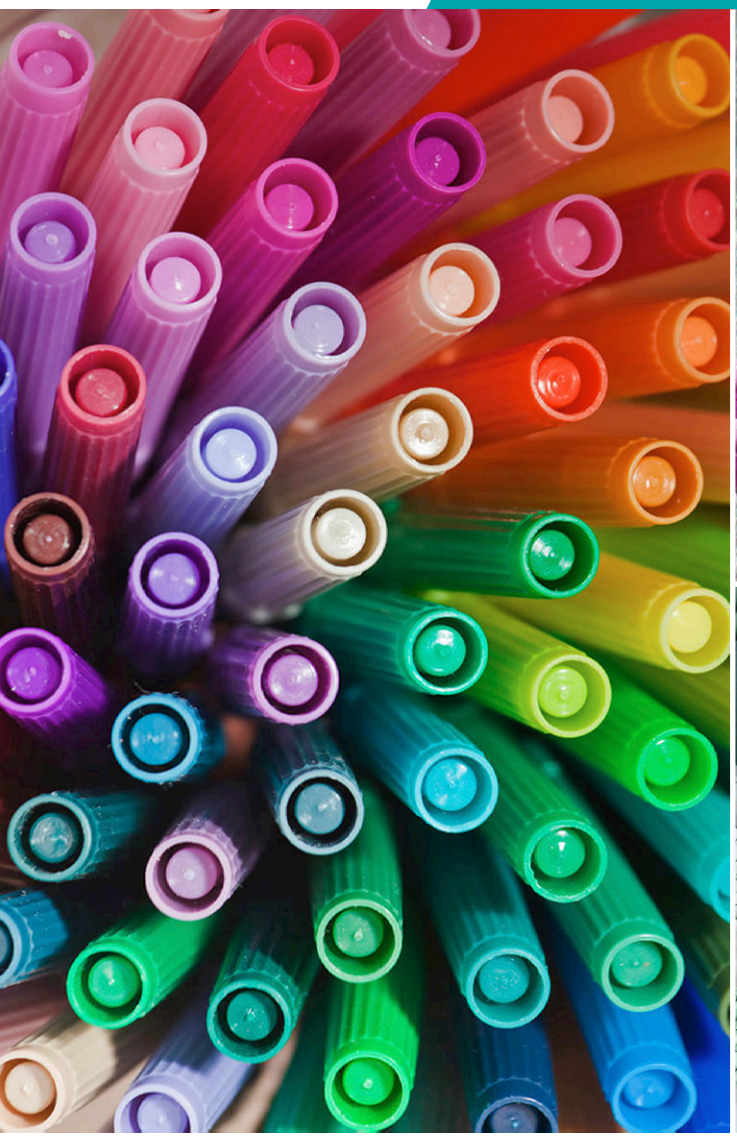

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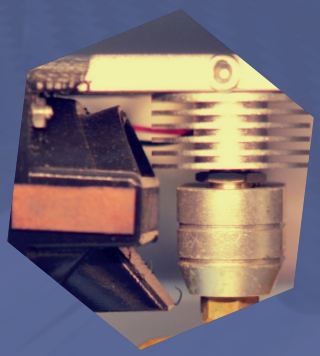

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while producing extremely stable, low-dew point drying air.

The powerful standard control in the large D Series line also opens up new, cost-saving control options for users of Conair's ResinWorks centralised resin-handling and pre-conditioning system. The company says that when a large D Series dryer is combined with a ResinWorks sled (sleds contain multiple, temperature-controlled hoppers), it is possible to manage the entire sled directly from the dryer. That means you can control or monitor drying temperatures, trending data, energy usage, auto-start/stop or other features for each hopper. There is no need for separate controls on each hopper. If a control is required or desired, an HMI can be applied to each hopper. This allows for individual control of each hopper locally but also unlocks more feature capability for the entire system.

The latest Conair ResinWorks central drying and pre-conditioning system gives users the option to equip each drying hopper with its own 4-inch colour touchscreen HMI, enabling independent operation, data monitoring, and other advanced control features. "This option allows users of new ResinWorks systems to implement advanced control features on a per-hopper basis, even if they are using an older Conair dryer - or certain competitive dryers," says Zambanini. The new HMIs, part of a control system upgrade reaching across Conair's dryer line, offer much simpler, plain-text interaction with hopper features, settings and help information.

Conair has also added two new capabilities – centralised, full-featured machine controls and programmable performance indicators – to its latest update of SmartServices, an Industry 4.0 solution for auxiliary equipment monitoring, management and analysis. The development of these latest capabilities was shaped in part by the experience and input of processors running six-month trials with the programme, first announced at NPE 2018. The company says that Smart Services continues to evolve as a web-based portal, supported by cloud-based data processing capabilities. It helps plastics processors manage data generated by dozens or even hundreds of pieces of plant equipment into actionable information. The system collects machine data through a network of compact data hubs that transmit it into the secure, cloud-based SmartServices database for processing and presentation in the user's HMI, where it appears in a dashboard format.

"Now, through the portal, authorised users can access the complete control system of individual auxiliary machines and execute functions from a remote location the same way they would if they were present at the machine itself," says Alan Landers, SmartServices project leader for Conair. "This capability is not only valuable to a manager monitoring processing operations, but is of particular value for maintenance and service personnel. For example, the system can page a maintenance supervisor anywhere, even when he is at home. The supervisor can launch the portal, open the machine control, clear the alarm, figure out the problem, and correct it without leaving home."

Another new feature lets users customise and program KPIs that can alert them to anomalies. "Through the portal, you've got the capability to reach into everything and look at all of your machines. Some of our users do exactly that on a daily basis," says Landers. "But other users, pressed for time, told us that they don't want so much to reach into the portal as to have the portal reach out to them. For them, Conair now offers user-programmable KPIs. They now can choose a specific KPI, set custom performance thresholds, and ask the portal to notify them – or others on the team – and report only when a machine performs outside that threshold. If a SmartServices user wants to keep a close eye on dryer dew point readings, he can customise the dew point KPI to specify a high and low limit. If any dryers vary outside that range, the portal will send him a notification indicating the variation, with a link to the dryer that is involved."

Piovan has developed the GenesysNext, a high performance, fully automatic, single-hopper drying system that optimises the production process of PET preforms. The company says that it has been specifically designed to optimise energy consumption, due to a new configuration of the regeneration circuit and a heating power recovery system. The dryer also features the PETformance system,

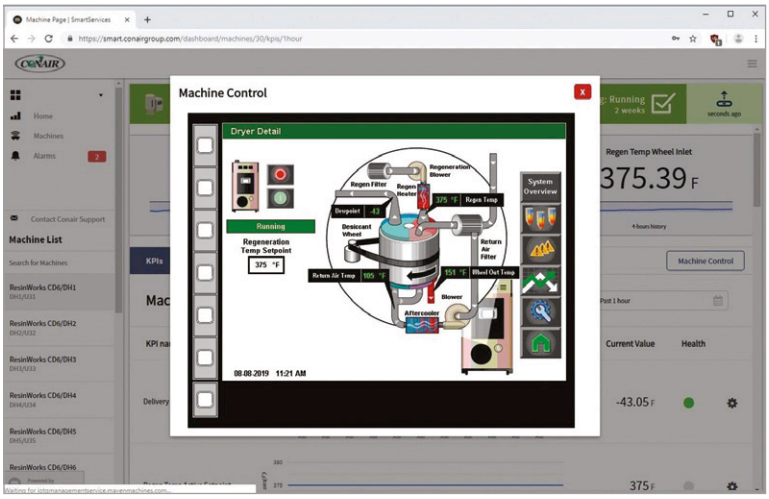

IMAGE: CONAIR

Above: SmartServices from Conair is an Industry 4.0 solution for auxiliary equipment monitoring, management and analysis


IMAGE: KOCH TECHNIK

Above: EKON is a new type of dry air dryer from Koch-Technik that combines the CKT and EKO drying concepts

introduced to allow a direct connection between the drying and the injection processes, resulting from the ability of GenesysNext to read the injection process in real time and minimise and stabilise it on the set value. In this way, the target is maximum efficiency of the complete production process with scrap rate reduced to a minimum.

The system is fully automatic and Moisture Minder, the on-line instrument for the measurement of residual humidity in plastic chips, is now integrated in the GenesysNext controls. The PureTech filtration system is available as an option, providing filtration of VOCs that can be present in process air. This is particularly useful for processing recycled materials that can release low boiling substances during the heating or injection process. The PureTech filtration system guarantees that every preform produced is contaminant-free. This system also protects the desiccant towers, while ensuring consistent performance rates and a longer machine life.

Koch-Technik has introduced EKON, a new type of dry air dryer that combines the CKT and EKO drying concepts. EKON is available in eight various construction sizes ranging from 110-2,000 m³/h. The concept of the heat exchanger with piping system is taken from the company's EKO dryers and has been further improved in the EKON series. As the heat is recuperated, energy consumption is reduced by 20-30%, depending on the material drying temperature. In addition to the standard blower with frequency regulation the new dryer is also equipped with Koch ÖKO's energy management system, which intelligently adapts to the drying process to save energy and protect the material, to ensure maximum energy savings. By combining dew point control with frequency regulation, ÖKO equipment and blowers can achieve up to 50% energy savings when drying the granulate. Due to the modular system, Koch says that various drying containers with a capacity of 20-600 litres can be integrated into EKON dryers.

The company says that the user can display all relevant operating conditions and information and adjust parameters such as drying time, temperature and dwell time, using the 10.4-inch touch panel. Safe operation of the dryer is ensured by micro filters, overload protection, air checks and a temperature limiter. The drying process is constantly monitored by sensors. Dry air with a dew point of -55°C can be produced in order to absorb moisture from the granulated plastic and to achieve the required residual moisture content of the dried material.

Using an Ethernet connection, the EKON device can be connected to the corporate network to control the drying centrally through Koch visualisation software. The new dryers are also equipped with the OPC-UA open interface standard allowing data exchange between production machines and peripherals independent of the manufacturer.

Moretto has extended its X COMB dryer series to cover higher production needs. These small dryers are fully electric, equipped with powerful turbo-compressors, zeolite technology, dew point equaliser and the OTX hopper. X COMB dryers can be used with the MOWIS process supervision and control system. The dryers offer dew point up to -60°C (-76°F), constant performance and self-adaptive airflow. As with all Moretto dryers, the Moisture Meter for precise in-line measurement of residual granule moisture can also be installed on the X COMB series. Moisture Meter analyses and detects the exact content of residual moisture up to 15 parts per million.

At K2019 Moretto demonstrated energy

IMAGE: PIOVAN

Right: The GenesysNext from Piovan is a high performance, fully automatic, single-hopper drying system that optimises the production process of PET preforms

efficiency systems dedicated to packaging and the beverage sector. For the large-scale dehumidification of PET granules, Moretto presented a drying system consisting of a XD 800X series dryer combined with the OTX hopper and Moisture Meter Manager. This solution is able to guarantee certifiable results, energy efficiency for any type of material and a completely automated drying process.

Motan Colortronic has developed the Luxor CA A advanced compressed air dryer in 15, 30 and 60 litre sizes. The unit has the company's ETA Plus throughput-based control for a temperature range of 30-180°C. The compressed air dryers have a fully insulated stainless steel drying bin, sight glass and hinged lid with mounting flange for a Motan hopper loader. Heating is with a temperature regulator, air flow meter and fully adjustable air flow mounted on the bin. It is suitable for installation on the intake flange of the processing machine. The 30 litre drying bin has an air volume of 6-15 m^3/h, while the 60 litre version is 10-25 m^3/h.

ProTec Polymer Processing has introduced the SOMOS RDF modular resin drying system for flexible stationary use without a central dry air generator. The system consists of autonomously operating units with their own Industry 4.0-capable controllers. Depending on requirements and desired throughput, the individual modules can be combined into a variable overall system with central visualisation and control.

Depending on the required throughput, the company says that the modular stationary RDF (Resin Dryer Flexible) drying system can be made up of a number of independently operating drying modules. Components are available with capacities of between 50 and 400 litres, each one being individually controllable by its own controller. Alternatively, when interconnected, they can be controlled using a common operator control unit. As standard, they offer drying temperatures of 60-140°C and high-temperature variants for up to 180°C are also available. Each module has an integrated air generator, ruling out complete failure as may occur with a centrally supplied drying system.

The modules are compact and, in comparison with a central drying system, do not require extensive supply and return air piping. The RDF modular drying system also saves energy because only the components which are actually required are operated. If requirements change, modules can be simply added or removed. The RDF modules also have an Industry 4.0-compliant PLC controller capable of storing up to 200 formulations. They have their own dry air generators and also provide various smart energy-saving systems. The drying air volume is automatically adapted to actual throughput while regeneration cycles are controlled on the basis of the actual water content of the pellets.

IMAGE: PROTEC

Above: ProTec Polymer Processing's SOMOS resin drying system. The RDF modular drying system can be used without a central dry air generator

Vismec has developed a line of wheel dryers that now require around 40% less energy. They can be pre-set and provide a constant dew point of between -20°C and -50°C. The process and regeneration air flow is adjustable and there is no water or compressed air connections. They offer material protection against under- and over-drying at drying temperatures of 50-180°C. The dryers have a new touchscreen control.

Versions include the DW 14 Medical with H6 drying hopper, which is built completely in stainless steel and includes filter housing and air pipes. The DW 25 Touch Screen with H30 drying hopper is on a compact frame with fully insulated suction box, while the DW 80 with H150 drying hopper and inspection door is also on a compact frame with fully insulated suction box. The company also offers a portable dew point controller with an internal vacuum pump that guarantees ideal air flow through the dew point probe.

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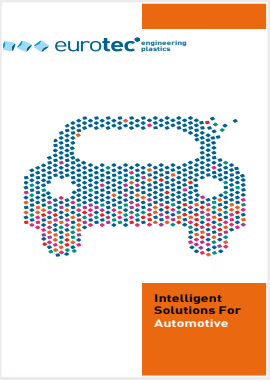

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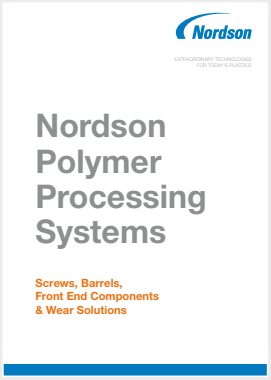

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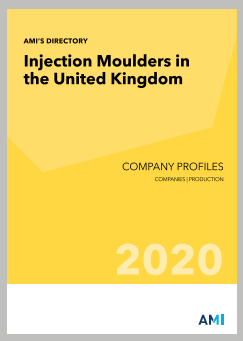
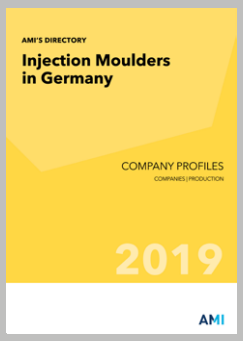
Injection Moulders in the United Kingdom



A complete and up-to-date picture of the injection moulding industry in the United Kingdom. Find out the polymers processed, the products manufactured and the number and size of machines operated by 904 injection moulding sites in the United Kingdom.

CLICK HERE

Injection Moulders in Germany



Germany is the leading country for injection moulding in Europe. Gain access to this market with profiles of 2162 injection moulding sites in Germany. Access in-depth contact and production data equipped with extensive search capabilities. Alternatively, the pdf version supplies basic company profiles.

CLICK HERE

Injection Moulders in France

Get an updated picture on the injection moulding industry in France with instant access to 884 production sites. Get managerial contact names, polymer consumption, market and machinery data for each site. Access manufacturers supplying plastic products to the automotive, medical, building and packaging sectors amongst others.

CLICK HERE

Injection Moulders in Italy

Get a key insight into the fragmented Italian market with managerial contact names, polymer consumption, market and machinery data for 1128 sites. Identify companies of interest for your business by receiving an updated overview on their production activities.

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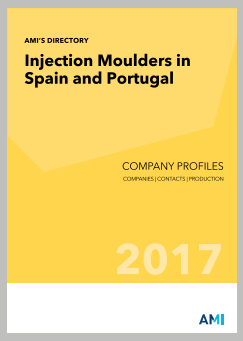
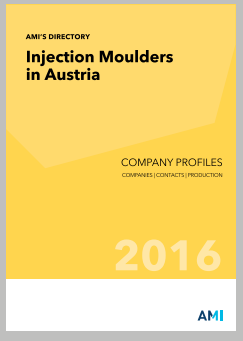
Injection Moulders in Spain and Portugal



A unique insight into the production of 1011 injection moulders in the Iberian peninsula. This directory gives you access to managerial contacts and production information on 790 manufacturing sites in Spain and 221 in Portugal serving a number of markets such as medical, automotive, electronics as well as food and non-food packaging.

CLICK HERE

Injection Moulders in Austria



This directory identifies 189 injection moulders in Austria serving the electronic and electrical markets as well as other industry segments. The data is available in pdf format or as a database which enables you to search companies by polymers processed, markets served or number and make of machines operated.

CLICK HERE

Learn more about AMI's upcoming conferences

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

PLASTIC CLOSURE INNOVATIONS

Barcelona in Spain hosts AMI's 8th Plastic Closure Innovations conference on 1-3 June 2020. This leading industry event brings together brand owners, packaging producers and closure makers to discuss regulatory and technical challenges.

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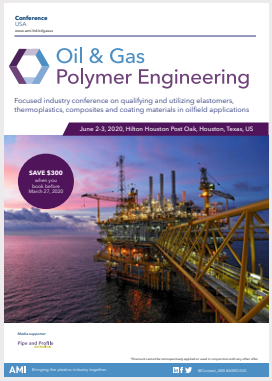
OIL & GAS POLYMER ENGINEERING



AMI's sixth Oil & Gas Polymer Engineering Texas conference takes place in Houston, Texas US on 2-3 June 2020. The event provides expert insight into the formulation, qualification and utilisation of polymers in the oil & gas industry.

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COMPOSITES IN RAIL

The Composites in Rail conference returns to Berlin, Germany on 3-4 June, 2020. This technical conference will bring together expert speakers from across the supply chain to evaluate and discuss the challenges and opportunities for composite materials in the rail sector.

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THIN-WALL PACKAGING

The 9th edition of AMI's international Thin Wall Packaging conference will take place on June 23-24, 2020 in Chicago, IL, US. The event offers a unique networking opportunity for leading food companies, retailers, packaging manufacturers and suppliers.

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MASTERBATCH

The Masterbatch conference returns to Cologne, Germany from 30 June to 2 July 2020 for its 33rd edition. This event is the international meeting for senior managers and decision makers in the masterbatch industry and incorporates three days of networking.

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CHEMICAL RECYCLING

This new conference, taking place on 30 June - 1 July 2020 in Hamburg, Germany, will explore the potential for chemical recycling to turn waste plastics into new materials. This event is relevant for all areas of the supply chain.

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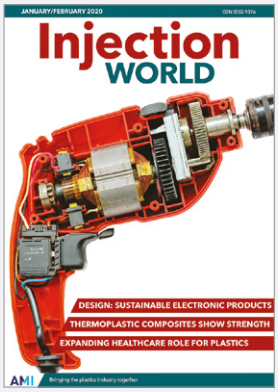
To see our full line-up of more than 50 plastics industry events over the next 12 months, please visit www.ami.international/events

Keep informed: read our latest editions

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



Injection World
January/February 2020
Injection World magazine's first issue for 2020 looks at how careful plastics design can make electrical and electronic items more sustainable. It also examines the latest in thermoplastic composites and healthcare polymers.

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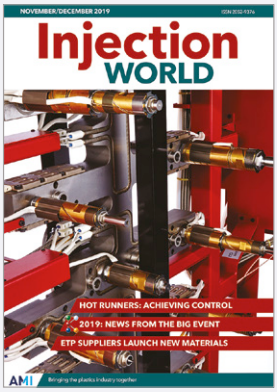

Injection World
November/December 2019
The November/December edition of Injection World takes explores new developments in hot runners and engineering thermoplastics. It also examines some of the latest automotive applications and details innovations on show at K2019.

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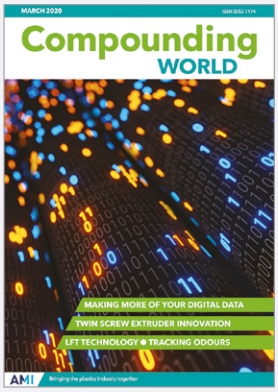

Compounding World
March 2020
The March 2020 edition of Compounding World shows how suppliers of twin-screw extruders continue to find ways to get more from this flexible machinery. Plus features on long-fibre thermoplastics, simulation and monitoring odour, and regular news on plastics compounding.

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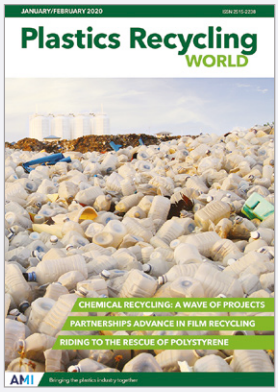

Plastics Recycling World
January/February 2020
The January-February of Plastics Recycling World takes a deep dive into chemical recycling, with features on the many technologies being developed for polyolefins and polystyrene. Plus the latest on film recycling technology and projects.

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Pipe and Profile
March 2020
The March edition of Pipe and Profile Extrusion magazine looks at the latest ideas in screw production. It also reviews developments in laboratory extruders, computer-based process simulation, and polyolefin applications.

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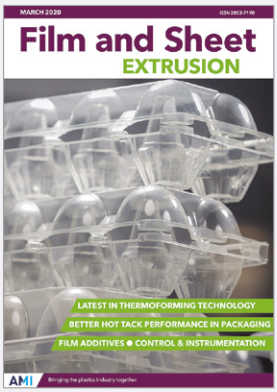

Film and Sheet
March 2020
The March issue of Film and Sheet Extrusion has features on the latest applications in thermoforming, additives for film production and optimised film structures with hot tack/ seal integrity.

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

Compounding WORLD
Film and Sheet EXTRUSION
Pipe and Profile EXTRUSION
Injection WORLD
Plastics Recycling WORLD

GLOBAL EXHIBITION GUIDE

2020	**24-26 March**	Plast Print Pack, Lagos, Nigeria **POSTPONED**	www.ppp-nigeria.com
	7-13 May	Interpack, Dusseldorf, Germany	www.interpack.com
	12-14 May	JEC World, Paris, France **NEW DATE**	www.jec-world.events
	19-22 May	Plastpol, Kielce, Poland	www.targikielce.pl
	8-11 June	Argenplas, Buenos Aires, Argentina	www.argenplas.com.ar
	3-6 August	Chinaplas, Shanghai, China **NEW DATE**	www.chinaplasonline.com
	29 September-1 October	Interplas, Birmingham, UK	www.interplasuk.com
	7-8 October	Compounding World Expo Europe, Essen, Germany	www.compoundingworldexpo.com/eu/
	13-17 October	Fakuma, Friedrichshafen, Germany	www.fakuma-messe.de
	4-5 November	Compounding World Expo USA, Cleveland, USA	www.compoundingworldexpo.com/na/
	8-11 November	Pack Expo, Chicago, USA	www.packexpointernational.com
	23-26 November	All4Pack, Paris, France	www.all4pack.com
	2-4 December	Plastic Expo, Tokyo, Japan	www.plas.jp/en-gb.html
	5-8 December	Plast Eurasia, Istanbul, Turkey	www.plasteurasia.com/en
	10-12 December	Plast Print Pack West Africa, Accra, Ghana	www.ppp-westafrica.com
2021	**4-7 May**	Plast 2021, Milan, Italy	www.plastonline.org/en
	17-21 May	NPE 2021	www.npe.org

AMI CONFERENCES

1-3 June 2020	Plastic Closure Innovations, Barcelona, Spain
2-3 June 2020	Oil & Gas Polymer Engineering, Houston, TX, US
3-4 June 2020	Composites in Rail, Berlin, Germany
23-24 June 2020	Polymer Foam, Pittsburgh, PA, US
30 June-1 July 2020	Chemical Recycling, Hamburg, Germany
30 June-2 July 2020	Masterbatch Europe, Cologne, Germany
16-17 September 2020	Plastics Recycling Technology, Vienna, Austria

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

www.ami.international

PLASTICS RECYCLING WORLD EXPO

POLYMER TESTING WORLD EXPO

PLASTICS EXTRUSION WORLD EXPO

COMPOUNDING WORLD EXPO

7 - 8 October, 2020

ESSEN, GERMANY

4 - 5 November, 2020

CLEVELAND, OHIO

www.ami.international/exhibitions