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INNOVATIONS AND APPLICATIONS IN FOAM

STATIC CONTROL ● RECYCLING & GRANULATORS

SCREENCHANGERS/MELT FILTRATION ● REVIEW





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Film and Sheet EXTRUSION

5 Industry news

13 Removal service: melt filtration

Higher throughput, greater efficiency and easier maintenance are just some of the factors that the latest generation of melt filtration equipment needs to live up to

19 Circular innovation: recycling & granulators

A variety of systems – including granulators, recycling lines, shredders and sorters – helped ensure that K2019 was full of circular economy innovations

31 Discharging duties: latest in static control

Removing static build-up from extrusion lines can mean the difference between a high-quality product, and one that is rejected as unsuitable

37 In the cells: foamed sheet applications

Foaming can reduce the density of film and sheet, as well as adding extra properties – ranging from greater insulation capacity to higher oxygen barrier

43 K2019: recyclability of multi-layer packaging



Among the many sustainable exhibits at the show were a number of tie-ups between machinery and materials suppliers, in the field of recyclable multi-layer packaging

50 Extruder of the month: AMG

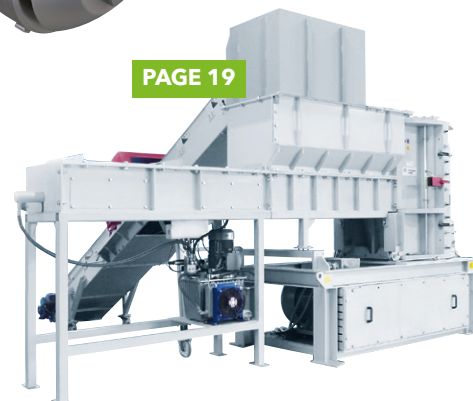
52 Dates for your diary

COMING NEXT ISSUE

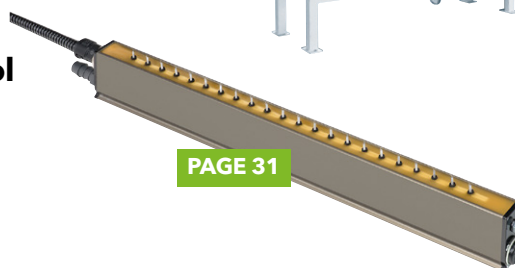
› Bioplastics › Materials testing/quality control › Polyolefins › Medical materials/applications



PAGE 13



PAGE 19



PAGE 31



PAGE 37



PAGE 43

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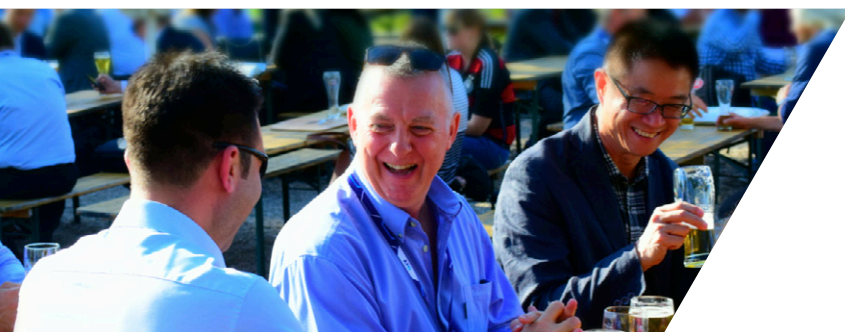


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Film production line adds sustainability at Scanfill

Swedish packaging specialist Scanfill has started running a new production line at its plant in Ystad – which it says will help it boost its environmental performance.

During the autumn, it installed the a extruder that can produce a wider range of materials while being more efficient than its predecessors.

“Now we can produce up to seven-layer materials with five extruders – tailored to meet customers’ unique requirements,” said Pontus Björklund, technical manager at Scanfill. “This new technology enables us to meet the increasingly stringent demands that the market puts on the packaging industry.”

The line allows Scanfill to produce barrier materials that are recyclable and have adaptable sealing properties.

“This allows us to customise the foil even more specifically to the customer’s requirements



Scanfill's new production line uses recycled material more efficiently

and minimise the resources needed,” he said.

Because the machine is flexible and physically wider, this opens up opportunities to work with new industries such as electronics and construction, he said.

Oscar Hugoson, vice president at the company, added: “With the new line, we will be able to use recycled material more efficiently by being able to

build layered structures that allow the foil’s core to be produced from recycled material.”

The company is continuing to grow in Northern Europe, and this year has entered new markets including Germany, Slovakia and Poland, said Hugoson.

Scanfill, a wholly-owned subsidiary of Polykemi, was founded in 2008.

➤ www.scanfill.com

New flex-pack plant for India

Constantia Flexibles has opened a new plant in Ahmedabad, India, to produce a mono-PE laminate for a variety of applications.

The laminate, called EcoLam, is fully recyclable – and Constantia says its carbon footprint is around 32% lower than that of comparable products. It is available in a range of barrier grades.

“With Constantia Ecoflex Ahmedabad we are making a big step towards more sustainable packaging,” said Alexander Baumgartner, CEO of Constantia Flexibles.

The plant has opened after more than two years of preparation. Test runs began in September 2019. It has an area of 24,500 sq m and currently employs 50 people – though this is expected to triple by the second quarter of 2020.

➤ www.cflex.com

Innovation honoured at Inovyn PVC awards

This year’s Inovyn awards, which recognise innovation in PVC, saw winners in fields as diverse as pharmaceutical packaging and an inflatable bathtub.

“We had nearly 100 projects this time – about 25% more than the last awards three years ago,” said Filipe Constant, Inovyn’s chief commercial officer.

“That shows the growing drive for innovation and sustainability in the industry.”

In the sustainability category, the

gold award went to film producers Bilcare Research and Perlen Packaging, for their PVC films for packaging pharmaceuticals. With coordination by the AGPU (PVC and Environment Working Group and recycling network VinylPlus, it turns waste from the manufacturing into building profiles.

Perstorp took the silver award for its Pevalen Pro non-phthalate plasticiser, which is based on partly renewable raw materials.

In the process category, Solvay took

silver with its Alve-One, a chemical blowing agent for use in flooring and artificial leather in the car industry. It can also be used for cables, cladding, foam sheets, pipes and packaging.

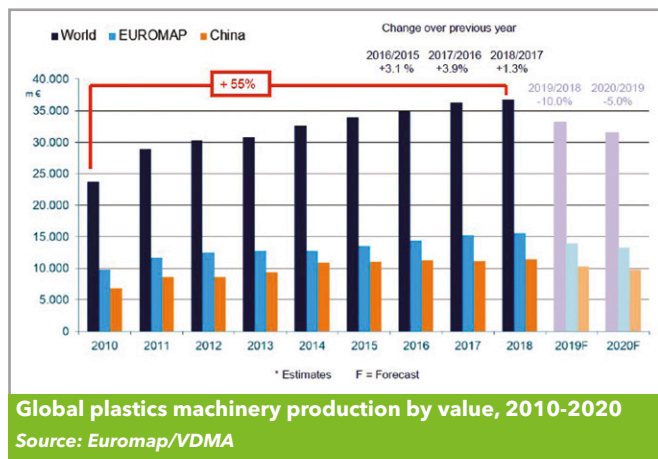
In the new product category, a special commendation went to Confort Banho – a shallow inflatable bathtub for bedridden patients of all ages. A group of social entrepreneurs saw the potential and launched the project, which uses 100% PVC.

➤ www.inovynawards.com

Global machinery output to fall by 10% in 2019, says Euromap

Global production of plastics machinery grew by 1.3% in 2018 to reach a value of €36.8bn, according to data released at K2019 by the European plastics and rubber machinery association Euromap. European machinery makers enjoyed growth above the global rate, at 1.9%, taking the total for the region to €15.6bn. However, that was a poor performance by recent standards and producers are now preparing for much weaker demand.

"After 10 years of continuous growth and an increase in the Euromap production of 59% since 2010, 2019 will see the expected economic dip," said Luciano Anceschi, President of the association.



"Apart from a worldwide economic slowdown, it's above all the slump in the automobile sector as well as decreasing investments due to political uncertainties caused by the trade conflict between USA and China, Brexit and unpredictable national laws for the use of plastics that are clouding

over business prospects."

Euromap is forecasting a 10% decline in global production this year to €33.1bn. The value of European plastics and rubber machinery production will also fall by 10% in 2019 to €14.0bn.

A further 5% contraction is forecast for 2020, with

both global and European production down 5% to €31.5bn and €13.3 bn respectively.

The association believes EU demands to raise plastics recycling volumes to 10m tonnes by 2025—four times today's levels—and to ensure all plastics packaging is recyclable by 2030 will provide a boost for manufacturers of both recycling and processing machinery. "Circular Economy will thus become a growing business field and have positive impacts on machinery manufacturers who enable a functioning circular economy by applying their technologies," said Euromap Vice President Michael Baumeister.

► www.euromap.org

KP joins Spanish rPET trial

Klöckner Pentaplast is taking part in the CEUS project.

Being trialled in Pravia, Spain, CEUS will recover plastics from domestic general waste collections, and if successful could be rolled out nationwide, say the organisers.

The PET material recovered in the CEUS project is being used in trials by KP for tray to tray recycling.

► www.kpfilms.com

Associations hit out at Italian tax

Leaders of Europe's three plastics industry associations - Renato Zelcher of European Plastics Converters, Javier Constanter of PlasticsEurope and Ton Emans of Plastic Recyclers Europe - announced their opposition to the Italian government's proposed €1,000/tonne tax on plastic packaging.

Speaking at K2019, they said it "is likely to have a negative impact on the local market, in terms of job losses and consumers being negatively affected by such a regressive tax".

About 50,000 people work for 2,000 SMEs in the



PHOTO: SHUTTERSTOCK

Plastics associations say Italy's proposed plastic packaging tax would hurt the economy

plastics value chain in Italy, which is Europe's second largest producer of plastics products after Germany. The associations said the proposed tax would

jeopardise their jobs, as well as costing households €140/year on average.

► www.plasticsconverters.eu

► www.plasticseurope.org

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Free registration opens for industry expos in Germany

Free online [registration](#) has opened for four exhibitions focused on plastics extrusion, recycling compounding and testing.

Organised by AMI, the Compounding World Expo, Plastics Extrusion World Expo, Plastics Recycling World Expo and Polymer Testing World Expo will take place at Messe Essen in Germany on 3-4 June 2020.

By registering in advance, visitors will receive free admission to all four exhibitions, featuring more than 300 international suppliers, plus free entry to five focused conference theatres hosting technical presentations, educational seminars and debates.

"The event will provide visitors with a great opportunity to meet and compare suppliers from around the world, as well as giving them the chance to learn from business leaders and technical experts in the conference sessions," said Rita Andrews, head of exhibitions at AMI.



The debut event, held in Essen last year, attracted a variety of exhibitors

The expos will feature a wide array of leading manufacturers of extrusion, compounding, recycling, testing and analysis equipment, plus suppliers of a huge variety of polymers, additives and related services.

The conference theatres will feature more than 100 expert speakers over the two days, including influential representatives from leading compounders, extruders and recyclers, plus exclusive market presentations from AMI's consultants and editors.

"Our debut compounding and recycling exhibitions in Essen, Germany attracted 184 exhibitors and 4,024 visitors in 2018," said Andy Beevers, AMI's events director. "We are confident that our next Essen event in 2020 will build on this success with the addition of two new focused exhibitions and many more exhibitors."

The exhibitor line-up already includes a large range of international companies such as Azo, BASF, Biesterfeld, Borealis, Bühler, Buss, Cabot, Clariant, Coperion, Dynisco,

Erema, Evonik, ExxonMobil, Farrel Pomini, Fraunhofer, Frontier Lab, Gabriel Chemie, Gneuss, IMCD, JSW, Konica Minolta, KraussMaffei Extrusion, Maag, Mixaco, Mitsui, Montello, Motan Colortronic, NGR, Nordson, Norner, Omya, Solvay, Starlinger, Veolia and over 200 additional leading suppliers.

The limited number of remaining booths are being filled on a daily basis. To find out more about exhibiting at any of the expos, visit <https://www.ami.international/exhibitions>.

Essen is readily accessible by car and public transport from major industrial hubs in Germany, Benelux, France and beyond. In addition, it is just 20 minutes' drive from Düsseldorf airport. Making the same journey by S-bahn and U-bahn trains takes under 60 minutes.

To book your free ticket, which is valid for both days of the event, visit: www.ami.ltd/Register-AMI-Expos

Italian machine sales slow in first half of year

Amaplast, the Italian plastics machinery association, released mid-year figures showing that the country's trade in plastics machinery continued to decline in H1, albeit at a slower rate in Q2 than Q1.

Overall, the association said imports were 17% down on H1 2018, while exports were 5% down. There was a very slight improvement in the balance of trade.

The decline is mainly the result of a slump in trade with Germany, which is Italy's largest biggest import and export partner for plastics machinery. Imports and exports fell by 26% and 33% respectively, Amaplast said.

Most other European national markets were also down for Italian exporters, as was South America. North America was slightly up but by far the strongest markets were in the Far East

and Middle East, with China showing a 39% increase, Thailand 55% and Indonesia more than doubling albeit from a low base.

Looking ahead, the association predicts ongoing weakness in the plastics market. "Overall, there is concern for the tendency towards a postponement or reduction in orders by customers," the association said.

➤ www.amaplast.org

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North America sees machine sales dip in third quarter of 2019

The value of primary plastics machinery (injection moulding and extrusion) deliveries in North America fell slightly marginally in the third quarter of 2019, according to statistics from the Plastics Industry Association's Committee on Equipment Statistics (CES).

The early estimate of sales from reporting companies totalled nearly US\$294 million. After an 8% increase in the second quarter, deliveries fell by 0.5% in the third quarter. However, while total delivery value decreased, extrusion machinery sales increased in the quarter: single- and twin-screw extruder sales rose by around 5% and 14%, respectively, compared to Q2, while those for injection moulding fell nearly 2%.

While it appears that deliveries flattened from the previous quarter, they were down nearly 16% from a year ago.

The delivery value of twin-screw extruders fell by almost 30% in that time, and single-screw extruders fell by more almost 6%. For comparison, injection moulding machinery sales value fell nearly 16% compared to the same period last year.

"The plastics industry is a mature industry and its growth will continue to track gross domestic product (GDP)," said Perc Pineda, chief economist at the association.

"The third quarter numbers moving sideways are in sync with weaker manufacturing activity in the economy this year. In Plastics Quarterly, our GDP growth forecast for the second and third quarters were 2.0% and 1.9%, respectively and that's what we got," he added.

The CES also conducts a quarterly survey of plastics machinery suppliers that asks about present market



Pineda: "Plastics industry growth will continue to track GDP"

conditions and expectations for the future. In the coming quarter, 39% of respondents expect conditions to either improve or hold steady – lower than the 56% that felt similarly in the previous quarter.

For the next 12 months, 63% expect market conditions to be steady-to-better, up from 53% in the previous quarter's survey.

■ The US plastics industry maintained a trade surplus in 2018 – though one much reduced compared to the previous year.

In 2018, the surplus shrank to US\$500 million – down from US\$3 billion in 2017.

"A strong US dollar and sustained economic expansion has increased the economy's propensity to consume imported goods – in addition to the use of imported intermediate goods in US plastics manufacturing," said Perc Pineda. "This caused imports to rise faster than exports, which shrank our surplus, but it also indicates strong demand for plastics."

At the same time, apparent consumption of plastics industry goods grew by nearly 7% in 2018.

➤ www.plasticsindustry.org

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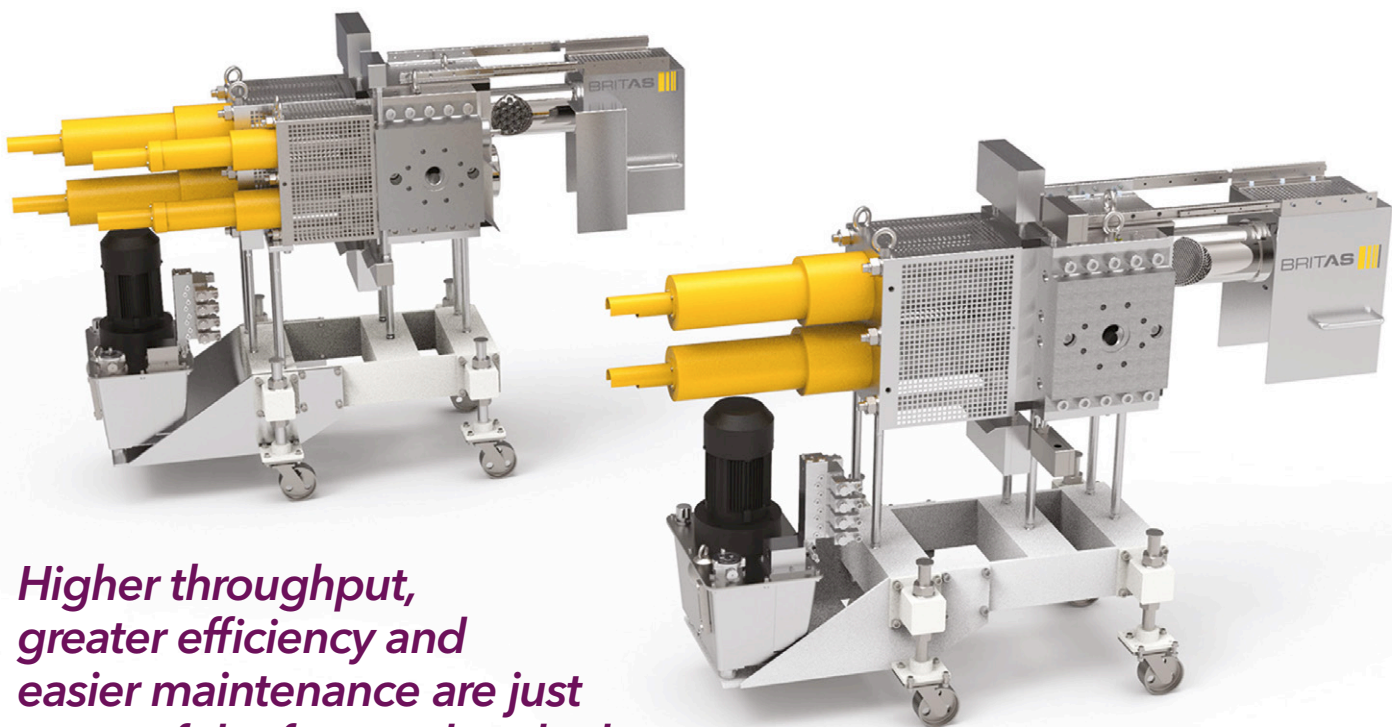


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Higher throughput, greater efficiency and easier maintenance are just some of the factors that the latest generation of melt filtration equipment needs to live up to

Removal service: screen changers and melt filtration

As recycled plastic becomes increasingly important, it makes sense that melt filtration and screen changer technologies - which help to control the quality of the recycle - were prominent at K2019.

Germany-based **Britas** launched a new series of piston screen changers at the show. These are aimed at applications where plastic waste is not heavily contaminated.

The continuous (CMF) and discontinuous (DMF) models can be used with both industrial and production plastic waste. They add to the company's existing ABMF, ABMF 1600 & ABMF PET models.

"CMF and DMF screen changers are aimed at customers who want to recycle waste plastics with less pollution," said Friedrich Kastner, chairman of Britas Recycling.

The systems are mainly used in the post-industrial, post-production and new product sectors. Depending on required flow rates and different operating modes, customers can choose between the discontinuous version - which typically has one piston - or the continuous one, which has two pistons.

Basic versions are the CMF as automatic continuous piston screen changer and the DMF as

discontinuous piston screen changer - available in square or round execution.

"The DMF-rd is a round case that is heated with ceramic heating bands. This filter is the most cost-effective filter version and is mainly used as a pre-filter for coarse contaminants, as a pump protection or used in reduced space conditions," said Heiko Henss, managing director of Britas Recycling.

Raised temperatures

The DMF-sq is suitable for higher temperatures (up to 350°C) and higher pressures (up to 500 bar) due to its square housing, and is heated with heating cartridges. Both types can be used for polyolefins, melt adhesives and for many engineering plastics.

The CMF-BF can clean the screens automatically, and a back-flush attachment includes two pistons that automatically perform the back-flushing process. When a filter change is required, one of the two back-flush pistons is moved into the back-flush position first. As a result, the melt inflow of the corresponding filter is interrupted. A small melt stream of already purified material is diverted and

Main image:
Britas launched its CMF and DMF piston screen changers at K2019

Right: The ERF 1000 high melt filter is Ettlinger's largest to date and can handle up to 10,000 kg/h

passed backwards through the filter to be cleaned and discharged to the outside. This process is automatically repeated for the second filter.

High throughput

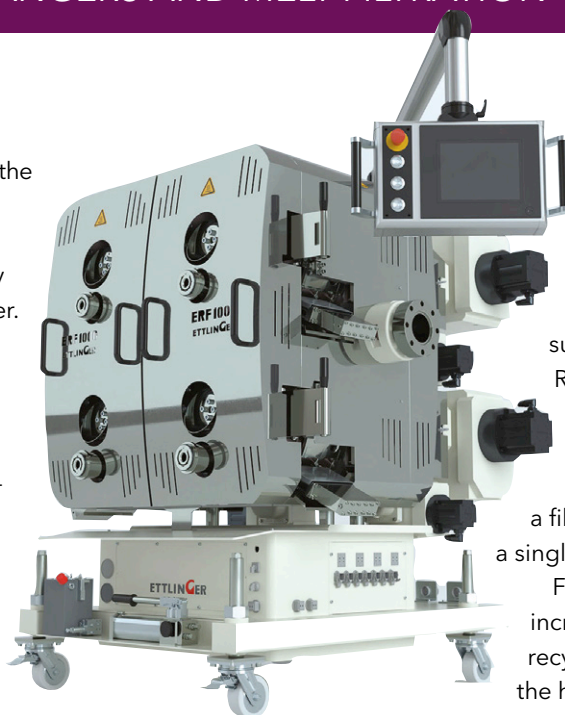
Ettlinger used K2019 to unveil the ERF 1000 melt filter for very high throughputs in plastics recycling. It is Ettlinger's largest melt filter to date: four filter drums provide a total of 6,280 cm² of filtration surface - twice as much as the ERF 500, its previous top-of-the-range model.

The ERF 1000 removes foreign particles from polymer feedstock containing up to 18% contaminants. The filter has maximum throughput of 10,000 kg/h depending on the application. Ettlinger says ERF filters are now available in four sizes, starting with the ERF 200 for throughputs up to 800 kg/h.

The new ERF 1000 is self-cleaning and works with a rotating, perforated drum, through which there is a continuous flow of melt from the outside to the inside. A scraper removes the contaminants that are held back on the surface and feeds them to the discharge system. As a new feature, the ERF 1000's four filter drums can be individually replaced without disrupting production.

This allows the filter to run continuously and fully automatically, often over a period of several months at a time. Ettlinger says its advantages include low melt losses and good mixing and homogenising of the melts.

Ettlinger is part of Maag, the manufacturer of gear pumps, pelletising and filtration systems and pulverisers.



Double screen

Fimic has developed its new GEM melt filter, which has two screens to offer a greater filtering surface than its established RAS700 filter. At K2019 it displayed a GEM unit with two screens and two discharge valves, enabling a filtering area of 5,552cm² on a single machine.

Fimic says this innovation will increase production from recycling lines while keeping the highest quality of the final

product. It is also simple in operation and contributes to reduced operation costs. The company says the GEM filter enables shorter residence time of the material, lower energy consumption and lower consumption of spare parts, and additionally leads to less waste and a more efficient and faster replacement of the screen.

Continuous improvement

Key Filters - part of **Parkinson Technologies** - has made a number of refinements to its KCH continuous belt screen changer. These include more robust construction, cooling enhancements and maintenance features.

"Our engineers, assembly personnel and field service technicians worked closely with our customers to make a great machine even better," said Justin Marriott, product manager of Key Filters. "This recent iteration saw the most advances since the KCH's inception."

To increase robustness, vital machine sensors were guarded, moved further away from high-heat locations and upgraded to meet extreme production environments.

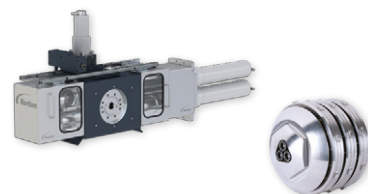
"As an example, the puller sensor was upgraded

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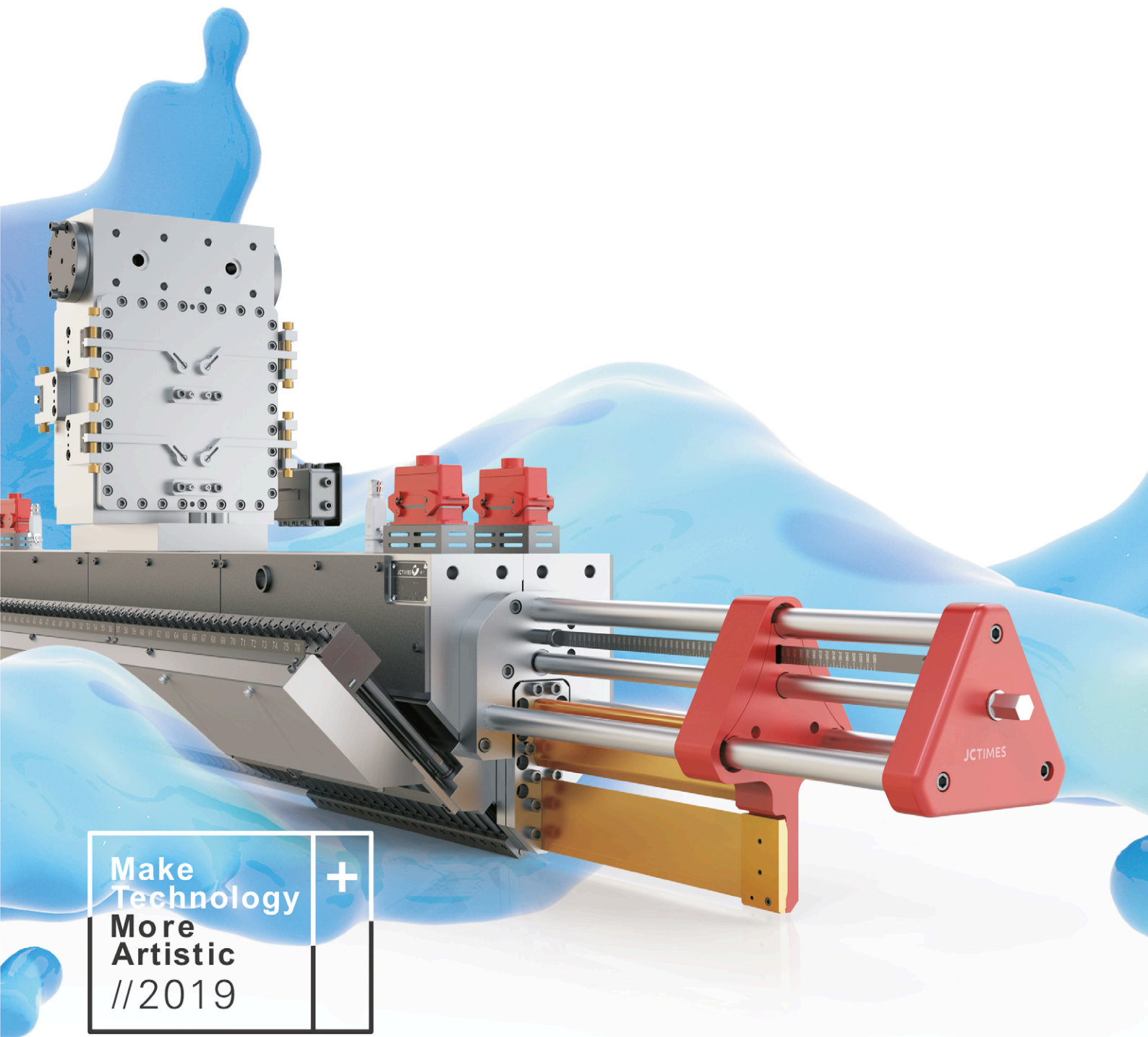


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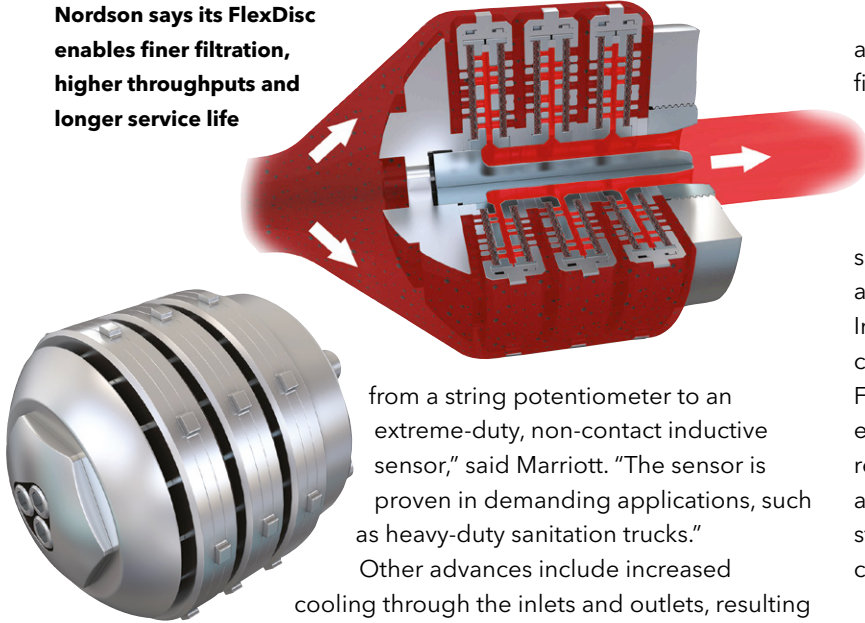
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JCTIMES 
From dreams to reality

Nordson says its FlexDisc enables finer filtration, higher throughputs and longer service life



from a string potentiometer to an extreme-duty, non-contact inductive sensor," said Marriott. "The sensor is proven in demanding applications, such as heavy-duty sanitation trucks."

Other advances include increased cooling through the inlets and outlets, resulting in three times the flow rate of the previous version. This accelerates the formation of the sealing plug, which allows the KCH to advance the screen more quickly – thus filtering out higher volumes of contaminants and reducing the risk of downtime.

When working with heated polymer, situations that are outside the screen changer's control can arise, which may cause downtime or damage to the machine. These include: increasing the screw speed on the extruder too quickly at start-up; and interrupting the cooling water to the screen changer, which results in a loss of the sealing plug in the screen outlet.

Key Filters looked at ways to reduce potential downtime in these situations by separating the puller and outlet assemblies. The heated polymer bypasses the puller assembly, eliminating component damage and providing an easier clean-up if plug loss occurs. An extrusion line can be fully operational in just a fraction of the time, says the company.

Right: Key Filters has refined its KCH continuous belt screen changers

Increased area

Nordson has developed the BKG FlexDisc to provide PET recyclers with more filtration area than standard screens, without an increase in machine size. The company says that the FlexDisc filter for piston-activated screen changers substantially enlarges available filtration area without the need to increase machine size, enabling processors and recyclers to achieve finer filtration, higher throughputs, longer filter service life, and reduced specific backflush volume. Nordson recommends the BKG FlexDisc for enhancing quality in bottle-to-bottle PET recycling, PET fibre recycling and battery separator film applications.

FlexDisc enables processors and recyclers to achieve finer filtration, higher throughputs, longer filter service life, and reduced specific backflush volume. Nordson recommends it for increasing productivity and enhancing quality in applications such as battery separator film.

The function of the hydraulic pistons is to insert screen cavities into the melt stream for filtration and to remove them for cleaning or replacement. In systems where FlexDiscs are used, each cavity contains a filter stack comprised of two to four FlexDiscs, depending on machine size. Each is equipped with two Nordson screen packs. As a result, there is at least twice the filtration area available for each cavity than with conventional standard round screens, and around 25% more compared to the former FlexDisc version.

Screen changers that use Nordson's backflush technology include the BKG V-Type 3G and BKG HiCon K-SWE-4K-75/RS. Backflushing diverts contaminant from the melt stream. The higher efficiency of the new FlexDisc reduces the frequency of backflushing, says Nordson.

"The increased efficiency of the FlexDisc can enable the processor or recycler to save on investment cost by purchasing a smaller machine without sacrificing throughput," said Christian Schröder, global product manager at Nordson. "There are also significant operational savings possible with the reduction of backflush volume."

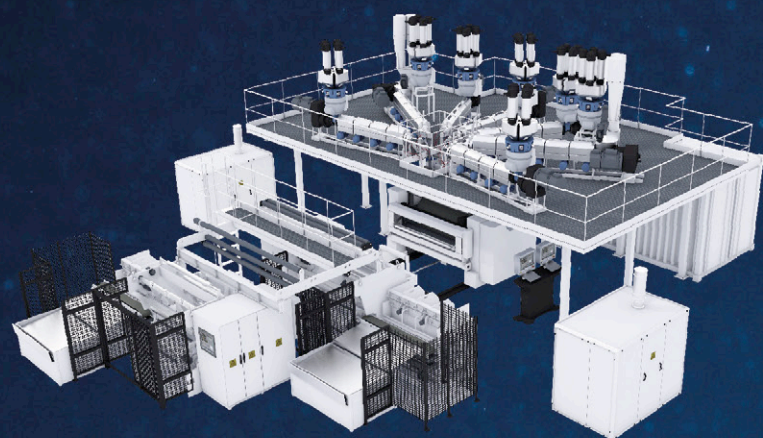
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A variety of systems - including granulators, recycling lines, shredders and sorters - helped ensure that K2019 was full of circular economy innovations



Circular innovation: latest in recycling and granulators

K2019 was full of innovations related to the circular economy. However, while chemical recycling and single-material multi-layer packaging grabbed most of the attention, there were also many developments in mechanical recycling.

At the show, **Starlinger** presented a closed loop system for big bags made from woven polypropylene (PP).

The closed loop concept for big bags (or FIBCs: flexible intermediate bulk containers) begins with PP granulate and leads back to PP regranulate via stages of bag production, usage, recovery, and recycling. In cooperation with the major big bag manufacturers Louis Blockx and LC Packaging, Starlinger has simulated this loop and produced new big bags from fabric with high recycled PP (rPP) content.

The recycling stage is carried out on Starlinger's RecoStar Dynamic recycling line. Apart from saving costs for raw materials, the recycling of big bags lowers the carbon footprint of this type of bulk packaging, says the company.

Samples of the closed loop bags were seen at

the show, to demonstrate rPP big bags have the same quality as those made from virgin material in terms of tensile strength, weight, and safety factor.

A live demonstration of the bag recycling took place at an open house event at Starlinger's facility in Weissenbach, Austria.

Recycling in Romania

Romania-based recycler Calex recently installed a Starlinger RecoStar dynamic 105 C-VAC recycling line, for post-consumer film.

The new line joins three other Starlinger lines at the same facility in Satu Nou de Jos, and three more at its parent company's facility in Sollenau, Austria.

Calex processes up to 700 tonnes/month of plastic waste in Romania. Here, it operates two Starlinger RecoStar 105 C-VAC recycling lines. One processes big bags, while the other recycles coloured, transparent and highly printed LDPE packaging films.

During extrusion, the high ink content and the residual moisture after the washing process on the upstream washing lines can lead to the increased

Main image:
Calex recently
bought a new
Starlinger
recycling line
to process
post-consumer
film

Right: NGR and Kuhne have combined their expertise in recycling and direct sheet production



formation of gases. This is handled by combining a Smart feeder, continuous melt filter and C-VAC degassing module.

Through densification and homogenisation of the material and the resulting friction, the Smart feeder has a drying effect, and after removal of residual contamination by the melt filter, the melt surface is increased by 300% in the C-VAC module, allowing efficient extraction of gases.

"Our regular customers have to be able to rely on the quality of the regranulate," said Gheorghe Campan, managing director of Calex. "We installed a second Starlinger 'dynamic' in July because the first line shown its suitability for post-consumer recycling."

Moist film

The 54-TTC recycling system from **Tecnova** is designed to handle highly printed and highly moist film material.

The line includes one or more storage silos and a forced feeding system designed to continuously feed the extruder. This is equipped with two venting zones and can be specified with options including dosing systems for additives. The innovative VTS (Vacuum Twin Stuffer) system is available for materials with high humidity.

Tecnova has also developed the new 3M7 melt filter, which can be used for several applications: compounding, pellets,

post-industrial and post-consumer recycling and agricultural film. The filtering element is a mesh belt available in different sizes and different filtration ranges, up to 80 microns.

It guarantees high regranulate quality at low operating costs and using a fully automatic process, says the company.

Direct sheet production

NGR (Next Generation Recycling Machines) teamed up with **Kuhne Group** at K2019. Since their first collaboration at K2016, several joint projects have been implemented, and interest in the combination of recycling and direct sheet production has grown, says NGR.

During K2019, a demonstration line for direct rPET-to-sheet production was seen in the large R&D area of Kuhne's facility in St. Augustin.

Within the integrated system, the PET melt travels from the NGR recycling extruder through its LSP reactor for boosting intrinsic viscosity with a seamless transfer into the Kuhne sheet line. NGR says thermoforming companies can use the system to produce packaging with very uniform and high strengths, excellent optical properties and which are approved for 100% food contact applications.

NGR has also extended its C Gran series of recycling machines to handle outputs of 2,200 kg/h and above.

This follows the market trend of increasing plastic recycling quantities and modernisation of recycling plants to satisfy the increased demand for high-quality recycled pellets, it says. As well as having to increase recycling quantity, the industry must ensure that the quality of recycled pellets is high.

"We have a broad portfolio of recycling machines with very different, specialised technologies," said Patrick Steinwendner, product and marketing Manager at NGR. "We recommend shredder-feeder-extruder combinations - especially for dry industrial waste - but for high moisture

Below: NGR's C Gran recycling machine can now handle outputs of 2,200 kg/h





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mixed plastics from the post-consumer waste stream, cutter-compactor-extruder combinations offer advantages.”

Single-stage shredder

Vecoplan introduced a single-stage shredder from its new VIZ (Vecoplan Infinity Shredders) series at K2019. The machine can be equipped either with the high-torque, quick-start HiTorc drive from the company's VAZ series, or with the ESC, which is Vecoplan's frequency-controlled, belt-type direct drive. Both systems are patented and are designed for high energy efficiency.

The VIZ shredder offers flexibility in terms of the cutting geometry. It can be precisely adapted to different input and output requirements by changing the rotors and blades and by selecting the right screen, says Vecoplan. The performance can be precisely determined by the interface. Thanks to the efficient machine concept, users benefit from short set-up times and a high level of adaptability to cater for different output requirements, says the company.

Vecoplan says it offers solutions not only for mechanical but also for chemical recycling.

Dry and wet operation

Herbold Meckesheim used K2019 as a platform to launch new technology for plastics recyclers. The new EWS 60/210 high-capacity shredder was developed for both dry and wet operation and is said to be very robust and durable. The development work focused on requirements needed in the crusher stage in the recycling process, such as the need to deal with foreign bodies. The company says it focused on making a perfect wear-protected rotor that, in addition to custom knife configurations, is equipped with bolted armour plating and a special grinding chamber seal.

Herbold Meckesheim also showed a new

Below:
Vecoplan's
V-ECO series
shredder

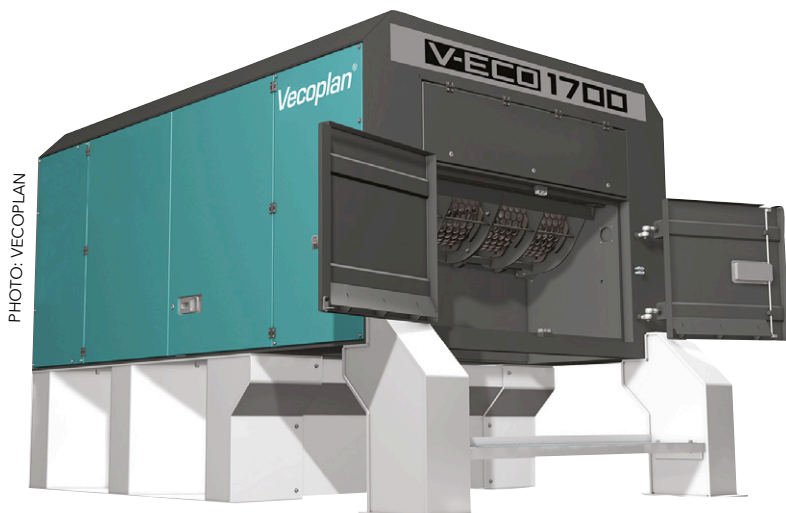


PHOTO: VECOPLAN



Researchers at the University of Alicante have used steam distillation to remove odours from recycled plastics

Removing smells helps raise recycling levels

Spanish researchers have devised a new way of eliminating odours from recycled plastics – using water vapour.

The researchers, from the **University of Alicante**, have spent 18 months on the project. They say that the technique – which uses steam distillation – could increase the re-use of plastics from domestic and industrial waste streams.

The procedure was patented recently and has attracted the interest of five companies.

The researchers – professor of chemical engineering Andrés Fullana, and research assistant Andrea Cabanes – use plastic containers as the raw material, as there is an increasing need to improve the quality of this type of recycled material. However, household plastic waste reusability is limited due to the high content of food waste and cleaning products. These are absorbed into the polymer matrix, which contributes to the bad smell.

The substances responsible for the smell are volatile organic compounds (VOCs), which cannot be eliminated by conventional washing or mechanical recycling.

The new patented process patented includes several stages. The first consists of separating and conditioning the plastic; the second is shredding; the third is chemical washing using a surfactant (soap); the fourth is rinsing; the fifth is mechanical drying; and the sixth – the deodorisation of the plastic – is performed in a steam distillation column.

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Below: Rapid's ThermoPro granulators are designed for in-line processing of skeletal waste

two-shaft DWS shredder, which has a stator positioned in the middle. Due to the large surface area of the rotor, the machine has a very good feed performance and is suitable for materials that can only be fed in doses using conventional shredders such as big bags or high-volume containers, says the company.

Other company products on show included SB series granulators with force feeding, the new VWE 700 prewashing unit, mechanical and thermal dryers and HLR label removers.

Combination unit

Hosokawa Alpine has developed a combined shredder and granulator.

The Polyplex PPC 50/120 has a vertically arranged rotor with a top-mounted shredder and granulator section underneath.

"Granulator fineness values are achieved in a single step," said Josef Zöttl, senior sales manager in the company's recycling and granulators division. "The joint drive makes the size reduction far more energy-efficient."

With the aid of an intake unit, feed material is automatically dosed and charged to the shredder-granulator unit. Feed rate can be adjusted to suit the problem specification. After passing through the shredder section, the material falls into the granulator section and is reduced to granulator fineness.

The machine is especially suitable for in-house recycling. Different plastic parts can be charged together. The vertical design of the mill also brings advantages when cleaning, enabling easy access to the rotor and cutting knives. This guarantees fast cleaning and reduces downtime.

Skeletal waste

At K2019, **Rapid Granulator** presented its complete line of ThermoPro machines – a

new range of granulators specifically designed for in-line processing of skeletal waste from sheet and film thermoforming lines.

The ThermoPro is equipped with a heavy-duty roller feed system that also can handle the start-up cups up to 200mm height in the web, eliminating any extra labour costs and material waste. ThermoPro with integrated loop control is made in super sound proof execution in order to operate at noise levels below 80dBA. Rapid currently offers 15 different base configuration machines, depending on customer requirements.

The company has also upgraded its Raptor Duo – a machine that combines the benefits of a pre-cutter and a granulator that was initially launched at K2016.

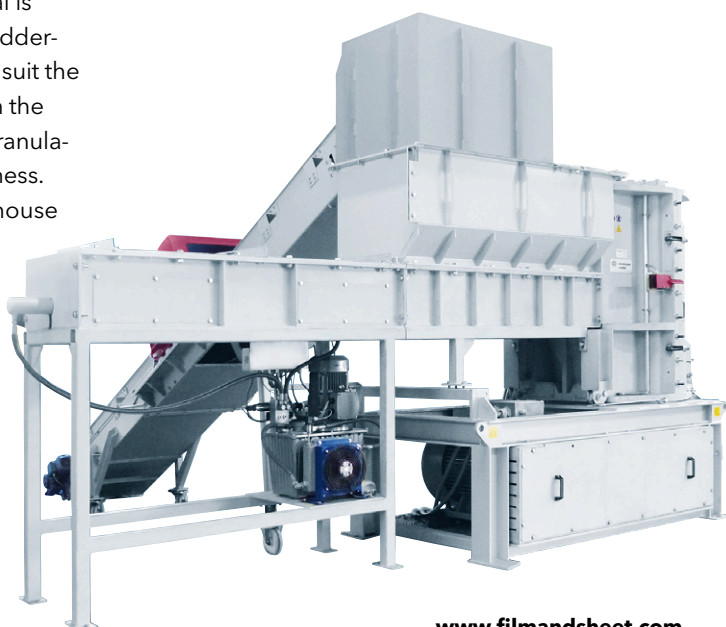
Bengt Rimark, CEO of Rapid, says that his company is in a strong position due to an increasing focus on plastics recycling – and said that sustainability was a key theme at the show.

"We are fortunate to be in a business that is part of the solution to reducing the environmental impact of plastics," he said. "Customers are desperate to get recycled materials in their product as their consumers are demanding it. We are not only helping customers recycle their materials, we are also making them more profitable when doing it," he said.

Granulator evolution

CMG launched its new Evoluzione series of granulators for post-consumer recycling. The model on display at K2019 was the 9-tonne EV616. All the Evoluzione granulators are equipped with advanced Industry 4.0 controls to make the machine operation 100% monitorable and manageable. These cover operating temperature, blade wear, productivity, operating efficiency, energy usage, and all functional parameters

Right: Hosokawa's Polyplex PPC 50/120 combines a shredder and granulator in a single vertical shaft



managed on the machine or remotely with OPC-UA protocol connectivity.

CMG also offers its XT35-120 CMG, for sheet recovery, skeletal and reject parts in the production of thermoformed packaging. The model has a cutting chamber with a design that is dedicated to sheet grinding, special steel blades for extended performance and a precision roller unit - with double motor and automatic pressure control. The range can be used for both in-line and off-line applications.

Getting it sorted

Tomra develops collection and sorting systems that optimise resource recovery and minimises waste. Its sensor-based sorting solutions - including Autosort, Autosort Flake and Innosort Flake - were on show at K2019.

Volker Rehrmann, executive vice president of Tomra Recycling & Mining, said: "Continuing to use our resources in an unsustainable and inefficient way should no longer be an option. At Tomra, we continue to develop new sorting solutions."

The Innosort Flake, seen at the show, is a good example of "positively impacting and purifying the recycling process", he said. Since its launch earlier



Left: CMG's EV616 granulator is part of its Evoluzione series

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this year, it has shown to be a good dual-sorting solution for plastic recovery facilities – sorting plastic fractions of 2-12mm by colour and simultaneously by polymer types. This means that large amounts of contaminants can be removed – and the potential loss of PET flake material can be significantly reduced.

This all-in-one solution with ultra-high resolution and specialised sensor configuration offers high performance results.

"It's an economically favourable sorting solution providing a quick return on investment and scalable flexibility," said the company.

The company is also developing ways of further improving the sorting process. Based on improvements in collecting and managing large amounts of data – and the development of artificial intelligence – Tomra has developed deep learning software for sensor-based sorting.



The software can learn individually from a large amount of collected data, equalling or even surpassing sorting results achieved by humans and typical machines, it says. By combining deep learning models with Tomra's sorting solutions, objects that could previously not be separated can now be sorted.

Left: Tomra showed several of its sensor-based sorting solutions at K2019, including Autosort Flake

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- > www.starlinger.com/en/recycling
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- > www.ngr-world.com
- > www.kuhne-group.com
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Removing static build-up from extrusion lines can mean the difference between a high-quality product, and one that is rejected as unsuitable

Discharging duties: latest in static control



Static control is an important technique, dealing with the invisible static charges that build up on film surfaces – and can cause production problems if they are not removed. Several suppliers used the recent K2019 exhibition to show off their latest technologies.

Meech International showcased a number of new static control and web cleaning products at the show. They include the CyClean R web cleaner, Hyperion IonCharge50 (75W) and IonCharge30 (15W) static generators and the Hyperion 960IPS static control bar.

CyClean R is aimed at wider webs where lower tensions are common. The single or double-sided non-contact web cleaner uses positive and negative airflows to clean low-tension plastic webs.

"It is compact, making it suitable for use in tight spaces, and can handle high speed webs up to 800m/min," said Ralph Simon, sales director at Meech. "What's more, it only requires a low level of air consumption to operate, meaning energy usage is kept to a minimum."

The company's latest static generators – Hyperion IonCharge30 (15W) and IonCharge50 (75W) – are versatile, compact and simple to install. They are suitable for use within a range of plastic-based applications that require temporary bonding of materials. IonCharge30 is compact and easy to install, while IonCharge50 is Meech's most

powerful static generator.

The new mid-range Hyperion 960IPS is a pulsed DC ionising bar, which is versatile and simple to install. With adjustable voltage, frequency and balance, the bar possesses powerful ionisation of up to 15kV and provides 50% greater maximum working distance than the earlier 929IPS ionising bar.

BOPP improvement

UK-based BOPP film producer **Innovia Films** has used Meech's 935 ionising blowers during the winding process.

The blowers ensure that the film lies smoothly on the reel, has a clear and untainted finish and does not pose a hazard to operators.

"Polypropylene generates static throughout our process, and eliminating this is essential," said Neville Cox, engineering maintenance manager at Innovia Films. "Without eliminating the static charge, the rolls of film can prove hazardous during later processing. What's more, the film may not lay smoothly onto the reel, resulting in ribbing and other effects on its surface."

These impressions on the film could remain once the reel is unwound, affecting final product appearance and leading to product rejection, increasing wastage and downtime.

"If the ribbing is severe, tightly wound rolls can experience shrinkage, which often means they

Main image:
Meech offers a number of new static control and web cleaning products

Right:
Vetaphone
showed a
double-sided
Corona treater
for extrusion
and converting
at K2019

need to be disposed of," said Cox. "In other cases, rolls need to be unwound and then rewound again but at slower than normal speeds, causing costly delays."

To counter the generation of static on the BOPP film, Innovia uses 20 of Meech's 935 long range blowers at its Wigton factory. The blowers are mounted on the floor facing up towards the nip of the reel, neutralising both sides of the film as it rewinds into a full reel. This prevents ribbing and other effects that prevent its ability to form a neat, uniform roll.

"The long-range blowers have been very useful in eliminating static at the crucial point of winding - when our polypropylene films are made into rolls," said Cox.

Surface treatment

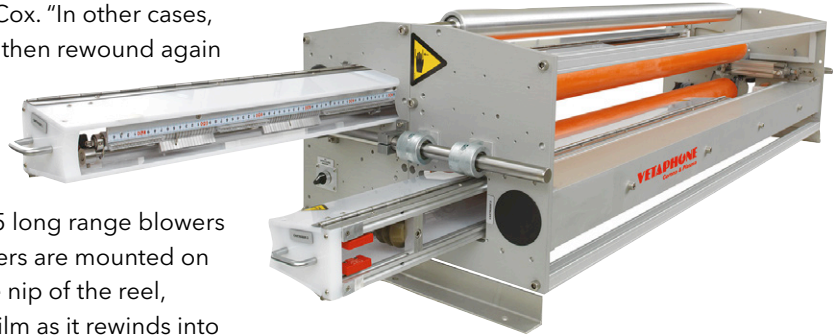
Vetaphone displayed a range of surface treatment technologies at K2019.

These included four standard Corona units from its portfolio. The VE2-B model is for extrusion and converting applications, which is capable of double-sided treatment. The VE1-D and VE1-E models are also for extrusion and converting applications but can distribute a higher power charge or run at higher speeds than the B model. The final unit on display, the VE1-L, is a compact model designed for lamination environments where space is at a premium.

All four units are equipped with Vetaphone's iCC7 control panel that logs function and maintenance and has remote access for performance and fault analysis. By using a proprietary hardware interface, all Vetaphone Corona systems can be controlled centrally from the main machine HMI, allowing one operator to manage several lines at the same time.

"Many see the integrated display as the end-game - we see it as the beginning and have made it available on our iCC7 unit since 2017," said Frank Eisby, CEO of Vetaphone. "The aim is to make the use of our technology completely intuitive."

Below:
Taiwan-based
Kung Hsing fits
Vetaphone
surface
treatment
products to its
extrusion lines



Corona installations

Puerto Rican packaging converter **Alco High-Tech Plastics** recently installed two Vetaphone corona systems to its extrusion operation.

Its products include printed and laminated bags, films, stand-up pouches, zip lock products, and flexo-printed labels.

The first order was for a two-sided 1.4m wide VE2B-A corona system, that was fitted to a Carnevali line in December 2018.

"The commissioning went smoothly - everything arrived in the one box and assembly was straightforward," said Gilberto Nieves, operational manager at the company.

Vetaphone's B models are designed for the slower extrusion process and this 1kW system is suited to Alco's production with its 25m/min operating speed. It also features segmented electrodes lane treating, built-in guide rollers and QC quick change electrode cassettes.

In February 2019, a second Vetaphone Corona system was installed - to a Carnevali extruder with limited headroom. This VE2B-A model had a 2.2m width and 4kW power specified to run at 60m/min.

Installation of the second system was less straightforward, said Ted Wolski, Vetaphone's area sales manager for the Americas.

"The limited space dictated another B model to be supplied, as anything larger would not have fitted under the roofline," he said. "It's testimony to the way we can tailor our systems to fit space limitations and other unusual requirements."

Fitted in place

Taiwan-based extruder manufacturer Kung Hsing (KS) fits a number of Vetaphone surface treatment products to its extruders.

The company produces six different blown film extrusion lines, including a nine-layer co-extrusion model.

"Our customers have very high expectations of quality and very little tolerance of inconsistency as they seek to add value to their packaging," said Stephanie Shea of KS. "We found we were unable to guarantee quality with locally sourced corona

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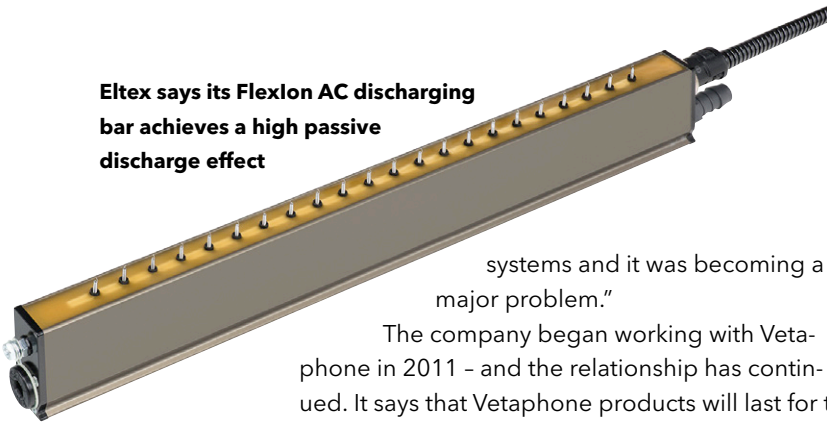
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Eltex says its Flexlon AC discharging bar achieves a high passive discharge effect



systems and it was becoming a major problem."

The company began working with Vetaphone in 2011 – and the relationship has continued. It says that Vetaphone products will last for the life of the extruder.

"We need to educate the market to total cost of ownership," said Shea. "We know that our customers will only ever need to buy one unit for the working lifetime of their KS machine."

Electrostatic novelties

Eltex introduced a number of novelties at K2019.

It says that its patented Flexlon AC discharging bar – with freestanding air-supported spring tip – achieves a high passive discharge effect, allowing active operation even at a low level of high voltage AC.

A small amount of air can be blown through the hollow spring tip to increase the range and to continuously clean the emission tips, says the company.

The Flexlon bar features good discharging results at low and maximum speeds. The special feature is that the discharge performance remains constant from short distances up to large ranges. This makes it the only discharging bar in the world that can be used in different geometric situations – even in narrow, grounded machine environments – according to Eltex.

Advantages include: flexible, freestanding emission tips with new resistor technology; integrated air duct (with Flexlon air); and wear-protected emission tips.

At the same time, its Misting Tacker is a double-roll DC plasma electrode that prevents ink mist. During printing and coating processes, ink mist (or particle mist) arises in the outlet of double-roll systems. This unwanted particle deposit reduces product quality, raises maintenance costs and increases ink consumption. Ink mist is particularly noticeable during coating and printing processes.

The new plasma electrode acts separately on both particle streams and ensures an optimal ink transfer. The electrode is connected to the company's high voltage generator HSG61.

Advantages include: complete particle deposit on the roll surface or on the substrate; and, optimal print/coating at high processing speeds and low maintenance costs.

Right: The Misting Tacker from Eltex prevents ink mist during printing and coating

Static performance

Haug Ionizing Systems offers a wide range of products for measuring, reducing – and even generating – static electricity.

Electrostatic charging can be very disruptive in many production processes – and can raise reject rates, reduce product quality and even affect the health and safety of production staff, according to the company.

As well as these unwanted charges, there are production processes where the electrostatics are integrated into the production process – such as for accurate positioning of labels during printing, or to ensure constant trajectory during film winding. Haug offers a range of ionisers are available in a number of versions.

Static Line is for AC systems in active design. Air Line allows an air-based discharge by eliminating electrostatically adhesive particles.

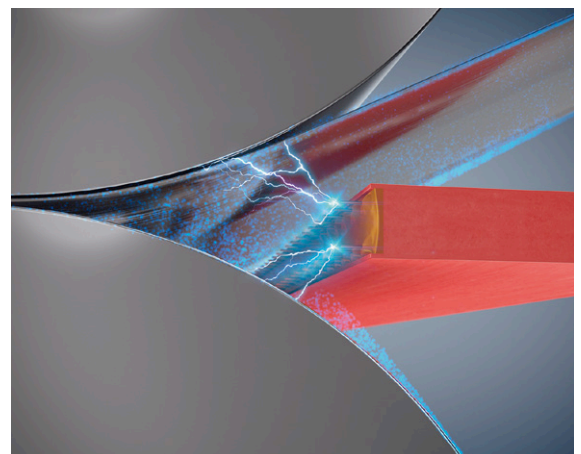
They come in different versions such as ionising bars, ring ionisators or portable ionisation compressors such as the Accu Jet, Accu Jet Fan and Ion Fan.

Ex Line – with the Multistat EX SDN power supply and El Ex T the ionising bar – was developed in accordance with the European ATEX directives and is available for use in potentially explosive areas of production.

For high-speed manufacturing procedures and for neutralising high electrostatic charges, the DC Line offers direct voltage ionising instruments. For this purpose, positive and negative ions are continuously coupled on surfaces.

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Foaming can reduce the density of film and sheet, as well as adding extra properties - ranging from greater insulation capacity to higher oxygen barrier



In the cells: foamed sheet applications

Foamed plastics have a reputation for being environmentally unfriendly - whether due to historical blowing agents, lack of recyclability and many other factors. However, a number of researchers and developers are trying to remedy that.

For instance, researchers at **Washington State University** in the USA have developed a bio-based alternative to polystyrene foam, which they claim offers superior insulating performance.

The foam is made mostly from nanocrystals of cellulose - the most abundant plant material. The researchers have also developed a manufacturing process to make the foam, which uses water as a solvent.

The researchers say that other cellulose-based foams cannot compete with polystyrene foam - in terms of strength, insulation, and their resistance to temperature and humidity.

The WSU team created a material that is made of about 75% cellulose nanocrystals from wood pulp. They added polyvinyl alcohol - which bonds with

the nanocellulose crystals and makes the resultant foam more elastic. The material has a uniform cellular structure, which makes it a good insulator.

This is the first time that a plant-based foam has surpassed the insulation capabilities of polystyrene foam, said the researchers. It is also lightweight and can support up to 200 times its weight without changing shape.

"We have used an easy method to make high-performance, composite foams based on nanocrystalline cellulose with an excellent combination of thermal insulation capability and mechanical properties," said Amir Ameli, assistant professor in the school of mechanical and materials engineering, who co-led the research.

Details of the work are published in the journal *Carbohydrate Polymers*.

Slim fit

BASF showed its slim, high-performance insulation materials in new applications at K2019.

Main image: Washington State University researchers have developed a cellulose-based foam that has better insulating properties than polystyrene

Right: Zotefoams says its ReZorce technology makes mono-material barrier packaging that is easier to recycle

Its Slentite and Slentex are energy-efficient, aerogel-based insulation materials. BASF will present new applications in carbon concrete facade elements and motorhomes.

In a pilot project in Leipzig, a house is being built with a hybrid load-bearing structure of carbon concrete and reinforced concrete. To reduce wall thickness, the new Slentite and Slentex materials can be used to create an insulating layer between the layers of concrete – reducing wall thickness by up to 50% compared to conventional insulation materials.

This allows new aesthetic approaches, and also a gain in space. In addition, the insulation materials can be integrated in the automated precasting of the elements in the concrete plant without further system adjustments.

“Owing to their outstanding insulation performance, Slentite and Slentex are ideal for the production of slim precast element walls,” said Alexander Kahnt, chief architect and research associate at Leipzig University of Applied Sciences.

The materials have also been used in the automotive sector. At K2019, BASF showed a typical motorhome – made in cooperation with a motorhome manufacturer – that uses the insulating materials to create extra internal space.

Foam barrier

UK-based **Zotefoams** has developed a recyclable mono-material barrier packaging technology – which relies in part on foamed film.

ReZorce is suitable for a wide range of foodstuffs and beverages that require an oxygen or moisture barrier. Trials have shown that it can replace current versions of crisp packets, laminated paper, pouches and cartons – which can all prove difficult to recycle due to their use of multiple materials.

The technology involves a multi-layer HDPE film.



The foamed layers are critical in providing barrier properties. They also contribute to a paper-like feel and fold characteristics, and the surface is compatible with typical printing methods. Recycled HDPE can be used in the product's central layers with the internal surface using a thin layer of FDA-approved material to ensure food safety.

The first licensee of the process is a US processor. The company is introducing it on a new film-based product and expects to make a material saving of 20%. It claims that the ability to easily recycle its die-cut waste will also result in a 600-tonne reduction in material going to landfill on its first product in the first year.

“This is the first time we have licensed a process technology,” said David Stirling, CEO of Zotefoams.

The technology can be applied to any blown film line. Modifications that need to be made include gas introduction points on the extruders and – potentially – a new die, depending on the specific application and film format.

“The construction has to be designed around the application,” said Stirling.

Products made using ReZorce technology are compliant with FDA and EU food contact requirements, which are determined by the resin used. Typical constructions comprise multiple core layers with 30-70% solid combined with solid internal and external skin layers. Weight savings of 15-30% are typical, he said.

Constructions for high oxygen barrier can be assembled using very small amounts of traditional barrier resins such as EVOH.

Stirling says the key barrier improvement in the ReZorce system is due to the use of the multiple foamed layers. “If you have a multi-layer structure you have to go through the interface layer and that interface forms a barrier,” he said.

Zotefoams has invested US\$1m in a new pilot

Right: Cortec has begun offering stock and custom sizes of its VpCI 130 series foam sheet





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Above: SML and Kiefel have developed three-layer PET sheet with a foamed central layer, for making heat-resistant cups

plant in New England, USA – which will begin operation early next year – to demonstrate and trial the technology.

Stock sizes

Cortec of Croatia has begun offering stock and custom sizes of its VpCI 130 series foam sheet – having recently installed a foam fabricating machine. The company says this will help it to offer smaller quantities to its clients with shorter delivery time.

VpCI-130 foams combine VpCI protection and desiccant action with good anti-static capabilities, which helps to prevent component rusting. Metal parts packaged with the foams receive continuous protection against humidity, condensation and other harsh conditions.

They have Cortec's VpCI impregnated into the foam's polymeric matrix and will provide multi-metal protection while not changing physical or chemical properties.

Within the same series, the company now offers custom perforation for its VpCI-137 foam rolls. They can be perforated to the desired sizes for easy tear-off of individual pieces. When storing or shipping metal parts, a piece of foam can easily be pulled off the roll and inserted into a package.

VpCI inhibitors diffuse into the enclosure, forming a protective molecular layer on the surface of the metal part. When unpacked, parts are ready for use – with no need for degreasing or coating removal.

Hot fill sheet

SML of Austria is developing foamed sheet for hot fill applications – with new features in terms of heat resistance, insulation and recyclability – in a joint R&D programme with thermoforming machinery manufacturer **Kiefel**. The basis for these new products is a three-layer PET (or PP) sheet with a physically foamed central layer.

Mono-material foamed PET or PP sheet made

with SML's new systems have product features that can help to replace difficult-to-recycle hot fill applications made of expanded polystyrenes. Generally, PS is permitted for food applications, but it is considered to release the chemical compound styrene into the environment, says the company.

The foamed sheet from SML's new lines has an A/B/A structure, in which the central B layer is foamed while the two outer layers are rigid. The central layer is physically foamed with the injection of nitrogen or carbon dioxide. Mono-material structures facilitate recycling while the foamed layer reduces weight up to 50% compared to PET sheet with the same properties. No special additives are required to enhance the heat stability of the sheet making it suitable for economic production of low-weight cups with good insulation properties.

In a new joint R&D project, Kiefel and SML are exploring and further developing the potential for this type of foamed sheet. As well as developing end products with specific mechanical and thermal properties, the research will look to optimise the manufacturing processes and develop new recycling methods.

The first outcome is that cups with a heat resistance of up to 100°C have been created from standard APET. The sheet for such cups can have an overall density of about 0.65 kg/dm³, which saves material and increases the insulating properties – making it possible to hand-hold the cups when they are filled with hot liquids. The cups were seen at K2019 recently.

Free of PVC

Simona launched its new range of PVC-free foam sheets at K2019. It says that its new Simopor product family allows creative designs in the field of visual communication and structural engineering. Four new variants are available.

Simopor S is an all-rounder for all applications, meeting high standards in terms of technical properties and certifications. Simopor SP is a specialist product in functional white that is optimised for digital printing. Simopor E is a cost-effective, entry-level product. And, Simopor EP is an economical, lightweight product in pure white.

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- > www.basf.com
- > www.zotefoams.com
- > www.cortecpackaging.com
- > www.sml.at
- > www.kiefel.com
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Among the many sustainable exhibits at this year's show were a number of tie-ups between machinery and materials suppliers, in the field of recyclable multi-layer packaging



K2019: tie-ups boost multi-layer packaging recyclability

This year's K show had a heavy focus on sustainability – with both machinery and materials suppliers jostling to promote energy efficient machines and recycled or bio-based grades of material.

One key aspect of sustainability – recyclability – was the subject of a number of collaborations. The most prevalent was the issue of recycling multi-layer packaging. While such packaging is widely used – as its multiple layers can each add different attributes such as strength, stiffness or barrier – the variety of materials used can make it difficult to recycle.

While methods to recycle multi-material packaging are being developed, the most common approach of these many collaborations is to develop mono-material packaging that can be recycled in a single waste stream (typically polyethylene).

Machinery suppliers including Windmoller & Holscher, Reifenhäuser, Hosokawa Alpine and Macchi all revealed details of projects – as did materials suppliers including ExxonMobil and Dow.

PE and PP

Windmoller & Holscher showed off a two different mono-material laminates at K2019 – using either polyethylene (PE) or polypropylene (PP).

"We want to show the wide range of possibilities regarding sustainability and how these can be efficiently achieved with W&H lines using both cast film and blown film processes," said Lennart Ederleh, head of technical sales for blown film at the company.

One key aspect of the technique was to use machine direction orientation (MDO) to add the necessary stiffness to make the stand-up pouches. The all-PE pouches were made on a Varex II blown film line – giving a product with the same functionality as conventional films made from PET-PE.

Both the MDO-PE film (which is 25 microns thick) and PE sealing film (110 microns) can be produced on the same line. Edge trimming of the MDO-PE film is regranulated and integrated into

Main image:
Windmoller & Holscher
showcased two different mono-material laminates at K2019



Right:
Hosokawa Alpine used its MDO technology to add stiffness to PE film, allowing it to be used for stand-up pouches

the production process of the sealing film.

Using a Filmex II cast film line, W&H demonstrated an all-PP stand-up pouch. The laminate structure consists of a 20 micron bioriented PP film and a 60 micron cast PP film with an integrated thin, recyclable barrier coating.

The company is also developing a solution for a recyclable high barrier film – by using polyamide, polyethylene and thin layers of a water-soluble barrier polymer. Here, it has replaced a traditional EVOH barrier layer with BVOH G Polymer from Nippon Gohsei.

The Varex II line offers the high melt distribution needed to make the 11-layer packaging film, says the company.

For the recycling process, the film is shredded and washed in water. BVOH layers dissolve, while the pure polyamide sinks to the bottom and the PE flakes float on top.

"This separation enables the pure polymers to be recycled," said the company – which stresses that this is an ongoing study.

Oriented advantage

Hosokawa Alpine has worked with a number of partners – including ExxonMobil, Erema and Henkel – to develop a number of 'all-PE' multi-layer packaging solutions.

Like W&H, it has used its MDO technology to add stiffness to the film, allowing it to be used for stand-up pouches.

Using monoaxial orientation, characteristics such as stiffness, oxygen permeability or appearance can be adapted and the film thickness reduced. The company says that its patented Trim Reduction for Inline Orientation (Trio) technology also ensures definite savings in materials when trimming the boundary strips.

Hosokawa says that its new MDO 04 orientation line, combined with Trio, can produce high-quality



film, while allowing lamination and printing of full-PE material composites.

"Providing all-PE solutions is a big topic in blown film," said Holger Niemeier, executive vice president at Hosokawa Alpine.

He says the big push is to replace polyester in these types of film.

"The MDO film has better properties and can replace the PET – though it is not exactly the same," he said.

While oriented PE has many 'PET-like' attributes, he says it will never have the same glossiness.

"Consumers would have to accept that these new films are not so glossy – but they are greener," he said.

He cites three separate collaborative projects in this area – with ExxonMobil, Total and Dow. The project with **ExxonMobil**, for instance, has developed a stand-up pouch. It uses several of ExxonMobil's polyolefins – including Exceed and Enable – to make an all-PE laminated film. For added sustainability, it also uses 30% recycled PE content.

ExxonMobil is confident that the optical properties of the film is good enough to compete with PET-based solutions.

"This film has twice the haze performance of a typical HDPE – it is on a par with a PP/PA film and only slight below PET," said Peter Paul de Moor, business development manager for chemical, plastics and resins at the company.

In many cases, he says, PET is overspecified in these applications – and the needs of brand owners are different.

"The marketing mix of brand owners is changing," he said. "Being able to say it's recyclable often over-rides things they've done in the past."

While gloss is a 'want', recyclability is increasingly being seen as a 'need', he added.

Heavy-duty application

ExxonMobil has also teamed up with **Reifenhäuser** to create a line of heavy-duty sacks using multi-cycle PE from earlier generations of sack.

Below:
ExxonMobil and Reifenhäuser teamed up to create heavy-duty sacks using multi-cycle PE



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Right: Dow, RB and Drukpol Flexo have created a resealable - and recyclable - pouch for dishwasher tablets

This solution, which uses up to 37% recycled PE heavy duty sack film with virgin performance PE polymers from ExxonMobil, maintains the performance properties of new heavy duty sacks even when fourth-cycle recycled PE heavy duty sacks are included in the formulation.

"When you are using recycled post-consumer PE, material quality is always an issue," said Ralf Wiechmann, product manager for blown film at Reifenhäuser.

Combining recycled PE from heavy duty sacks with Exceed XP and ExxonMobil's HDPE maintains the package integrity of the new sacks, even when using multi-cycle recycled PE. These formulations with the tracking technology can be tailored to deliver defined properties that meet the needs of specific heavy-duty sack applications. To date, tests have shown that the solution is well-suited for heavy duty sacks with dry or semi-dry goods.

Reifenhäuser says that its Evo five-layer blown film converting technology lowers melt temperatures by as much as 20°C. When combined with a compact die head, this allows for increased processability, said the companies.

Back on the subject of stand-up pouches, Reifenhäuser says that its Evo Ultra Stretch process can be used to make film for all-PE pouches.

The process involves stretching the film from initial heat to 10 times its surface area. Due to the position in the haul-off, the Evo Ultra Stretch features extremely low energy consumption and high process stability, says the company.

A major advantage is that the PE film can be converted on existing conversion lines with no adaptation required. This makes the switchover to packaging made from PE mono-material much easier.

"To help our customers introduce the product as smoothly as possible, we supply a full know-how package from a single source - complete with technology, film recipe and processing parameters," said Eugen Friedel, sales director at Reifenhäuser's blown film division.

The application has already passed field trials at a Reifenhäuser customer and brand owner.

"Monomaterial packaging is the key to a functioning circular economy," said Friedel.

As with many things, moving to new technology takes investment - and machinery maker **Macchi** says this is not a trivial task.

"Using MDO to make mono-material film will be a growing trend - but it is not an easy tool to use," said Matteo Spinola, sales and marketing director at the company. "It's a large unit and requires extra investment - but it helps to improve sustainability."



Washed clean

A joint development between **Dow**, brand owner RB, and converter Drukpol Flexo has created a resealable, recyclable dishwasher tablet pouch.

"The innovative mono-material pouch is another example of the power of collaboration," said Karin Katzer, marketing director of end use for Dow's packaging and speciality plastics business.

The partners worked to overcome the challenge of creating mono-material PE-film packaging on existing equipment - with extra functionalities such as zippers, easy opening, and the right mix of stiffness and flexibility.

Part of the success was down to the use of Dow's Affinity, Dowlex and Agility resins.

Krzysztof Krajewski, head of packaging innovation at RB, said: "With this innovative mono-material pouch, we are able to offer consumers easy-to-use packaging with enhanced features. It is supported by existing recycling waste management systems and because the packing is lighter in weight, we are also able to reduce transportation costs and emissions."

The pouch is used commercially, to package Finish dishwasher tablets from Reckitt Benckiser.

Ultimately, any growth in the use of mono-material packaging is ultimately in the hands of brand owners. They will decide - in the face of consumer or legislative pressure - whether package recyclability is more important than appearance.

CLICK ON THE LINKS FOR MORE INFORMATION:

- www.wuh-group.com
- www.hosokawa-alpine.com
- www.exxonmobilchemical.com
- www.reifenhäuser.com
- www.macchi.it
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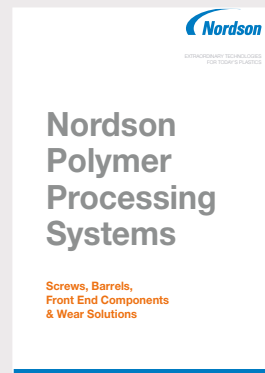
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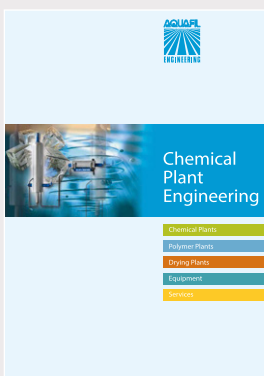
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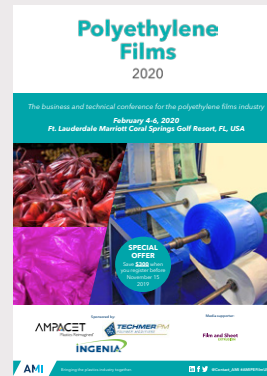
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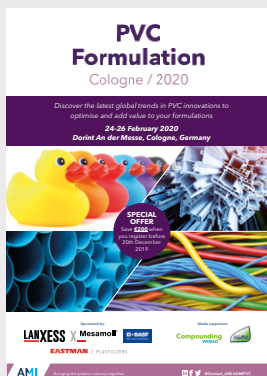
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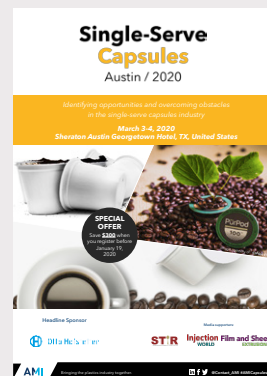
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AMG Plastic

Head office:	Cikarang, West Java, Indonesia
Owner/founders:	Michael Jusanti, Iin Purnamasari
Founded:	2008
Ownership:	Private
Profile:	AMG, which was founded in Cikarang in 2008, began with a focus on polyethylene (PE) for flexible packaging. It has since expanded, and its main focus is now custom LLDPE-based film for both lamination and collation shrink film. The company also makes multi-layer film, including barrier packaging.
Product lines:	The company offers a wide range of LLDPE films. Its general-purpose films are used for applications such as dry and frozen goods, as well as powdered products including flour and cosmetics. It also makes lidding film for cups - including a high strength version - as well as film products for food sachets (such as for sauces), vacuum packaging (for meat and seafood), stand up pouches (for both wet and dry products), heavy duty bags (for products such as beans, seeds and rice) and both mulch film and geomembrane film.
Factory location:	AMG's factory in Cikarang is responsible for producing all its products. Here, it runs three 3-layer blown film lines with an installed capacity of around 6,000 tonnes/year. In addition, the company is in the process of installing what it says is Indonesia's first seven-layer blown film line. The machine, supplied by Bandera of Italy, was recently seen at the K2019 show in Germany - from where it is being delivered. This new line, due to be up and running in January 2020, will have an installed capacity of 3,000 tonnes/year. It will be used to make two main products: high barrier thermoforming film for the meat industry; and barrier stand-up pouches for cooking oil and liquid detergent.

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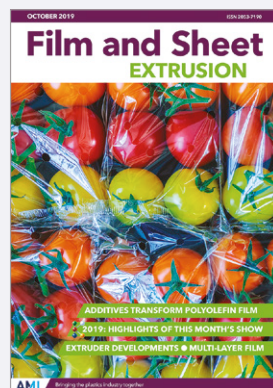
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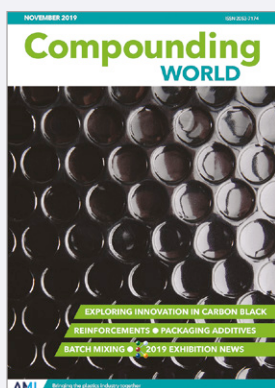
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Film and Sheet October 2019

The October edition of Film and Sheet Extrusion explores the latest additive introductions for polyolefin film production. It also takes a look at the role of mineral fillers and previews some of the machinery innovations on show at K2019.

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The November edition of Compounding World looks at the sustainability drive in carbon black production, delves into the world of mixing technology and surveys the latest in polymer reinforcements and packaging additives. Plus: news from K2019.

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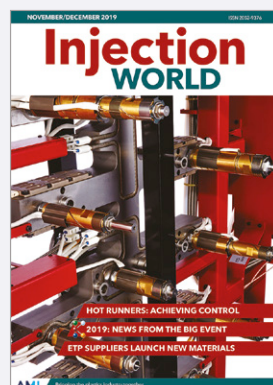
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	21-23 January	Swiss Plastics, Lucerne, Switzerland	www.swissplastics-expo.ch
	28-31 January	Interplastica, Moscow, Russia	www.interplastica.de
	24-26 February	Plastics, Printing & Packaging, Addis Ababa, Ethiopia	www.expogr.com/ethiopia/pppexpo
	9-11 March	Plast Alger, Algiers, Algeria	www.plastalger.com
	11-13 March	Expo Plasticos, Guadalajara, Mexico	www.expoplasticos.com.mx
	26-28 March	MECCSPE, Parma, Italy	www.mecspe.com
	21-24 April	Chinaplas, Shanghai, China	http://www.chinaplasonline.com
	7-13 May	Interpack, Dusseldorf, Germany	www.interpack.com
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10-11 March 2020	Specialty Packaging Films Asia, Bangkok, Thailand
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