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AMI postpones plastics industry expos in Essen until September

AMI has announced that its four focused plastics industry exhibitions – which were scheduled to take place at Messe Essen in Germany on 1-2 June 2021 – have now been postponed to 29-30 September 2021.

Ongoing uncertainty created by the Coronavirus pandemic led to the decision to delay the Compounding World Expo, Plastics Recycling World Expo, Plastics Extrusion World Expo and Polymer Testing World Expo.

AMI announced the decision to reschedule the event on 1 February.

"We felt it was important to make and announce this decision now, in order to end the current uncertainty and to allow exhibitors, speakers and attendees to plan effectively for the new dates," said Andy Beevers, events director at the company. "We have had tremendous support and understanding from the industry during this process and are now all looking forward to a successful return to Essen at the end of September."

Rita Andrews, head of exhibitions at AMI, added: "We have been reviewing the ongoing situation and consulting with exhibitors and visitors. Our primary concerns are for the health and safety of all attendees at our events and delivering the very best audience for our exhibitors."

With these factors in mind, AMI decided to postpone the expos until late September, she said.

"Exhibitor numbers are up substantially compared to our launch event in 2018, and we want to ensure visitors can feel confident and comfortable in attending the expanded exhibitions," she added.

Admission to the four expos and their five conference theatres will continue to be free of charge. Registrations that have already been made for the June dates will still be valid, while anyone wanting to register for free tickets for the September dates can do so **here**.

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

PE firm buys into Aquapak

UK-based private equity firm ADM Capital Europe has invested in British biodegradable plastics company Aquapak Polymers, through its Cibus Enterprise Fund.

Aquapak says its biodegradable, water-soluble polymer – called Hydropol – is three times stronger than alternatives and can be easily processed into films and laminates. The base plastic is currently used for dishwasher tablets, ingestible pill casings and soluble stitches. It can be recycled, re-pulped and composted, and is compatible with anaerobic digestion. If released into the environment, it will dissolve and biodegrade.

Aquapak says Hydropol is easily processed into films and laminates

Applications of Hydropol include garment bags, organic waste disposal bags and laundry bags for infection control. Products under development include packaging for dried pet food, snacks and convenience foods.

"The Cibus Enterprise Fund invests in a number of disruptive food technologies and in Aquapak we see a company that can revolutionise food packaging," said Alastair Cooper, head of venture investing at ADM Capital Europe.

Mark Lapping, CEO of Aquapak, added: "With Cibus' support, we look forward to accelerating Hydropol into a platform technology to bring circular economy packaging solutions to the global food sector."

› **www.admcap.com**

› **www.aquapakpolymers.com**

Lanxess biocides purchase

Lanxess has acquired French company Intace, a biocide company that manufactures speciality fungicides for the packaging industry.

The purchase price has not been disclosed. Lanxess expects the transaction to be completed in the first quarter of this year.

"We are actively participating in the market consolidation of the consumer protection sector," said Nicolas Gallacier of the material protection products business unit at Lanxess. "With this, we are strengthening our biocide technology platform."

› **www.lanxess.com**

Exolon makes a "good start"

Exolon, the company formed out the former plastic sheet business of Covestro, says it has made a "good start" in its first year of business.

The company is now a privately owned subsidiary of Serafin Group.

"During the coronavirus pandemic, demand for some Exolon products – such as transparent plastic sheets for all forms of infection control – increased significantly, meaning production was considered essential," said Jens Becker, CEO of Exolon.

Strict hygiene controls led to high demand for transparent plastic sheet, and there were also healthy sales from the construction and DIY sectors, for products such as multi-wall sheet, he said.

Exolon has rebranded Bayblend and Bayloy polycarbonate products as Exoblend and Exolon, as well as adding new Vivak and Axpet brands.

› **www.exolongroup.com**

Italy estimates dip in 2020 machinery sales

Italy is estimating an 18% drop across the board for plastics machinery sales in 2020.

Amaplast, which represents Italian machinery makers, says that production, exports, imports and the domestic market are all expected to shrink by around 18% in 2020. The preliminary figures are based on actual statistics from the first nine months of the year.

Amaplast expects production to drop from €4.4billion (US$5.2bn) to €3.6bn (US$4.3bn) for 2020, while exports are expected to fall to around €2.5bn (US$3bn). The domestic market is estimated to shrink to €1.85bn (US$2.2bn). In addition, the trade balance is expected to shrink to €1.75bn (US$2.1bn).

Italian market for plastics machinery, 2019/2020, m€ (estimated)

	2019	2020
Production	4,400	3,600
Exports	3,060	2,500
Imports	920	750
Domestic market	2,260	1,850
Trade balance	2,140	1,750

Exports to the rest of Europe are expected to rise slightly, while those to most other regions are expected to fall. The proportion of sales to Europe is expected to rise slightly, to almost 60%, while the portion of sales to both Asia and North America is expected to fall. The share of sales to Africa and to South/Central America are expected to remain broadly constant.

Amaplast says that the impact of the pandemic has caused machinery makers to develop new technologies, such as energy efficient designs, interconnected machinery and new methods of remote installation.

"It is difficult to make forecasts for the new year, mainly because of the uncertainty that continues to surround the pandemic," said Amaplast. "A rebound is likely thanks to the impulse from exports, but it is not likely to be of such magnitude that we will soon see figures similar to those in the pre-crisis period."

› **www.amaplast.org**

Peak Rock completes takeover of AMB

Private equity firm Peak Rock has completed its acquisition of Italian packaging manufacturer AMB.

Ownership is now split between Peak Rock, AMB's owners the Marin family, and AMB's management team.

AMB operates in several European markets including the UK and Germany.

› **www.ambpackaging.com**

SK acquires thermoforming packaging firm

SK Capital, a US-based private equity firm, has taken a majority stake in Lacerta – which designs and manufactures specialist thermoformed packaging.

Lacerta's co-founders, Ali and Mory Lotfi, will retain a significant ownership stake in the company. Terms of the deal were not disclosed.

Founded in 1993, Lacerta mainly supplies the food sector. It offers customer PET packaging, including its tamper-evident 'Fresh N' Sealed' products. Most of its products are recyclable, and can be made using recycled materials.

"This is an exceptional business with a best-in-class reputation for customer service, innovation and sustainable products," said Jack Norris, managing director of SK Capital. "We look forward to continuing its extraordinary growth."

Ali Lotfi, president of Lacerta, added: "This marks the beginning of an exciting new chapter for Lacerta. We chose to partner with SK Capital given its track record of successfully supporting the growth and improvement of family-owned businesses."

› **www.skcapitalpartners.com**

› **www.lacerta.com**

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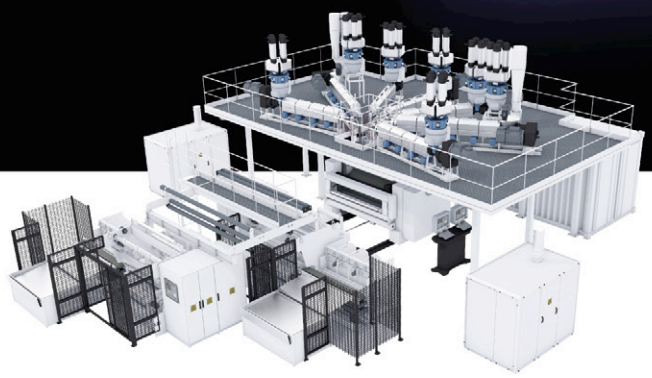

Get yourself into the next generation of film production and supply chain

A few days ago, due to the worldwide Pandemic, the Plastics Industry Association Board of Directors decided to cancel the in-presence NPE show, which is something understandable: we are aware that the priority always has to be the everybody's health and safety. Anyway, even in such a situation, the show must go on! Don't worry, we have come up with a contingency plan: we are putting together a virtual event which will allow you to enjoy the same show that you would have experienced "phisically" at the NPE in Orlando.

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Trinseo acquires PMMA

Trinseo is to acquire Arkema's PMMA business – saying the deal will help it to become a specialist solutions provider.

It says the PMMA complements its offerings across several end markets including automotive, medical and consumer electronics.

"This acquisition will be a catalyst for portfolio transformation toward becoming a higher margin, less cyclical solutions provider," said Frank Bozich, president and CEO of Trinseo.

The transaction is expected to generate around US$50 million in annual pre-tax cost synergies by 2023 and extra revenue synergies by leveraging Trinseo's market overlap and existing Asia organisation.

› **www.trinseo.com**

Plastics associations say market 'on turn'

Germany's plastics and rubber machinery industry association, VDMA, said in December this year's downward trend in orders has flattened out with evidence of an upturn in September and October 2020 (the latest months for which figures are available).

Like every other part of the economy, the plastics machinery industry was badly affected by the Covid-19 pandemic. However, VDMA said the situation began to improve in mid-2020 and, cumulatively, from January to October 2020, incoming orders were just 3% below the first ten months of 2019. It said September saw a 13% year-on-year growth in incoming orders, with order books for October standing at twice the level of the same period in 2019.

"This means the German plastics and rubber machinery industry is about to turn the corner," said Thorsten Kühmann, VDMA Managing Director. "It gives us confidence to see that companies have adapted to the challenges better and better over the course of the pandemic. Business is up and running again."

IMAGE: VDMA

VDMA Managing Director Thorsten Kühmann

Total sales for 2020 are still expected to end up 10-15% down on 2019, as these lag well behind orders. However, for 2021 and 2022 the association expects to see respective sales growth of 5% and more than 10%, setting the industry on the path to return to pre-crisis levels in 2023.

Meanwhile, Plastics-Europe's latest annual report, 'Plastics: The Facts 2020', has identified similar trends in production and demand for materials. After a "sharp drop" in the first half, it said production started to recover in the second. "We expect the recovery to continue in the last quarter of 2020 and during 2021, while pre-crisis levels of production will probably not be reached before 2022," the association said.

› **www.vdma.org**
› **www.plasticseurope.org**

Plast/NPE shows hit by coronavirus

The ongoing Covid pandemic continues to impact the global plastics exhibition calendar, with NPE, the biggest show in the US, now cancelled and Italy's Plast fair postponed.

US-based Plastics Industry Association, organiser of NPE, announced earlier this month that it had decided to cancel the event, which takes place every three years and was due to take place in Orlando in Florida on 17-21 May this year. The US show typically attracts close to 55,000 visitors and more than 2,000 exhibitors.

Meanwhile, in late December last year, Plast show organiser Promaplast announced that the 2021 event in Milan, Italy, was to be rescheduled from 4-7 May to 22-25 June. The show also takes place on a three-year cycle and attracts around 50,000 visitors.

› **www.npe.org** › **www.plastonline.org**

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Domo sells films to Jindal to focus on PA

Germany's Domo Chemicals is to sell its Italy-based Domo Films Solutions (DFS) business to the European subsidiary of India's Jindal Films. The deal is expected to close in Q1, subject to required regulatory approvals.

According to Domo Chemicals CEO Yves Bonte, the move will allow the company to "concentrate in its competence area of polymers and engineered materials."

Domo bolstered its polyamides business in 2019 with the acquisition of Solvay's PA66 production activities in Europe, sold by BASF to gain regulatory approval for its acquisition of Solvay's global polyamide activities.

That move roughly doubled the size of Domo's polyamide polymers and compounds activities and included the Technyl product line (albeit with a time-limited restriction to Europe.) This month Domo announced it was preparing to rebrand all of its PA products under the Technyl banner and commence global sales from February 2022.

Domo Chemicals CEO Yves Bonte

IMAGE: DOMO CHEMICALS

DFS is one of the largest European producers of biaxially oriented and cast PA films for flexible packaging in the food, pharma, medical and other industrial sectors. Jindal said the business will complement its existing capabilities in polyolefin-based films for the pharma, medical and other high end flexible packaging segments.

› **www.domochemicals.com**

Biopolymers will grow faster than polymer market

The annual growth rate for bio-based polymers over the next five years is expected to be well ahead of the overall polymer market.

A report from Nova Institute in Germany estimates an 8% compound annual growth rate for bio-based polymers, while the general market is expected to grow at 3-4%.

"The year 2020 was a promising one for bio-based polymers," said Nova.

It said that high demand for PLA in 2019 has led to increased capacities. Two major manufacturers – NatureWorks and Total Corbion – have recently announced capacity expansions for PLA. At the same time, there are likely capacity expansion for PE and PP based on bio-based naphtha, as well as newer materials such as PBAT and PHA.

"A lower production is only observed for bio-based PET," said Nova.

In 2020, Nova says that total production of bio-based polymers was 4.2 million tonnes – representing about 1% of total polymer production.

■ Read our Bioplastics report on page 13.

› **www.nova-institute.eu**

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Bioplastics offer different approach

Bio-based plastics are finding their way into wider applications, helped by fundamental research and the use of new additive technologies such as graphene

As the quest to reduce carbon emissions continues, development of new bio-based materials – especially for packaging – keeps gaining pace. A key factor for new materials is that they compare favourably with the 'conventional' polymers (such as polyethylene) that they are replacing.

UK-based **Toraphene** says it has developed a biodegradable, compostable and commercially viable alternative to conventional plastic packaging.

The new material, also called Toraphene, uses biopolymers that compost naturally and biodegrade without human intervention – even in the ocean. The material is combined with graphene – a form of carbon – to make it stronger, thinner, and less permeable than alternatives.

"Plastic waste is known to be a huge, global problem and many plastic alternatives now exist – so why don't we see them everywhere?" said Gaute Juliussen, CEO of Toraphene. "It's because they need specific man-made conditions to biodegrade, and many degrade into microplastics."

Graphene is added at a loading of 0.1-0.2% by weight, which Toraphene says would add around 13% to the cost of the film.

"This is more than compensated for by the reduction in thickness made possible from the increased strength of graphene, the better barrier and improved food/content preservation and contamination safety," said Juliussen.

Toraphene is renting production equipment from plastic bag manufacturers and plugging directly into existing supply chains. It says it is already in talks with consumer brands, retailers and food packaging suppliers.

Preventing waste

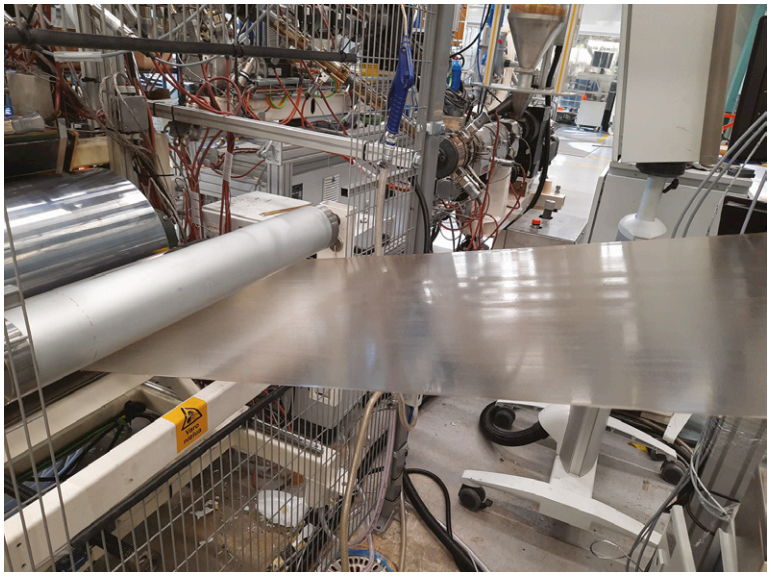
The pan-European Refucoat project – which ended last year – has developed a range of bio-based packaging solutions to help reduce food waste.

The project, led by **Aimplas** of Spain, used materials including PHA and PGA to develop three different bio-based active packaging systems, to package fresh chicken meat, cereals and snacks.

The project also formulated bacteriophage-based coatings that reduce the proliferation of *Salmonella* bacteria in chicken breast samples packaged in a modified atmosphere. Barrier packaging typically has a multi-layer structure –

Main image: Refucoat has developed a range of bio-based packaging to help reduce food waste

IMAGE: VTT



Above: VTT's new plastic, based on cellulose, runs on standard equipment

making it hard to recycle – but the systems devised within Refucoat can be recycled or composted.

"Packaging must be recyclable and also maintain barrier properties," said Lorena Rodríguez Garrido, a packaging researcher at Aimplas and scientific coordinator of Refucoat. "Current packaging has a complex multilayer structure and is made from non-renewable sources. It provides all the protective functions but is difficult and expensive to recycle."

Aimplas is also involved in the Biontop project, which aims to develop packaging that can be designed to be mechanically recycled, composted or anaerobically digested.

In the first year of its four-year development period, project partners began experimental work on co-polymers and compounds with customised biodegradability and multifunctional coating solutions.

One task performed in the first year was to define the specifications for PLA-based products with customised end-of-life and properties. Two technical deliverables and one scientific paper have been published with these initial project results.

Grachi: "Benvic is developing a Plantura grade for the consumer market which should be ready in 2021"

Cellulose packaging

Finnish research centre **VTT** has begun testing its Thermocell plastic film – based on cellulose and fatty acids – for use as food packaging.

The material, made from renewable components, will be used in the same way as conventional plastic. Many features of the film already meet the requirements of the food industry, says VTT.

VTT is collaborating with Arla Foods, Paulig, and Wipak on the project.

Cellulose, extracted from wood, does not compete with food production. In addition, efficient production methods have already been established in the production of cellulose. However, it lacks the important thermoplastic behaviour needed of packaging plastic – though this is what VTT's method overcomes. Here, cellulose polymers are split into shorter chains before adding fatty acids. This improves the reactivity of the cellulose, making the resulting material more thermoplastic. At the same time, it gives better protection against water and can be more easily heat sealed.

"In our most recent test runs we have used small amounts of traditional plastic additives because they make it easier to manufacture film, and improve its features," said Jarmo Ropponen, the research team leader at VTT.

The current focus of development work in the manufacture of films is in extrusion technology. The film can also be heat sealed using the manufacturers' standard equipment.

"We have moved from the laboratory to bigger machinery while improving the quality of the film," said Ropponen. "Our goal is to show that the film can be produced on an industrial scale using the same equipment as that for traditional plastic films – with features that meet the needs of the food industry."

With advances in production machinery, the film's thickness has been reduced to 100 microns. To compete against thin plastic films, this needs to be reduced further. The aim is also to orient the film and improve its strength and protective qualities.

"Feedback from partner companies has allowed us to see other important features – such as friction characteristics – so it could be more easily used on industrial packaging lines," said Ropponen.

Natural solutions

Benvic has developed a range of biopolymers aimed at the packaging sector.

The Plantura range are available in compostable and durable versions. They can be used across a wide variety of packaging applications, both consumer and industrial.

Several different polymers – including PLA, PBAT and PBS/PBSA – are used in the films. Some, like PLA, are biobased, while materials like PBAT and PBS meet compostability requirements, says the company.

Benvic says it has also worked hard to make Plantura resins easily processable, and at a competitive cost.

The company has identified three main advantages of Plantura for the film sector: aesthetics; meeting legislative requirements; and mechanical performance. Plantura OK grades are available in translucent and transparent versions. Benvic has also ensured that the material meets all legislative requirements and specifications, particularly for food

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packaging – including issues of disposability, food contact and performance at frozen temperatures. Finally, Benvic is developing a variety of grades offering low elongation and high stiffness up to 1100 MPa in order to manage heavy duty applications.

"Currently our Plantura OK compost film works well for industrial, but would not meet conditions for the home composting sector," said Denis Grechi, product managerat Benvic. "We are developing a Plantura grade for the consumer market which should be ready by mid-2021."

Strong stuff

Cortec says it has developed the world's first compostable industrial strength machine grade stretch film.

Eco Wrap uses a certified compostable resin, plus tackifier additive, to make the product, which can be used on most standard automated stretch wrap equipment.

Cortec says users can benefit from material and waste reduction in a number of ways. First, most applications requiring three wraps of standard film can use two wraps of Eco Wrap without losing strength or protection. Second, the material is commercially compostable according to ASTM D6400. Using it may allow users to avoid tariffs or fines in areas where polyethylene is prohibited or restricted.

Potential uses include agriculture bundling (of hay bales, for instance), pallet wrapping and luggage wrapping in airports.

The company says it has also developed a range of biodegradable, compostable static dissipative films and bags. These are targeted mainly at electronics, telecommunications, packaging and electric car industries.

In anticipation of new EU regulations penalising sales of non-recyclable plastic packaging materials, Cortec says the bags offer an acceptable alternative to conventional PE electrostatic dissipating (ESD) films.

Right: Cortec says its Eco Wrap is the first compostable industrial strength machine grade stretch film

Tree support

Biome Bioplastics of the UK has secured Government funding to develop and test a new generation of biodegradable tree shelters – which are extruded from the company's bioplastic material.

Tree shelters are used to protect young trees and bushes from attack by animals. They help to limit losses in the early years of a tree's life. However, most are never collected at the end of their life and end up littering the landscape.

Biome and tree shelter manufacturer Suregreen will develop and manufacture prototypes of a novel bio-based, biodegradable tree shelter. The prototypes will initially be subjected to laboratory testing in accelerated ageing conditions before extensive field testing.

"Approximately 15 million tree shelters are used in the UK each year. This is a step towards supporting tree planting in a sustainable manner," said Paul Mines, CEO of Biome Bioplastics.

PLA production rising

Bioplastic production is also on the increase – especially in PLA.

Corbion and Total are to build a new PLA bioplastics facility in Europe through their **Total Corbion** PLA joint venture.

The companies say that, with an expected capacity of 100,000 tonnes/year, it will be the first world-scale PLA production facility in Europe. It will be located in Grandpuits, France and should be operational in 2024.

"PLA is increasingly finding its place as a bioplastic, enabling acceleration towards a circular economy," said Olivier Rigaud, CEO of Corbion. "One of our goals, together with Total, is to become the market leader in PLA. This new plant puts us firmly on track to achieve that."

The construction is expected to need capital expenditure of around €200 million (US$230m). Corbion and Total will contribute equal funding for the project, which may also rely on third party debt.

Corbion will continue to supply lactic acid to the Total Corbion PLA joint venture. Earlier this year, it announced it will build a new lactic acid plant in Thailand, which is expected to open in 2023.

"This PLA investment accelerates further expansion plans for lactic acid, with a European location as one of the likely options," said the company.

The joint venture already produces its Luminy PLA resin at a 75,000 tonnes/year capacity plant in Thailand – which began operating two years ago.

NatureWorks adds 10%

US-based PLA plastic producer **NatureWorks** says it is raising output by 10%.

It says that a "slate of manufacturing technology projects", including lactide monomer purification efficiency, will deliver the increased capacity of its Ingeo biomaterials.

Installation is underway at its facility in Blair, Nebraska, which is scheduled to be completed by the end of 2021.

"The market continues to evolve due to the Covid-19 pandemic and the demand for bio-based alternatives to petrochemical-based plastics," said Rich Altice, president and CEO of NatureWorks. "This purification technology is one of many additional capital improvements we are actively working on at our facility in Blair.

At the same time, we continue to pursue a potential future second manufacturing site outside the US to serve our growing international markets," he concluded.

Left: Biome and Suregreen are developing prototypes of a biodegradable tree shelter

CLICK ON THE LINKS FOR MORE INFORMATION:

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- **www.vtt.fi**
- **www.benvic.com**
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Putting plastics to the test

Manufacturers of materials testing equipment continue to focus on making their systems easier to use and more productive. Peter Mapleston reviews some of the latest developments

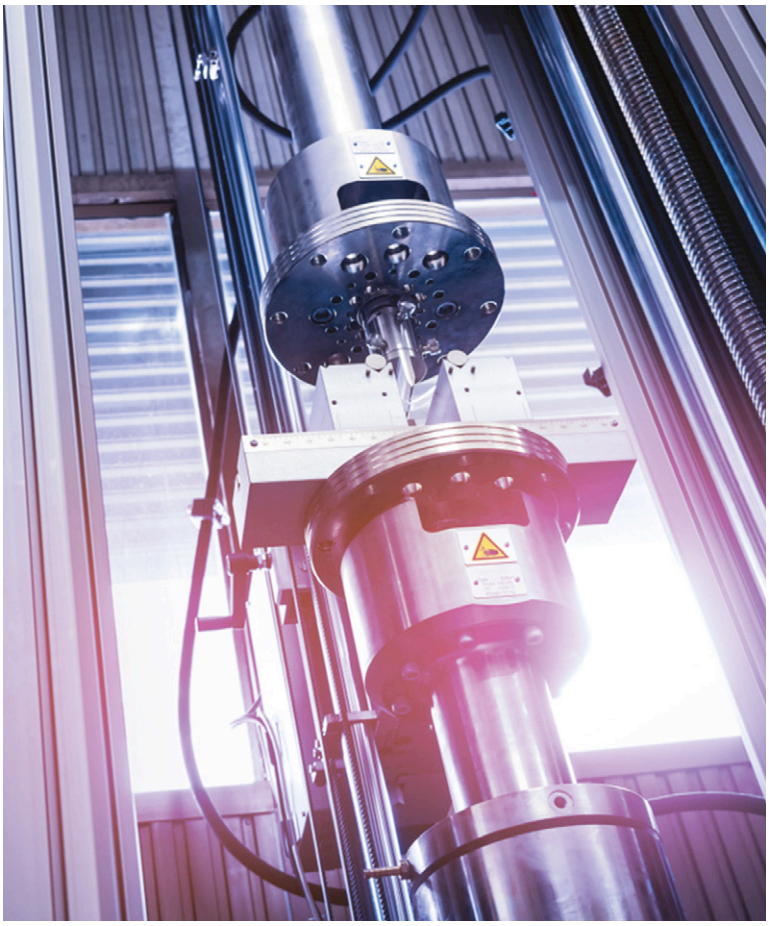

IMAGE: SHUTTERSTOCK

Main image: Testing is a vital element in the development of polymer materials, requiring equipment that is both accurate and simple to use

Property testing is a fundamental part of polymer and compound development. But it often requires considerable repetitive and tedious work on the part of equipment users, whether for tensile testing, thermal analysis, or for assessing rheological properties. Some of the latest examples of testing hardware go a considerable way towards simplifying test procedures, at the same time making the entire testing process more accurate, faster, and potentially less costly.

"Automation has been proven successful in increasing efficiency, consistency, quality, and reducing costs across a vast array of processes. The question that needs to be answered is how much automation improves results obtained from laboratory testing." That's the thinking from testing equipment start-up **LabsCubed**, which last year launched a compact automated tensile tester, the CubeOne.

The CubeOne integrates fully automated hardware and cloud-based software. The user loads up to 12 tensile or tear samples into a tray, places the tray in the machine, then sets up the tests via a touch screen. Once the start button is pressed, the device automatically loads one sample at a time, tests it, removes and deposits the broken test piece, analyses the stress-strain data, and continues to the next sample.

The first version of the CubeOne, which came onto the market last year, is designed for elastomers but a new version for testing plastics should debut before the end of Q1, circumstances permitting, says CEO Khaled Boqaileh. At the time of writing this article, the equipment was said to be in pre-production, with a number of examples in use at a few selected customers. LabsCubed is currently taking pre-orders and carrying out comparison testing on its working machines. Boqaileh expects the company to be in full production by Q4.

Very different in appearance to a standard tensile testing machine, the current elastomer version of the CubeOne measures 1,300mm wide, 520mm high, and 420mm deep, with a touch screen control panel mounted on top and a small drawer for loading samples on the front. The plastics version of the CubeOne is similar but will feature a larger loading tray. It will work with ASTM and ISO standard tensile samples and offer a maximum pulling force of 10kN. Boqaileh says a version of the CubeOne for carrying out flexural tests is in progress and should be ready around the end of the year.

LabsCubed has carried out a study to quantify potential improvements and savings by comparing its CubeOne solution to conventional methods. "LabsCubed enables and expedites the creation of

IMAGE: LABSCUBED

Right: LabsCubed aims to introduce a plastics-focused version of its CubeOne automated tensile testing system, which was originally designed for elastomers, early this year. A version for flexural testing is in development

new and innovative materials," the company says in a White Paper on the study. It explains that manual material testing hinders development by limiting throughput, producing inconsistent data, and increasing costs.

The study was undertaken using a mix of materials (all elastomers) from LabsCubed clients. To ensure study accuracy, the samples were created and tested at the same time, reducing mixing and production errors.

Reproducibility is key

"The results from manual vs CubeOne tests showed that, for both stress and strain, the data produced by the CubeOne is well within the compounders' internally defined acceptable range," says the White Paper. "This is important as data reproducibility is key to ensuring continued testing with no correlation issues.

"Specifically, it was found that the average difference for stress at break is 0.5%. The CubeOne uses an Omega load cell that is calibrated and certified to ASTM standards and therefore results in highly accurate data," the company says.

"For strain at break, compounders' in-house data was produced using clip-on physical extensometers, while the CubeOne uses a contactless vision extensometer. These different methods of measuring strain result in a slightly higher difference at around 2%. The vision extensometer found in the CubeOne is also calibrated and certified to ASTM standards."

To compare data consistency, the standard deviation was calculated across five samples for each compound set. For strain at break, it was found that the consistency of the data was 40% higher using the automated system than with the manual machine. As for stress at break, it was found that the automated system increased consistency by 36%.

LabsCubed says the biggest cost savings achieved when using the CubeOne derive from the technician no longer having to perform repetitive manual tasks. On average it was found that to test a single sample on a manual machine, an operator would require approximately four minutes, while the CubeOne system requires approximately 30 seconds to prepare a sample.

"Total savings per year are estimated at $43,750, which is a significant and direct savings," the White Paper claims. "This translates to a ROI of less than 1.25 years for the average customer."

The company claims the CubeOne can replace any current manual machine without problems for both quality-control or R&D testing. It says the consistency gains that result from automation amount to up to 40%, with users also seeing savings in time and money. ›

Guill invests in rheology laboratory

US-based extrusion tooling company Guill Tool has established an in-house rheology laboratory in its facility at West Warwick in Rhode Island. The lab's equipment list includes a Hybrid Rotational Rheometer, Differential Scanning Calorimeter, and Thermal Conductivity Meter.

Guill says the invesment means it is now equipped to test customer's materials and work with them to create extrusion tooling that will give them a competitive edge. Having the capability in-house also speeds up turnaround on test results, reducing delays during the tool design process and offering better control over the processes and test parameters. The rheology lab will be available for use by extrusion processors as well as material formulators.

› **www.guill.com**

Some of the equipment in use in Guill's new rheology lab at its US plant in Rhode Island

IMAGE: GUILL TOOL

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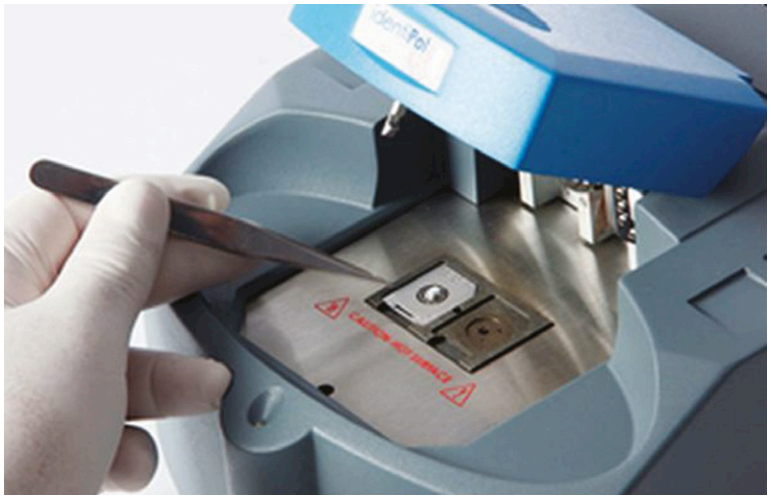
IMAGE: FTT/LACERTA TECHNOLOGY



Above: IdentiPol is claimed to be a cost-effective thermal analysis tool for routine quality testing

Bridging the gap

Improved ease of use also figures in new developments in other areas of materials testing. At **Fire Testing Technology** (FTT), Marketing Manager Teri-Leigh Peach says its IdentiPol thermomechanical analysis quality control bridges the gap between the basic plastic tests found in traditional quality assurance facilities and the complex instruments used in scientific laboratories.

FTT is the worldwide distributor of IdentiPol products, which are manufactured by **Lacerta Technology** (both companies are based in the UK). The techniques used by IdentiPol are said to be comparable to those used in Dynamic Mechanical Analysis (DMA) and Differential Scanning Calorimetry (DSC). "It has been designed as a cost-effective tool for quality assurance, with quick and easy use in mind," Peach says. "A test can be run by an unskilled operator from start to finish in about 15 minutes [including sample preparation]."

There are four basic functions in IdentiPol: identification of the material; confirmation that a new batch of material is the correct specification; comparison of any test result with stored reference data; and estimation of MFI with each test (available for PE and PP only).

Materials identification is derived from measured thermomechanical properties, for example glass transition temperature and melting point. These key properties are automatically determined, without the need for user intervention. "Since these are bulk properties, analysis is unaffected by fillers, fibres and pigments," claims Peach, who adds that the IdentiPol system can distinguish between most commonly used plastics.

Confirmation of batch consistency is achieved by comparing measured properties with reference data from previously tested batches. "Unlike other techniques that provide only chemical information, these thermomechanical measurements provide structural information, which will depend on crucial factors such as molecular weight, chain branching, crystallinity, and these can have a significant effect on both processing parameters and product performance," Peach says.

Chemometric analysis

The analysis uses what FTT describes as chemometric techniques to automatically assess the match of the incoming material, ultimately providing a pass/fail indication. Batch reports can be generated, which list the key thermomechanical properties together with the chemometric score. "This is useful when a problem arises and it provides solid evidence to a material supplier of differences between current and old batches – a must-have feature where recyclate is used in production," Peach claims.

Using the "comparison" feature, any test result can be scored for similarity against all reference data. This is said to be especially useful when comparing an equivalent grade, perhaps for replacement or substitution of an original material or for the incorporation of recycled material, as it can be used to see how the properties of various grades differ. A practical example of where this can be used is in the event there is uncertainty over the contents of a silo or bin of material. The Identipol system can match the grade to others being used in the factory in one simple test, immediately avoiding the wrong material being used.

IMAGE: NETZSCH

Right: The TMA 402 F3 Hyperion Polymer Edition thermomechanical analysis system is designed specifically for low temperature work

German engineering group **Netzsch** has been busy both in product development and in business development. Last year, it acquired Taurus Instruments and merged it with Netzsch Analyzing & Testing to create Netzsch Taurus Instruments, based in Weimar, Germany, expanding its product range for determining thermal conductivity and heat transmission in materials and fire testing. The company has also added rheology to its thermal analysis product line through the acquisition

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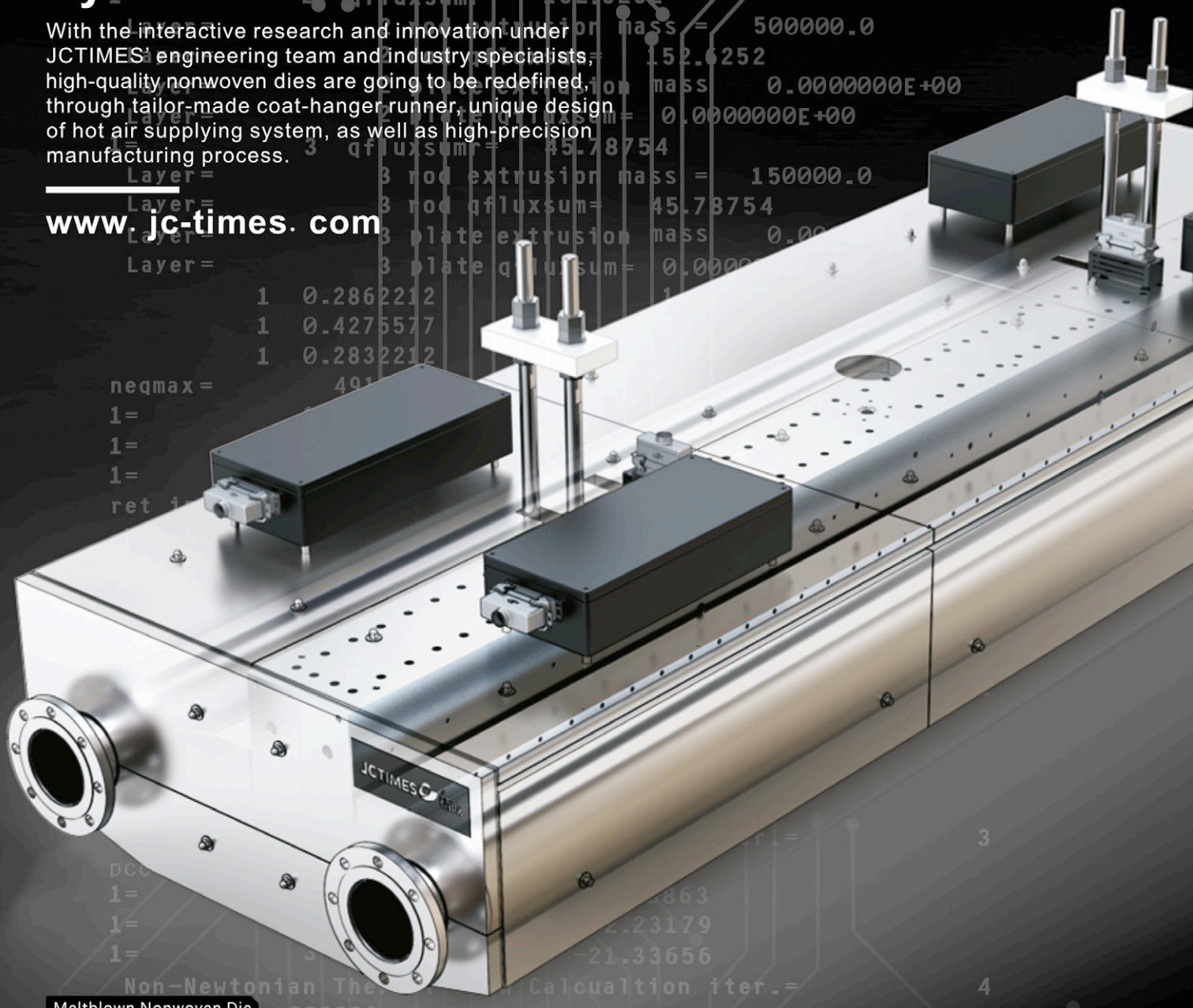

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of the rheometer product line of Malvern Panalytical. This includes the Kinexus rotational rheometers and Rosand capillary rheometers.

Dr Shona Marsh, Application & Product Marketing Manager for Rheology within the company, says the rotational rheometers "possess an ultra-low friction air bearing which is what makes them so incredibly sensitive. In comparison to a simple viscometer, the performance of a rheometer allows far greater characterisation of flow, deformation and even tackiness of a material (for Newtonian and non-Newtonian materials).

Capillary rheometers are designed to operate at much higher shear rates than rotational rheometers, allowing the rheological behaviour under processes such as extrusion or injection moulding to be investigated.

They provide information about the material's shear viscosity (resistance to flow) but also the extensional viscosity (resistance to stretch). "This means we can detect how different polymers/grades will perform in processes such as blow moulding," says Marsh.

New to the thermomechanical analysis product line-up is the TMA 402 F3 Hyperion Polymer Edition, which is described as a robust, reliable, and easy-to-operate instrument for quality control, especially of polymers.

Left: PerkinElmer's EGA 4000 offers integrated thermogravimetric analysis and infrared spectroscopy with evolved gas analysis

Philipp Köppe, Head of Marketing at Netzsch, says this new device is tailor-made for low-temperature applications, determining various viscoelastic properties such as stress relaxation and creep.

The TMA 402 F3 Hyperion Polymer Edition comes with a compact furnace capable of covering a temperature range from -70°C to 450°C and uses a mechanical cooling system that works without the need for liquid nitrogen. ›

IMAGE: TA INSTRUMENTS

Right: The Discovery X3 DSC from TA Instruments' offers multiple sample capabilities to speed up DSC testing

Easing the pressure

"Customers in the plastics compounding world are experiencing a number of pressures and pain points when it comes to testing and analysis," according to Venkata Mattegunta, Product Marketing Manager, Materials Characterisation, at **PerkinElmer**. These include the ability to carry out cost-effective raw material identification of a wide variety of samples; streamlined study of chemical composition and interaction of additives; accurate study of biodegradability, and the effects of environmental degradation. On top of this comes single-use recycling analysis – especially useful given the boom in take-out dining during the Covid-19 pandemic – and overall management of QA/QC of finished compounds.

Aiming to address these needs, PerkinElmer has introduced the EGA 4000, which it says is the industry's first fully integrated TG-IR (thermogravimetric analysis-infrared spectrometry) system for evolved gas analysis (EGA). The company says the unit's design "eliminates issues posed by current EGA systems to offer a simplified TG-IR analysis, accessible to experienced and novice users alike."

Mattegunta says current TG-IR systems use separate instruments via transfer lines, introducing operational complexity and maintenance issues. The EGA 4000 incorporates a fully functional PerkinElmer TGA analyser into its Spectrum 3 FT-IR spectrometer, "combining all aspects of instrument control and analysis into a simple user interface." Hardware and software are controlled by a single software platform.

The Discovery X3 DSC is the latest addition to the **TA Instruments**' line of Differential Scanning Calorimeters (DSC). The company says the ability to keep pace with demand for high performance materials is limited by the fact that most traditional DSC equipment is limited to analysing a single sample at a time.

It says that the Discovery X3 has been designed to eliminate multiple testing steps, generating three times the amount of experimental data as a standard DSC system. It uses the company's Fusion Cell technology to allow users to compare different formulations side-by-side under the exact same test conditions. Its three sample calorimeters are said to provide unmatched flexibility whether used for replicate testing for statistical analysis or for validation/verification against a control sample.

The Discovery X3 is supported by the introduction of a Batch Processing feature in the company's Trios software, which is designed to handle the additional data generated with the X3 DS. Optional equipment includes a variety of cooling options, sample cutters, pans, and linear autosampler with 54 programmable tray positions.

Mflow, from ZwickRoell, can measure MVR of high flow PP grades used in non-woven production

IMAGE: ZWICKROELL

Melt flow challenge

Melt-blown polypropylene non-woven fabrics can function as filter materials to provide high filtration efficiency against very small particles. They are found in a variety of medical applications, including respirator masks as well as other non-woven, medical protective clothing, and have been in particularly high demand during the Covid-19 pandemic. Quality assurance of the raw material often involves the use of an extrusion test but, as the volume flow index (Melt Volume Rate, MVR) of PP grades for melt-blown non-wovens typically lies between 1,200 and 2,000 cm³/10 min, this is a challenging task.

"A high MVR value such as this requires a sophisticated instrument to accurately and repeatably measure test results," says **ZwickRoell**, which supplies melt flow test equipment. Especially important for compounders, the MVR of a polymer may change significantly after the addition of additives. "A change to the MVR may affect processing and it is therefore important to understand to what degree various additives effect the MVR of a material," says the company.

ZwickRoell's Mflow unit can be fitted with a die plug that ensures the material stays in the barrel

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during the preheat time. Once the test begins, the die plug is removed from the barrel, the material begins to flow, and a travel transducer automatically records the MVR. "These accessories on the Mflow ensure accurate and repeatable results of high MVR polymers like melt-blown PP," says the supplier.

"A recent redesign of the Mflow to include a new colour touchscreen electronic improves efficiency and saves space in a crowded lab. These new electronics offer a user interface that follows the logical layout of ZwickRoell's testXpert III software, with relevant parameters, operator inputs, and results grouped for fast and easy access."

Tracking contaminants

Contamination can also be a problem in compounding applications. **Sikora**'s Purity Scanner Advanced online inspection and sorting system combines an X-ray scanner with up to three optical cameras. X-rays make it possible to detect metal inclusions with a size down to 50 µm in the raw material. Black specks and colour deviations are detected by optical cameras.

IMAGE: BUEHLER

Integrated software provides the operator with a statistical evaluation providing detailed information about the size, area, and number of the detected contaminants during production. Impurity data can be saved in an image gallery.

"Due to continuously increasing quality requirements of plastic processors, the demand for online inspection and sorting systems will further grow," says the company.

The company claims that these higher quality requirements can only be fulfilled using future-oriented technologies such as the Purity Scanner Advanced.

IMAGE: SIKORA

Left: Sikora's Purity Scanner technology detects a wide variety of contaminants in polymer pellets

Sikora also supplies offline systems to inspect and analyse smaller amounts of pellets randomly, for example after they have been sorted out by the Purity Scanner Advanced.

ITW group company **Buehler** says its new Wilson RH2150 hardness tester is an appropriate solution for a large range of applications in quality control and research environments, including plastics (the RH2150 can be used for ISO 2039 ball indentation testing of hardness of plastic materials).

The company says the equipment is based on its well-proven RB2000 concept but incorporates a number of newly developed functions. Buehler says a new user interface, advanced statistical calculations, result graphing, and easy test programmability all help to optimise testing processes.

Left: Buehler's Wilson RH2150 can test plastic hardness to ISO 2039

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Boosting the green credentials of polyolefins

Polyolefins are the most widely used of all plastic materials – and many current developments focus on environmental factors such as recyclability and thickness reduction

Many developers of plastic packaging – and their resin suppliers – are focusing their efforts on making their products as environmentally responsible as possible.

To do this, they are looking to use more recycled resins in their formulations, as well as developing thinner films – and mono-layer structures that are simpler to recycle.

SABIC has developed a range of packaging for frozen food that combines a new polyethylene (PE) grade and film production technology.

The packaging is based on a mono web TF-BOPE film structure with a thickness of 20 microns. This thin gauge provides a potential packaging material reduction of approximately 35-50% compared to existing blown PE film. The reduced thickness minimises environmental impact and helps brand owners reduce packaging material consumption. The packaging solution is recyclable, and fits mono-PE recycling streams.

TF-BOPE is a PE grade that can run in tenter frame machines that are traditionally used to make BOPP film. It could be used in applications where mono material solutions are required to enhance recyclability, as it can replace multi material laminates in a mono-PE structure.

The film, made from the company's LLDPE BX202 material, offers tear direction, low tear strength and easy unidirectional opening, along with high gloss and transparency. It is the result of a collaboration with film suppliers and extruders Ticinoplast and Plastchim-T, and packaging machinery manufacturer Syntegon Technology.

Main image: SABIC LLDPE BX202 has been used in a new TF-BOPE film for frozen food packaging

Recycled resins

Nova Chemicals is to sell recycled LDPE and LLDPE – based on recyclate – produced by Revolution. The agreement is an exclusive partnership with a resin manufacturer, and builds Nova's range of PCR offerings, it says.

Revolution makes plastic films for a variety of consumer and industrial products and packaging, which are later recycled and reused in new products. Nova began providing these resins – which have a range of melt indices – in January.

"Working with Revolution, we will further widen our product offerings for recycled plastics," said Luis Sierra, president and CEO of Nova. "Together

Right: Plastigaur is the first large-scale commercial user of Dow's Agility CE, which uses 70% recyclate

we will offer a PCR portfolio to enable our customers and brand owners to meet their sustainability goals."

The grades are ideal for use in flexible packaging applications such as heavy duty sacks, shrink and stretch wrap, agricultural film and pouches, says Nova.

Nova will also offer technical support to help customers incorporate PCR into applications. It has a dedicated team with wide PCR expertise, as well as a range of technical facilities.

Stretch success

Plastigaur, a leading film converter in Spain, is the first large-scale commercial user of the Agility CE resin from **Dow** – which is made with 70% recycled plastic.

The company will use the grade in its collation shrink film, which is typically used in the transportation of cans or PET bottles.

The resin is based on low-density polyethylene (LDPE) into which post-consumer recycled (PCR) material from shrink film is incorporated – without losing material quality or functionality in the final application. The PCR content in the final shrink film made by Plastigaur is 50%, which helps reduce carbon emissions by 25%.

Dow has also helped Plastigaur reduce the thickness of the shrink film from 45 to 40 microns. By reducing thickness – while maintaining functionality – the film enables additional CO_2 savings of 11% and cuts overall environmental impact by 32%, says Dow.

"We've demonstrated a commercially viable solution that uses high-quality packaging made from recycled content," said Agnieszka Godlewska, marketing manager for industrial and consumer packaging at Dow. "This is not a concept or a project anymore – this is reality."

Below: Profol says its CPPouch films are completely recyclable

PP for pouches

Profol says that its CPPouch family of films provide flexible packaging pouch structures that are completely recyclable – and do not require the use of foil or solvents.

The films meet the packaging industry's need for highly functional, single-material solutions that can be more easily separated and recycled, says the company.

CPPouch polypropylene film – for stand-up and pillow pouches – offers high functionality and differentiated performance for narrow web and traditional pouch converting markets. As well as improved sustainability and recyclability, PP-based pouches can offer operational efficiency and can be designed for low haze, directional tear and higher stiffness advantages in comparison with PE pouches.

To expand on solutions where this pouch film can be used, a version suitable for retort applications is being developed. The films also provide a barrier to moisture and options for an oxygen barrier.

"Our CPPouch gives manufacturers an important tool for improving sustainability of packaging materials," said Mark VanSumeren, director of new business development at Profol.

CPPouch solutions include a coextruded, PP-based film material. There are no extra lamination steps and no need for adhesive curing, which allows pouch manufacturers to increase production speed and reduce costs, says the company.

BOPE boost

Ampacet has developed a new masterbatch portfolio for bioriented polyethylene (BOPE) film.

The product, Biax4CE, can be used to create mono-material film – helping film manufacturers and their customers meet tough recycling targets for their products. The company says that, because PE recycling is more prevalent that PP recycling, it makes sense to develop more BOPE film applications.

"BOPE film production also benefits from idle capacity on existing BOPP film manufacturing

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equipment, requiring only an adjustment in processing conditions – with no major machinery changes," it said.

In laminated packaging, BOPE film allows substitution of some non-PE substrates such as BOPP, BOPA and BOPET – allowing the manufacture of a mono-material PE structure. It also offers some benefits over BOPP – such as greater seal strength and seal integrity, said the company.

Biax4CE masterbatches include additive and white masterbatches – including anti-block, anti-static, migrating and non-migrating slip and anti-fog products.

Bio-based BOPP

Innovia has developed a new family of recyclable BOPP films, called Encore, which are made from renewable, non-food based raw materials.

Encore packaging and labelling film will have the same properties as equivalent fossil-based BOPP film – including clarity and gloss, stiffness, water vapour barrier and printability. The material has been assessed by Interseroh – an independent German recycling and consulting company – and received its highest rating, confirming they are fully recyclable.

"Using our in-house Life Cycle Analysis (LCA) programme we have calculated that, by using renewable polymer, Encore films offer reductions in [cradle to gate] carbon footprint," said Steve Langstaff, business manager for packaging at Innovia.

The first two grades of Encore film are a low temperature heat seal film for packaging and one for pressure sensitive labelling applications.

Innovia says Encore C45cn is the first carbon neutral BOPP label film. It is ISCC certified and will contribute to reducing carbon footprint and reducing the use of fossil resources, says the company.

It is a high MD stiffness 45 micron BOPP bubble film for automatic label dispensing performance," says Innovia, which could allow the replacement of standard 50 micron films – to give a 10% material saving.

"This represents the first step in our journey to produce more sustainable films, with the next step being products that contain recycled post-consumer content," said Langstaff. "We have agreements in place and hope to be able to launch the first of these in 2022."

Fighting microbes

Cosmo Films of India has developed a BOPP-based clear thermal lamination anti-microbial film.

It is effective against a broad range of bacteria and inhibits germ growth. It also shows positive effect against bacteria including *Staphylococcus aureus* and *Escherichia coli*.

Innovia's Encore BOPP films are made from renewable raw materials

It has an extrusion coated surface with low temperature melting resin, which enables easy lamination of film on paper products by heat and pressure. This technology is safe, affordable and can be easily replicated into all types of labels, flexible packaging solutions and synthetic paper, says the company.

"Amid the Coronavirus pandemic, we all are searching for ways to stay safe and healthy," said Pankaj Poddar, CEO of Cosmo Films. "Our antimicrobial technology will prove to be effective against a broad range of bacteria."

In addition, Cosmo has introduced a BOPP-based coated film which slowly releases a fragrance over time. The film is matte finished on one side, while other is extrusion-coated for thermal lamination applications. Through initial tests, the films have proven to remain fragrant for more than two months. It is expected that the film would continue to release its fragrance for almost six months. It is available in 24 microns thickness and is suitable for thermal or wet lamination.

It can be used for applications such as catalogues, book covers, cosmetics packaging for cosmetics and personal care items.

Cosmo has also developed a BOPP-based transparent film aimed at large packs and pouches in the fresh food packaging Industry. The new antifog film has good cold and hot anti-fogging property, superior fusion sealing strength (of 1226-3498 g/in), hot tack ranging from 280 to 530 g/in for a temperature range of 130-140°C and is available in thicknesses of 25, 30 and 35 microns. ❯

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Recycled PP film

Taghleef Industries has introduced a new range of films called Relife, which incorporates recycled polypropylene (PP).

The films can be used in a number of packaging and labelling applications, depending on the type of recycled PP that they contain. Films containing either chemically recycled PP, or granules reprocessed from internal production, are food-contact compliant. Those that contain mechanically recycled PP are not.

The films are suitable for most of the same applications as traditional film grades, and ensure the same technical function and performance, says TI.

Right: Mondi has developed all-PE packaging for a German petfood retailer

PP to replace PET

Braskem has developed a grade of polypropylene (PP) that it says can replace PET in consumer packaging applications such as ready-made meal trays that require high temperature resistance.

The grade, part of its Inspire series, has optical properties approaching those of PET, and thermal properties that are superior to both PET and traditional random copolymer PP. The new grade can be thermoformed, which demands a balance of clarity and heat resistance. The higher heat resistance allows containers to be used in dishwashers and re-used.

"Our Inspire series allows thermoformers to use a single pellet for a wide-range of applications that require varying levels of stiffness, clarity or impact – creating a simplified inventory approach," said Alexandre Elias, vice president of polyolefins at Braskem America. "This latest grade is designed as an ideal solution to replace PET because of its recyclability and unique properties."

In June 2020, Braskem finished building a new PP production facility in La Porte, Texas, which has a production capacity of over 450,000 tonnes/year. It can produce the companys entire PP portfolio including homopolymer, impact copolymer and random copolymer grades.

Keeping petfood fresh

Mondi has developed all-polyethylene (PE) packaging for German petfood retailer Zooplus.

The barrier packaging is used for a new dry dog food in its 'Wolf of Wilderness' line.

Mondi is supplying Zooplus with a pre-made FlexiBag Recyclable and BarrierPack Recyclable form-fill-and-seal (FFS) reel material. The company said it was able to deliver the necessary barrier properties against moisture, oxygen and odours while maintaining a premium look and feel.

At the same time, the previously metallised highlights on the label – and in the eyes of the wolf – are also recyclable.

Pallet film from PCR

Trioplast of Sweden has recently launched three new grades of stretch film that contain a large proportion of recycled material.

Most recently it launched Trioloop, a machine stretch film with more than 60% recycled contect – including more than 50% post-consumer recyclate (PCR).

Late last year, it developed a stretch hood film made from up to 50% PCR polyethylene. Trioplast says it reduces carbon footprint by more than 30% by increasing the use of recycled material – without increasing film thickness or affecting product performance.

It has also developed a manual stretch film made from 75% recycled material, of which at least 51% is from post-consumer recycled (PCR) sources.

Magdalena Bengtsson, product manager for pallet stretch film at Trioplast, says the company has long experience of products based on recycled material. "This gives us a major advantage now that we are transferring this knowledge to more product areas within increasingly advanced applications," she said.

The company offers a number of sustainability concepts, including Triolean (downgauging with sustained or increased performance), Triogreen (products based on renewable raw materials) and Trioloop (products made from recycled plastic).

"Using PCR in a stretch film is a ground-breaking move that is a major step forwards in transitioning transport packaging into a circular economy," said the company.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.sabic.com**
- **www.novachem.com**
- **www.plastigaur.com**
- **www.dow.com**
- **www.profol.com**
- **www.ampacet.com**
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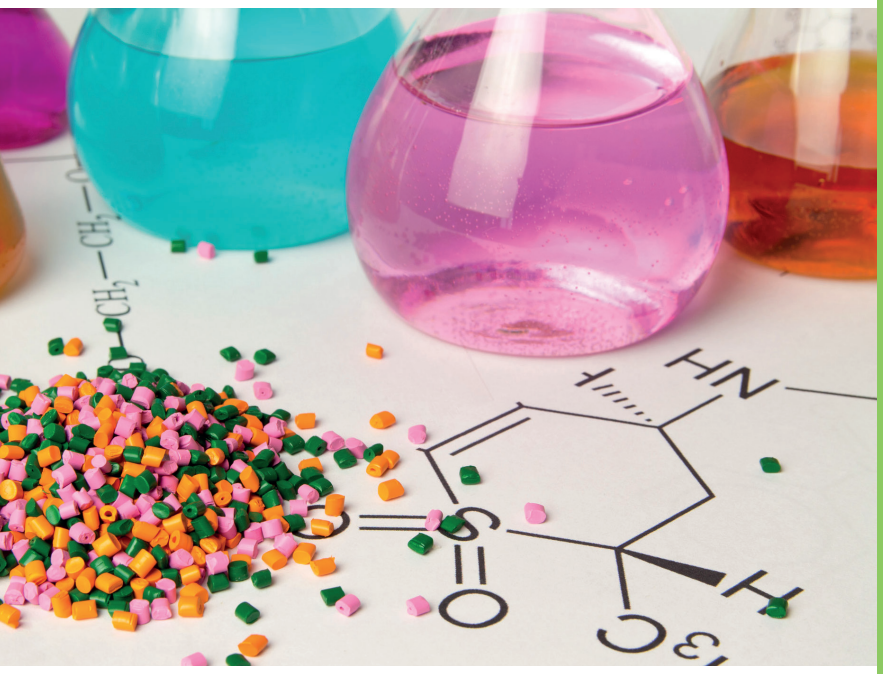

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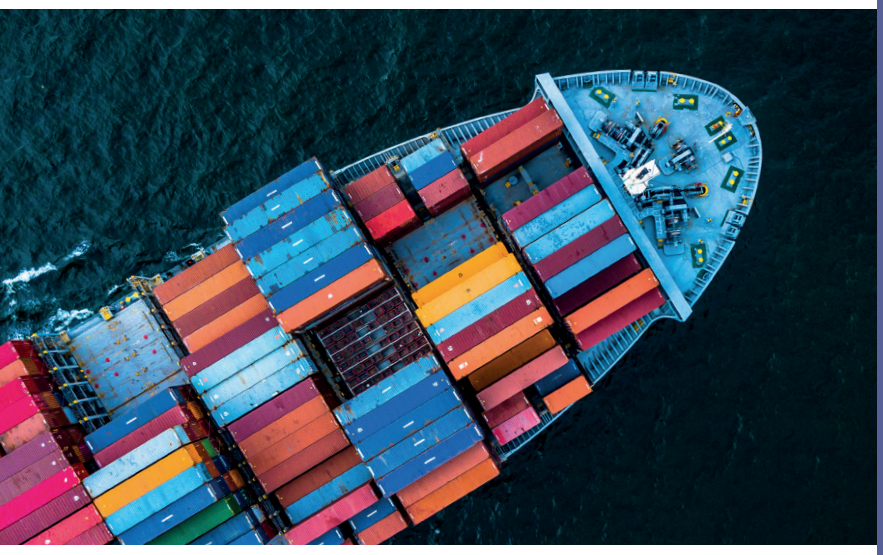

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Standing up to Coronavirus

Demand for protective equipment has soared in the last year due to the Covid-19 pandemic – and both materials and machinery suppliers have responded to the situation swiftly

The last year has been dominated by medical concerns caused by the Coronavirus pandemic. Demand has soared for a number of plastic products – including facemasks and other protective equipment.

Many film and sheet manufacturers found themselves working flat out at a time when many manufacturing operations have been shuttered. At the same time, development of new materials to make these products has been on the rise.

Anti-fog film

SABIC has developed polycarbonate-based anti-fog film, for use in personal protective equipment such as face shields and goggles for medical environments.

Lexan HP92AF anti-fog film features a one-sided coating that extends the time-to-fog even at very high ambient humidity, for extended optical clarity. The film has confirmed its superior anti-fog performance in extensive testing under harsh conditions and does not exhibit any hazing at saturation – as is the case with competitive materials, says the company. The coating technology also has no effect on the abrasion resistance and impact strength of the polycarbonate film.

"Our new film combines the characteristics of excellent optical quality, high impact strength of polycarbonate and our advanced anti-fog technology," said Ahmet Kizilirmakli, senior business manager for the Americas at SABIC. "It makes the product the ultimate choice for face shields and other clear view personal protection equipment with long-lasting optical clarity in these environments."

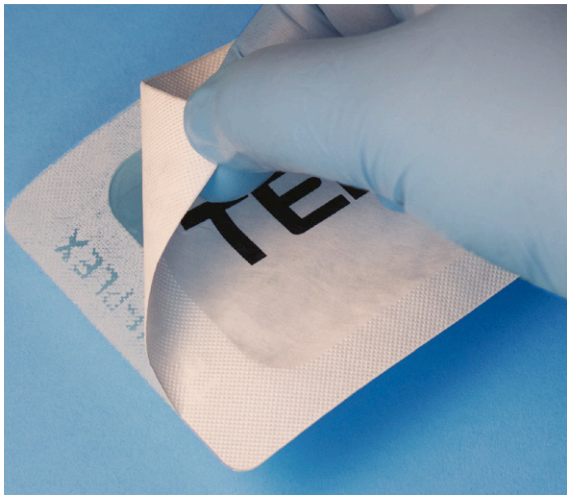
The film has already shown its optical performance in several pilot applications for healthcare facilities and meat packing plants, where high humidity and temperature fluctuations can occur – especially in transition zones between controlled and uncontrolled work climate. As well as visors, facemasks and safety goggles, further targeted applications include medical instrument lenses and displays.

The film exhibits good die cutting and printability. It is thermoformable and withstands repeated cleaning, preferably using lukewarm, mild soap solutions or common glass cleaners. With a width of 48in (1,220mm), the film is globally available in a wide range of gauges from 7 to 30 mil (175 to 750 microns).

Web investment

US-based **Tekni-Plex** recently invested around US$2 million in a new narrow web, flexographic press to meet increased demand for printed lidding for larger-sized medical devices. The press

Main image: SABIC's polycarbonate anti-fog film is aimed at medical applications such as protective masks



Right: Tekni-Plex has invested US$2m in a flexographic press due to increased demand for printed lidding

is located at its facility in Ashland, Massachusetts.

An increasing emphasis on minimally invasive procedures such as laparoscopies, orthopaedics and others that require a longer journey through the vascular system, medical device manufacturers are designing larger devices.

"As a result, these devices also require larger thermoformed trays and lidding to contain them," said Timm Goodmanson, vice president of the flexible division at Tekni-Plex. "Our investment in a new narrow-web press, which is capable of producing 35in length lidding, will handle these demanding applications."

The press has a web cleaner for the base material and an inline vision system to ensure that printing meets stringent medical device requirements. It also features 360-degree registration adjustment and controlled ink densities which produce high quality dots in a simple and repeatable fashion. In addition, the new 17in wide press will reduce lead times – delivering standard materials in two-to-four weeks. This will help medical device manufacturers meet shorter go-to-market timelines, says Tekni-Plex.

The four-color press will be used to die-cut coated lidding – made from materials such as DuPont's Tyvek – at the company's Milwaukee and Madison, Wisconsin plants, using proprietary heat seal coating formulations. Tekni-Plex's Ashland facility also provides prepress services, including artwork and printing plates.

Production shift

Another consequence of Coronavirus has been to convert plastic machinery – including some laboratory-based equipment – into production lines for medical equipment.

One example of this was seen at **Reifenhäuser** of Germany, which has now converted two lines in order to make protective medical garments.

Reifenhäuser normally uses its Technology Centre to research and develop new applications in collaboration with its customers. Two of the lines have since been converted for medical use. The first line was used to make meltblown film to make around 1 million facemasks per day.

The company has now converted a second pilot line. The first batch has produced 110 tonnes of protective film for a leading manufacturer for medical coveralls, for use in hospitals. This volume is enough for about 1.2 million coveralls.

One blown-film line in the centre is running around the clock. It is making film that protects against infections – but allows air exchange, which is vital for hospital workers who must wear coveralls for long periods of time. Breathability comes from the pore structure in the material which is produced by a special calcium carbonate addition, followed by a stretching process (on the company's EVO Ultra Stretch).

"Our intention with this project is to strengthen international production capacity – which is currently exhausted – so as to supply a sufficient volume of high-quality protective garments during the Coronavirus crisis," said Heino Claussen-Markefka, managing director of Reifenhäuser's blown film division. "We are delighted to use our pilot lines for this."

Protective production

Similarly, Austrian plastics machinery manufacturer **SML** set up a pilot plant last year to make laminates for protective clothing.

Production can be carried out on an industrial scale on a modern extrusion line at the company's site in Redlham. This plant is otherwise only made available to customers as a demonstration line and for product development.

"Normally our business is to develop and manufacture machines, and not the production of materials – however these extenuating circumstances require extraordinary measures," said Karl Stöger, managing director of SML.

The line has been used to make materials for protective clothing is an extrusion line for coatings and laminates. It is equipped with SML's patented DoubleCoat process. This process is typically applied to the production of thin laminates and membranes.

CLICK ON THE LINKS FOR MORE INFORMATION:

- **www.sabic.com**
- **www.tekni-plex.com**
- **www.reifenhauser.com**
- **www.sml.at**

POLYCARBONATE

Sheet has high flame resistance

US-based sheet producer Plaskolite has introduced a flame-resistant, transparent polycarbonate sheet for interior applications.

The sheet, called Tuffak CA, adds Class A flammability performance to the product portfolio, without affecting impact strength or optical clarity. It meets the International Building Code (IBC) Class A flammability criteria for interior wall and ceiling finishings, says the company.

"Polycarbonate sheet has natural protective properties for any number of applications," said Jeff Bostic, vice president of the polycarbonate division of Plaskolite.

› **www.plaskolite.com**

MULTI-LAYER FILM

Collaboration creates multi-layer meat casing from PCR

DSM, SABIC and several partners have developed a multi-layer barrier casing for meat products that uses post-consumer plastics.

Produced by Viscofan, the casing comprises several layers of different sustainable polymers. DSM supplies its Akulon polyamide (PA) while SABIC supplies the polyethylene from its Trucircle portfolio.

Both products are based on used and post-consumer plastics which would otherwise be landfilled or incinerated. Instead, the used plastic is converted into new feedstock, which then enters the production chain to make new virgin-quality materials.

"By introducing Akulon CRC-MB, DSM is taking the next step in its sustainability journey," said Jason Zhang, VP of the performance polymers business line at DSM Engineering Materials.

Upstream partners are Cepsa – which makes certified circular phenol – and Fibrant, which uses the phenol to make caprolactam, a precursor of polyamide.

Óscar Ponz, chief plastic business officer at Viscofan, said: "In our sustainable casings programme, next to this achievement, we're also in a position to offer bio-based alternatives."

Multi-layer barrier films offer strong sustainability advantages by helping to reduce preventable food waste – which accounts for 8% of total global greenhouse gas emissions – according to the partners.

› **www.dsm.com**

› **www.sabic.com**

BARRIER FILM

Resistant to oxygen and moisture

Innovia Films has developed a new film in its Propafilm Strata range of transparent, high barrier packaging films.

The film, SLF, has high barrier levels to oxygen, moisture, aroma and mineral oils. It has been designed with a wide sealing range making it applicable to high speed horizontal-form-fill-seal packaging of biscuits, bakery and confectionery type products.

"With SLF, we have developed a new barrier film that has an outstanding oxygen and aroma barrier, and an enhanced moisture barrier over standard polypropylene films," said Alasdair McEwen, global product manager for packaging at Innovia Films. "This means there is an opportunity to increase product shelf life and reduce food waste. It is the perfect replacement for PVdC coated films."

Like other Propafilm Strata films, SLF provides a high barrier to aroma and oxygen even at high relative humidity levels. It is printable, glossy and is food contact compliant globally.

"We have incorporated a wide sealing range polymer into the formulation of SLF, so it has been designed specifically for use on high-speed horizontal packaging lines," McEwen added.

› **www.innoviafilms.com**

BOPP

Gulf Packaging awaits delivery of 10.4m wide BOPP extrusion film line

Saudi Arabia-based Gulf Packaging Industries has bought another BOPP line from Brückner Maschinenbau.

The company, which makes a range of film products, is due to take delivery of a new 10.4m wide BOPP line at its manufacturing complex in Jubail Industrial City this autumn. It already runs a number of Brückner lines at its facility. The expansion is part of Gulf Packaging's growth strategy.

"We will continue on our growth path to serve our customers regionally and globally," said Nader AlDakheel, CEO of Gulf Packaging.

Helmut Huber, COO of Brückner, added: "We are happy to continue our longstanding partnership with Gulf Packaging Industries. In the last 30 years we realised five joint BOPP projects – with the size, speed and output of the production lines steadily increasing."

The latest line is the fastest, widest and most powerful that Brückner has supplied to Gulf Packaging – and is completely customised for its needs.

■ Brückner – with sister companies Kiefel and PackSys Global and other partners – is a member of the PrintCYC initiative for recycling printed films. The project researches and tests new ways to recycle printed plastic films (in PE and PP). In the first phase of the project, PP film and packaging samples containing more than 50% PP recyclate were produced. The base material was printed BOPP films on nitrocellulose (NC) ink formulations.

› **www.brueckner.com**

INSPECTION

Surface analyser retrofits to third-party film machinery

Optical Control Systems (OCS) of Germany says that its FSA100EXT film surface analyser is available as a retrofit on third-party extrusion lines.

The optoelectronic inspection system provides real-time defect analysis with customer-specific results, says OCS.

Upgrading an existing extrusion line with the FSA100EXT optimises quality control in the polymer production process, it says – to improve product quality. The customised frame allows easy and quick adaptation into the existing plant.

State-of-the-art camera technology is concealed in the customised OCS frame. The V2 camera technology consists of a high-resolution dual-line CMOS camera and a user-specific high-performance LED. This combination enables optimal defect detection in transparent, opaque and coloured polymer film, says OCS.

With the OCS FSA100 software, measurement results are analysed according to customer specifications and defects are classified accordingly – providing information about the film quality.

› **www.ocsgmbh.com**

ANCILLARIES

Zeppelin takes over MTI

Zeppelin Systems of Germany is the new owner of MTI Mischtechnik, which became insolvent in October last year.

The MTI portfolio includes heating, cooling and universal mixers for plastics processing and chemical applications.

"Since the mixer solutions from MTI and Zeppelin are largely used in different industries, the overlap of the portfolio is small," said Rochus Hofmann, managing director of Zeppelin Systems.

The former MTI team will continue to be based at the company's site in Detmold.

"With this acquisition, we are further expanding our market position in mixing," said Hofmann.

› **www.zeppelin-systems.com**

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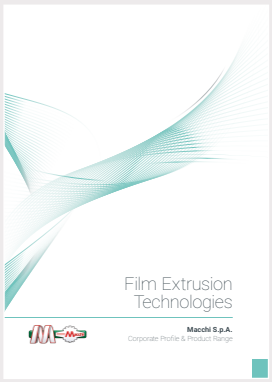
MACCHI: FILM EXTRUSION



This 28-page brochure from Macchi covers the company's wide range of film extrusion technologies including coextrusion lines, wide webs, die heads, take offs, winders, trim recovery and control systems.

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COLINES: BARRIER FILMS

This new brochure from Colines focuses on extrusion lines for the production of barrier films for vacuum and modified atmosphere packaging to preserve foodstuffs and medical products.

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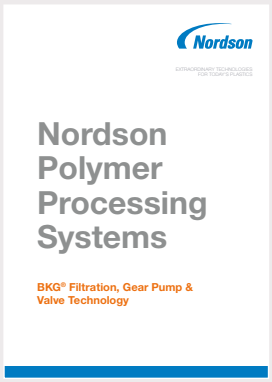
NORDSON: FILTRATION SYSTEMS



The BKG range of filtration systems and screen changers from Nordson Polymer Processing Systems are detailed in this six-page brochure which also features products from BKG's ranges in gear pump and valve technologies.

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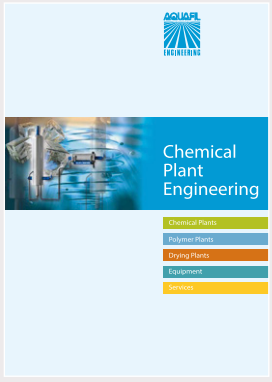
AQUAFIL: PLANT ENGINEERING



This 12-page brochure from Aquafil Engineering details its comprehensive range of chemical plant engineering capabilities, which include polyamide polymerisation, polyester condensation and polymer drying installations.

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STRUKTOL: INNOVATIVE ADDITIVES

Struktol manufactures a wide range of additives that benefit performance and processing of resins and compounds. Its portofolio includes additives for PVC, wood-plastic composites, recycling, odour control and more, as this brochure shows.

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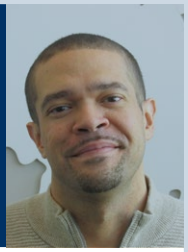

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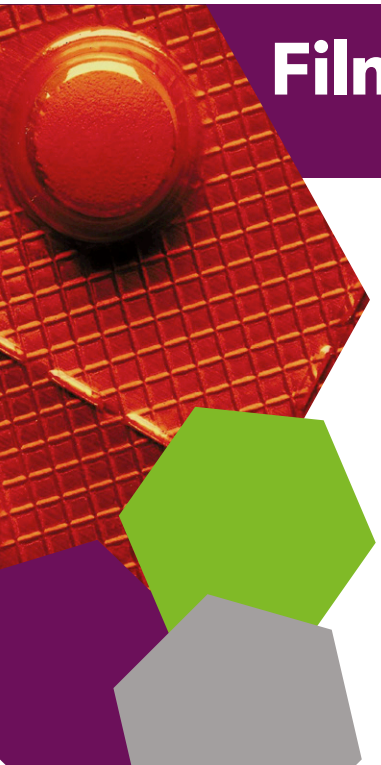
Employees:	Around 140
Turnover:	Around €55 million
Profile:	Plastigaur, founded in 1989, grew out of an earlier company, Manipulados Enara – which made paper products such as serviettes. The company opened a 2,000 sq m facility in Andoain in 1989, and soon switched production to plastic products only. Its product range includes a wide variety of primary, secondary and tertiary flexible packaging – from petfood film to collation shrink film.
Product lines:	Its primary packaging products include a range of films, for applications as diverse as dry and frozen food, baked goods and hygiene products such as wet wipes. Its secondary packaging products include shrink film – both printed or plain. Its tertiary packaging products include stretch hood film for pallet wrapping, and shrink tube. It offers a number of films with an environmental focus, including Refilm (made partly from recycled material), Ecodoy and its Berripla/Berriplast flexible PE films for food packaging, which have optimal barrier and anti-fog properties.
Factory location:	Plastigaur has a total production area of around 8,500 sq m at its plant in Andoain. It says it has an annual output of 30,000 tonnes and exports around a quarter of its production. In a recent project, it began using Dow's Agility CE polymer – made from 70% recyclate – in a new shrink film.

To be considered for 'Extruder of the Month', contact the editor on lou@filmandsheet.com



Film and Sheet EXTRUSION FORTHCOMING FEATURES

The next issues of Film and Sheet Extrusion magazine will have special reports on the following topics:

March 2021	**April 2021**
Thermoforming	Film winders
Additives for film	Photovoltaics
Control/instrumentation	Agricultural film
Barrier film	Chinaplas preview

Editorial submissions should be sent to Lou Reade: lou@filmandsheet.com

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

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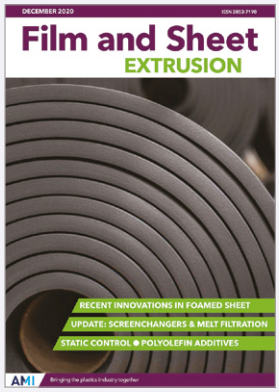

Film and Sheet December 2020
The final 2020 edition of Film and Sheet Extrusion looked at the latest trends in foamed sheet materials. It also reviewed some of the newest developments in polymer melt filtration, static charge control, and additives for polyolefin films.

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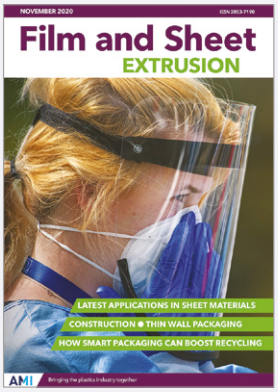

Film and Sheet November 2020
The November issue of Film and Sheet Extrusion contains in-depth features covering sheet materials, thin wall packaging, construction applications and how smart packaging can help improve recycling. Plus news from around the global industry and regular features.

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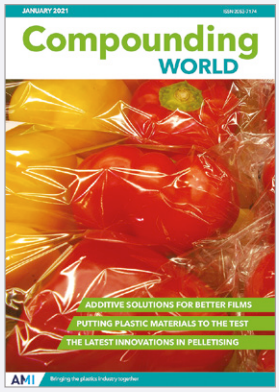

Compounding World January 2021
The first 2021 edition of Compounding World magazine looks at the latest additive developments for film production. It also explores the latest pelletising technologies and reviews new materials testing options.

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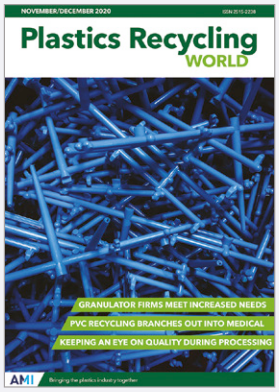

Plastics Recycling World November/December 2020
The final 2020 edition of Plastics Recycling World looks at the latest developments in the world of plastics granulation. This edition also reviews innovations in PVC recycling and examines some applications of automated quality control technology.

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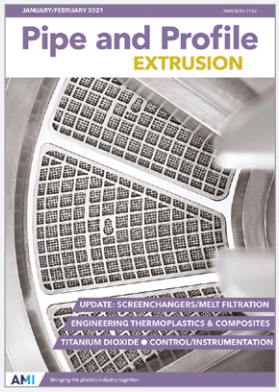

Pipe and Profile January/February 2021
The January-February issue of Pipe and Profile Extrusion contains in-depth features covering melt filtration and dealing with recycled material, the role of ETPs and composites in extruded pipes and profiles, and control systems for ancillary operations.

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Injection World January/February 2021
The January-February issue of Injection World investigates the increase in demand for medical plastics during the Covid-19 pandemic. Plus the latest in thermoplastic composites and new granulator technology for injection moulders.

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

GLOBAL EXHIBITION GUIDE

2021

9-11 March	Plastimagen Light **VIRTUAL EVENT**	www.plastimagen.com.mx
7-9 April	Plastics, Printing & Packaging, Dar-es-Salaam, Tanzania	www.expogr.com/tanzania/pppexpo
13-16 April	Chinaplas, Shenzhen, China	www.chinaplasonline.com
4-6 May	Kuteno, Rheda-Wiedenbruck, Germany	www.kuteno.de
17-21 May	NPE 2021, Orlando, USA **CANCELLED**	www.npe.org
1-2 June	Plastics Extrusion World Expo Europe, Essen, Germany **POSTPONED**	https://eu.extrusion-expo.com
15-18 June	FIP, Lyon, France	www.f-i-p.com
22-25 June	Plast 2021, Milan, Italy **NEW DATE**	www.plastonline.org/en
21-25 June	Colombiaplast, Bogota, Colombia	www.colombiaplast.org
14-18 September	Equiplast, Barcelona, Spain	www.equiplast.com
29-30 September	Plastics Extrusion World Expo Europe, Essen, Germany **NEW DATE**	https://eu.extrusion-expo.com
3-7 October	Plastex, Brno, Czech Republic **NEW DATE**	www.bvv.cz/en/plastex/
12-16 October	Fakuma, Friedrichshafen, Germany	www.fakuma-messe.de
3-4 November	Plastics Extrusion World Expo North America, Cleveland, USA	https://na.extrusion-expo.com
8-12 November	Plastico Brasil, Sao Paolo, Brazil **NEW DATE**	www.plasticobrasil.com.br
15-18 November	Arabplast, Dubai, UAE	www.arabplast.info
1-3 December	Plast Print Pack West Africa, Accra, Ghana	www.ppp-westafrica.com

AMI CONFERENCES

23-25 February 2021	Fire Resistance in Plastics **VIRTUAL SUMMIT**
2-4 March 2021	Chemical Recycling North America **VIRTUAL SUMMIT**
16-18 March 2021	Functional Fillers **VIRTUAL SUMMIT**
23-25 March 2021	Specialty Packaging Films **VIRTUAL SUMMIT**
13-14 April 2021	Breathable Films, Berlin, Germany
20-22 April 2021	PVC Formulation North America **VIRTUAL SUMMIT**

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

29 - 30 September, 2021
ESSEN, GERMANY

3 - 4 November, 2021
CLEVELAND, OHIO

www.ami.international/exhibitions