

Film and Sheet EXTRUSION



PRINTING INNOVATIONS FOR FILM & SHEET

UPDATE: BLOWN FILM DIES ● MASTERBATCH

DEVELOPMENTS IN DOWNSTREAM EQUIPMENT



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Film and Sheet EXTRUSION

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OECD: global plastic waste may triple by 2060

The amount of plastic waste produced globally could triple by 2060 – with only a minority likely to be recycled.

A report from the OECD – *Global Plastics Outlook: Policy Scenarios to 2060* – says around half the waste will end up in landfill and less than a fifth will be recycled. It estimates that almost two-thirds of plastic waste in 2060 will be from short-lived items such as packaging, low-cost products and textiles.

"If we want a world that is free of plastic pollution, we will need to take much more stringent and globally co-ordinated action," said

Mathias Cormann, secretary-general of OECD.

The report projects global plastics consumption rising from 460 million tonnes in 2019 to 1,231m tonnes in 2060. Growth will be fastest in developing and emerging countries in Africa and Asia, although OECD countries will still produce more plastic waste per person (238kg per year) in 2060 than non-OECD countries (77 kg).

Globally, plastic leakage into the environment will double to 44m tonnes/year, while build-up in lakes, rivers and oceans will more than triple – as plastic waste rises from 353m tonnes in 2019

to 1,014m tonnes in 2060.

The report proposes a number of policies that could help to prevent this scenario. These include: taxes on plastics, including packaging; incentives to reuse and repair plastic items; targets for recycled content in new products; improved waste management infrastructures; and increased litter collection rates.

"These concrete policies could significantly curb – and even eliminate – plastic leakage into the environment," said Cormann.

A preliminary version of the report is available [here](#).

Toppan adds Thai film maker

Japan-based Toppan has acquired a majority stake of Thai flexible packaging manufacturer Majend Makcs.

It says the acquisition will enable it to make flexible packaging in Thailand in order to supply Europe, North America and Southeast Asia.

"We are excited to have Majend Makcs join Toppan," said Masahiko Tatewaki, managing executive officer of Toppan's global packaging business. "It affords us greater capacity to manufacture and market more price-competitive packaging materials to customers throughout the world."

Majend Makcs, founded in 2002, is based in Ayutthaya, Thailand. It manufactures and sells flexible packaging for food, consumer and medical applications.

Thailand is a major production location for global food and consumer brands

➤ www.toppan.com

IMAGE: COVESTRO



Covestro is to expand capacity of its paint protection film (PPF) in Changhua, Taiwan. The "multi-million US dollar" investment will be realised by 2023, with dedicated capacity for PPF and R&D facilities to meet increasing demand, it said. Covestro is a major supplier of TPU-based PPF, which it says is increasingly replacing traditional PVC solutions.

➤ www.covestro.com

European PVC recycling approaches 27%

Recycling of PVC in Europe reached almost 27% in 2021, according to VinylPlus.

For the year as a whole, it reported that 810,775 tonnes of PVC waste were recycled and used in new products. This represents 26.9% of all PVC waste generated in 2021 in the EU-27,

Norway, Switzerland and the UK.

It says that the rate is above the 23.1% estimated by AMI for overall plastics recycling in Europe in 2021.

Within the total, the amount of pre-consumer recycling – in which factories reprocess their waste internally – increased by around 25%, but

post-consumer recycling (where PVC is collected after use) fell by around 6%.

Recycling of flexible PVC and films jumped last year by around 50%, rising from 170,000 tonnes in 2020 to 262,000 tonnes in 2021. The majority of this was in pre-consumer recycling.

➤ www.vinylplus.eu

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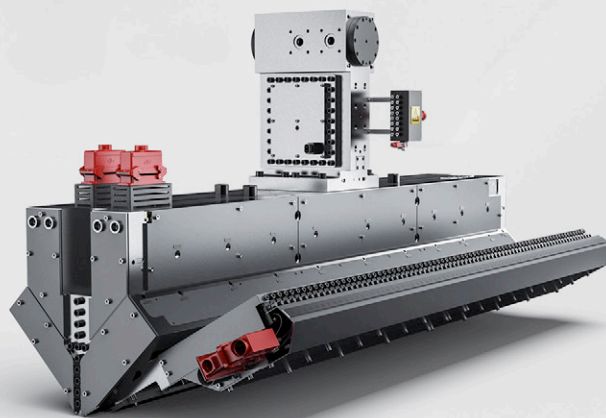
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jc-times.
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NatureWorks and CJ Bio team up to develop bioplastic applications

Two leading bioplastics producers are looking into ways of developing new applications that combine their materials.

US-based NatureWorks – which makes polylactic acid (PLA) – has signed a letter of intent with South Korean PHA producer CJ Bio to develop “high-performance biopolymers that will replace fossil fuel-based plastics”.

The materials are aimed at a range of applications, including compostable food packaging and personal care.

The companies say that initial collaboration has shown “very promising results” when using CJ Bio’s amorphous PHA in combination with NatureWorks’ Ingeo PLA.

“We want to amplify the



Above: NatureWorks and CJ Bio are to develop applications of their PLA and PHA bioplastics

impact of our Ingeo technology with promising, new bio-based solutions, and feel that CJ Bio is an ideal partner to achieve our goal,” said Rich Altice, CEO of NatureWorks.

CJ Bio supplies fermentation-based

bioproducts for animal nutrition, human nutrition and biomaterials at 13 manufacturing facilities. It recently announced commercial-scale production of PHA at a new facility in Pasuruan, Indonesia.

Seung Jin Lee, head of the

biomaterials business at CJ Bio, added: “Plastics are an essential material, but their fossil sourcing and after-use impact present a major climate challenge. I am excited by the opportunity to create new solutions in tandem with NatureWorks.”

The companies will collect feedback from existing and potential customers to understand the growing need for functional product requirements that align with sustainability goals. This will inform their product and technology development roadmap, they said.

The letter of intent is expected to be the start of a long-term relationship between the two companies.

➤ www.cjbio.net

➤ www.natureworkslc.com

Three-layer blown film investment

US-based Poly tarp Products has ordered a 3m-wide blown film line from Bandera.

The three-layer line will help Poly tarp make larger, more durable layflat combo liners for leak proof applications – mainly in the food industry.

Installation and start-up is scheduled in early 2023.

➤ www.polytarp.com

➤ www.luigibandera.com

Cosmo grows sales and profits

India-based Cosmo Films raised both sales and profits in its latest financial year.

For the year ended 31 March 2022, the company posted a 33% increase in sales – to exceed Rs30 billion (around US\$392 million). At the same time, profitability (EBITDA), grew by 44% to exceed Rs6 billion (around US\$80m).

Cosmo, which makes films for applications including packaging, labelling and lamination, has recently diversified into products including speciality chemicals – and



plans to launch films for consumer applications. Due to the diversification, it plans to change its name to Cosmo First.

In the final quarter of the

Left: Poddar: “Future growth driven by films, consumer care, speciality chemicals and pet care”

financial year, the company posted a sales growth of 22% and an EBITDA growth of 31%.

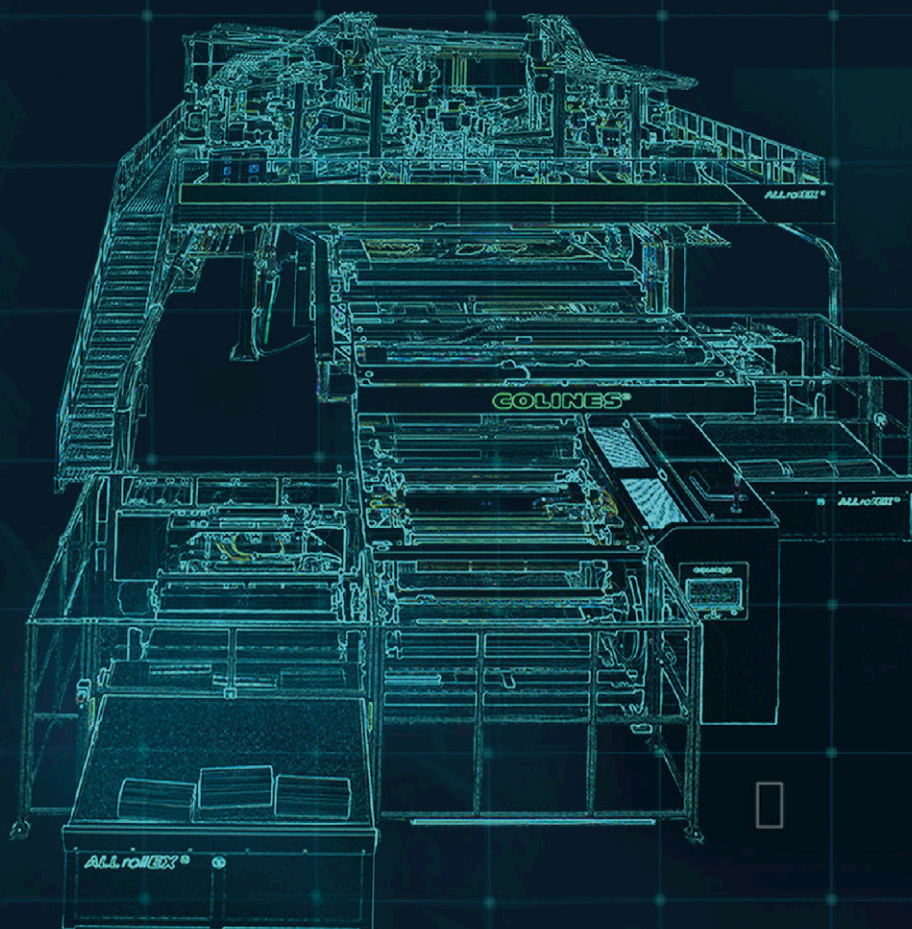
“In coming years, growth will be driven by the films division – specialised polyester, CPP and BOPP – as well as consumer care, speciality chemicals and pet care,” said Pankaj Poddar, group CEO of Cosmo Films.

➤ www.cosmofilms.com

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VDMA adjusts its forecast for 2022

VDMA, the German trade body for plastics and rubber machinery, has amended its forecast for 2022.

It now expects a growth of between 0 and 2% - having earlier predicted growth of 5-10% this year.

Orders fell in the first quarter of the year by 27%, compared to the same period in 2021. At the same time, sales grew by 3%.

Due to factors such as material shortages, the war in Ukraine and an ongoing Covid lockdown in China - which create uncertainty - VDMA is now downgrading its original forecast.

"We only expect a sideways movement or - in the best case - a slight increase in turnover for 2022, despite full order books," said Thorsten Kühmann, managing director of VDMA.

"We expect a development of zero to 2%."

■ VDMA has formed an alliance with Germany's two other major plastics associations - GKV and Plastics



IMAGE: VDMA

Above: Kühmann: "We expect a sideways movement or a slight increase in turnover for 2022"

Europe Deutschland - in attempt to improve sustainability. It includes the five member associations of GKV.

The initiative, called 'We are plastics', will promote the circular economy and promote transformation within the plastics industry.

➤ <http://vdma.org/kug>

➤ www.dein-kunststoff.de

Avery spends €60m on European expansion

Avery Dennison has invested more than €60 million (US\$64m) to expand two of its European facilities.

It says the investments in France and Luxembourg will help it meet growing demand for its label and packaging materials.

The company has already begun a three-year, €45m (US\$48m) expansion of its facilities at Champ-sur-Drac, France. Enhancements include new logistics buildings, an automated warehouse, and an extra hotmelt adhesive coater - scheduled to come online during 2024.

In Luxembourg, where it specialises in labels made with acrylic emulsion adhesives, a €15m (US\$16m) project will redesign operational flow and add a new emulsion speciality coater - expected to come online in early 2023.

"These investments will allow us to meet customer demand by freeing capacity throughout our European manufacturing network," said Tim Presto, vice president of supply chain and operations for EMENA at the company.

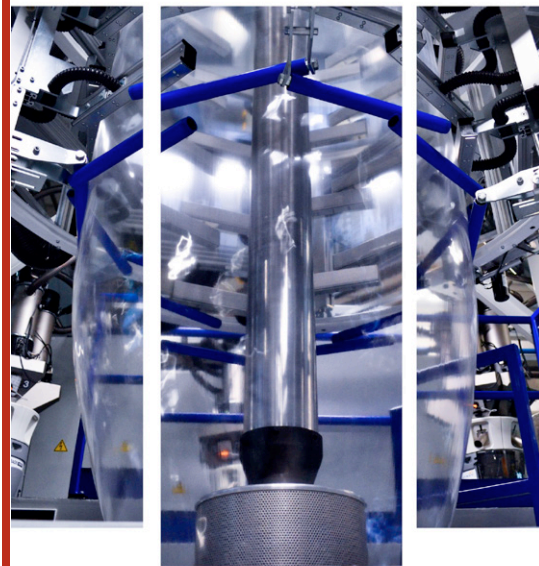
➤ www.averydennison.com

www.filmandsheet.com



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IMAGE: ENTEK



Above: Entek plans to raise annual production of battery separator film

Entek raises output of battery film in USA

Entek is to raise its output of lithium-ion battery separator film in the USA.

The company has begun an expansion programme that will see annual production rise to 1.4 billion sq m of film by 2027 – which it says is enough to power 1.4 million electric vehicles.

"With our proprietary IP and vertically integrated engineering and fabrication competencies, we have the capability to supply the growing US lithium-ion battery industry with US-produced separators," said Larry Keith, CEO of Entek.

The company's investment in

battery separators begins by installing 50 million sq m of extra ceramic coating capacity at a new facility in Henderson, Nevada. This is scheduled to be commissioned in the first half of 2023, to support current base film production.

It has secured a contract with Brückner of Germany to provide the biaxial stretching equipment and technology needed to produce the separators.

Entek's investment includes building two separate, giga-scale xEV lithium-ion battery separator sites.

➤ www.entek.com

ProAmpac extends its reach

US-based flexible packaging specialist ProAmpac has acquired Specialty Packaging, a family-owned packaging manufacturer.

ProAmpac said that the takeover would extend its reach with food service customers and expand its footprint to the southwestern USA.

"Specialty Packaging has a complementary offering of high-quality products," said Greg Tucker, CEO of ProAmpac.

Specialty Packaging provides film, foil bags, sandwich wraps and other custom products to fast food and food service brands. It makes its products at a 100,000 sq ft facility.

Hank Dorris, president of Specialty Packaging, said: "With ProAmpac's manufacturing capabilities, we will be able to better serve our existing customers while expanding into new end-markets."

➤ www.proampac.com

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Image conscious: printing advances in film and sheet

Recent innovations in printing for extruded film and sheet include faster presses, a new system for label production and an inspection system that reduced customer complaints



IMAGE: BOBST

Printing has become an ever-more important element in film and sheet production, as brand owners work to distinguish themselves from their rivals. This requires faster, more accurate printing presses – and systems that can pick up defects instantly.

Windmüller & Hölscher says that its updated Heliostar II gravure printing press can run at production speeds up to 600 m/min.

The machine now has improved production stability and control – even at fast speeds – and is equipped to print mono-material films made of MDO-PE.

The increase in stability and production control is due to the installation of a new sensor tracking system and the use of Supergrip idler rollers. The sensor system ensures fast register control – which is no longer pneumatically controlled but motor-

ised, to ensure a faster response to material movements in the press. With the Supergrip idler roller, W&H has developed a new technology that guides the material through the machine in a more stable way.

In addition, a central Procontrol panel has direct access to all machine functions and quality parameters, which helps to improve machine operation and handling. A Vision control system allows the operator to make a detailed and precise job control.

Printing new types of films such as MDO-PE can be a challenge, because the material is highly stretched and does not run homogeneously over the entire working width. Heliostar II is equipped to deal with this, in part due to the use of Supergrip technology.

There are two machines available. Heliostar II S

Main image:
Bobst has added its Digital Master series for label printing

Right: Comexi has supplied an F2 MB press to Brazilian flexpack manufacturer Bomplastic

is very flexible and can be configured for all packaging films, laminates and special customer requirements, while Heliostar II A is positioned in the market with up to 10 printing units for the core area of flexible packaging.

Label production

Bobst has launched its Digital Master series for label printing.

The two new models will provide a digitalised, automated production line – from printing to embellishment and cutting. The series is based on a modular and upgradable architecture, allowing customers to build their own press and develop it over time.

“Developments in label production are moving at pace, with brand owners looking for converters that can deliver better products more quickly, at more competitive prices,” said Patrick Graber, strategic marketing manager at Bobst.

The company’s All-in-One platform – which includes Digital Master – allows high quality, digitally printed labels to be produced at high productivity and lower costs, he said.

The new presses will be available in 340mm (13.5in) and 510mm (20in) print widths. Like the Master DM5, it offers printing, embellishment, and cutting in a single pass, with seamless native integration between the UV inkjet digital engine and the flexo and converting modules.

Adding a 510mm version adds new opportunities to expand application versatility into larger-sized labels, for instance. It provides higher production volume but still only needs one operator to run the press.

Running at up to 100 m/min (328 ft/min) in four or six colours – plus optional digital white – the machines bridge the gap between traditional digital and flexo machines. They can also be upgraded on-site at a later stage.

“Customers can adapt the machine over time to



changing application needs and new market trends,” said Graber. “When new technologies for these platforms are released, they can be retrofitted on site.”

Quality control is improved by the inclusion of Bobst Accucheck for % inline inspection at full speed. It checks registration, quality, and colour consistency of digital and flexo print – and all embellishments – to ensure fault-free production, says Bobst.

Flexo precision

Comexi has supplied an F2 MP 10-colour press to Geissmann Papier, a Swiss specialist in flexible packaging.

The central drum flexographic press will allow Geissmann to strengthen its position in the Swiss market. This is the third Comexi machine that Geissmann has bought.

“Once again, we are able to offer Geissmann the highest quality and technology,” said Ramon Jonama, Comexi area manager for the region.

Comexi says that the press has high mechanical robustness, and precise electronics and automation – allowing it to perform all types of print order. It can “effortlessly” print at 500 m/min, for instance. In addition, the automation allows fast job changeover



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Thin film offers higher security

Leonhard Kurz has applied its thin film technology to tax stamps – to offer more reliable protection against tampering.

Its ValiGate technology forms a 'bridge' between physical and digital tax stamp protection. It prevents counterfeiting attempts through double encryption. Here, the unique security pattern gives every QR code a copy-protected identity. The digital component of the tax stamp sleeve can be individually designed and checked using a smartphone. This

provides direct information about the authenticity of the tax stamp.

In addition, the company is further developing its Trustseal technology,



which is already used for security and ID documents. Recently, security features such as Diffractive Gold or Diffractive Red have been added, along with other features based on Optical Variable Device (OVD) technology. These can be combined with digital security features according to customer demand.

➤ www.kurz.de

Left: Kurz has applied its thin film technology to tax stamps to improve tamper protection

and set-up, which helps to increase productivity.

Daniel Geissman, executive director of Geissman, said: "This press has evident synergies with our other Comexi machines."

The Comexi F2 MP is designed to meet the long-run printing needs of the flexible packaging sector. It incorporates Comexi's GeniusTech solution that helps printers to overcome challenges such as a lack of skilled operators, shorter job lengths and an increased number of job changes.

In similar fashion, Comexi has supplied an F2 MB press to a Brazilian flexpack manufacturer. Bomplastic says the machine will allow it to offer more diversified and innovative products, to meet the needs of various market niches.

The F2 MB is designed to satisfy the print needs of medium runs in the flexible packaging sector.

"We are very pleased with the F2 MB, which will allow us to enter new markets," said César Mangaravite, manager of Bomplastic.

Bomplastic will use the F2 MB to print high-quality, high-definition packaging. Mangaravite says his company is interested in acquiring more Comexi machines in future.

Plates without solvent

In addition, Comexi has installed a solvent-free thermal platemaking system from **DuPont** at its technical centre in Girona, Spain.

The Cyrel Fast 2000 TD system combines thermal processors and a variety of photopolymer printing plates for flexible packaging and other applications. It offers high productivity and performance and can reduce processing costs, processing time, and environmental impact compared to solvent-based methods, says DuPont.

"Cyrel Fast enables a workflow from file to print-ready plate in less than an hour," said Jan Scharfenberg, business leader for DuPont Cyrel Solutions East.

Comexi said that offering thermal platemaking to its customers – from its technology centre – adds to its ability to offer turnkey services for the integration of pre-press.

"This will help us in the use and visibility of this technology within the environment of Comexi customers," said Yago Luling, pre-press manager and colour specialist of Comexi CTec.

Eight-colour line

Retal Baltic Films recently invested in an eight-colour flexoprinting line from Comexi, which it says will extend its range of packaging solutions.

The line has been installed at Retal's facility in Klaipeda, Lithuania, alongside another recent investment – form-fill-seal testing equipment that allows complete analysis of top and bottom packaging materials.

"Brands can face the challenge of establishing a reliable seal where the bottom tray and the top lidding film meet – especially if they change

Below:
Windmüller
& Hölscher's
Heliostar II
gravure
printing press
can run at up to
600 m/min



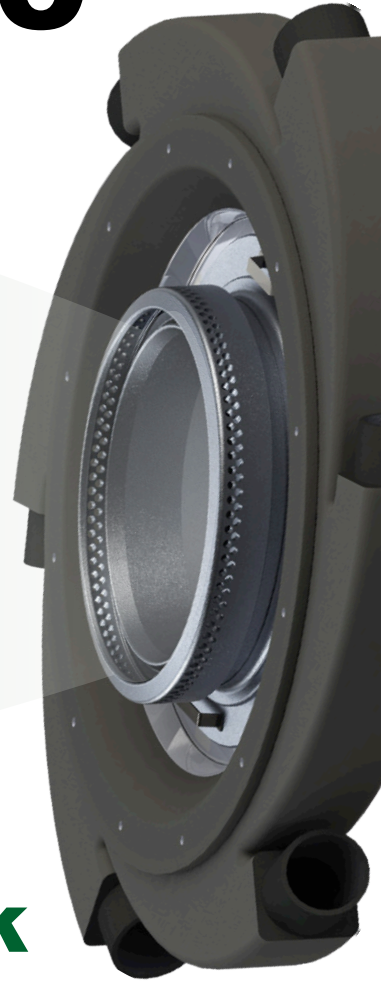
IMAGE: WINDMÜLLER & HÖLSCHER

MacroCool D10

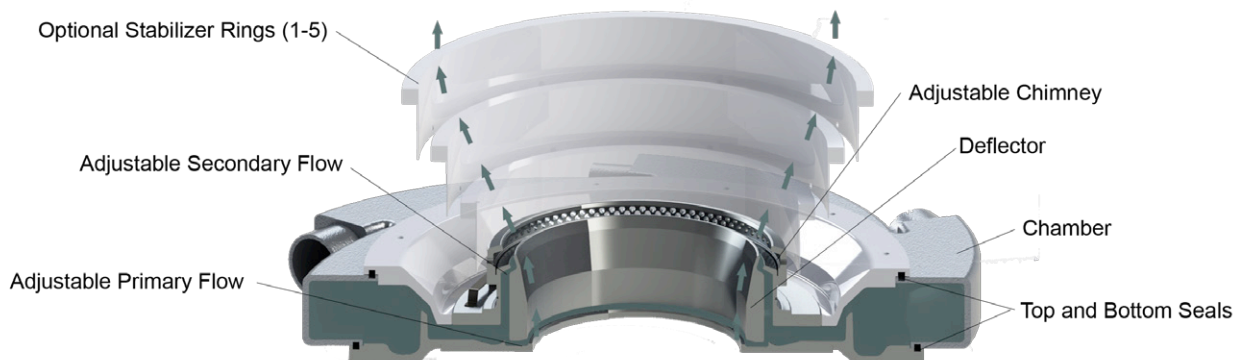
D10 Air Rings

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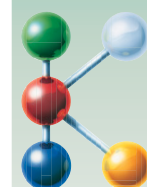
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- Quick bubble lock for fast startups
- Easiest air flow adjustments allow for full control on the fly
- Superior gauge uniformity
- Individual control of primary and secondary air flow



The Industry Benchmark



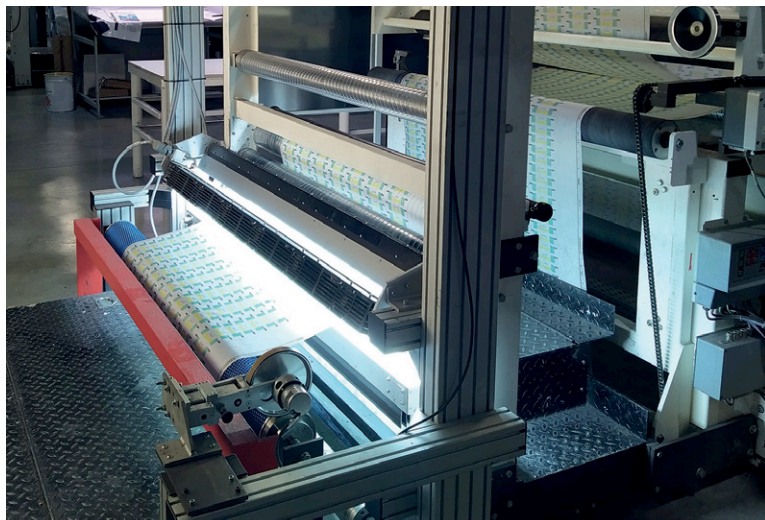
- Macro's D10 Dual Lip Air Ring is the only air ring available on the market which allows the operator to adjust the bottom lip with a bubble up
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IMAGE: ISRA VISION



Above: French print shop G'imprim has used Isra's PrintStar to identify product defects

materials," said Remigijus Sedys, sales representative at the company. "Our testing facilities guarantee the process is smooth by the time it gets to the customer's production line."

Sedys says that Retal's printed film works "in harmony" with its range of thermoforming films.

"We can support the selection of materials to suit each customer's specific needs, then analyse the complete FFS process - minimising the final testing procedure at the customer's production line," he said.

Retal says it can now offer food brands a complete packaging solution - including rigid bottom and top lidding film with flexographic printing.

Curing module

US-based **Baldwin Technology** introduced a new curing module at the recent ICE show in Germany.

Its XP Quatro LED-UV curing module, with one head and two frequencies for broader applications, is designed to cure LED-formulated printing inks and coatings on sheet-fed and web offset printing presses, as well as on larger-format flexo presses and digital print engines.

It provides high system flexibility and reliability, says Baldwin. Hosting two large, high-performance LED-UV arrays, the module delivers twice the dose of a standard LED solution in a size only slightly larger than Baldwin's standard compact XP module. The XP Quatro can emit two different wavelengths from the same head, which has several advantages.

One example is applications that require simultaneous powerful curing of deep-layered substrates and surface-curing for inks. This is because longer wavelengths penetrate more deeply, while the shorter waves achieve surface curing. Also, in applications with dual chemistry on one

substrate - such as two ink colours that cure better with different frequencies - both can be cured simultaneously.

The XP Quatro allows easy integration of LED-UV technology into virtually any analogue or digital printing press, to enhance print quality while operating at high speed.

This year, Baldwin has also showcased its colour-management solutions and inspection technology at a number of security-related printing events, such as for banknotes and tax stamps.

These include its Complete Solution and Guardian PQV systems.

"Our Complete Solution allows security printers to improve quality, manage defects and add value to their product," said Gerry Stanford, global sales leader at Baldwin. "Printers can also prevent future waste by monitoring and improving their processes with valuable performance data in hand."

Guardian PQV camera systems can be mounted on one or both sides of the product to perform print-quality inspection, verify variable data and inspect challenging security print features. It offers lighting options for all materials and substrates, and for special applications, such as holograms. It can also be retrofitted to existing presses and machines.

Quality boost

G'imprim, a French print shop for flexible packaging, has installed a PrintStar inspection system from **Isra Vision**, to improve product quality and prevent customer complaints.

The company runs seven 8-to-10-colour flexo lines, offering a scalable capacity of up to 600 million linear metres per year. G'imprim's product range includes shrink films for the beverage and canning industry, packaging films for pulp producers and both breathable and standard films for hygiene products.

Right: Retal says buying a printing line from Comexi will extend its range of packaging solutions



IMAGE: RETAL

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Right: Sun Chemical and HP have collaborated on a new flexible packaging solution

It says that print defects, such as ink splashes or gaps, imply that a product is of poor quality – which damages brand perception. Previous inspection solutions were no longer meeting the company's quality requirements, so G'imprim installed the new system from Isra – which had been used within a sister company.

PrintStar complements the partial images made by matrix cameras from other systems. Built around high-resolution line cameras, the system offers benefits in the inspection of continuous material, such as detecting tiny defects that are missed by solutions that use matrix cameras.

Combined with ultra-bright LED lighting, it enables continuous quality and process monitoring of the printed image, lamination, and coating. PrintStar detects and classifies emerging defects in real-time so that their causes can be corrected early.

The new system was ready for operation one week after installation began. It has saved money by reducing the need for repeat production, and led to fewer customer complaints.

Installing the inspection system required no mechanical changes to the printing presses. Additional modules such as ColorStar (for monitoring colour accuracy) and ViewStar (for detecting tiny details during web monitoring) could be added in future. The next step toward monitoring the process and the system status itself will soon be available through new software upgrades, such as EPromi Live.

Digital press

Sun Chemical has collaborated with HP to produce flexible packaging with HP's Indigo digital press



and Sun's new solventless lamination solution SunLam.

Due to its fast-curing, ultra-low monomer and solvent-free properties, SunLam can help brands improve their sustainability, says the company.

As part of the partnership, Sun and HP developed stand-up pouches printed on HP's Indigo 25K digital press using mono-material polyethylene (PE) and polypropylene (PP) substrates, laminated with SunLam.

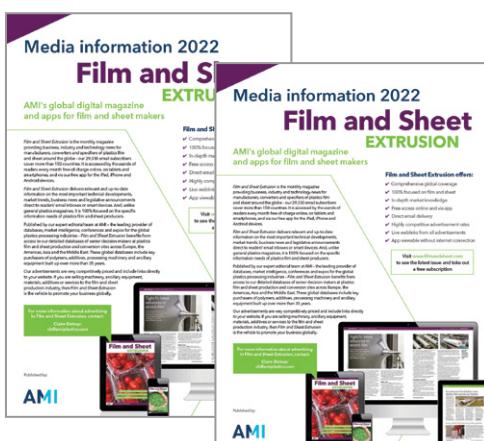
The all-PP pouch was certified by Germany's Institute Cyclos-HTP after being tested for a recyclability rate of 96%.

The PE and PP laminated structures were produced with HP Indigo using SunLam adhesives ZA-1000 and ZB-301 on standard mono materials with lamination on a Nordmeccanica Super Simplex E-800 solventless laminator.

"This collaboration can develop faster routes to market for flexible packaging – enabling printers and brands to meet the most stringent food safety regulations," said Pierangelo Brambilla, product director for global laminating adhesives and cold-seals at Sun Chemical. "This provides more sustainable packaging and consumer choice."

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Added benefits: recent masterbatch advances

Recent masterbatch developments include new anti-block and anti-fog formulations, grades to improve film recycling and a formulation that extends the life of greenhouse film

Masterbatch offers a convenient way of introducing additives into a formulation. In the case of functional additives, it can be applied to a range of polymer matrices – and a variety of end markets.

Ampacet recently introduced an antifog masterbatch for flexible polyethylene (PE) applications that offers high slip performance and machinability on packaging equipment.

Specific applications for Fresh+ 1032 AF include grocery packaging for washed, pre-cut and ready-to-eat vegetables and fruits. In this type of packaging, fog and water droplets can form on interior surfaces, affecting shelf appeal and shelf life.

The new masterbatch provides attractive shelf appearance and good machinability – including a low coefficient of friction – for the manufacturing of form, fill and seal packaging.

The antifog benefits of Fresh+ 1032 AF are also

ideal for lidding applications, said the company.

The product shows good antifog performance in barrier and non-barrier single-wrap films – and laminated film structures – and provides good slip properties (COF < 0.25) without the use of a migrating slip additive.

The company has also developed a new product that can extend the UV resistance of multi-season greenhouse films that are subjected to high levels of pesticide.

AgriStab is a family of high-performance stabilisers that offer high UV resistance for applications such as greenhouses and polytunnels. These are widely used in the agricultural sector to accelerate plant growth and boost crop yields.

Farmers often use fumigation to control pests, but these chemicals can interact and deactivate light stabilisers – causing early degradation of the

Main image:
Ampacet's
AgriStab
masterbatches
extend the life
of greenhouse
film that is
exposed to
pesticides

film and shortening the life span of greenhouses.

AgriStab provides high UV protection to agricultural films when pesticides are heavily used – up to 5,000ppm for sulphur and 250ppm for chlorine. AgriStab masterbatches can extend the service life of multi-season greenhouse films beyond three years, reducing the frequency of replacement of film and lowering the impact of farming on the environment.

Testing times

Michael McLaren, a research scientist at **Ingenia Polymers** in Canada, told delegates at the recent *Agricultural Films* conference – organised by AMI – that analysis and testing can help to develop better polymer processing aid (PPA) masterbatches.

PPAs such as fluoropolymers are typically added to the melt, and coat metal surfaces of the extruder and die to reduce friction. Their performance can be affected by factors such as the presence of other additives in the mix. Adding the PPA as part of masterbatch can help to ensure the correct particle size, he said.

A typical PPA test in film processing is 'time to clear' (TtC) melt fracture testing, which measures

the time from PPA introduction to total elimination of melt fracture. For agricultural film, it is also important to test potential interactions with other additives such as hindered amine light stabilisers and anti-blocks.

In a typical test, a test resin (LLDPE) is exposed to different shear rates, and PPA loading increased gradually.

"In testing, our newer PPA grades showed significant reduction in TtC over older products," said McLaren.

Anti-block for PEF

Sukano is developing a series of anti-block masterbatches that can be incorporated into film made from polyethylene furanoate (PEF).

It is working with **Avantium**, which produces FDCA – a key precursor of PEF. Sukano and Avantium have carried out lab trials at Sukano's in-house R&D laboratory, producing biaxially oriented PEF films for packaging applications. The work has led to two prototype masterbatches that provide anti-block performance of the surface of biaxially oriented PEF film.

Both masterbatches reduce friction without



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Graphene composites

UK-based masterbatch manufacturer **Colloids** is developing a new facility to make bespoke polymer composites using its graphene masterbatch technology - called Graphanced.

Colloids has been working on its graphene R&D for more than seven years, through a number of collaborations with leading graphene producers. This work has led to the formulation of novel polymer composites. As a result, it can now offer bespoke solutions to its customers.

"We are proud to have achieved some remarkable developments in this field and are now working with major customers in the commercialisation of these products," said Marios Michailidis, new product development manager at Colloids

Left: Colloids can now offer bespoke graphene masterbatch solutions to customers

interfering with the performance of the stretched PEF films. The availability of anti-block masterbatches opens the possibility to further develop PEF and PEF-based films at pre-industrial scale equipment.

"We are impressed by the potential of PEF," said Norman Egger, CEO of Sukano. "Our expertise in additives and colour masterbatches for polyesters adds clear value to the use of PEF in various applications."

Film improvement

Evonik of Germany has developed a number of masterbatches to improve film recycling.

Firstly, Evonik developed a non-fluorinated polymer processing aid (PPA) alternative that helps to address environmental concerns. Secondly, it has focused on reducing raw materials by developing high concentration masterbatches - up to 70%

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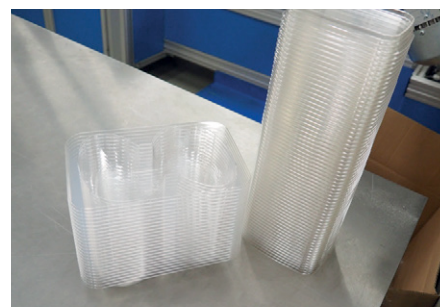
Production process

Too much friction of the sheet can result in process delays and quality loss. Anti-block agents reduce this friction so packaging can be easily separated from each other. It also ensures that exactly one cup or tray is picked up at automated filling lines.

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Top: Partly coated with anti-fog



Bottom: Stacked packaging, coated with anti-block

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IMAGE: EVONIK

Evonik trials show (left-right): a PP film structure without PPA; with fluorine-based PPA; and with 1% non-fluorinated Tegomer 6850

- that cut the use of virgin polymer, waste generation, transport and storage.

For film products, the need for sustainable performance drove development of its halogen-free PPAs - Tegomer 6810 and 6850. Their chemistries were designed as an alternative to fluorinated PPAs in film applications. The challenge was to ensure no loss in performance while removing a huge part of the base chemistry - fluorinated groups. The development relied on organo-modified siloxane (OMS) as the backbone of the new PPA. It led to a film product that was free of fluorine regulatory concerns and delivered the necessary performance. Even beyond the replacement, our exploration

"The new chemical structure resulted in an additional benefit: a permanent anti-slip property in the elastomeric PPA," said the company.

Continuing its focus on reduction, the team looked at the polymer process as a whole. One aim was to minimise waste in masterbatch additive production - by increasing loadings. Its Accurel Direct and Accurel XP help improve this with organic, porous carrier technology that is suitable

for polymers such as HDPE, PP, LDPE and EVA.

Functionally, the technology allows liquid additives to be used, absorbed and incorporated into a solid masterbatch for dosage on all extrusion lines. Users are free to add almost any liquid substance. A process using 7.5 tonnes of additive to achieve 15% activity would need 42.5 tonnes of resin and five shipping containers for the additive. With the Accurel carrier, 75% activity can be achieved using 2.5 tonnes of resin and a single shipping container, says Evonik.

"Replacement and reduction form the core of our efforts to create a sustainable future for packaging - and film that doesn't sacrifice performance," said the company.

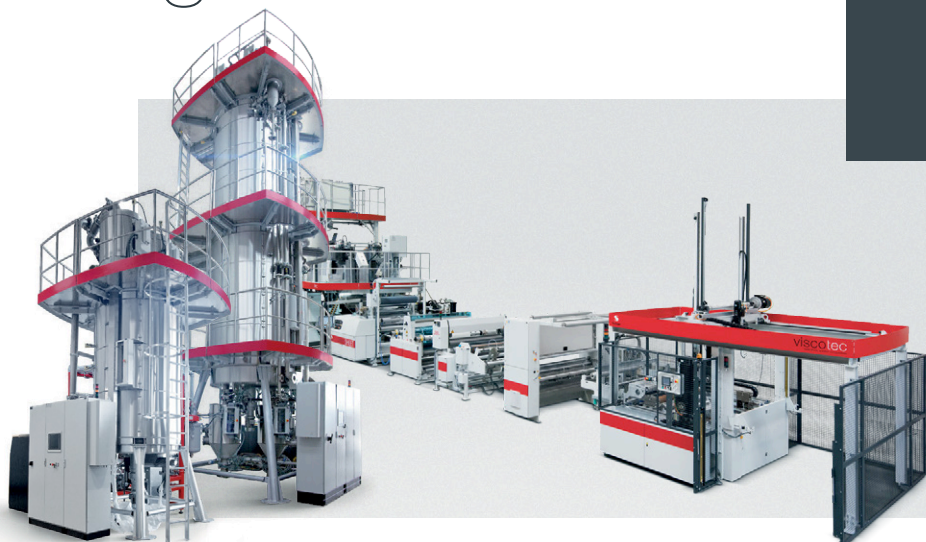
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IMAGE: DAVIS-STANDARD

Downstream equipment: latest in post-processing

Downstream equipment - whether it's stretching units, winders or roll sheets - help to ensure that finished film or sheet undergoes efficient post-processing once it has emerged from the extruder.

Davis-Standard has developed a new roll stand for both sheet and cast extrusion.

The XP Express AGT (Active Gravity Touch) features greater automation and process control for the full range of sheet (nominal 8 to 60 mil) applications.

Processors benefit from technical and bottom-line advantages of its inverted-down, multi-roll design. This facilitates improved die nip management and handling, efficient web cooling and conditioning capabilities, precision roll drive control, and high-performance web path options, says the company.

In addition, it addresses low melt strength resin delivery from die slot to nip, and expands the processing of thin gauge sheet.

"This is our most versatile and operator-friendly roll stand model yet," said Steve DeAngelis, vice president of sheet and foam at Davis-Standard. "It offers more automation and roll control, smarter ergonomics and a space-saving footprint."

The design is also engineered to give processors the flexibility to support more applications, especially in rigid and flexible packaging, he added.

The model is available in widths of 36-80in (900-2,000mm) and with process rates up to 5,500 pounds (around 2.5 tonnes) per hour. Processors can choose from three AGT roll stand options depending on requirements. Each offers an automated multi-roll gap nip, individual roll speed and temperature control, enhanced heat transfer, and an adaptable pull-roll design.

Four-point Y-axis and traverse X-axis control further supports operator functionality. In addition, uniform cooling on both sides, double polishing capabilities, reduced web stress, and consistent

Main image:
Davis-Standard's XP Express AGT roll stand is suitable for both sheet and cast extrusion

IMAGE: HOSOKAWA ALPINE



Above:
Polish film
manufacturer
ELA is making
MDO film,
using equip-
ment from
Hosokawa
Alpine

web orientation and thickness control promote high-quality flat sheets with high clarity.

Small footprint

US-based **Processing Technologies International** (PTI) has added a compact, configurable roll stand to its portfolio.

The eG series – aimed at processors with limited production floor space – is based largely on the existing G series of roll stands. This focuses on producing high-quality sheet by close temperature control, and incorporating design features to simplify the extrusion process – such as vertical nip height positioning.

Accurate sheet thickness and proper cooling is made possible via specifically engineered design of features that adjust temperature and positioning accordingly.

Hydraulic and linear bearing supported roll actuation, with motorised gap positioning, help to meet sheet thickness requirements. Spherical tapered roller bearings support chrome rolls for 0.0003 – 0.0005in Total Indicator Reading (TIR) runout in the stand. There is also dedicated heat and direct inject cooling for each chrome roll zone.

To achieve its compact footprint, the eG series offers a streamlined version of features within the G series. A linear rail sub-base system with integral floor levellers helps alignment and positioning of the system. Consolidated routings for water, hydraulic, air, and electrical utilities eliminates the need for rear-positioned energy tracks. A compact side car for temp station and control cabinet – fixed to the frame, along with a compact conveyor arrangement and fixed height controls pendant (PLC touch screen control interface) – reduces the overall layout and space requirements.

The eG series can be tailored to include equipment such as roll skew, servo motorised gap and an eAntiStat coater.

At a stretch

Polish film manufacturer ELA is to begin making mono-material laminated film, using a new line from **Hosokawa Alpine**.

The five-layer line has a layflat width of 2800mm and includes an integrated 3,000mm inline MDO film orientation unit and vacuum roll. Mono-material laminated film is a growing trend within packaging, as it is easier to recycle than multi-material film.

ELA specialises in PE films for the food, rubber and home industries, and for flexographic printing. It produces bags for frozen foods, hoods for pallets and films for fertiliser packaging. It was one Hosokawa Alpine's first customers in Poland. ELA already operates five blown film lines with different layflat widths.

The MDO technology is based on monoaxial orientation of blown film. Here, the film is drawn between two rolls that rotate at different speeds. Depending on the application, the film passes over 8-12 rolls, two of which are stretching rolls. After heating to the optimum temperature, the film is brought to the desired ratio in the stretching phase.

"The stretching process reduces film thickness while improving optical and mechanical properties – such as barrier properties, stiffness, transparency and machinability," said Andrzej Olcha, area sales manager for Poland at Hosokawa Alpine. "Overall, the process can reduce raw material requirements and increase efficiency."

A Trio system integrated into the line reduces neck-in by up to 50%. Film flatness is optimised, and a uniform thickness profile is produced. The vacuum technology also ensures high process stability, says Hosokawa Alpine.

Sustainable boost

Wipak UK has used a laser slitter from **Comexi** in the production of its flexible barrier packaging.

The S1 DT slitter, with double-sided laser scoring, will help Wipak to "further develop its sustainable packaging portfolio". The slitter is installed at Wipak UK's site in Welshpool in Wales.

"This patented technology not only saves costs regarding the addition of labels, but also makes the perforation laser on both sides of the film – resulting in cost reduction, plastic savings and increased productivity," said Ramon Jonama, area manager for Comexi in the UK.

Cores, knives, laser heads, photocells and other adjusting elements of the machine are self-calibrating, thanks to an interactive user interface. This level of automation allows the operator to load the reel into the machine and deliver finished reels, without the need to intervene.

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New market report

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Above: PTI's eG series of configurable roll stands is aimed at processors with limited floor space

The turreted version of the S1 DT can perform jobs that require a large number of output reels, and can work with the thickest materials used in the flexible packaging market. It also includes Comexi's laser module. This system allows the converter to run any flexible packaging laser – including easy open, micro-perforations, windows and resealable. The in-line laser patented systems facilitate subsequent applications and processes, to increase productivity, capacity and customer benefits, says Comexi.

Andrew Newbold, managing director of Wipak UK, said the machine formed part of Wipak's largest project investment in the UK. It was chosen partly because other parts of the group have successfully installed Comexi machines.

Medical protection

At the recent **ICE Europe** converting exhibition, **Reifenhäuser** presented its new Ultrathin Coating process for film/nonwoven composites. It is particularly aimed at the medical sector, for making products such as medical protective clothing.

The process can produce lightweight film/nonwoven composites with higher cost efficiency and, consequently, more competitively. Advantages include: a reduction in film grammage by 66%; material consumption in the overall composite is cut by 28%; and it lowers costs by up to 34% compared to conventional semi-finished products. Cost savings are achieved in several ways – such as by replacing hotmelt adhesives, which helps to reduce line maintenance.

"We are experiencing a sustained increase in demand for medical protective clothing combined with a return strategy for local production capacity," said Mark Borutta, sales and marketing specialist at Reifenhäuser Cast Sheet Coating. "Against this backdrop, producers achieve a fast return on

investment and high profitability with Ultrathin Coating – even when production is based in Europe."

Even if manufacturers already make medical protective clothing – and prefer to handle the coating process internally in future, instead of importing the necessary composites – it is worthwhile setting up an in-house production facility, says the company.

Investing in Ultrathin Coating usually pays for itself within 12 months, says the company. The lower material input also reduces the consumption of fossil raw materials – which responds to the increased demand for more sustainable products.

ICE breakers

Several slitter and winder manufacturers also presented recent developments at ICE converting exhibition, which was held recently in Germany.

Euromac of Italy gave exhibitors a first look at its TB-3 08N model – part of its TB-3 series of duplex and duplex turret slitting machines. The new model will be introduced later this year. It was developed specially for printed material – but can be applied in many other applications, according to the company.

In addition, Euromac showed its CB800 Doctor rewinder, which has maximum web widths of 300-700mm.

In addition, **LAEM IMS** presented two of its machines. Riboslit is its new, compact slitter-rewinder designed for flexible packaging converters – requiring minimum operating space and investments; and TR4, a robust, automated slitter-rewinder designed for high productivity and efficiency requirements, says the company.

Happy customer

Another ICE exhibitor, **Bimec** of Italy, recently delivered its first BBox duplex turret slitter rewinder to Sacchital, a flexible packaging specialist.

Sacchital needed to expand production department with an automated, flexible and versatile slitter rewinder that could process different types of material and reduce downtimes between each working cycle.

It tested its own material on the system – in real time – at Bimec's premises. The machine's technical innovations include several automation and servo-assistance solutions that help to boost productivity.

For instance, core loading and positioning – and the reel ejection phase – have been automated and integrated with the rotating reel unloader. In addition, a gravity manipulator can handle reels up to 300 kg.

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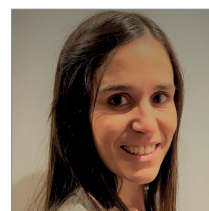
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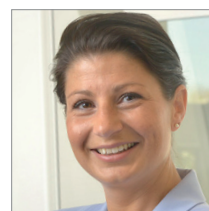
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The machine reaches a maximum speed of 800 m/min, unwinds mother rolls up to 1000mm – or up to 1200mm upon request – and rewinds finished rolls up to 610mm.

"We are very satisfied with BBOX," said Alberto Luppi, who heads up investment at Sacchital. "As soon as we tested it, we realised the benefits it would bring to our production department."

China supply

Goebel IMS is to supply 16 Monoslit 9000 BOPP slitter rewinders to a Chinese BOPP film manufacturer.

Fujian Forop Advanced Materials plans to build two new production sites in southwest and south-east China by 2025 – giving it six production sites with 30 BOPP production lines.

On top of the existing agreement, IMS expects to finalise another contract this year to deliver more primary slitter rewinders for another six BOPP production lines at Forop.

"This project is unique in our history," said Tobias Lankswert, managing director of Goebel Schneid- und Wickelsysteme. "With this project, we show we are a world leader in primary slitting and rewind-

ing, especially in high-speed BOPP converting."

Last year, Goebel supplied a series of Monoslit Giant slitter rewinders to Chinese client Yongguan Group as part of a €125 million investment in a new industrial site for making adhesive BOPP film tape. This involved Yongguan adding four BOPP film lines, using Goebel IMS slitter rewinders.

The first was an 11m Monoslit Giant with a slitting speed of up to 1,500m per minute. A second 11m primary slitter was also ordered, while the slitter for the third and fourth lines are both 9m wide.

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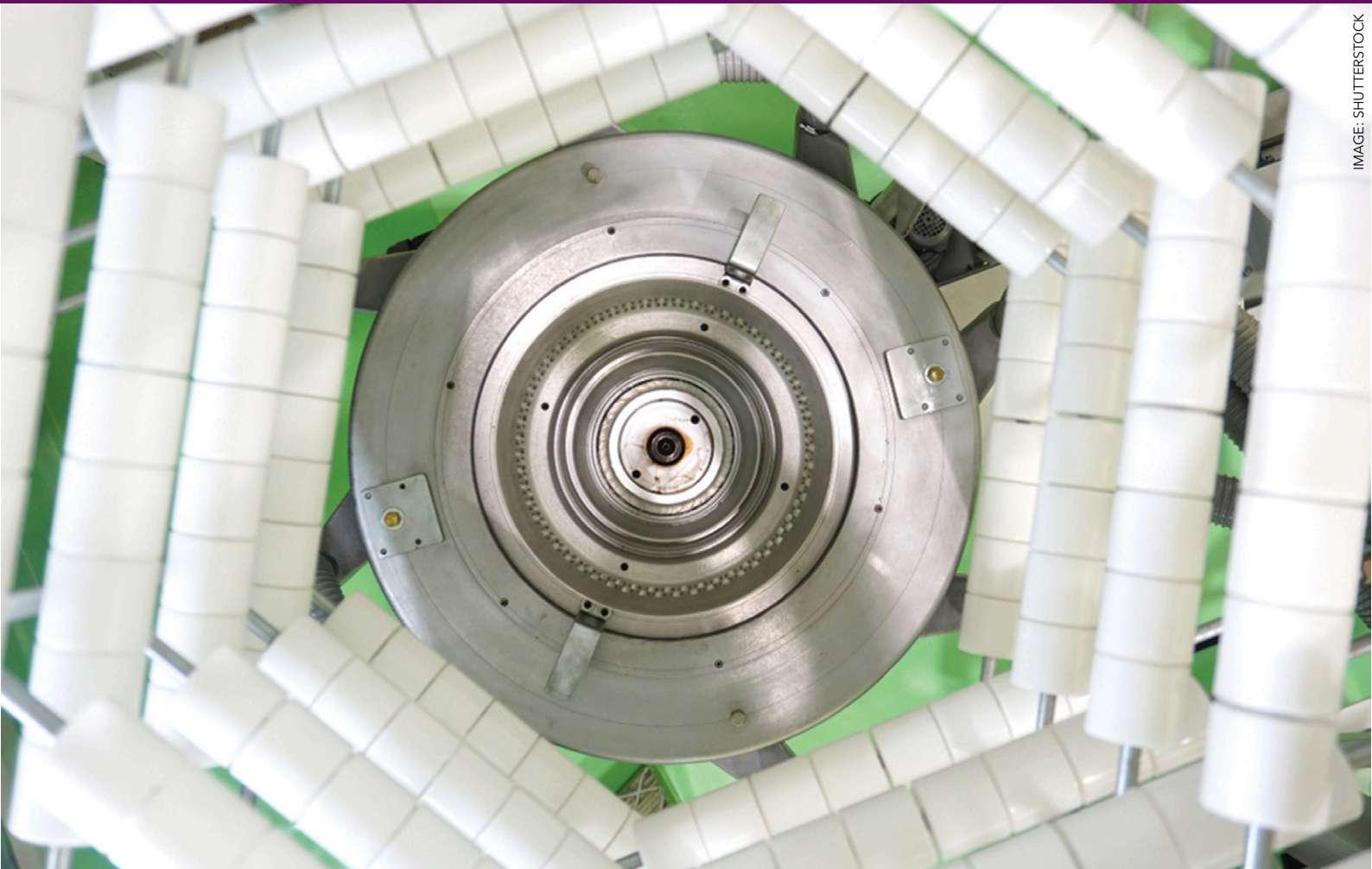


IMAGE: SHUTTERSTOCK

Bubble machine: blown film dies

Blown film dies and related components help to ensure that extruded film is produced at sufficient speed and quality – for either single- or multi-layer products

A new blown film line is a major investment and is likely to include all ancillary components – including dies. However, technology advances can mean that advances in areas such as dies can help to improve the running of the line.

Retro benefits

Windmüller & Hölscher (W&H) of Germany has retrofitted two blown film extrusion lines – one in Spain, and one in the USA – with more modern equipment, including dies.

At **Mondi** in the USA, the company has installed a new die and air ring, two 70mm extruders, a user interface and new drives.

"We were working within our budget and decided to optimise the line with a retrofit and it was

a great decision," said PJ Cormier, vice president of operations at Mondi, based in Jackson, Missouri.

The original W&H Varex line was fitted 23 years previously at Mondi.

"The new line is running great: we have seen an improvement in film quality and are filling more orders," said Cormier.

The films are being used for roll stock, and for printing and converting into bags onsite.

Don Farrow, extrusion department manager at Mondi, added: "The new die and extruders made a huge difference, as did the Arctis air ring and the single supply – which saves space."

He said that the installation took one month and went very smoothly – despite happening during the height of the COVID pandemic. ➤

Main image:
Blown film dies and accessories such as air rings are critical to film quality

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High stability

In addition, **Gaviplas** of Spain has increased blown film capacity while maintaining quality - without adding floorspace - by adding new air ring technology to an existing W&H blown film line.

First, data from the three-layer line - installed in 2018 - was collected and analysed. The machine, originally equipped with a dual lip air ring, was running at or above the guaranteed output - with bubble stability being the main limiting factor. The extruders and die head had noticeable spare capacity, so using a more powerful air ring would help to raise performance.

Analysis predicted an estimated 10% increase in output.

Exchanging the relevant air ring parts was completed in a few hours and the line was restarted without getting cold. Rather than having the Multicool dual lip air ring resting on top of the die head, the modified air ring operates in an elevated position.

An increase in bubble stability was immediately obvious. Under the guidance of the W&H technician, the new configuration was tweaked for maximum output.

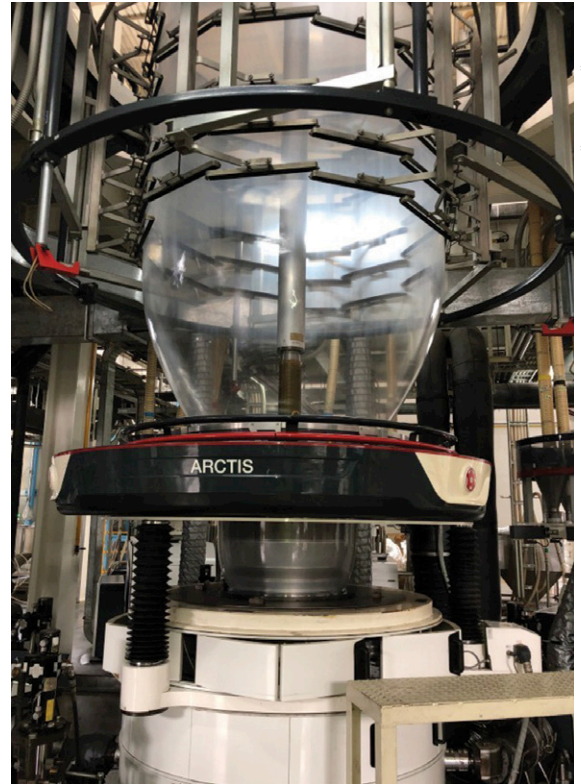


IMAGE: WINDMÖLLER & HÖLSCHER

Above: Mondi upgraded a 23-year-old W&H Vares line by retrofitting a new die and air ring

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Right: GAP has installed a 27-layer blown film line with 400mm coextrusion die at its R&D centre

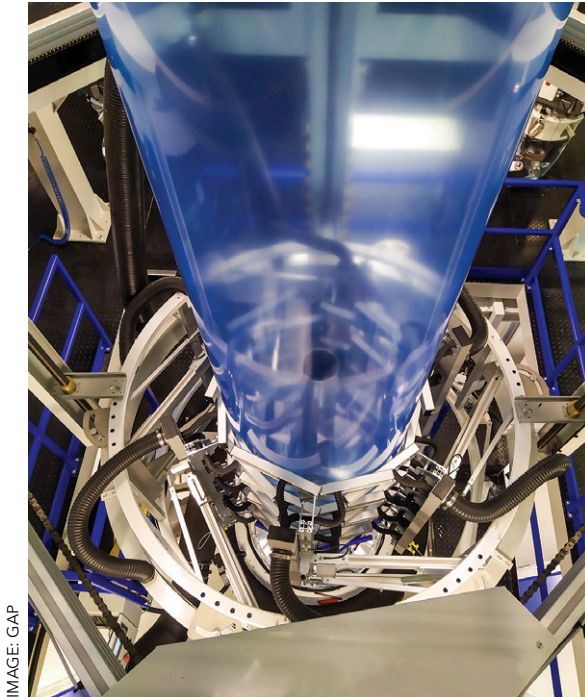


IMAGE: GAP

The most difficult product – a very high gauge film, made from soft material – reached a 10% output increase, while most products saw up to 20% higher output.

“Retrofitting new air ring technology to older lines will allow for even higher output increase numbers,” said W&H.

However, it was important to check that components such as the extruder and the die head have enough spare capacity to benefit from the increase in bubble stability.

“This was checked beforehand – so this retrofit was done with minimum risk,” according to the company.

Multiple layers

GAP of Italy has installed a 27-layer blown film line with multi-layer die at its research and development centre in Trecate.

The 27-layer bubble film line uses microlayer technology to create structures with improved mechanical characteristics and reduced thickness – which helps to save material.

The line includes nine extruders and a 27-layer coextrusion die with a diameter of 400mm. It also includes an automatic air-cooling ring control and software control systems. The line can use multiple combinations of materials to create different coextruded film structures.

GAP has tested several structures on the new line, both with blocks and alternating layers. Thanks to the laminar flow structure, it has managed to raise mechanical performance and reduce thickness by up to 25%.

Microlayers allow thin layers of polymer to be oriented more easily. For instance, layers of PP can be inserted between layers of PE to increase rigidity and decrease pin holes. GAP has inserted EVOH layers to improve the barrier effect and recyclability.

GAP will also install a series of three-layer bag production lines – incorporating 100mm die and IBC – at its R&D centre. The lines have been designed for low-range and high-flow production.

CLICK ON THE LINKS FOR MORE INFORMATION:

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www.ami.ltd/Polymer-Sourcing-event

MULTI-LAYER FILM

Adhesive with higher solids content

Toyo-Morton – part of Japan's Toyo Ink – has developed a new adhesive for use in laminated films that is partly bio-based.

Ecoad EA-B3860/EA-B1290 is a solvent-based adhesive for dry lamination of multi-layer films in flexible packaging that contains over 40% coating solids by weight. Formulations contain less solvent – which helps to reduce overall CO₂ emissions during lamination by about 25% compared to Toyo's general-purpose laminating adhesives.

The high level of solids also leads to less waste recovery and disposal – leading to greater operational efficiencies and a cleaner work environment. In addition, the new systems were formulated with up to



Above: Toyo-Morton's adhesive for laminated films is partly bio-based

10% by weight of bio-based or renewable content at the dried adhesive layer.

Toyo-Morton engineers raised the solids content of its laminating

adhesive compositions to 40% in the coating process, while replacing some of the raw materials with sustainably sourced equivalents.

Increasing the solids content typically raises the viscosity of the coating adhesive, which can impair coating performance and degrade physical properties. Using proprietary polymer design technology, Toyo-Morton eliminated these trade-offs.

"We responded to customer requirements to reduce hazardous chemicals at the raw materials sourcing stage and improve processing efficiency, while actively applying renewable raw materials," said Satoshi Maeda, general manager of Toyo-Morton's technical department.

➤ www.toyoink.jp/en/

BARRIER FILM

Barrier film at low cost

Toray Industries has developed transparent and flexible high barrier film that it says costs 80% less than conventional equivalents.

The saving comes from the film's design and formation technology. Toray plans to commercialise the film in 2023 for high barrier applications such as flexible devices and solar cell encapsulation.

Toray has adapted techniques used to make barrier film for food packaging and attained a high barrier to water vapour.

➤ www.films.toray/en/

BIOPLASTICS

Cellulose-based plastic film

Two Finnish companies have commercialised a new plastic film made from cellulose-based raw material.

Bag converter Amerplast has used the raw material from Woodyly to make a heat-sealed bag for takeaway products. The HelmiSimpukka restaurant chain in Finland is using the film to package its display case sandwiches.

Woodyly says that the film made from its material has a lower carbon footprint – and easier recyclability – than one made from traditional cellophane. The film can also prevent moisture condensation and preserve fresh food for longer, it says.

"With our material, we can cover many packaging product categories," said Jaakko Kaminen, CEO of Woodyly. "As a producer

Amerplast plays a key role when we are developing new material applications."

Ari-Pekka Pietilä, chief sales and marketing officer at Amerplast, added: "Woodyly's plastic material and our technical know-how is a perfect match that supports our commitment to increase the use of bio-based raw materials in our packaging."

➤ www.woodyly.com

➤ www.amerplast.com

ADDITIVES

BASF boosts antioxidant capacity

BASF has doubled capacity for its Irganox 1010 antioxidant at its site in Singapore, to meet increasing demand from Asia and the Middle East.

"Expanding capacity allows us to support our customers' growth plans," said Hermann Althoff, senior VP at BASF Performance Chemicals Asia Pacific.

Irganox 1010 is a sterically hindered phenolic primary antioxidant that protects against thermo-oxidative degradation.

➤ www.basf.com

MONOMERS

Making precursors from CO₂

LG Chem and the Korea Institute of Science and Technology (KIST) have developed a way to make plastics precursors from carbon dioxide from the air.

The joint researchers say that their electrochemical conversion reactor increases the efficiency of converting CO₂ into carbon monoxide (CO) – which can be used to produce various chemical raw materials.

The reactor produces both carbon monoxide and Syngas, which serves as a raw material for various fuels and chemical compounds. The reactor controls the ratio of carbon monoxide and hydrogen by adjusting the voltage.

The team said that the

efficiency of the electric current used for CO₂ decomposition and reduction was over 90% – claiming this was “the highest figure reported in any published paper thus far”.

They added that the technology showed good potential for commercialisa-

tion by applying a stack method – where cells in the reactor are stacked sideways.

“This research has laid the foundation for commercialising carbon dioxide conversion technology,” said Yu Jiyung, CTO of LG Chem.

➤ www.lgchem.com



Above: LG Chem and KIST have developed plastics precursors from carbon dioxide from the air

RECYCLING

Plasma conversion of plastic

Researchers at Iowa State University say they have devised a way to convert waste plastic films into biodegradable polymers at relatively low cost.

They have developed a process called non-thermal plasma-based, chemical conversion. Non-thermal (or ‘cold’) plasma is a partially ionised gas with high chemical reactivity, which is generated by applying a high-voltage electric field to neutral gases.

“Our hybrid conversion technology will convert waste plastics into biodegradable polymers at improved carbon and energy efficiencies,” said Xianglan Bai, associate professor of mechanical engineering at Iowa State.

Bai and her team plan to convert contaminated waste plastic films, mainly polyolefins, into “environmentally friendly polymers”.

➤ www.iastate.edu

BARRIER FILM

Recycling of blister packaging

Recycling specialist TerraCycle has recognised Honeywell’s Aclar barrier film blisters as technically recyclable for PVC and PETG-based blisters.

Honeywell has developed a lab-scale process that allows Aclar – a high-barrier film for pharmaceutical packaging – to be separated from blister

packaging. Honeywell expects the reclaimed material to be used downstream for non-pharmaceutical products.

➤ www.honeywell.com

RECYCLING

Enzymes used to recover barrier film

Solvay and Carbios have shown that multi-layer PET/PVDC films can be recycled using enzymes.

The research shows that the PET is fully depolymerized, while the PVDC coating remains intact.

The process uses Carbios’ enzymatic technology. It is based on results of a proof of concept by Solvay, which showed that PVDC

multi-layer film can be recycled without affecting its barrier.

“OEMs and brand owners are under pressure to improve sustainability,” said Guruprasad Sivakumar, head of marketing for consumer, healthcare and environment at Solvay. “PVDC has long been used for coating flexible PET films, but these multi-layer structures have been challenged

regarding their recyclability.”

The recycling process uses enzymes to break the PET molecules back into their constituent monomers. It uses moderate temperatures and can be applied to both post-industrial and post-consumer waste. The monomers could be purified for reuse in the making new PET.

➤ www.solvay.com

Download these new product brochures

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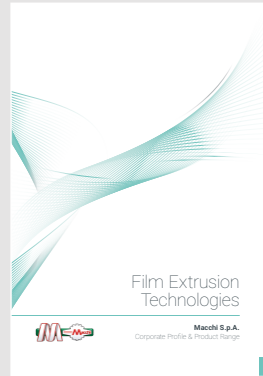
DIING KUEN: BLOWN FILM



In this brochure, Taiwan-based Diing Kuen provides all the specifications of its blown film technology to produce mono, two, three and five layer films. The film lines are divided into four categories: HTRL horizontal top rotating; EBLR vertical top rotating; BFL fixed; and other types.

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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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CHEMOURS: PROCESSING AIDS



In this brochure, Improving the Efficiency and Quality of Polyolefin Extrusion, Chemours explains how issues including melt fracture and extrusion instabilities can be addressed with its Viton FreeFlow products, the next generation of polymer processing aids.

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POLYSTAR: PLASTICS RECYCLING



Recycling Made Simple is the brochure from Polystar where you can find information about all of the company's plastics recycling systems. Its Repro Flex lines can recycle post-industrial and post-consumer PE/PP packaging and PP raffia/woven materials.

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GLOBAL COLORS GROUP



Find out about Global Colors Group in this brochure showcasing the group companies, their vision and focus on quality, R&D, technology and sustainability. Its portfolio includes colour, white and black masterbatches.

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If you would like your brochure to be included on this page, please contact Claire Bishop claire.bishop@ami.international. Tel: +44 (0)1732 682948

East Jordan Plastics

Head office:	East Jordan, Michigan, USA
President:	Scott Diller
Founded:	1947
Ownership:	Private
Profile:	East Jordan Plastics, founded in 1947, began as a manufacturer of wooden greenhouse flats. Today, it is a leading producer of thermoformed (and injection moulded) plant containers. It supplies the horticultural market - both directly and through a team of distributors across North America. Most of its containers use a high percentage of recycled plastic and are recyclable through the use of a 'closed loop' recycling process. The company recycles more than 20 million pounds (around 9,000 tonnes) of horticultural containers each year.
Product lines:	The company produces a diversity of products, though all focused on a single market: horticulture. These include pots, trays, hanging baskets and other products for home gardeners - sold mainly through garden centres. As well as selling unmarked growing pots, the company has a wide range of labelled and printed pots. These include adhesive labelled pots, and pots that can be directly printed on with everything from logos to barcodes.
Factory locations:	The company makes its products at three separate facilities in Michigan: at its East Jordan headquarters, and two other facilities in Beaverton and South Haven (which is a recycling facility). In addition, the company recently invested around US\$44 million in a new 255,000 sq ft factory in Lyons in Georgia. In its first year, the facility will be used for logistics and distribution. Over the next five years, it will be developed to include recycling and manufacturing operations.

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:

July August 2022

Bioplastics
Plastic pouches
Stretch/shrink film
K2022 Visitor Guide

September 2022

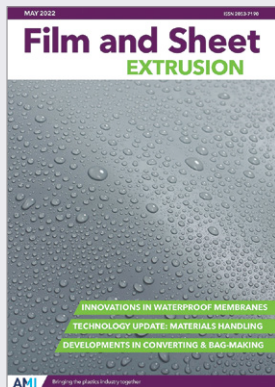
Multi-layer packaging
Thermoforming
Plasticisers * Lab extruders
K2022 visitor guide

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

For information on advertising in these issues, please contact:
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Film and Sheet May 2022

The May edition of Film and Sheet Extrusion has features covering advances in waterproof membranes, how polymer processing can be improved through materials handling and developments in converting and bag-making.

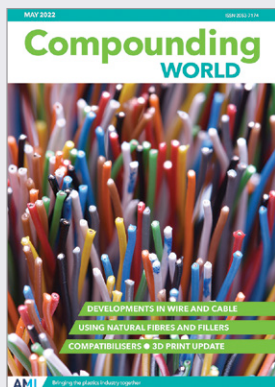
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Film and Sheet April 2022

The April issue of Film and Sheet Extrusion has features that shine a light on advances in photovoltaics, the advantages of polyolefins for recycling of films and the latest products from suppliers of slitters and rewinders.

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Compounding World May 2022

The May issue of Compounding World looks at how electric vehicles and other growth markets are supporting demand for wire and cable. Plus features covering plant-derived natural fibres and fillers, compatibiliser additives, and 3D printing materials.

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Plastics Recycling World May/June 2022

The May-June edition of Plastics Recycling World has these features covering: Shredding advances lead to greater precision; What's new in compatibilisers; Processors can get more from in-house recycling.

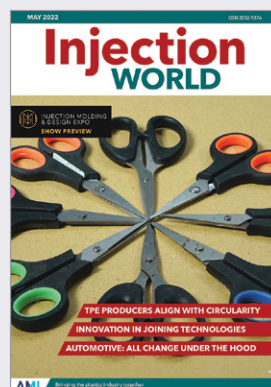
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Pipe and Profile May/June 2022

The May-June issue of Pipe and Profile Extrusion examines corrugated pipe, how it continues to find use in cutting-edge projects, and how machinery producers look to improve speed, performance and control. Plus features on recycling/granulators and pressure pipe.

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Injection World May 2022

The May edition of Injection World magazine takes a look at how TPE producers are responding to the needs of the circular economy. It also explores some of the latest innovations in plastics joining technologies and under-the-hood automotive.

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GLOBAL EXHIBITION GUIDE

2022	10-13 June	IPLAS, Chennai, India	www.iplas.in
	26-30 September	Colombiaplast, Bogota, Colombia	www.colombiaplast.org
	27-29 September	Fachpack, Nuremburg, Germany	www.fachpack.de
	4-7 October	Plastex, Brno, Czech Republic	www.bvv.cz/en/plastex
	19-26 October	K2022, Dusseldorf, Germany	www.k-online.com
	9-10 November	Plastics Extrusion World Expo North America	https://na.extrusion-expo.com/
	29 Nov-1 Dec	Plastic Print Pack West Africa, Accra, Ghana	www.ppp-westafrica.com
2023	17-19 January	Swiss Plastics Expo, Lucerne, Switzerland	www.visit.swissplastics-expo.ch
	1-5 February	PlastIndia, New Delhi, India	www.plastindia.org
	17-20 April	Chinaplas, Shenzhen, China	www.chinaplasonline.com
	4-10 May	Interpack, Dusseldorf, Germany	www.interpack.com
	30 May-2 June	Equiplast, Barcelona, Spain	www.equiplast.com
	5-8 September	Plast 2023, Milan, Italy	www.plastonline.org/en
	26-28 September	Interplas, Birmingham, UK	www.interplasuk.com
	17-21 October	Fakuma, Friedrichshafen, German	www.fakuma-messe.de


AMI CONFERENCES

13-15 June 2022	Thin Wall Packaging North America, Chicago, USA
14-15 June 2022	Chemical Recycling Europe, Cologne, Germany
16-17 June 2022	Multilayer Flexible Packaging North America, Chicago, USA
16-17 August 2022	Agricultural Film North America, San Diego, USA
7-9 November 2022	Waterproof Membranes Europe, Cologne, Germany
15-17 November 2022	Multilayer Flexpack Europe, Vienna, Austria
30 Nov-1 Dec 2022	Breathable Films Europe, Berlin, Germany

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