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COVER IMAGE: SILVIA CARDARELLI, UNIVERSITY OF MICHIGAN

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Constantia expands in printing

Flexpack manufacturer Constantia Flexibles has acquired Lászlópack, a Hungarian specialist in flexo printing. Financial terms of the deal have not been revealed.

Lászlópack operates a plant in Komárom, around 100km northwest of Budapest, and employs nearly 90 people. It supplies mainly food applications to the local market and some export countries.

Constantia has previously expanded its European flexo printing platform through the acquisitions of Propak in Turkey, FFP Packaging Solutions in the UK and Drukpol in Poland.

"This acquisition further seizes new growth opportunities for Lászlópack to grow outside Hungary - and for us to support their customers with our more sustainable product offerings," said Pim Vervaat, CEO of Constantia Flexibles.

➤ www.cflex.com

Researchers replace windows in Ukraine

UK-based researchers have developed a temporary solution for windows that have been destroyed by the war in Ukraine - and is distributing them.

The charity, called Insulate Ukraine, says that up to 10 million windows have been blown out during the war. Rising energy prices and winter temperatures make this an urgent problem, they say - as windows are a key component of good building insulation.

The solution insulates in the same way as double

glazing, lets light through, costs around US\$15 per window, and can be assembled at home - using basic materials - in around 15 minutes, says the charity.

The window uses one-inch PVC pipe to build a frame. A single sheet of polyethylene is then wrapped around this and secured in place by an 'insulation noodle' attached to the frame. The outer frame is then wrapped using more polyethylene. This results in a window made of triple-glazed PE sheet.

➤ www.insulate-ukraine.org

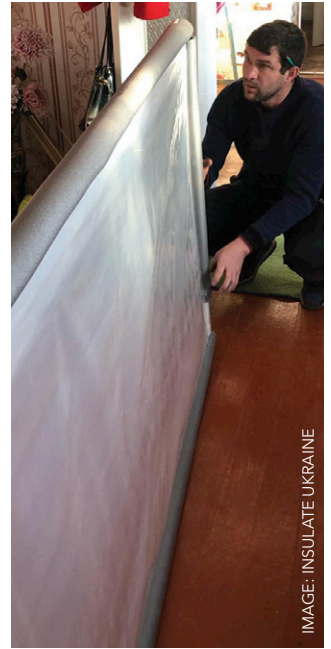


IMAGE: INSULATE UKRAINE

French solution for flexible film waste

TotalEnergies and recycling group Paprec have signed a long-term agreement to develop a value chain for chemical recycling of plastic film in France.

Under the agreement, Citeo, the main organisation in charge of end-of-life household packaging in France, will provide a stream of flexible PCR plastic waste

to Paprec's plant at Amiens, where a sorting and preparation line will be built. TotalEnergies will use Paprec's output in its chemical recycling plant at Grandpuits, which is currently under construction.

"This long-term agreement is a major milestone for our advanced recycling plant at Grandpuits

as it guarantees a supply of waste of French-origin," said Valérie Goff, Senior Vice President Renewable Fuels & Chemicals at TotalEnergies.

The Grandpuit chemical recycling plant is designed to process 13,600 tonnes/yr of waste plastic and is scheduled to begin operation in 2024.

➤ <https://totalenergies.com>

Recycling PET trays into PET packaging film

Indorama and Evertis are teaming up to use flake from recycled PET trays to produce PET film suitable for food packaging trays.

Indorama says its technology could divert 50 million post-consumer PET trays from landfill or incineration each year.

After six years of R&D, Indorama is commercially producing recycled PET

flakes from post-consumer trays at its Verdun facility in France. This supports a closed-loop economy for PET trays, it says.

"PET trays provide safety and convenience to consumers, ensuring longer shelf life for food and reducing waste," said Marta Matos Gil, chief sustainability officer at Evertis. "This project helps us to meet our

sustainability goals and boost product innovation in terms of circularity, recyclability, and eco-design."

Yash Lohia, chairman of Indorama's ESG council added: "Our Deja sustainable ingredients brand, including rPET, supports the EU's plastic collection and recycling targets."

➤ www.indoramaventures.com

➤ www.evertis.com

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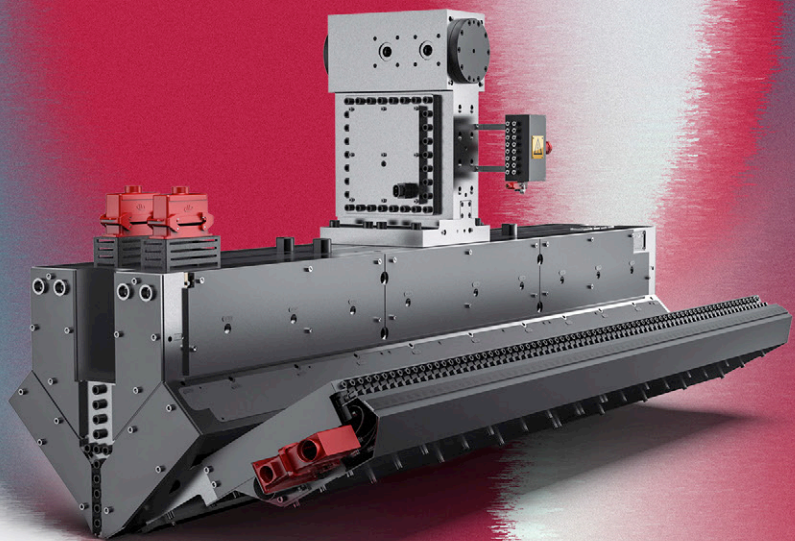
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Italian machinery manufacturers see sales rise by 5% in 2022

Sales of Italian plastics and rubber processing machinery grew by 5% in 2022.

Amaplast, which represents Italian machinery makers, said that the sales of nearly €4.7 billion (US\$5.1bn) was its second-highest performance of all time.

The main driver for the growth was exports, which rose nearly 9% to €3.25bn (US\$3.56bn). Within this, exports to the European

Union rose 8%, though sales to the UK were down by nearly 10% - taking it from sixth to tenth on the table of largest export markets. Sales to the Americas rose 12% thanks mainly to a 33% rise in exports to South America. At the same time, sales to Asia rose by 9% - with India up 24% but China down 7%.

Export sales of extruders rose by 23% while those of thermoforming machines

fell by 22%. For comparison, injection moulding machinery sales were flat and blow moulding machines were down 19%.

The domestic market remained stable, with a growth of less than 1% to €2.54bn (US\$2.78bn).

Regarding the first quarter of 2023, Amaplast members expected to see an average 7% in orders (compared to Q1 of 2022)

and a 6% increase in sales.

"The outlook for the rest of 2023 remains uncertain, given the economic and political context," said Amaplast. "While energy costs and the availability of raw materials and components have shown some improvement, troubles continue to be the order of the day - such as the recent bank crisis."

➤ www.amaplast.org

VTT scales up cellulose film production at its pilot plant

Finnish research centre VTT has invested €1.5 million to scale up a pilot plant for making cellulose film.

The material can be used to replace conventional plastic film in food packaging. The investment will allow the plant to begin testing and developing processes to enable mass production of these films.

"There is a great need to replace polypropylene film with a more sustainable alternative," said Ali Harlin, research professor at VTT. "The new facility is a step forward in making sustainable materials more mainstream."

The pilot plant's focus is to improve barrier properties and to make packages from the new materials. VTT estimates that the material could have wide industrial use within five years. It says



Harlin: "Customers can't differentiate between our cellulose-based films and traditional plastic wraps"

it is already working with more than 30 partners.

"We've received feedback from our customers that they can't tell the difference between our cellulose-based films and

traditional plastic wraps," said Harlin.

VTT first announced its sustainable alternative for plastic film back in June 2022.

➤ www.vttresearch.com

Amcor tests nano-coating

Packaging major Amcor is looking to use nanocoating technology from Nfinite Nanotechnology to enhance both recyclable and compostable packaging.

In the proof-of-concept phase of the project, Nfinite's coating technology will be applied to Amcor's existing recyclable and compostable packaging material. The aim is to deliver an oxygen barrier to boost performance.

"This joint research project agreement showcases our commitment to sustainability and innovation," said Frank Lehmann, VP of corporate venturing and open innovation at Amcor.

➤ www.amcor.com

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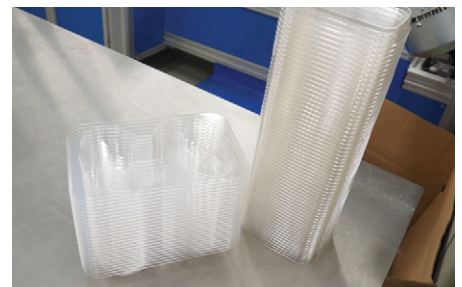
Production process

Too much friction of the plastic sheet can lead to process failures and loss of quality. Anti-blocking agents reduce this friction, making it easy to separate packages from each other. It also ensures that exactly one cup or tray is picked up at automated filling lines.

Would you like to know more? Let's get in touch!



Top: Partly coated with anti-fog



Bottom: Stacked packaging, coated with anti-block

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Extruder deliveries in North America improve in Q4 2022

Deliveries of primary plastics machinery - including extruders - in North America rose in the final quarter of 2022, according to the statistics from the Plastics Industry Association.

The preliminary estimate of total value from reporting companies was nearly US\$433 million for the period - an increase of more than 22% compared to the third quarter. Compared to Q4 2021, it represented a rise of over 4%.

Of the three primary types of plastics machinery, the value of single-screw extruders increased the most - up nearly 35% compared to Q3 2022. Injection moulding deliveries rose 25% in the same period, while those of twin-screw extruders rose nearly 9%.

Compared to Q4 2021, deliveries of single- and twin-screw extruders rose by around 8% and 25%, respectively, while injection moulding

machines were nearly 3% higher.

"The increase in plastics machinery in the fourth quarter speaks of the importance of plastics manufacturing - and the stable demand for plastic and plastic products in the economy last year," said Perc Pineda, chief economist for the organisation. "As expected, the increase includes backlog production resulting from supply chain problems in previous quarters."

The association's Committee on Equipment Statistics (CES) also conducts a quarterly survey of plastics machinery suppliers, for their perspective of market conditions and expectations.

The survey showed an increase in participants expecting market conditions in the next quarter to remain unchanged or improve - from around 31% to 36%. Similarly, those participants who expect market

conditions over the next 12 months to remain unchanged or improve rose from 34% to 45%.

Plastics machinery exports fell 10% to nearly US\$199m in the third quarter. Mexico and Canada remained the top export markets of plastics machinery from the US in the third quarter. Combined exports to USMCA partners reached nearly \$110m - representing two-thirds of total plastics machinery exports from the US.

Imports fell 12% to \$424m in Q3. The US plastics machinery trade deficit narrowed from \$261m in Q2 to \$225m in Q3. This shows that moderating global economic growth and a strong US dollar is slowing the plastics machinery trade, said the organisation.

"I previously said that Q4 2022 shipments would surpass Q3 2022 shipments - and that's what we got," said Pineda.

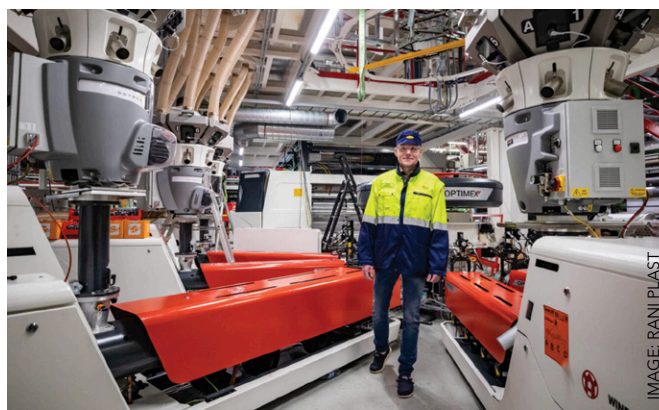
➤ www.plasticsindustry.org

Raising capacity of agricultural film

Rani Plast of Finland has invested in its Bjölas plant in order to raise production capacity.

The investment includes three lines for five-layer film and one for seven-layer. The factory now has four production lines producing seven-layer agricultural film. Adding the fourth line has boosted capacity and extended its product range, says the company.

"We can deliver silo film in several dimensions - in widths from 5 to 22 metres," said Dennis Granqvist, sales director at Rani Plast. "The demand for silo bags has grown, partly due to the war



Above: Rani Plast has boosted capacity of agricultural film at its Bjölas plant in Finland

in Ukraine. The new production line has enabled us to better meet our customers' needs."

The investment also included an 'Eco facility' to

help the company achieve its sustainability goals. It has been used to melt Rani's production waste into granules.

In future, it will also

process plastic waste from customers.

"Our customers have their own production lines that generate waste. This will enable us to process their waste and speed up the shift to a circular economy," said Granqvist.

He adds that the investment not only boosts production but improves flexibility and efficiency.

"The extruders have new features - including an in-line printing unit - offering converters a relatively cost-effective way to streamline their processes," he said.

➤ www.raniplast.com

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Chinaplas returns to Shenzhen for 2023



IMAGE: ADSALE

Above: Chinaplas 2023 will have a strong focus on green technology

The Chinaplas show will run again this year, following last year's cancellation due to the country's 'Zero Covid' policy.

The event is held at the Shenzhen World Exhibition and Convention Center (SWECC) in Shenzhen on 17-20 April 2023.

Adsale, the show's organiser, expects more than 3,900 exhibitors to be at the event, including many from overseas. In addition, it says there are nine overseas 'country pavilions' - from countries including France, Germany, Italy, Japan, the UK and the US.

In addition, China has relaxed its travel restrictions - which have, in the past few years, prevented most

foreign visitors from attending the show. This year, Adsale says only a negative PCR test is required. There is no quarantine on arrival.

The show will have a strong focus on sustainability - with a series of special events and presentations on the topic.

One example is its Recycling & Circular Economy Conference and Showcase, which takes place on 16 April - the day before the show opens.

During the event itself, Tech Talk sessions will showcase a number of sustainable technologies and applications.

> www.chinaplasonline.com

US association says NPE floor space 'selling quickly'

The US-based Plastics Industry Association has sold more than 1 million sq ft of space for the NPE show - to more than 1,100 exhibitors.

The space was sold at an in-person Space Draw event. NPE takes place on 6-10 May 2024 in Orlando, Florida.

"We're thrilled to see this level of commitment, 14 months ahead of the

show opening," said Matt Seaholm, president and CEO of the association.

The show will highlight product and service advances in seven technology zones, covering areas including advanced manufacturing, materials science, recycling and sustainability, and packaging.

> www.npe.org



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Growing pains: using plastics in agricultural film



IMAGE: SHUTTERSTOCK

Agriculture relies heavily on plastic films - from mulching to crop protection - but the need to boost sustainability means users and producers must look at ways to reduce problems such as pollution

Sustainability in agriculture has become increasingly important - and this extends to its use of plastics in products such as greenhouse film and mulch film. While they help to boost output, they can cause pollution if they partially decompose and get into the soil.

Delegates at the recent *Agricultural Film* conference in Barcelona - organised by **AMI** - heard how developers have come up with new biodegradable film formulations that can also help to improve soil properties.

Chelo Escrig Rondán, agriculture and aquatic environment group leader at Spanish research organisation **Aimplas**, explained how active substances - such as fertiliser - can be incorporated into biodegradable plastic film, for applications such as mulching.

The active substance can be adsorbed by porous materials such as hydrophilic silica, which is then incorporated into a plastic matrix such as an

extruded film. One example is to add an anti-fungal additive to mulch film, at a loading of around 0.3%. Aimplas tested it against typical fungi, in comparison with standard biopolymer film. At 24°C, a standard film saw 50% infection with both *Botrytis cinerea* and *Aspergillus niger* after seven days. In each case, the anti-fungal film reduced this to zero. At 8°C, *Botrytis cinerea* managed to infect the standard film completely - but this was reduced to 67% on the anti-fungal film.

"Mulching with anti-fungal film can be used for watermelon crops, as a measure to combat fungal growth during all stages of cultivation," he said.

Compost containing 10% of the biofilm also broke down completely over three months, with no toxic effects, he added.

Faster composting

Hugo Vuurens, VP of business development at **CJ Biomaterials**, told delegates that the company's

Main image:
Mulch film is critical to the production of many crops

Right: Aimplas says that mulching with anti-fungal film can combat fungal growth in watermelon crops

polyhydroxyalkanoate (PHA) material - when combined with PLA - could help to speed up the composting of agricultural film.

PHA is made industrially using bacterial fermentation, in various carbon-chain lengths.

"Many bacteria produce and use PHA as an energy storage material," said Vuurens. "Theoretically, more than 150 types of PHA can be created."

PHAs can also be crystalline, semi-crystalline or amorphous - which leads to a variation in properties. Crystalline PHA, for instance, has a flexural strength of around 1400MPa, while that of amorphous PHA is around 4MPa. The material is also far more biodegradable than materials such as PLA - with both amorphous and semi-crystalline versions biodegrading under both industrial and home composting conditions - as well as in soil and the sea.

"PHA is enzymatically digested, while synthetic biodegradable polymers are hydrolysed," he said.

CJ Bio and PLA manufacturer NatureWorks recently created a partnership to develop materials based on their PHA and PLA portfolios.

One area is to combine the two in products such as agricultural film in order to improve properties



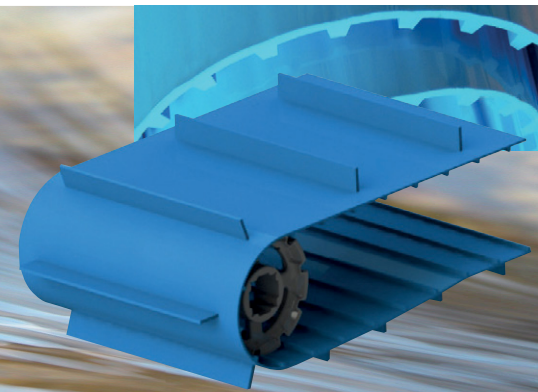
IMAGE: SHUTTERSTOCK

and speed up composting. Adding 5-10% amorphous PHA to PLA can help to make the film more ductile, said Vuurens. In addition, it could speed up industrial composting - though he stressed that tests were still ongoing, and not yet conclusive.

Because of this, he said it could find wide use in agricultural film, as it will biodegrade quickly in soil - meaning that it can be left on the land at the end of the season.

In a small screening study, it did not affect cabbage yield compared to commercial PE and

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IMAGE: SHUTTERSTOCK



PBAT mulch films. Microscopic analysis showed that decomposition occurred on the surface after three months.

Mulch analysis

Francis Rodrigues, head of technical services at **Plastiblends** India - a masterbatch supplier - said that many greenhouse and mulch films are plagued by a typical problem: high basicity HALS stabilisers being destroyed by pesticides.

He pointed out key differences between the two

cases. For greenhouse film, pesticide is sprayed from 3-5m away, the film is typically 120-200 microns thick, and can overheat from contact with the steel frame. For mulch film, the film is thinner (usually 12-25 microns), is usually exposed to iron and copper substances at the same time, and is typically exposed directly to pesticides. This all makes the mulch film more likely to degrade due to pesticides.

There are many reasons behind mulch film failure, he said - including the choice of UV stabiliser, film thickness, contaminants (such as iron) and the amount of pesticide used. He went through a number of case studies - in which mulch films had been studied by various analytical techniques.

In one, white/black mulch film - 20-22 microns thick - failed within 45 days, despite having a claimed UV stabiliser loading of around 0.3%.

"The actual UV stabilisation was less than 0.075%," he told delegates.

One test carried out was an amine reactivity test - which revealed the true level of the UV stabiliser. In addition, HPLC analysis detected no HALS UV stabiliser in the failed film.

"Was it a very low dosage - or had it been completely deactivated?" Rodrigues said.

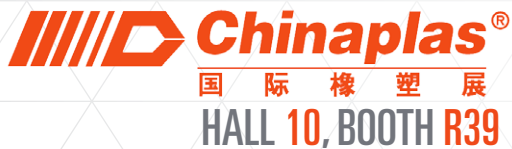
Left: Minagris is a pan-European research project that assesses the effects of micro- and nano-plastics in the soil



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IMAGE: SHUTTERSTOCK



Above: Polyisobutene grades can help improve cling properties in silage film, says Ineos

Microscopic damage on the film included cracks on the surface and pesticide residue. The company also found a high level of iron in the film.

Other tests found other contaminants, including copper, silicone and sulphur. These came from sources such as aluminium pigments (used on silver mulch films), pesticides and pesticide dispersing agents.

Possible solutions for mulch films included: using only pesticide-resistant UV stabilisers; adding a higher dosage of antioxidants; and using iron metal deactivators.

“Film thickness – and the amount and type of pesticide used – are also important factors,” he said.

Finding microplastics

Maarten van der Zee, senior scientist for bio-based products at **Wageningen University** in the Netherlands, explained how the pan-European Minagris project is assessing the accumulation – and effects – of micro- and nano-plastics (MNPs) in the soil.

“Plastics can improve production efficiency and be beneficial in reducing pesticides, fertilisers and water use in farming,” he said. “However, today’s plasticulture may also cause soil pollution. There is insufficient knowledge on long-term environmental sustainability.”

Conventional plastic pollution in soil is difficult to solve – so policies and practices must consider long-term soil sustainability, he said.

The project’s objectives include: monitoring plastics contamination in agriculture across Europe; assessing its impact on factors such as plant productivity; and recommending how plastics can be used more sustainably in future. It has 20 partners from across Europe, with 11 case study sites across six different ‘biogeographical’ regions (including Mediterranean, Alpine and Atlantic).

By the end of the project, it expects to have developed standardised methods for analysing

plastic debris in agricultural soil; determined the sources of plastic found in agricultural soil in the EU; developed a smartphone app for monitoring plastic debris; and gained insight into the impact of MNPs on crop productivity and plant physiology.

“Not all plastics used in agriculture will contribute to soil contamination,” he added.

He explained that, in addition to products such as mulch film, other plastics products – such as general plastic litter – can end up polluting agricultural soil. In addition, agricultural practices such as irrigation and soil enrichment (with additives such as manure) are also potential sources of MNPs in soil, he said.

Some potential sources have already been identified. Mulch films, when not properly removed, can lead to 12-62 kg of plastic debris per hectare. Coatings of controlled-release fertilizers, seeds and pesticides account for another 40 kg/ha, while the use of urban compost can result in amounts as high as 28 kg/ha, he said.

“Several reports address how much plastics is on the market – and used in agriculture – but quantification of the resulting soil pollution and impact requires attention,” he said.

Clinging on

Szilard Csihony, customer technology service and market development for polyisobutene at **Ineos Oligomers**, told delegates how its polyisobutene grades can help to improve cling properties in silage and stretch film.

Its Indopol materials are typically used at a level of around 10% on the inner layer of a silage film. They are stable to UV light and have barrier properties against air and water. The improvement in cling properties helps them maintain the integrity of a load (such as a hay bale) after wrapping – and during prolonged storage.

“They contribute to holding force – thanks to good inter-layer cohesion – and limit air and moisture ingress between the film layers,” he said.

They work by slowly migrating to the surface of an LLDPE matrix. On the day of production, the polyisobutene (PIB) will be fully homogeneous within the LLDPE; after one month, it will have migrated to the surface.

A grade with higher molecular weight will give a higher peel force, while one with a molecular weight will give a faster, higher lap cling force. A lower density LLDPE matrix will also produce a higher cling force. This is because the lower density LLDPE has less crystallinity, allowing the PIB to migrate to the surface. For the higher-density LLDPE, there is more crystallisation – trapping the PIB.

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In addition, storing the film at higher temperatures (up to around 40°C) ensured the best development of cling properties.

“Good cling properties largely contribute to the integrity and the stability of the load,” he said. “The selection of raw materials, LLDPE, storage and extrusion conditions together determine the development of cling properties.”

Stable performance

To extend the life of plastics used in agriculture, stabilisation - especially against the effects of UV radiation - is critical.

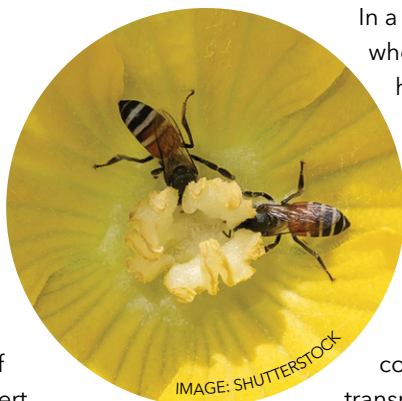
Hanna Schwartz, R&D manager at **Kafrit**, told delegates about the company’s additives that can help greenhouse film resist the effect of UV. These needed to work in concert with sulphur treatment - which is seen as an effective ‘environmentally friendly’ fungicide, which is allowed in organic farming.

It has carried out field trials of its UVA 00701 LD and 07160 LD grades. In one case, it evaluated the effect of the additives on the stability of greenhouse films that are subjected to sulphur treatment. Three- and five-layer films, 180 microns thick, were produced and exposed to up to 3,000 ppm sulphur. The new grades were compared to three existing grades. These had a time to failure of 24, 26 and 33 months. The two new grades saw failure times of 33 and 36 months.

In a three-year trial with rose and pepper growers, film made with 00716 LD retained 68% of

its tensile strength after 36 months. In addition, it found that the 00701 LD grade was still actively blocking 70% UV after three years.

“Longer-lasting UV absorbers slow down the degradation rate of the greenhouse films,” she said. “Combining these with chemically resistant HALS significantly prolongs greenhouse film service life in a harsh chemical environment.”



In a second study, Kafrit looked at whether UV absorption and blocking had any effect on pollination activity by bees. Here, it studied 16 greenhouses - half of which used the sulphur-resistant UV film. The crop grown inside was melons. Researchers spent part of their time counting bees inside the greenhouses. They also found a correlation between UV transmittance (at 365-375nm) and pollination. Greenhouse film based on 00701 LD led to the highest yield of melons.

■ The next edition of Agricultural Film runs in Houston in the USA, on 15-16 August 2023. For more details, contact Angelina Ruocco on +1 610 478 0800 (angelina.ruocco@amiplastics.com).

Left: Kafrit found that its UV stabilisers did not affect pollination by bees

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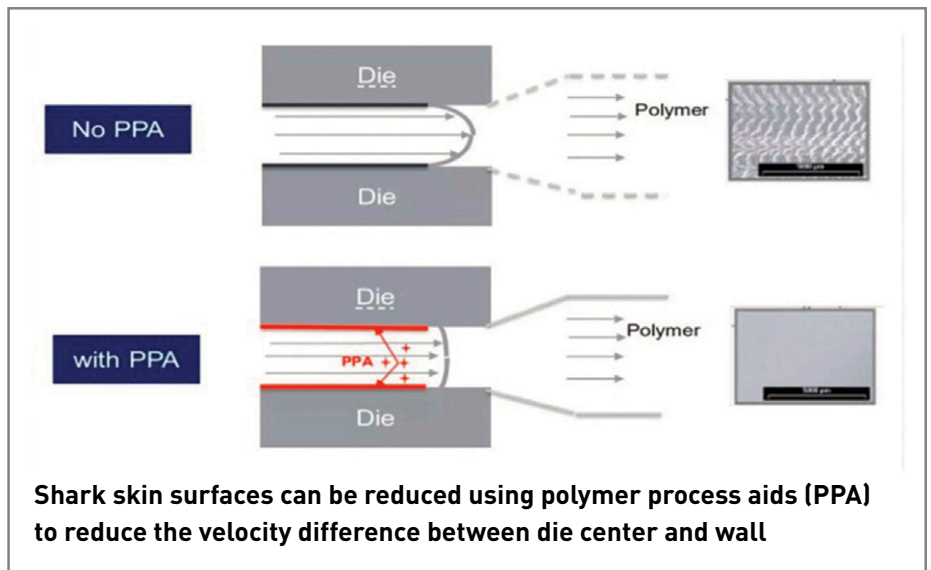


Processing Optimization for Polyolefin Films

Hiformer™ Liquid Additives for Polyolefins

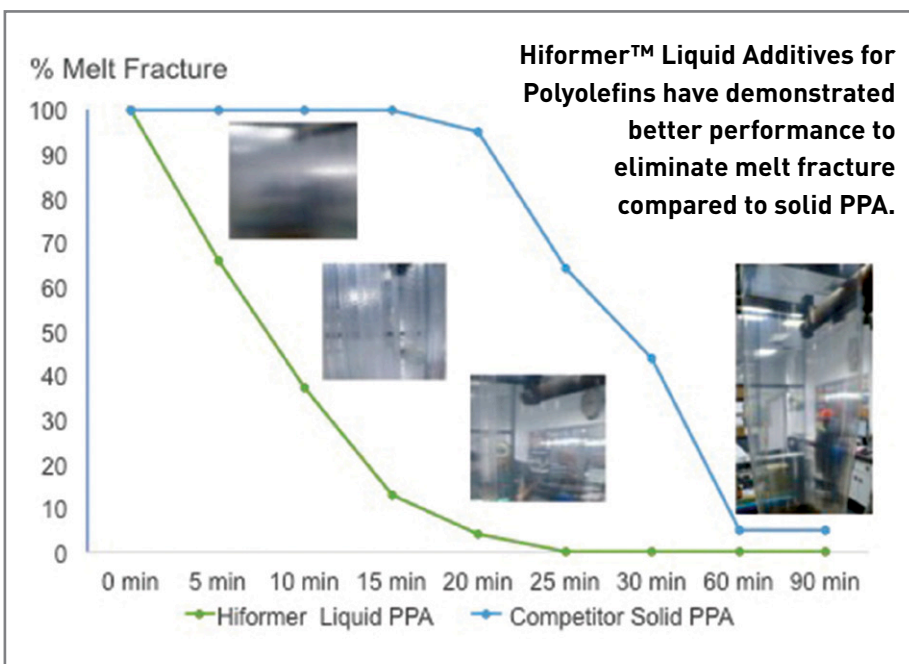
Demand for various packaging applications such as food, industrial, personal care, and homecare continues to rise, resulting in a sharply growing need for polyolefin flexible film to help packaging protect products. Polyolefin flexible film is a popular choice to meet this demand because it helps lower the use of fossil fuels and water, and can also help reduce greenhouse gas emissions compared to rigid packaging alternatives.

However, the manufacturers of these films (and all films) need help meeting these demands, including optimizing processes and improving overall productivity. Here, Hiformer™ Liquid Additives for Polyolefins can help these manufacturing processes.

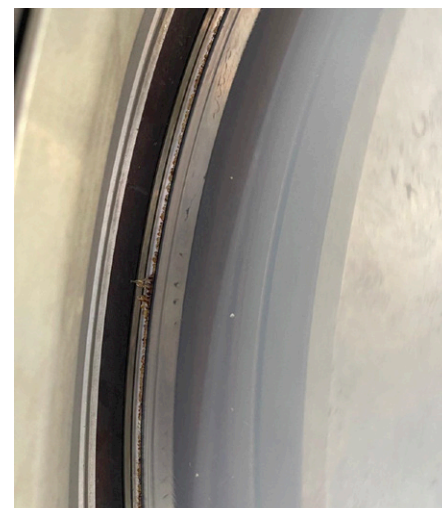


For polyethylene/polypropylene (PE/PP) film producers, melt fracture (surface roughness/shark skin effect) is a common issue that can have a negative impact on productivity and

film aesthetics. This is because of the significant velocity difference from the center of the melt to the die wall. Hence, processing aid additives are needed to eliminate the melt fracture issue by coating the metal surface and die wall. When coated on surfaces, processing aid additives can act as a lubricant, reducing interfacial tension. As a result, this can help reduce the velocity difference from the center to the die wall. The polymer tends to remove the processing aid additives from the wall – this means optimum processing aid is needed to maintain the coating to ensure better aesthetics and glossiness of polyolefin films.



In addition, during polyolefin film production with either cast film or blown film processes, PE/PP film producers also often encounter the



Avient's Hiformer™ Liquid Additives for Polyolefins tackle build-up to improve aesthetics and minimise black specks

issue of a die deposit build-up due to the residues of low-MW polymer, additives, and degradation products accumulating on the die and extruder surfaces. These deposits can create die lines, carbonized material (black specks), and other defects on the end products when they are released. When processing aid additives are added to the die and extruder surfaces, the coating layer will be created to displace degraded materials clinging to the die. This minimizes stagnation in the extrusion process and protects against thermal degradation.

Avient Hiformer™ Liquid solutions comprise colorants and additives, which are placed into plastics to deliver excellent dispersion

and dilution. Hiformer™ Liquid Additives for Polyolefins are the new range of polymer processing aids (PPA) in liquid form for polyolefin applications and can be compatible with all extrusion processes. These liquid solutions are formulated with selected additives at a higher loading level compared to standard solid equivalents. They feature excellent metering accuracy thanks to the liquid pump technology at a low let-down ratio.

Hiformer™ Liquid Additives for Polyolefins effectively prevent die build-up and shark skin effects. As a result, it helps to improve overall manufacturing efficiency while lowering total expenditure significantly.

Customers who currently use Avient's Hiformer™ Liquid Additives for Polyolefins routinely provide positive feedback regarding shorter machine start-up time and melt fracture improvement versus solid solutions they have used in the past. In addition, customers are also impressed by reductions in the need for die lip cleaning caused by die deposit build-up.

Avient Hiformer™ Liquid Additives for Polyolefins are suitable for cast film, blown film, extrusion hose, extrusion coating, and extrusion HDPE bottles.

To learn more contact:
vincent.tan@avient.com
asina.lee@avient.com

Description	Standard Solid Additives	Hiformer™ Liquid Additives
Application	PE Blown Film and Cast	PE Blown Film and Cast
Loading level	2 – 5%	20 – 50%
Dosage	0.5 to 2%	0,05 – 0,2%
Dosing	Blending with standard polymer or pellet dosing unit	Pump equipment
Functionality	Avoid melt fracture & die deposit build up	Avoid melt fracture & die deposit build up
Process stability	+ Good process stability	+++ Excellent process stability and extended production run
Availability	Commercial	Commercial

The advantages of liquid polymer processing aid are:

- Better processability
- Fewer logistics - lower impact on carbon footprint
- Lower networking capital
- Easier production handling
- Higher working safety due to less handling in production
- Better performance due to the faster kinetics of additives

Susannah Owen provides insight into the new market report Thin Wall Packaging Europe 2023



Susannah Owen, Consultant

Sustainability led investment maintains growth in European thin wall packaging

The European thin wall packaging market has grown 1% a year to reach 3.4 million tonnes of polymer converted in 2022. The market has changed significantly over the last five years driven by legislation and plastics taxes, pressure from NGOs, brand owner/retailer sustainability commitments and consumer perception. This has resulted in changes both in the types of polymer converted and seen a shift towards formats perceived as more sustainable.

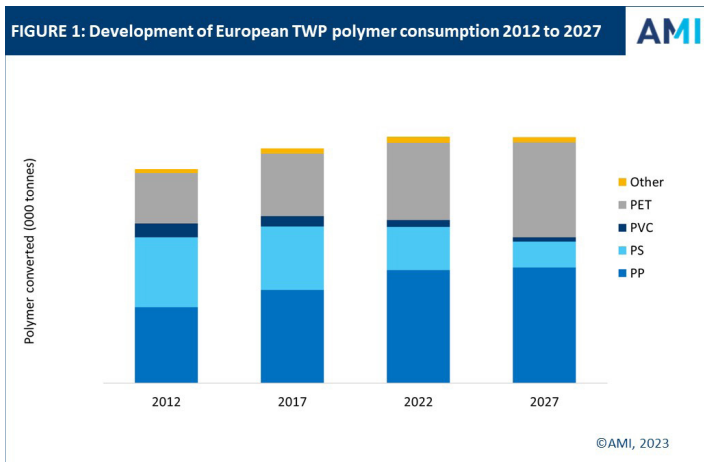
The functionality and cost effectiveness of plastic thin wall packaging has helped maintain a strong position within many key end-use applications: The ability to offer barrier, the move towards reusable formats and high levels of functionality regarding convenience and on-the-go growth have all offered opportunities. Although the market has reached saturation point in terms of volume expansion, growth opportunities abound throughout the industry offering profitable niches to ensure value growth is maintained and delivered.

As the industry approaches the sustainability milestone of 2025, growth in polymer converted for thin wall packaging is expected to stagnate. Certain end-use markets are under pressure from plastics bans and alternative packaging substrates, and lightweighting and plastics reduction initiatives continue. The popularity of hybrid solutions is growing as are developments in PET injection moulding, mono material barrier solutions, IML and many more. Lightweighting and other efficiencies remain top of mind for plastic packaging converters.

Consolidation continues to achieve economies of scale and efficiencies. M&A is taking place both horizontally but also into new verticals with thin wall packaging converters acquiring recyclers and capabilities outside their core material / plastics to add value and growth to their offering and support customers with packaging requirements.

There is unprecedented demand for mechanically and chemically recycled material, and bio-sourced material, and to meet PPWR targets, the availability of recycled content material needs to accelerate. Developments are taking place throughout the entire value chain to increase availability of and incorporate recycled material into thin wall packaging.

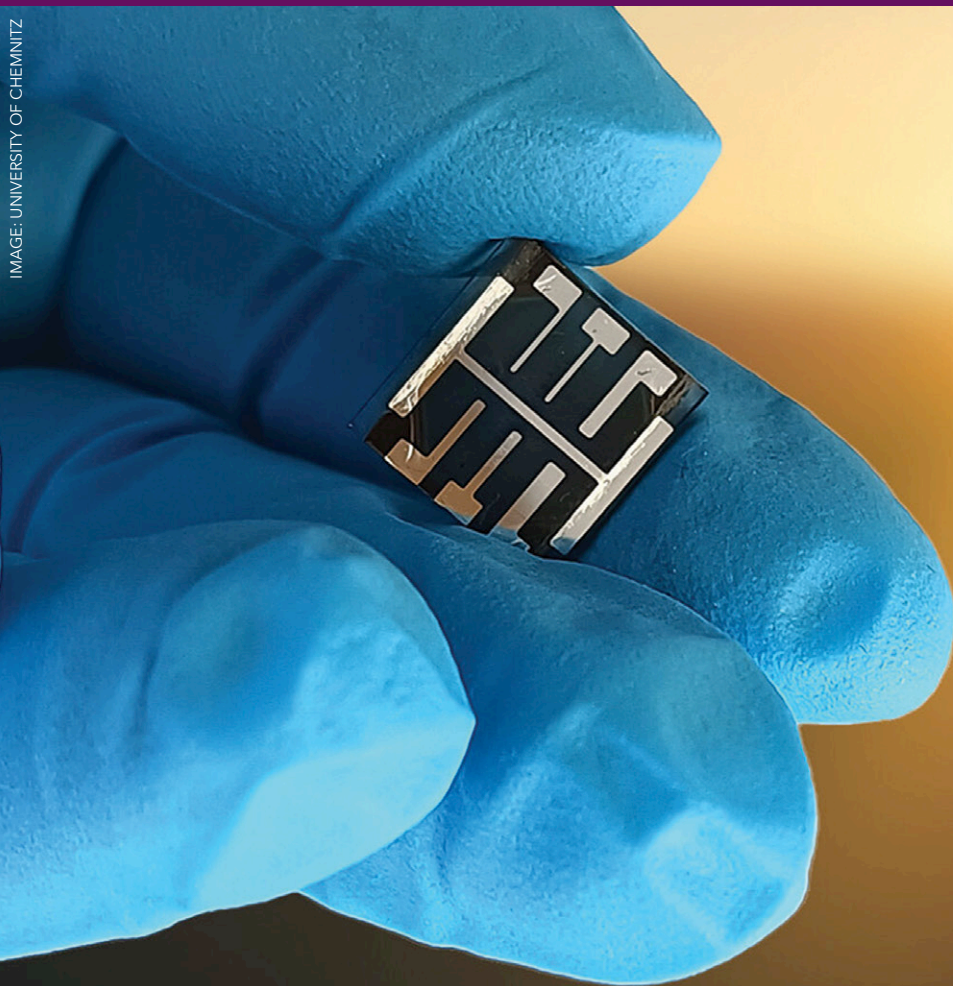
Sizeable volumes of rPET are employed however rPET availability remains challenging. Tray2Tray initiatives are growing in momentum and will become more widely available as TWP circularity grows in importance. Advancements in mono-material PET tray solutions and progress on active barriers are increasing the attractiveness.



PP remains the main polymer consumed within the European thin wall packaging market but the development of food grade rPP streams remains essential to maintain its position. To this end, there is strong value chain collaboration in the development of smart sorting technologies and solutions to achieve FG rPP.

Developments in partially renewable PP are helping reduce reliance on virgin grades. The outlook for PS is more challenging with continuing volume declines. Development of rPS streams and collection and recycling infrastructure will ensure volumes remain relevant, but AMI expects these developments to only slow the decline as alternative solutions are developed.

The latest edition of AMI's highly regarded Thin Wall Packaging in Europe report is the result of an extensive research program, providing a detailed independent assessment of this industry in times of uncertainty, and highlights how it is responding to sustainability pressures, and how the market is likely to develop over the next five years to 2027.



Organic solar cells – which rely on plastic substrates – will become a critical green energy source in future, as long as the problem of lower efficiency can be solved

Bright ideas: advances in solar cell technology

Solar cells are one of the key technologies for reducing reliance on fossil fuels. Those that are based on plastics – rather than silicon – may have lower efficiency, but their lower price may also help to make the technology more widespread.

German solar energy company **Heliatek** recently completed a project to install organic solar cells at the Port of Barcelona in Spain. It involves installing 584 of Heliatek's solar films onto undulating rooftops at three port facility buildings. Heliatek says this proves that unconventional building structures can become green electricity generators.

The installation, completed in February 2023, was part of the Life BIPV project. It will generate green electricity while reducing the port's carbon footprint.

"This project is not just beautiful – it's a game-changer," said Guido van Tartwijk, CEO of Heliatek. "Our solar films have transformed three undulating rooftops into ultra-green electricity generators, seamlessly integrating into the existing port landscape.

He said it was the company's largest installation of its kind on non-straight building shapes. The cells cover an area of 509 sq m and has a capacity of 29.5 kWp.

Solar recipe

Researchers at the **University of Texas at Dallas** have found a 'recipe' to increase the efficiency of organic solar cells. The research was published in *Nano Energy*.

"If solar panels covered half a percent of the land in the US, they alone could meet all our electricity needs," said William Vandenberghe, associate professor of materials science and engineering at the university, and a corresponding author of the study. "The main roadblock to an expansion of the capacity of solar power is that solar panels remain too expensive."

Organic solar cells (OSCs) could reduce the cost of solar panels because they are made with organic polymers and molecules instead of silicon, he says

Main image: Research at Chemnitz University shows that 'slow electrons' reduce the efficiency of organic solar cells

IMAGE: HELIATEK



Above:
Heliatek has installed organic solar cells at the Port of Barcelona in Spain

- though they are typically less efficient than conventional solar cells.

“Optimising the efficiency of these solar cells is like creating a new cake recipe – it needs a knowledgeable cook who knows how to tweak the ingredients, plus a bit of trial and error,” he said.

Vandenberghe, and colleague Julia Hsu, have been investigating how dilute-donor organic solar cells work - and how to advance the technology. Hsu has conducted extensive research into solar energy, including on solar cells made from another material called halide perovskite.

“We need to have a portfolio of different types of renewable energy,” said Hsu.

Hsu’s experiments found differences in the efficiency of organic solar cells made with two types of donor molecules, but it was not clear why one performed better. Using computer simulations, the team found that they could make organic solar cells more efficient if they changed the shape of the donor material.

While more research is needed to make organic solar cells viable, the team’s findings help to advance a property of organic solar cell technology that could one day help to boost output current.

Slow electrons

Research by **Chemnitz University of Technology** and partner universities has shown that slow electrons reduce the efficiency of plastic-based organic solar cells.

Organic solar cells offer a more affordable alternative than conventional solar cells - which are typically based on silicon. However, organic solar cells usually have a lower potential for energy conversion efficiency.

The results of the study have been published in Nature Communications.

Although organic semiconductors capture sunlight well, the low mobility of the charge carriers is still a drawback, say the researchers. This is

Right:
University of Michigan Researchers have found a way to scale up their semi-transparent solar cells

because conductivity and efficiency depend on it. A common challenge is that the slow charge carriers must be extracted from the organic solar cell before recombination can take place. This is the only way the solar electricity can be used.

“One of the key findings of our study is that transport resistance is a performance-limiting mechanism in modern organic solar cells that needs to be addressed,” said Carsten Deibel, who led the research.

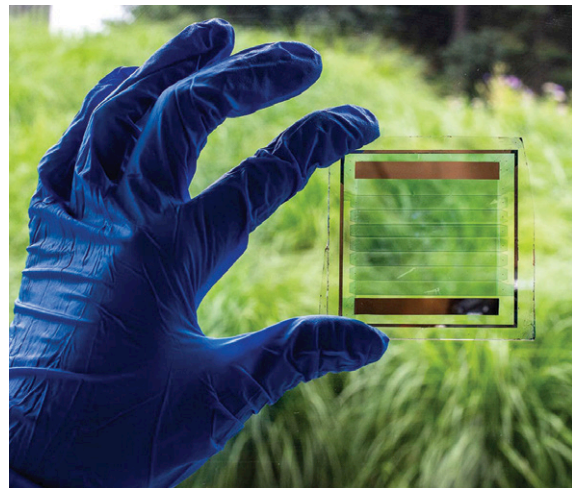
Stopping degradation

Researchers from South Korea have discovered what causes degradation in large-area organic solar cells - and developed a new polymer additive to prevent it.

The team, from the Advanced Photovoltaics Research Centre at the **Korea Institute of Science and Technology (KIST)** focused on the photoactive layer’s compositional form in and the solution process - which is a part of the organic solar cell manufacturing process.

The spin-coating method, which is mainly used in the laboratory, creates a uniform photoactive layer mixture as the solvent evaporates rapidly while the substrate rotates at a high speed. However, the large-area, continuous solution process designed for industrial use caused solar cell performance deterioration because the so evaporation rate was too slow. This led to unwanted aggregation between the photoactive materials.

The researchers developed a polymer additive to prevent this - by interacting with materials prone to aggregation. In addition, owing to possible nano-level structure control, solar cell performance improvements and stability security are acquired against light-induced temperature increases during solar cell operation. A 14.7% module efficiency was achieved, resulting in a 23.5% performance increase compared to that of the conventional binary system.



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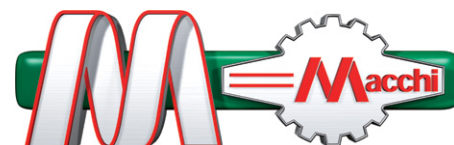
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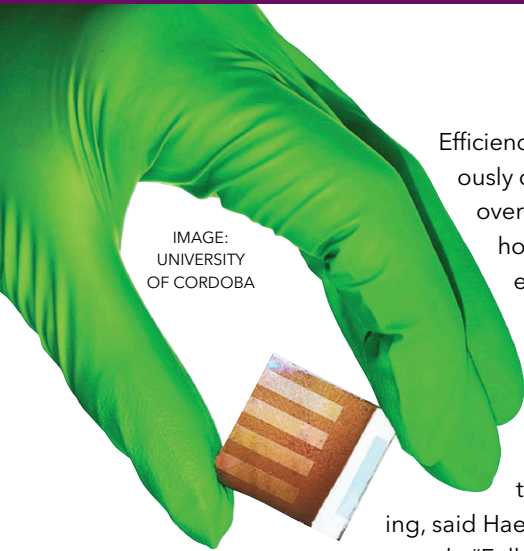


IMAGE: UNIVERSITY OF CORDOBA

Above: The Sunrey project aims to make perovskite solar cells more sustainable, efficient and durable

Efficiency and stability were simultaneously demonstrated by maintaining over 84% initial efficiency for 1,000 hours, even in an 85°C heated environment.

"We have got closer to organic solar cell commercialisation by proposing the core principle of a solar cell material capable of high-quality, large-area solution processing, said Hae Jung Son of KIST, who led the research. "Follow-up research will enable

eco-friendly, self-sufficient energy generation - which is easily applicable to exterior building walls and automobiles and also utilised as an energy source for mobile and IoT devices."

The research was published in *Nano Energy*.

Scaling up

Researchers at the **University of Michigan** have developed a way to scale up their semi-transparent solar cells.

"In principle, we can now scale these organic solar cells to two meters square, which brings them much closer to reality," said Stephen Forrest, professor of electrical engineering at the university, and corresponding author of a study published in *Joule*.

Silicon-based solar cells are opaque, so can be mounted on a roof but not within a structure such as a window. This is where organic solar cells could be applied. For this reason, the team has looked into how it can scale up the manufacturer of its transparent solar cells. One challenge is to create the micron-scale electrical connections between individual cells that comprise the solar module. Conventional methods using lasers to pattern the cells can easily damage the organic light absorbers.

Now, the team has developed a multistep

'peel-off' patterning method that achieves micron-scale resolution. They deposited thin films of plastic and patterned them into very thin strips. Then, they laid down the organic and metal layers. Next, they peeled off the strips - creating very fine electrical interconnections between the cells.

The group connected eight semi-transparent solar cells, each 4 cm x 0.4 cm, to create a single 13 cm² module. The power conversion efficiency of 7.3% was around 10% less than for the individual solar cells in the module. With a transparency of around 50% and a greenish tint, the cells can be used in commercial windows. Higher transparencies - needed for the residential market - could also be achieved with the technology, said the researchers.

Xinjing Huang, a doctoral student at the university and co-author of the published paper, said: "It is now time to get industry involved - to turn this technology into affordable applications."

Eventually, the flexible solar cell panel will be sandwiched between two window panes. The goal for these energy-generating window films is to be about 50% transparent with 10-15% efficiency. The researchers believe this can be achieved within a couple of years.

The university has applied for a patent and is seeking partners to bring the technology to market.

Plant light

Researchers at the **University of California Los Angeles** have developed solar panels that can be added to a greenhouse roof - and still allow through the light that plants need.

Yang Yang, a materials scientist in the school of engineering, leads a team that designed the device. The research is published in a study in *Nature Sustainability*. Incorporating a layer of L-glutathione - a naturally occurring chemical that is commonly sold as an antioxidant dietary supplement - helped to extend solar cell lifetime, improve efficiency, and still allow sunlight to reach plants in a greenhouse prototype.

"Organic materials are uniquely suitable for agrivoltaics because of their light-absorption selectivity," said Yang. "The main drawback that has prevented their widespread use up to now is their lack of stability."

Organic solar cells tend to degrade more quickly because sunlight can cause organic materials to oxidise and lose electrons. The researchers found that an additional layer of L-glutathione prevented the other materials in the solar cell from oxidising, which resulted in the organic cells maintaining more than 80% efficiency after 1,000 hours of continuous use - as opposed

Right: UCLA has developed transparent solar panels that can be added to a greenhouse roof



IMAGE: UCLA

to less than 20% without the added layer.

The team tracked the growth of common crops including wheat, mung beans and broccoli in two separate demonstrations: one had a transparent glass roof with segments of inorganic solar cells; the other had a roof made entirely from semi-transparent organic solar cells. The crops in the 'organic solar roof' greenhouse grew more crops. The scientists believe this is because the L- glutathione layer blocked ultraviolet rays - which can inhibit plant growth - and infrared rays, which causes greenhouses to overheat.

UCLA has now established a start-up that aims to scale up production of the organic solar cells for industrial use. The researchers hope to make greenhouses incorporating organic solar cells commercially available in future.

Perovskite boost

The pan-European Sunrey project aims to make perovskite solar cells more sustainable, efficient and durable.

It intends to push the development of efficient solar cells based on non-critical raw materials. The three-year project began in November 2022, and is



IMAGE: BASF

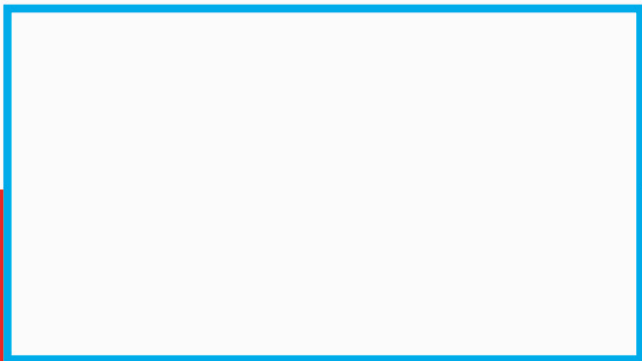
coordinated by the **Fraunhofer Institute for Applied Polymer Research (IAP)** in Potsdam, Germany.

"Making perovskite solar cells more sustainable and efficient - in order to have less impact on the environment - is the central goal of Sunrey," said Armin Wedel, who coordinates the project and is head of the functional polymer department at Fraunhofer IAP. "To this end, we are developing materials with low lead content."

Above: HALS additives from BASF have been used to prevent UV damage to solar pontoon



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Solar pontoon

BASF has installed a proof-of-concept floating solar pontoon at its manufacturing site in McIntosh, Alabama, USA.

The system, from Noria Energy, uses renewable energy to power three aerators that improve the water quality of a scenic pond at the facility.

BASF's hindered amine light stabiliser (HALS) additives are used to protect the polymer against degradation of harmful UV light.

"The additives and antioxidants used for the pontoons - and produced at our McIntosh site - improve durability and extend the lifetime of the systems," said Marcus Pezent, site director at BASF.

Alex Mayer, chief technology officer at Noria Energy, added: "We set out to develop an innovative floating solar system to reduce capital requirements, including logistical costs. Working with BASF was instrumental in getting the system from concept to pilot installation in under a year."

Jobs in Georgia

Hanwha Advanced Materials is to invest US\$147 million - and create more than 160 jobs - in an encapsulant film plant in Georgia, USA.

It will supply the films to solar cell manufacturer Qcells in nearby Cartersville.

"Our products are an important piece of the clean energy supply chain puzzle," said Inhwan Kim, CEO of Hanwha Advanced Materials.

Hanwha will construct a new manufacturing facility in Cartersville, which is scheduled to open in summer 2024.

HG Park, president of Qcells North America, added: "Qcells is doubling down on building a complete, domestic solar supply chain, and this recent investment is critical to making that happen."

Qcells plans to expand solar panel production capacity in Georgia to 8.4GW.

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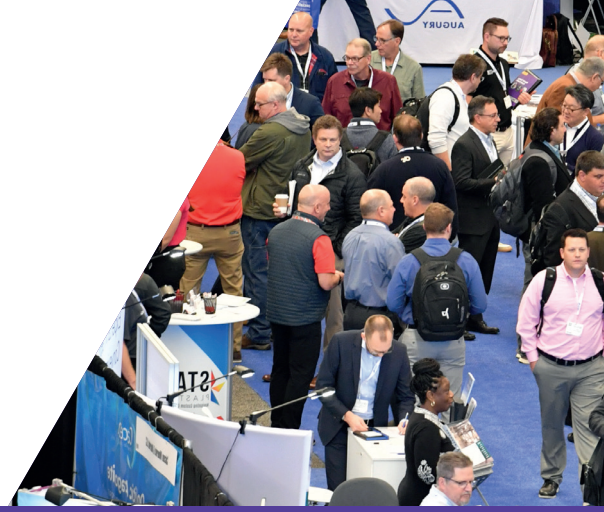
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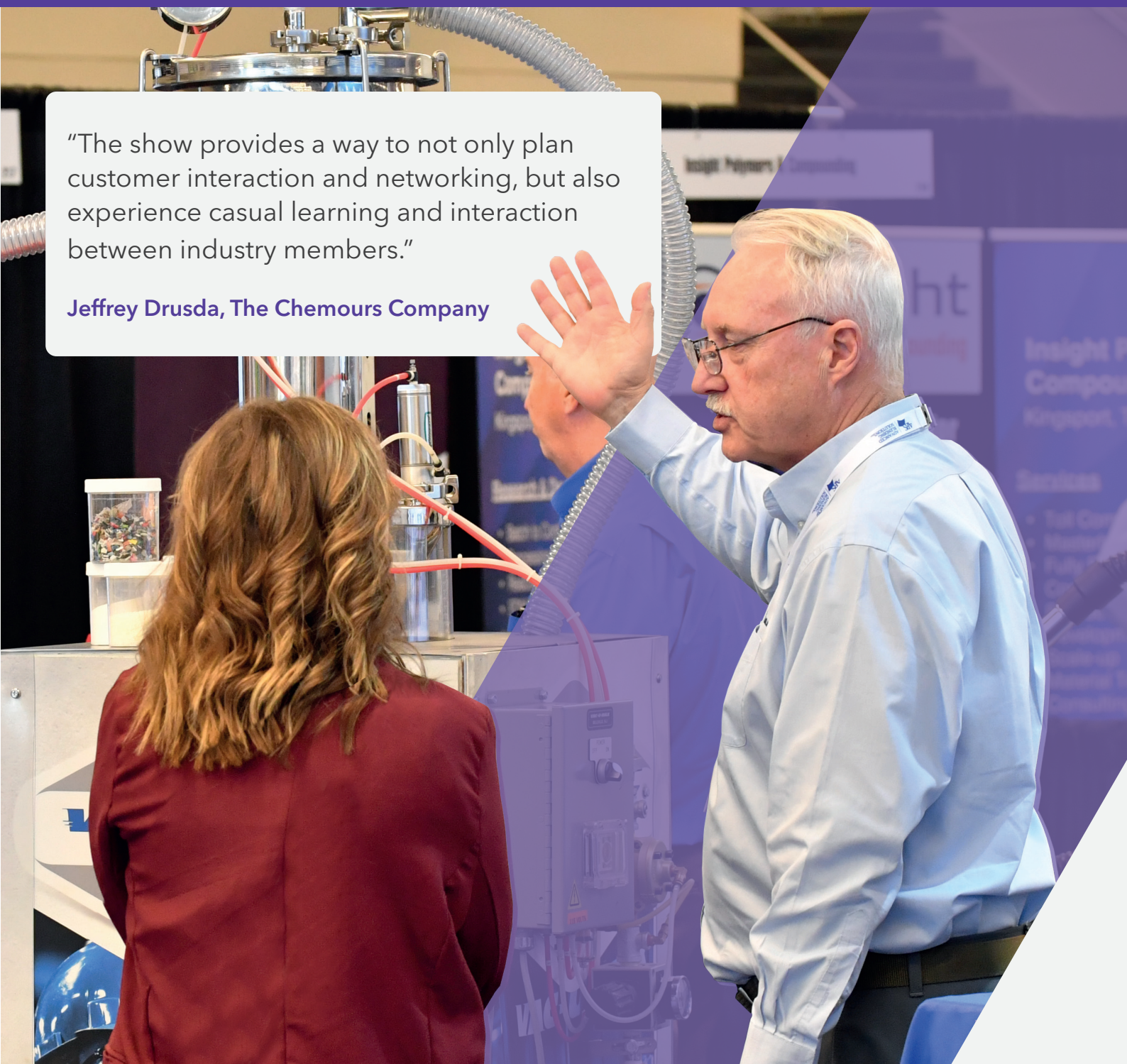
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IMAGE: BIMEC

Recent developments in slitters and rewinders include supply contracts for bioriented film in China, boosting label production in the Czech Republic and a faster, more compact model

Rolling up: advances in slitters and rewinders

Slitting and rewinding is critical in a host of end-use converter industries, from tape production to coated film. As with many types of machine, speed and accuracy are in constant need of improvement.

Bimec of Italy recently developed a new dual-spindle slitter rewriter – called the STB 550 – which is a redesign of its existing STM 50 model. The STB series already includes the STB 560 dual spindle slitter rewriter.

The two models have different configurations: STB 550 has a single-face structure and unwinds mother rolls with diameters up to 1000mm and rewinds finished rolls up to 500mm while the STB 560 has mother rolls on a shaftless unwind stand placed on the rear of the machine. It also unwinds mother rolls up to 1000mm and rewinds finished rolls up to 610mm diameter.

Both slitters boast ease of use, compactness and flexibility – giving them a competitive price, says Bimec.

Another benefit is that the electrical panel has also been positioned on the side – opposite the motors – allowing it to be completely isolated and give greater ease to reach the electrical components to carry out maintenance. An upgrade of the electrical and electronic parts has also been carried out. In addition, the reel-unloading system has 1200mm arms as standard – replacing 900mm

arms – allowing it to manage longer reels.

In addition, at K2022 last year, it showed its TCA 64C+ duplex turret slitter rewriter. This has been designed to combine a compact design with a configuration that allows a separate unwind stand. It is aimed at converters who need high performances and speed.

Chinese supply

Goebel IMS has supplied two new primary slitter rewinders to a Chinese producer of BOPET film, Zhejiang Yongsheng Technology Co.

A Monoslit Optical 6000 BOPET is used to convert technical films such as optical-grade films. With its multi-functional slitting unit (including shear cutting) and optional by-pass spreader roller, the machine can convert both thin and thick films. With special surface coatings for the guide rollers and the possibility to install web-cleaning devices and other special units, a wide variety of applications can be covered, it says.

The second machine, a Monoslit 9000 BOPET, is designed for high-speed converting of mainly packaging grade films – and runs at speeds of 1200 m/min.

A new agreement to supply two more primary slitter rewinders – a Monoslit 9000 BOPET and a Monoslit Giant 11000 BOPET – has since been

Main image:
Bimec has extended its dual-spindle slitter rewriter range with the STB 550



IMAGE: MARTIN

Above:
Martin's
Automatic LRD
rewinder has
been fitted to
Cologne's new
Gallus Label-
master

agreed. "These two additional Goebel IMS slitter rewinders will give us our first 10.6m BOPET production line," according to Xu Yongming, general manager of Zhejiang Yongsheng Technology.

In addition, Goebel IMS has supplied 16 Monoslit 9000 BOPP slitter rewinders to Fujian Forop Advanced Materials - a leading producer of BOPP film - with the potential to supply slitters for a further six production lines.

Forop intends to start two new production sites in southwest and southeast China by 2025 - for a total of six production sites with 30 BOPP production lines. This will boost the production potential of the group - which says it intends to become the world's largest producer of BOPP film.

Taking off

Hosokawa Kolb - a subsidiary of **Hosokawa Alpine** of Germany - has developed the AKHN-B, a standard film take-off unit with modular design and optional S-wrap tempering unit.

"The take-off is particularly user-friendly thanks to optimised accessibility of the components," said Michael Buchauer, managing director at Hosokawa Kolb. "We have done away with the separate control cabinet for the AKHN-B. This means that

rollers can be changed very quickly - and makes maintenance and cleaning very convenient."

The working width of the AKHN-B ranges from 1300mm to 2600mm as standard and can be optionally extended to 3200mm. The take-off speed ranges from 150 m/min to peak values of 300 m/min. It also has a low overall height. In order to optimise the flatness, and further improve film quality, it is also available with an S-Wrap 1, S-Wrap 2 and S-Wrap 4 tempering unit.

In terms of maintenance, the AKHN-B allows easy access to the interior through the sliding doors, a smaller number of crossbars in the frame, and a decentralised drive concept. It has also been integrated into the ExVis process visualisation system.

"Film recipes with the corresponding operating data are stored in ExVis and can be called up at any time," said Buchauer. "These are stored at a central location and can be imported into all Hosokawa Kolb system components."

Label production

Cologne Press, a Czech-based label converter, has installed an MBSF unwind splicer and LRD rewinder with slitting capability from **Martin Automatic**.

The new equipment is fitted to a Gallus Labelmaster 440 press at its facility in Kolin. It joins previous Martin nonstop unwind and rewind technology fitted to Cologne's Gallus RCS 330 presses in 2010 and 2015.

"Around 50% of our output by volume is self-adhesive labels, with blank labels and laminated tubes making up another 30%," said Dušan Prevrátil, production director at Cologne.

Martin's ability to adapt its technology to any situation was seen when the new equipment was fitted. Due to space restrictions, Cologne had been forced to install its Labelmaster with the operator side close to an external wall. This left insufficient space at the infeed end of the press for the opera-

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Troubleshooting roll-winding defects

US-based Maxcess has produced a guide to common roll-winding defects. It says that troubleshooting these - and alerting winders and operators to problems on the web - helps reduce scrap and improve throughput. It says there are four common defects to look out for.

Poor roll winding starts

Problem: Seeing an obvious difference between the web near the core and the rest of the winding roll can lead to a poor start.

Solution: To prevent poor starts, tighten the web before fastening it to the core. Use good quality, properly stored cores. Begin with the correct torque, nip or web tension.

Collapsed, offset, loose cores

Problem: Core problems can stem from collapsed, offset or loose rolls.

Collapsed rolls stem from stacking rolls on end too high, with the bottom rolls crushing in an axial direction. An offset core causes an abrupt positioning shift along the edge of the roll. A loose core causes rotational displacement with the web.

Solution: Core problems start when the web is wound too softly. It should be wound evenly, but harder at the start. Avoid stacking rolls too high to reduce offset. Make necessary tension adjustments gradually at the winder.

Low-quality roll edges

Problem: Poor slitting causes a rough, fuzzy, or dented roll-edged appearance. Edges may be frayed, and the web edge may not be straight. Fibres may be visible within packaging or on the film. A black cloth may reveal the presence of slitter 'dust'.

Solutions: First, ensure slitters are

sharpened. For shear slitting, slitters should be adjusted and set for the right cant angle and blade overlap. Slitter blades at the nip point should be moving slightly faster than the web. If it seems slower, the speed differential between web and slitters may need adjusting.

Telescoped or dished rolls

Problem: The defect shows a progressive roll edge misalignment that can be concave or convex.

Solution: Ensure caliper is consistent across the web width. Control tension throughout the wind. Ensure cores do not shift. This may indicate upstream problems that are creating thickness or moisture variations in the web. Proper torque transfer from winding shaft to core, along with precise control of web tension, are also essential.

tor to bring the blank rolls into the Martin MBSF unit on the same side.

Martin's solution was to supply a reverse direction unwind/splicer that allows rolls to be loaded from the opposite side. This created another problem for single-person operation: as the new roll was being loaded, the operator could not see what was happening on the press.

This was also easily solved, by fitting a camera to the delivery end of the press - feeding a monitor on the opposite side at the Martin MBSF unit, according to the company.

Speed increase

Rollomatic says it has improved its high-speed roll winder (HRW) to meet increasing demands from film and sheet manufacturers - so it now has a smaller footprint, is lower, and can be adapted into an in-line production environment.

The HRW's design makes it easy to tread the machine with an accumulator. Loading of cores is simplified with a floor-reachable magazine. Roll change is performed automatically without the need for taping or gluing of cores. A swing panel option allows the line to be operated from various positions.

Users can still benefit from the high number of roll changes per minute on lower-gauge film. For heavy-gauge film, the HRW can be equipped with a specially designed knife, allowing the cutting of eight layers of 6 mil film (more than 1200 microns in total).

Film can be wound on different core sizes including the most standard 1.5in (38mm) and 3in (76mm). The winder can wind roll diameters up to 10.6in (270 mm).

HRW can be adapted to out-of-line production at speeds up to 820 ft/min (250 m/min). It comes with a safety shaft to avoid operator access to the area with moving parts.

Prior to this, it supplied a roll winder to

Below: Goebel IMS has supplied primary slitter rewinders to a Chinese producer of BOPET film



IMAGE: GOEBEL-IMS

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Reciclados y Servicios del Noreste, a Mexican company whose film is made completely from recyclate.

An RW 3200 winder can handle up to 3200 mm (126 in) wide film, nonwoven, or similar webs. The wider RW will allow the company to raise production efficiency.

It will be able to produce two-lane, V-folded film in small rolls for the agriculture and construction sectors. The company has 1 RW line in its factory - and has already bought two more.

Duplex turret

At K2022 last year, UK-based **Ashe Converting Equipment** showed machines from its Diamond series - including a 1650mm (65in) wide automatic duplex turret. The model is commonly used by converters who are looking for a small footprint machine with high productivity and low downtime.

The company also presented a 1350mm (53in) Diamond duplex (twin shaft) machine, which highlighted the different configurations of the Diamond range to illustrate its flexibility for different applications. Ashe also showed a narrow web inspection slitter rewinder - which has its own



IMAGE: ROLL-O-MATIC

camera inspection system for product verification and the logging and editing of faults.

Above:
Rollomatic has improved its HRW to meet the demands of film and sheet manufacturers

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BOOK YOUR PLACE TODAY

As China stops its Zero Covid policy, this year's Chinaplas is set to go ahead in Shenzhen - and is likely to have larger foreign participation than recent editions of the show



Chinaplas 2023 gears up for more overseas visitors

Chinaplas has seen huge disruptions due to Covid in the last few years. Some recent events have been cancelled; those that have gone ahead have largely excluded overseas visitors, due to travel restrictions.

However, the show returns this year - and will run at the Shenzhen World Exhibition and Convention Center (SWECC) in Shenzhen on 17-20 April 2023.

China has relaxed its travel restrictions - which, in the past, have prevented many foreign visitors from attending the show. Only a negative PCR test is required to enter China, and there is no quarantine on arrival. For this reason, show organiser Adsale is expecting more overseas visitors this time.

"Uncertainty has made organisation more difficult," said Ada Leung, general manager at Adsale. "But this year, we can set a new record in terms of scale with an area of 380,000 sq m - up 8.6% from 2021."

Adsale expects to use all 18 halls of the venue and estimates more than 3,900 exhibitors will be at the event, including many from overseas. In addition, it says there are nine overseas pavilions - from countries including France, Germany, Italy, Japan, the UK and the US.

This year's show will have a strong focus on sustainability - with a series of special events and presentations on the topic. One example is its Recycling & Circular Economy Conference and Showcase, which takes place on 16 April - the day before the show opens. During Chinaplas itself, Tech Talk sessions will showcase a number of sustainable technologies and applications.

On the pages that follow, we highlight some of the companies - and products - that will be seen at this year's Chinaplas show.

➤ www.chinaplasonline.com

**Main image:
Chinaplas
2023 runs in
Shenzhen on
17-20 April**

Cargill will exhibit for the first time at Chinaplas 2023 – showcasing the range of speciality plastics additives acquired when it bought Croda Performance Technologies in 2022.

The Crodamide range is a leading brand of slip and anti-block additives – with a range of chemistries and physical forms suitable for many applications. The new name of the portfolio brand will be revealed at the show.

The company will also showcase other solutions including Ionphase permanent static control solutions, Atmer anti-static and anti-fogging additives, Incroslip high-stability torque release additives, IncroMold mould release and anti-scratch additives, and IncroMax additives for engineering polymers.

➤ www.cargill.com

BASF will present products and solutions for all phases of the plastics journey – which it calls make, use and recycle.

In the first phase, BASF says it improves how plastics are made – from product design to the choice of raw materials. This includes using renewable or recycled feedstock, and improving the manufacturing process. In addition, it says its product carbon footprints (PCFs) can improve CO₂ transparency and validate its customers’ claims for creating low-carbon plastics.

In the use phase, solutions to improve energy efficiency through BASF’s lightweight, durable materials are available. Here, its material solutions can enable more sustainable applications in infrastructures such as renewable energy, it says.

In the recycle phase, it highlights its efforts to accelerate a circular economy through mechanical recycling, chemical recycling, and other technologies.

“At Chinaplas, we will demonstrate how our help customers decarbonise their value chains,” said Andy Postlethwaite, senior vice president for performance materials in Asia Pacific at BASF.

➤ www.basf.com

Moisture Minder – an in-line sensor that reads the moisture content of moving resin to enable real-time analysis – is the highlight of several product presentations by **Conair**.

Valuable to plastics processors involved in areas such as extrusion and packaging, Moisture Minder detects residual moisture

levels as low as 10 ppm in a range of polymers at throughput rates of 20 to 5000 lbs/hr. Installed at the outlet of a drying hopper, it measures moisture content continually, confirming that material is properly dried – or issuing real-time alarms if levels drift outside prescribed limits.

“Processors who manufacture high-quality products know that it is essential to maintain process stability at all times,” said Sam Rajkovich, vice president of sales and marketing at Conair. “This offers a way to make a final check on the

moisture levels of materials before they enter processing equipment – where excess moisture could cause process instability and result in scrap.”

The device stores all readings for historical trending, allowing managers to recognise if process shift over time – and respond by making changes to dryer controls. These historical records can also validate process consistency and confirm that products were manufactured under acceptable conditions.

Three other products on display feature Conair’s new ‘common’ control architecture, which uses common colours, buttons, and interactions to deliver a uniform user experience. These are: the D200 Carousel Plus central dryer; the SmartFLX conveying control; and the TrueBlend 250 material blender.

➤ www.conairgroup.com

Coperion K-Tron of Germany says that its feeders offer maximum flexibility.

It will display its K2-ML-D5-T35/S60 quick change feeder, featuring the ActiFlow smart bulk solid activator and electronic pressure compensation (EPC) – in combination with a 2400 series vacuum receiver for refill. The T35/S60 quick change (QC) feeder on display is designed for applications requiring fast changeover of materials and the convenience of fast cleaning. The QC feeder allows for quick removal of the entire feeding module with screws in place for replacement with a second unit. Twin- and single-screw feeding modules are available.

The ActiFlow smart bulk solid activator offers a reliable way to prevent bridging and rat-holing of cohesive bulk materials in stainless steel hoppers without internal hopper agitation. The smart flow aid applies gentle vibrations to the hopper wall, which carefully activates the contained material with the optimal amplitude and frequency. It is designed

Right: Conair’s Moisture Minder offers an in-line, real time solution for moisture analysis



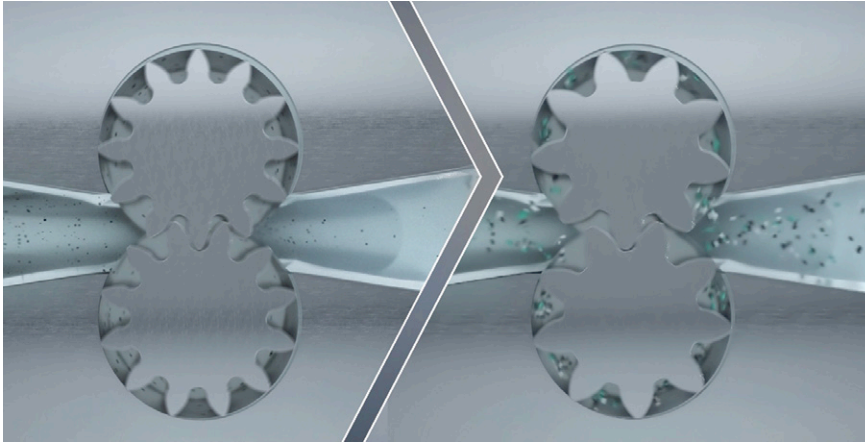
IMAGE: CONAIR

Below: Coperion K-Tron says its K2-ML-D5-T35 gravimetric feeder offers accurate, reliable feeding



IMAGE: COPERION

IMAGE: MAAG



Above: Maag will show its Extrex 6 standard and recycling pumps at Chinaplas

specifically to work with the company's own line of gravimetric loss-in-weight feeders.

In addition, its 2400 series vacuum receivers provide high-capacity sequencing - mainly where larger conveying rates or long distances are required - in applications with one or multiple destinations. They pneumatically convey powder, pellets and granular materials. Conveying rates range from 327 to 6,804 kg/h (720 to 15,000 lb/h). The 2415 pellet receiver will be on display at Chinaplas.

► www.coperion.com

Maag will showcase elements of its pumps and filtration systems division at Chinaplas.

Its Extrex gear pumps GA are designed for typical thermoplastic extrusion applications and offer high overall efficiency and minimum abrasion, thanks to their underlying gear and bearing technology. They allow low pulsation pump action - in cases of high differential pressure - and have a simple, compact design, says the company. The company has installed more than 15,000 gear pumps in China.

Its new Extrex recycling pump ensures reliable extrusion in the recycling process. It features an optimised geometry that can eliminate the need for an upstream protective filter - saving space and reducing the energy needed for heating and drive power.

In addition, the company will show

www.filmandsheet.com

its Ettlinger ERF 350 melt filter for heavily contaminated polymer feedstock. The filter is self-cleaning with a rotating, perforated drum, through which there is continuous flow of melt from the outside to the inside. A scraper removes the contaminants held back on the surface and feeds them to the discharge system. This enables the filter to be used fully automatically and without disruption over long periods without having to replace the screen. This allows reliable melt filtration, low melt losses and good mixing and homogenising of melts, says Maag.

► www.maag.com

Windmüller & Hölscher (W&H) will present a number of flexible packaging solutions at Chinaplas - including machinery for extrusion, printing and converting.

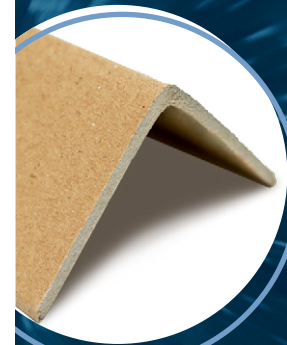
Among its film applications W&H will present its blown and cast film portfolio with a focus on sustainable solutions. Mono-material packaging is on the rise - which is catered for by W&H's machine direction orientation (MDO) range. PE films (which can incorporate EVOH) processed with MDO technology fulfill the needs of the downstream processes and enhanced barrier properties - while maintaining recyclability.

In printing, it will showcase machines for both CI flexo and gravure - with a focus on functional barrier coating and water-based inks. In converting, it will present machines

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Right: W&H says its MDO films allow mono-material barrier packaging that is easier to recycle

for tubs and bottoms for paper and PE sacks, including the valve bottomer AD Plastic 2 using hot air sealing technology and the new film for sift proof valve sacks (MP) and a light and strong bottom woven bag.

In addition, W&H's IoT system - called Ruby - can help to digitalise the value chain and use data to monitor, automate and improve packaging production.

➤ www.wh.group

Clariant will present a number of additive solutions, including: AddWorks PKG 158, which offers performance enhancement for packaging; and its AddWorks PKG 906 Circle and AddWorks AGC 970 G stabilisers, which are valuable in plastic film recycling and extending its service life.

Clariant says its additives have a broad spectrum of functionality and safety features. For safety and performance, it says its new AddWorks PKG 158 for polyolefin-based packaging offers increased functionality and improved economics - using polymers to enhance features such as processability, stability and static control on packaging materials. In addition, its AddWorks AGC 970 G light stabilisers provide protection against UV and agrochemicals - to extend service life of agricultural mulch films.

➤ www.clariant.com

ExxonMobil plans to show a number of materials with sustainability benefits, including its Exceed S polyethylene, Achieve polypropylene, Vistamaxx performance polymers, and Exxtend technology



IMAGE: W&H

for recycling of plastic waste in a range of applications.

It will demonstrate solutions with sustainability benefits that have been made through collaboration. One example is downgauged solutions that can reduce material use - while maintaining or boosting performance using performance polymers - such as downgauged air tube bags.

It will also showcase solutions designed for recyclability by reducing the number of components - such as all-PE stand-up pouches (SUPs) and laundry seed packaging.

➤ www.exxonmobil.com

SI Group will present its latest additives at Chinaplas - including its Evercycle platform, which it says can help to increase sustainability.

Visitors will have the chance to learn more about how SI's solutions - such as Weston 705 antioxidant, Evercycle additives, and speciality antioxidants - can contribute to a more circular economy in Asia-Pacific. At the show, it will host a technical presentation called 'Innovative antioxidant solutions for polyolefins and recycling applications' on 19 April.

SI has also continued to invest in the region. Most recently, it announced an expansion of phenolic antioxidant capacity at its Jinshan facility in China, and an expansion of Weston 705 production.

"In addition to expanding our manufacturing footprint, we have a growing team of sales and customer support representatives," said David Lu, VP and managing director of SI Group for Asia-Pacific.

➤ www.siigroup.com

Dates: 17-20 April 2023 **Hours:** 9:30-17:00 daily

Venue: Shenzhen World Exhibition and Convention Center (SWECC), Shenzhen, China

Organiser: Adsale Exhibition Services **Website:** www.chinaplasonline.com

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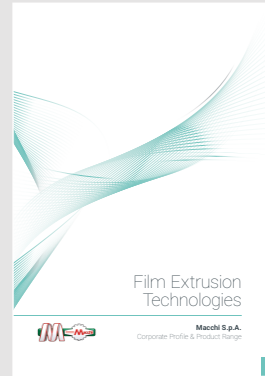
DIING KUEN: BLOWN FILM



In this brochure, Taiwan-based Diing Kuen provides all the specifications of its blown film technology to produce mono, two three, five and seven layers.. 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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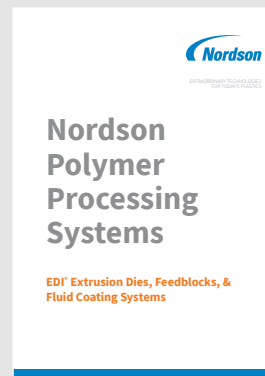
COLINES: BARRIER FILMS



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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NORDSON EDI: DIES AND FEEDBLOCKS



The EDI business at Nordson Polymer Processing Systems has published this brochure detailing its extrusion dies and feedblock products for different extrusion processes, plus its custom slot die coating systems.

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HAN KING



Han King, based in Taiwan, has produced this brochure outlining its machines for blown film extrusion, covering five-layer film, three-layer co-extruded film, agricultural film, geomembranes; plus other products in stretch hood, lamination and bags.

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VAN MEEUWEN: ADDITIVES



Van Meeuwen's functional additive range for plastics film and sheet producers includes anti-blocks, anti-statics, anti-fogs and specialty fluids. Suitable for plastic packaging applications, products comply with EU food contact regulations.

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

Rani Plast

Head office:	Terjarv, Finland
Chairman:	Mikael Ahlbäck
Founded:	1955
Ownership:	Private
Employees:	More than 1, 000
Turnover (2022):	Around €300 million
Profile:	Rani Plast, founded in 1955, is a major producer of cast and blown film, with its products used mainly in packaging, industry and agriculture. In its early days, the company made plastic bags on rolls, but has since branched out into many other forms of extruded film - from freezer bags and flexible packaging to timber-wrapping film and agricultural mainstays such as silage film and bale wrap.
Product lines:	The company's relevant product lines are in packaging, agricultural and industrial film. Its food packaging includes bags, sacks and shrink film. It also makes pallet stretch film. In agriculture, it offers silage film in lengths up to 22m. As well as conventional silage film, it offers products with an oxygen barrier, as well as underlayer and sidewall films.
Factory locations:	The company says it has nine factories in five separate countries, including those of sister or subsidiary companies. It recently boosted production capacity at its Bjolas plant in Finland, which makes packaging and agricultural film. Other production plants include its HP Rani Plast factory, which makes plastic bags on rolls, Art-Pak - which makes timber wrapping films and hoods - and Tervakoski Film, which makes electrical insulation films.

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

Film and Sheet FORTHCOMING FEATURES EXTRUSION

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

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Masterbatch

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

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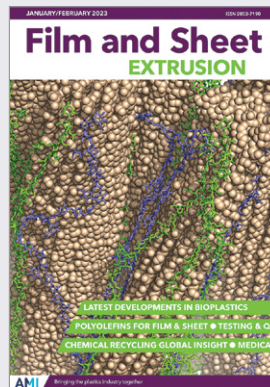
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Film and Sheet March 2023

The March edition of Film and Sheet Extrusion takes a look at recent developments in thermoforming. It also explores some of the latest additives for film production and reviews new introductions in digital extrusion control and barrier films.

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Film and Sheet January/February 2023

The first 2023 edition of Film and Sheet Extrusion looks at the latest innovations in the bioplastics arena. It also reviews developments in materials testing, medical materials, and polyolefins for film applications. Plus, Chemical Recycling Global Insight 2023.

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Compounding World April 2023

The April 2023 edition of Compounding World explores the latest developments in impact modifiers, polyamide additives and processing aids. Plus there is a special article on small batch compounding, with advice provided by three industry experts.

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Plastics Recycling World January/February 2023

The front cover article of Plastics Recycling World's January-February 2023 edition dives into the world of recycling polystyrene and other styrenic polymers. Other features look at solutions in recycling film-based packaging waste, and innovations in pelletisers.

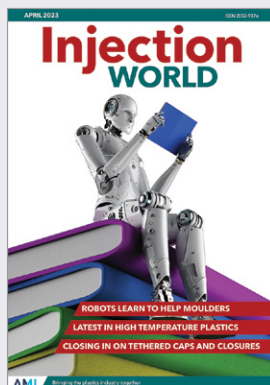
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Pipe and Profile March/April 2023

The March/April edition of Pipe and Profile Extrusion magazine looks at monitoring of screw and barrel wear. It also reviews developments in polyolefin materials for water and gas pipe and explores innovations in extrusion simulation and PE100 systems.

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Injection World April 2023

In the April issue of Injection World, the cover story looks at out how AI, vision systems and other technologies are helping robots assist moulders. Other features cover developments in caps and closures (including the move to tethering in Europe) and the latest in high temperature plastics.

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GLOBAL EXHIBITION GUIDE

2023	17-20 April	Chinaplas, Shenzhen, China	www.chinaplasonline.com
	4-10 May	Interpack, Dusseldorf, Germany	www.interpack.com
	23-26 May	Plastpol, Kielce, Poland	www.targikielce.pl/en
	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
	7-10 November	Plastimagen, Mexico City, Mexico	www.plastimagen.com.mx
	8-9 November	Plastics Extrusion World Expo USA, Cleveland, USA	www.extrusion-expo.com/na/
	22-25 November	PlastEurasia, Istanbul, Turkey	https://plasteurasia.com/en
	28 Nov-2 Dec	IPF Japan 2023, Chiba, Japan	https://www.ipfjapan.jp/english/


AMI CONFERENCES

18-20 April 2023	Stretch & Shrink Film Europe, Valencia, Spain
20-21 June 2023	Thin Wall Packaging North America, Chicago, USA
20-21 June 2023	Multilayer Flexible Packaging North America, Chicago, USA
15-16 August 2023	Agricultural Film North America, Houston, USA
26-28 September 2023	Biax Film Europe, Brussels, Belgium
3-4 October 2023	Polyolefin Additives, Barcelona, Spain
14-16 November 2023	Waterproof Membranes, Cologne, Germany
21-22 November 2023	Multilayer Flexible Packaging, Barcelona, Spain

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

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