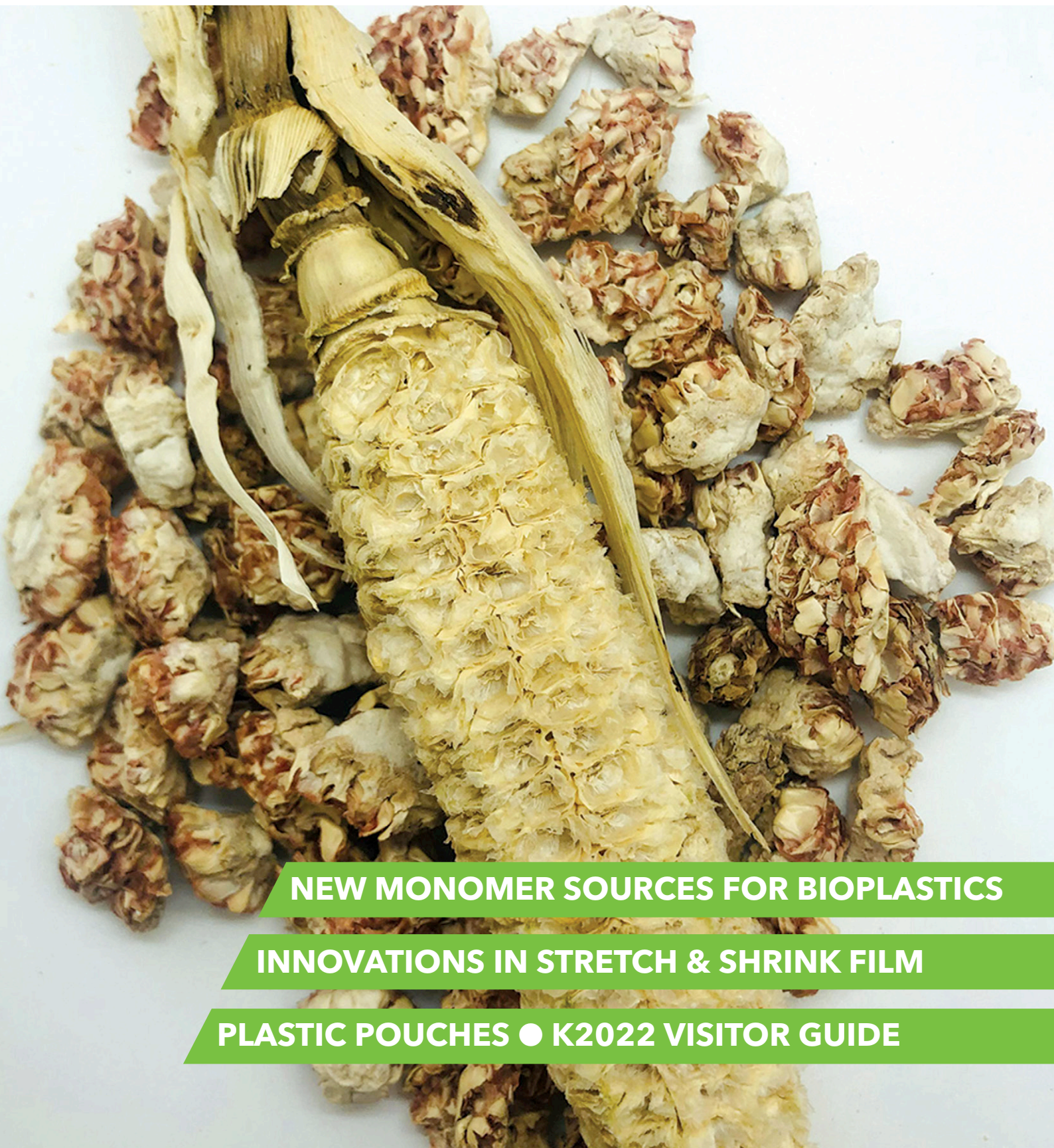


Film and Sheet EXTRUSION



NEW MONOMER SOURCES FOR BIOPLASTICS

INNOVATIONS IN STRETCH & SHRINK FILM

PLASTIC POUCHES ● K2022 VISITOR GUIDE



Want to read **Film and Sheet** magazine offline? **EXTRUSION**

Get the app and take your editions anywhere!

The *Film and Sheet Extrusion* magazine app is really easy to use and, once you've downloaded an edition, there's no need for a live data connection. It's great for anyone on the move. Just open the app to browse the latest edition on planes, trains, subways – anywhere.

The dedicated *Film and Sheet Extrusion* app is available free-of-charge for iPads, iPhones and a huge range of Android-based tablets and smartphones. Aside from enabling off-line reading, the app also gives you fast access to our archive

of more than 38 back issues allowing you to build up your own library. And if you opt for the free subscription on installation, all future editions will arrive on your device automatically.

The *Film and Sheet Extrusion* magazine app has already been downloaded more than 9,400 times by readers in more than 85 different countries. Why not try it out yourself. You can find the app in Apple's App Store, in iTunes and in the Google Play Store. Just search for "*Film and Sheet Extrusion*" or "AMI Plastics". Or click the relevant button below.



Film and Sheet EXTRUSION

4 Industry news

13 Green day: developments in bioplastics

Demand for sustainably sourced plastics is on the increase – and so is the range of sources from which materials can be made. Lou Reade reports

COVER IMAGE: LORENZ MANKER, EPFL

27 Standing firm: plastic pouches

Developments in plastic pouches include measures to reduce their weight, a multi-partner printing project and a high-barrier product that can be recycled easily

37 Stretching routines: stretch & shrink film

Recent sustainability advances in stretch and shrink film include a crystallisable PET shrink for Palmolive washing-up liquid that makes PET bottle recycling easier

43 K2022: guide for visitors

In this special section, we take a look ahead to the global plastics industry's essential event – providing useful links to help you get the most from your visit

48 Extruder of the month: Plastica

50 Dates for your diary



PAGE 4



PAGE 13



PAGE 27



PAGE 43



PAGE 37

COMING NEXT ISSUE

- › Multi-layer packaging › Thermoforming › PVC plasticisers › Laboratory extruders
- › K2022 Show Preview Part 1

CONTACT US

AMI

Third Floor, One Brunswick Square,
Bristol, BS2 8PE, United Kingdom
Tel: +44 (0)117 924 9442
Fax: +44 (0)117 311 1534
www.amiplastics.com
www.twitter.com/plasticworld
Registered in England No: 2140318

EDITORIAL

Editor-in-Chief: Chris Smith
cs@amiplastics.com

Editor: Lou Reade
lou@filmandsheet.com

Events and Magazines Director:
Andy Beevers
abe@amiplastics.com

[DOWNLOAD MEDIA DATA](#)

ADVERTISING

Advertisement Manager: Claire Bishop
cb@amiplastics.com T/ +44 (0)7905 848744

Head of Business Development: Paul Beckley
pb@amiplastics.com T/ +44 (0) 117 311 1529

Advertising Sales (China/Hong Kong): Maggie Liu
maggie.liu@ringiertrade.com T/ +86 13602785446

Advertising Sales (Taiwan): Ms Sydney Lai
sydneylai@ringier.com.hk T/ +886-913625628

Advertising and Expo Sales (India): Yogesh Vyas
yogesh@dexpo.com T/ +91 9920735930

CLICK HERE TO MAKE SURE YOU GET YOUR COPY

© Copyright Applied Market Information. No part may be reproduced without the prior written permission of the publisher.

Teraplast grows in stretch film

Romanian plastics extruder Teraplast is investing more than €11 million (US\$11m) to build a new stretch film production facility.

Construction will begin this year at its site in Saratel. The facility will have two production lines for polyethylene films for industrial use, representing a capacity of over 14,000 tonnes/year.

The plant will use a high level of automation.

Teraplast says the investment will generate a turnover of €28m (US\$28m) and EBITDA of €4m (US\$4m) – a margin of 14%.

The company has received state aid financing in order to build the factory.

In the last three years, Teraplast says it has made

investments of more than €44m co-financed by the state aid scheme.

"This project, part of our development strategy in a market segment with a major potential, involves the creation of a stretch film production centre in Romania, with long-term benefits," said Laszlo Vajda, chief development officer

at Teraplast.

The company estimates the stretch film market in Romania at around 30,000 tonnes/year – and says the new plant will reduce the need for imports. It aims to reach a market share of around 45% of the stretch film market by the end of 2025.

➤ www.teraplast.ro/en

Indevco adds film production

US-based Indevco Plastics has begun producing multi-layer polyethylene (PE) films at a new plant in Orangeburg, South Carolina.

The company has invested US\$25 million in the first phase and expects to create 50 jobs. The 100,000 sq ft facility – which houses manufacturing, warehousing, offices, and laboratory space – will manufacture PE converting films and both FFS and stretch hood films.

"Sustainable films are our growth focus," said Scott Sirmans, divisional sales director for Indevco Plastics. "We are aligning our supply chain to ensure we can deliver recycled and recyclable films to help customers reduce their environmental impacts, while meeting product performance requirements."

➤ www.indevcoplastics.com

Dow extends Africa recycling

Dow has expanded its Project Reflex initiative to Egypt and Guinea, following a successful pilot phase in Nigeria. The initiative aims to increase flexible packaging recycling in Africa to establish a market for recycle.

Dow aims to divert 10,000 tonnes of flexible packaging waste by 2025 and create employment for waste collectors in Nigeria, Egypt and Guinea through waste management company Wecyclers. So far, it has diverted 520 tonnes of flexible packaging waste into mechanical recycling streams and new applications.

➤ www.dow.com



IMAGE: WECYCLERS

Above: Project Reflex aims to divert 10,000 tonnes of flexible packaging waste by 2025

BOPP demand to keep growing

Global demand for BOPP film will grow at more than 4% per year to 2026, according to AMI.

In the tenth edition of **BOPP Films - the Global Market**, AMI says investment in BOPP capacity has reached "record levels". Asia dominates the increase, particularly in India and China.

Capacity expansion is coming from both existing players and new market entrants and is driven by several factors: an expanding retail sector in emerging markets; growth in middle classes; and consumer spending on packaged food and other goods.

The global market report provides detailed qualitative

insights into these investments around the world, and data on how they will affect utilisation rates each year as this new capacity comes on stream.

For the first time, it includes a chapter on BOPE, due to the recent development of hybrid BOPP/BOPE lines.

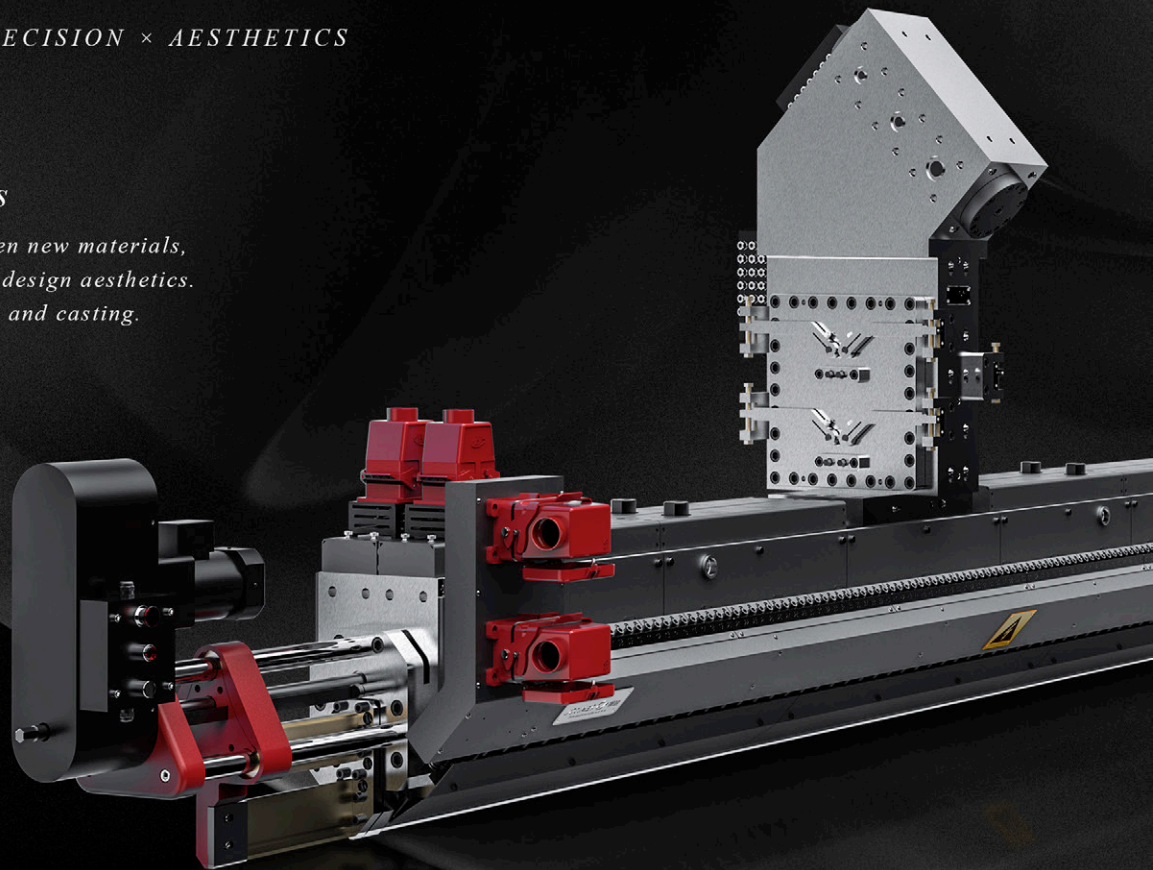
➤ www.ami.international

SEEKING GOODNESS AND BEAUTY

NEW MATERIALS × PRECISION × AESTHETICS

Cast Film Die Series

*Exploring connections between new materials,
precision manufacturing and design aesthetics.
Realizing effortless extrusion and casting.
Beauty is improvement.*



Registration opens for Plastics World Expo in Cleveland, US

The AMI Plastics World Expos return to the Huntington Convention Center in Cleveland, Ohio on 9-10 November 2022.

The plastics industry event - the largest in North America this year - brings together four focused exhibitions: Plastics Extrusion World Expo, Plastics Recycling World Expo, Compounding World Expo and Polymer Testing World Expo.

Free online registration has now begun. By registering in advance, visitors receive free admission to all four exhibitions - featuring more than 250 suppliers - and to five conference theatres hosting technical presentations, educational seminars and business debates. Attendees and exhibitors can also buy tickets (US\$50 each) for a networking party at the Punch Bowl Social on the evening of 9 November.

"The event will allow



Above: Conference sessions are a popular part of AMI's Plastics World Expos, which run in Cleveland again this year

visitors to meet and compare suppliers from around the world, and learn from business leaders and technical experts in the conference theatres," said Andy Beevers, events director at AMI. "When we ran these expos in Cleveland last year, they attracted more than 3,000 visitors."

The four expos will host many leading manufacturers of extrusion, compounding, recycling and testing equipment, plus suppliers

of a variety of polymers, additives and related services. The exhibitor line-up includes BASF, Clariant, Cloeren, Davis-Standard, Erema, Graham Engineering, Macro, Milliken, Nordson, Omya, PTi, Reifenhauer, Wacker, Windmoeller & Hoelscher and hundreds more. (See the full exhibitor list [here](#).)

To learn more about exhibiting at any of the expos, visit **www.ami.international/exhibitions**.

To book your free ticket for the expos and conferences - which is valid for both days of the event - visit: www.ami.ltd/Plastics-World-Expos-NA-Register

Ineos invests in MDO line

Ineos has made a "multi-million Euro investment" in a new extrusion line - which it says will help to create "more recyclable flexible packaging film".

The multilayer blown film line with machine direction orientation (MDO) - supplied by Hosokawa Alpine - will be installed in Ineos' R&D labs in Belgium, in 2023. Here, Ineos plans to develop mono-material flexible film packaging products. With partners such as converters and retailers, it plans to develop flexpack film based on polyethylene (PE) and polypropylene (PP) that uses fewer polymers - helping to increase recyclability.

"Flexible packaging films keep our food fresh and safe to eat, but we recognise and share people's concerns about plastic waste," said Rob Ingram, CEO of Ineos Olefins & Polymers Europe North. "This investment shows our commitment to taking action to create a more sustainable future."

➤ **www.ineos.com**

APC expands operations into western US

American Packaging Corporation (APC) has opened a new manufacturing facility in Cedar City, Utah - its first location in the western US.

The plant includes flexographic printing presses, laminating, preformed pouching and finishing equipment. The US\$100 million project

is the first of three planned phases.

In phase one, APC will hire 75 new team members - and eventually expects to add more than 135 jobs.

"In addition to attracting new business opportunities, the new location will enhance our support to our customers in the western half of

the USA by providing a production option closer to their operations - with shorter delivery requirements," said Ray Graham, COO of APC.

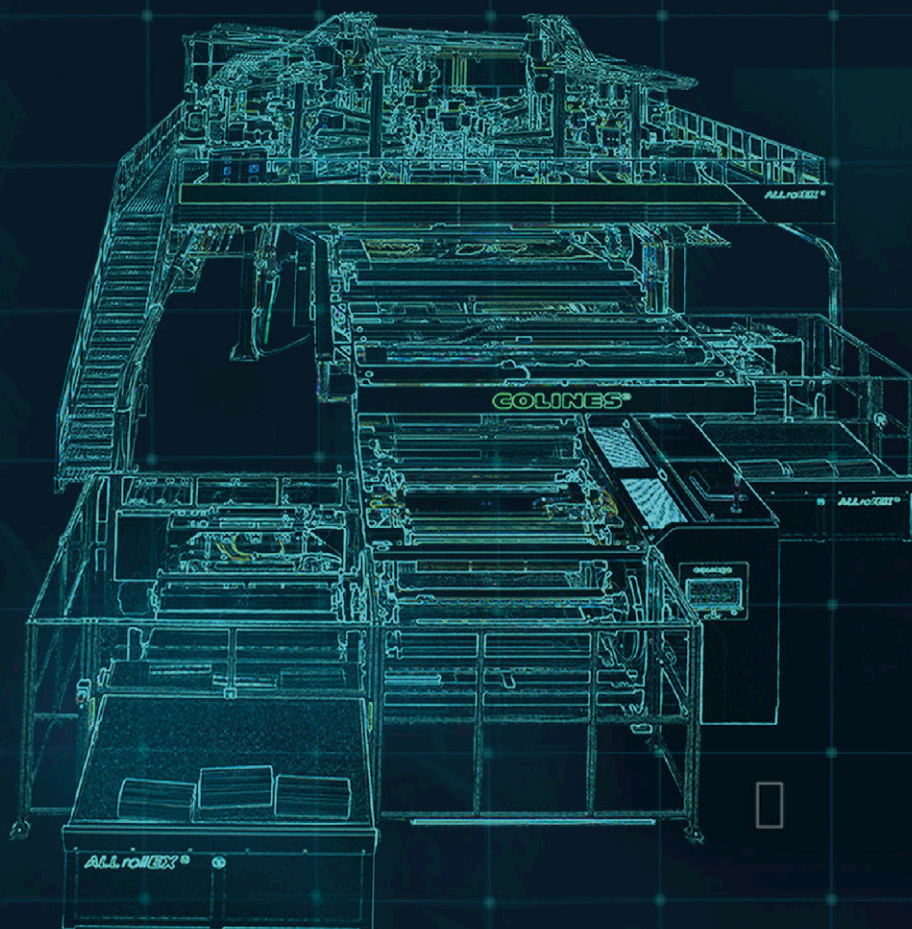
Founded in 1902, APC is a flexible packaging manufacturer that employs around 1,200 people.

➤ **www.americanpackaging.com**

COLINES®

2340966 304145642

COME AND DISCOVER THE PERFECT FORMULA



V I S I T U S A T

K2022

DÜSSELDORF
19-26 OCTOBER

EXTRUSION LINE IN OPERATION DAILY

DATA - ANALYSIS

27.33

86.67

54.00

16.00

992 8202 6903
323 8879 0784
706 5551 4834

<username>
<Service name>
<Executor name>
maxThreads=300
<Connector : Glob
ex



AMI | Events

Agricultural Film

August 16-17, 2022 | San Diego, CA, USA

Connect with your industry next month in sunny San Diego to discover global advances in agricultural film technology

Meet some of our expert speakers:



Karen Ross
Secretary of Agriculture,
California Department of
Food and Agriculture



Dr. Albert Zhang
Technical Manager,
Berry Global



James duBois
Senior Manager, Global
Environmental Impact,
Driscoll's



Cherish Changala-Miller
Vice President,
Sustainability
& Public Affairs,
Revolution Company

BOOK YOUR PLACE

Sponsored by:

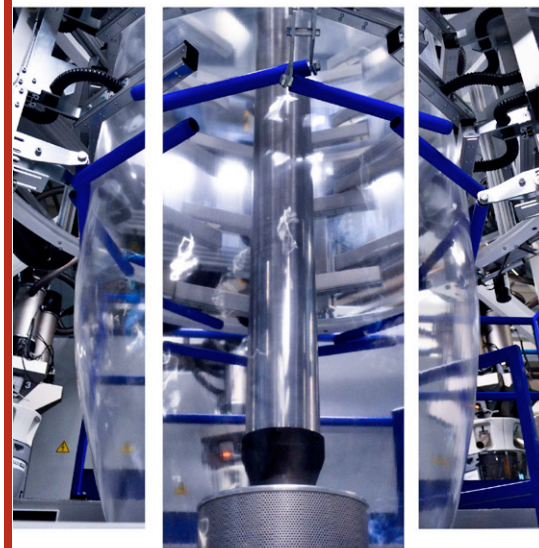




+39 0321 53479
info@gapitaly.com
www.gapitaly.com

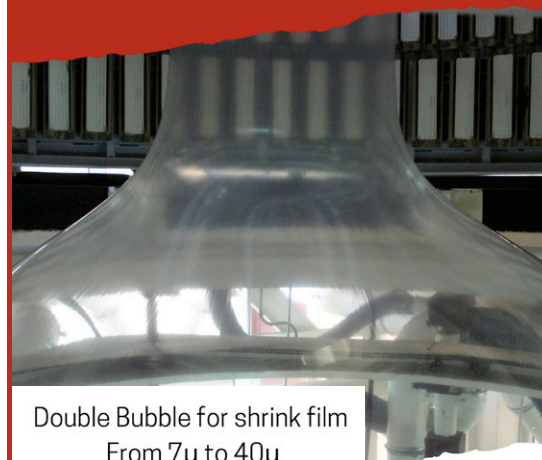
BLOWN FILM LINE

UP TO 27 LAYERS



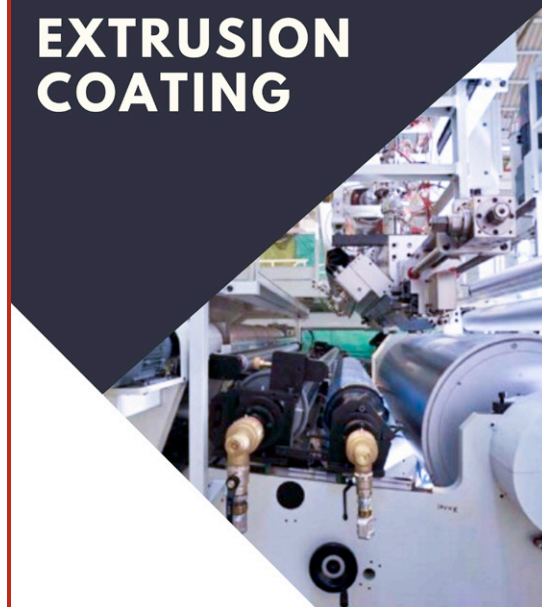
MICROLAYER SHRINK FILM

UP TO 27 LAYER WITH CROSSLINK



Double Bubble for shrink film
From 7 μ to 40 μ

EXTRUSION COATING



Innovia expands film capacity in Germany

Innovia is to invest US\$70 million to expand film capacity at its facility in Leipzig, Germany.

A new 8m-wide multi-layer co-extrusion line will produce thin-gauge label films to support growing demand for materials with lower resin content. The line will have an annual capacity of 36,000 tonnes.

Production will begin in the second half of 2024, with most of the capital deployed across 2023 and 2024.

"We see significant growth opportunities with films for pressure sensitive labels and plan to use our

existing assets in the UK for top-coated products and new initiatives, especially in the commercial graphics and signage sector," said Guenther Birkner, president of Innovia. "The new line in Germany will supply thinner films for the label market, close to where many customers are located."

Geoffrey Martin, president and CEO of CCL - Innovia's parent company - added: "Our strategy at Innovia is to deeply focus on label and other speciality end markets."

> www.innoviafilms.com

IMAGE: MANUPACKAGING



Above: Manupackaging's Manunature RR is a stretch film made with PCR LDPE

Saica supplies PCR

Film manufacturer Manupackaging has agreed a supply partnership with Saica, for post-consumer recycled (PCR) LDPE and LLDPE - which it will use in its products.

It will use Saica's PCR materials to make its Manunature RR polyethylene (PE) stretch film. The stretch film will contain up to 60% of PCR material.

"Increasing demand for sustainable packaging solutions is encouraging us to further develop eco stretch films and to extract more value from the

total product cycle of our raw materials," said Pierfranco Di Gioia, CEO of M Stretch, parent company of Manupackaging. "We are working closely with key partners throughout the relevant supply chain. Our goal is to launch a packaging project in Germany next year based on the circular economy."

The company recently installed two new extrusion lines dedicated to making the new films, he added.

> www.manupackaging.com

> www.saica.com

AMI | Events

Recycling Flexible Packaging

13-14 December 2022 | Cologne, Germany

Creating circularity through increased recovery and recycling of 'hard to recycle' flexible packaging

Brand-new focused event for the packaging and recycling industries

Opportunities to get involved include:

- Enhance your profile as a sponsor
- Increase your networking as an exhibitor
- Discover what's happening in the industry, attend as a delegate

NEW
FOR
2022



GET INVOLVED TODAY

VDMA: China exports overtake Germany's

Exports of plastics machinery from China exceeded those from Germany for the first time last year, according to VDMA, which represents German machinery manufacturers.

Figures from VDMA and the German Statistical Office show that China now accounts for almost 24% of total exports of plastics core machinery – equivalent to around €5,667 million (US\$5,960m). This came on the back of a 28% rise in exports. At the same time, Germany's exports accounted for 22%, or €5,213m (US\$5,483m). The next largest machine exporter is Japan, with a market share of just over 9%.

China also became Germany's top export market last year – accounting for just over €1 billion (US\$1.05bn) in sales following a 19% surge in demand. The US fell to second place, while India moved from 15th to third in Germany's export table. Overall, German exports increased by more than 9% in 2022.

Total sales for German machinery rose by nearly 6% last year, to €10,567m (US\$11,120m). Sales of core machinery rose more than 7% to

€7,549m (US\$7,944m), while turnover for flexographic printing machinery for films increased by more than 15% to reach €329m (US\$346m).

VDMA said that order books for its members are well filled, but supply chain problems – due to lockdowns and the Ukraine war – make it difficult to convert orders into turnover. In addition, prices for raw materials and energy are rising.

Euromap, the umbrella organisation for European machinery makers, added that world production grew 13% last year to reach a record level of €38.6bn (US\$40.6bn). This was driven by a 15% growth from China and 11% growth from Europe.

"In the medium term, [machine makers] in Europe will have to prepare themselves for a significantly higher price level, as raw materials and energy in particular have become much more expensive," said Luciano Anceschi, president of Euromap. "Processors are holding back on investments and therefore on new orders for machines."

➤ www.vdma.org/plastics-rubber-machinery

➤ www.euromap.org

Germany's leading export markets, 2021

Country	2021 sales, m€	2021 growth (%)	Position
China	1,002	27.9	1
US	781	-9.5	2
India	290	183.9	3
Italy	232	35.5	4
Poland	221	7.6	5
France	194	18.6	6
Mexico	143	25.6	7
Austria	129	15.0	8
Turkey	126	-3.3	9
Spain	124	15.4	10
TOTAL	5,213	9.4	

Source: VDMA

BRÜCKNER
MASCHINENBAU



A Member of Brückner Group



BOPE packaging for our future sustainability

- Multi-layer mono-structures
- Superior film properties
- Dedicated line concept
- Perfect match with the circular economy

www.brueckner.com

PLASTICS EXTRUSION WORLD **EXPO** **NORTH AMERICA**

**REGISTER
FOR FREE
TODAY**

November 9-10, 2022
CLEVELAND, OHIO, USA



REGISTRATION NOW OPEN!



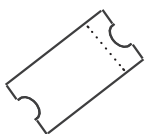
4 exhibitions



5 conference theaters



16 hours of face-to-face time



1 FREE TICKET



**CLICK
HERE TO
REGISTER**

Brought to you by:



Colocated with:



Proudly supported by:

Film and Sheet
EXTRUSION

Pipe and Profile
EXTRUSION

Green revolution: recent bioplastics developments

Demand for sustainably sourced plastics is on the increase – and so is the range of sources from which materials can be made. Lou Reade reports

While crude oil continues to be the main raw material of plastics, a growing range of raw materials – including sugar and other sustainable sources – is being used to create an emerging generation of polymers.

Using non-oil resources is nothing new. Only recently, petchems giant **Braskem** announced plans to raise production of its sugarcane-derived polyethylene (PE) by 30% – to 260,000 tonnes/year – at its plant in Triunfo, Brazil. Similar announcements have been made in the production of PLA, the most commonly used bioplastic.

However, a number of research teams are using alternative sources – such as sugar – to create new materials.

Sweet spot

At **Birmingham University** in the UK, researchers have used a particular sugar – called isosorbide – to create a novel elastomer that has superior elastic recovery and toughness. It is also degradable and mechanically recyclable, according to research leader Andrew Dove. The research was published recently in *Angewandte Chemie*.

The isosorbide has relatively ‘disordered’ chains, which leads to hydrogen bonding: this increases the polymer’s strength, elastic recovery and optical transparency.

“It also allows the material to retain its properties after recycling,” said Dove. “Hydrogen bonding is like ‘dynamic’ crosslinking.”

Elastomers typically get their properties from covalent crosslinking. These bonds are degraded when a material is mechanically recycled. In the new material, the hydrogen bonds naturally re-form after recycling – meaning that physical properties are maintained.



IMAGE: VTT

The team also created an elastomer using a very similar sugar – isomannide – but it did not form hydrogen bonds, so had inferior properties. As part of the research, the team created transparent thin films from both isosorbide and isomannide, which were thermally stable to 120°C. They were subjected to tests such as uniaxial stretching to determine their physical properties.

Typically, isosorbide-based polymers have high glass transition temperatures – making them stiff and brittle at room temperature. However, the new elastomer does not have the usual ‘hard-soft’ combination of ‘domains’ seen in typical elastomers. Instead, it uses more precise chemistry to create an alternating structure that determines the physical properties.

“This means you don’t get the same type of phase separation,” said Dove.

The research has been patented in collaboration with US-based Duke University. They are now looking for partners to help commercialise the material. Because the new elastomers are bio-derived – and both recyclable and degradable – Dove says they could be attractive in packaging applications. However, he says cost would be an issue, due to the way they are produced.

Sulphur links

Elsewhere in the UK – at **Bath University** – Antoine Buchard is also retaining the characteristics of

Main image:
VTT has developed a flexible, transparent film from regenerated or recrystallised cellulose

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

sugar molecules in new polymer materials.

A critical part of his research has been to use sulphur linkages – rather than oxygen linkages – to impart new properties to materials. This can transform properties such as degradability, he says.

Buchard and his team have subjected a sugar derivative called oxetane – containing a four-membered cyclic ether ring – to ring-opening copolymerisation (ROCOP) with carbon disulfide (CS_2). This creates a polythiocarbonate polymer. The team used a catalyst called CrSalen to lower the polymerisation temperature. The team has since developed a cheaper, aluminium-based catalyst that works more efficiently than CrSalen.

The research was reported in the journal *Polymer Chemistry*.

The presence of sulphur in a polymer linkage makes the material less thermally stable, more degradable and more sensitive to UV light than its oxygen counterpart – making it potentially important as the basis for degradable, bio-derived polymers.

In ongoing research, Buchard has replaced oxygen with sulphur in various positions and tried to figure out the consequences.

“Sometimes properties are improved, sometimes they are reduced. The reality is not clear,” he said.

PLA breakdown

Buchard has also studied how sulphur linkages could make PLA easier to degrade.

“People say PLA is biodegradable – but that’s a tricky word,” he said. “To degrade completely, it needs industrial composting conditions.”

The most difficult step is to break the long chains, he says. After this, breaking shorter chains is easier – such as by hydrolysis in the open environment.

This year, Buchard and colleagues reported how a copolymer of PLA will degrade under UV light. L-lactide – the monomer used to make PLA – is copolymerised with a cyclic xanthate monomer. This introduces sulphur-containing thionocarbonate and thioester linkages. This polymer, with around 3% of sulphur-containing linkages, was found to lose 40% of its mass within six hours of UV exposure.

Below: This image, magnified 2,000 times, shows that the ‘pillared’ structure of a lotus leaf (left) is mimicked in RMIT’s bioplastic (right)

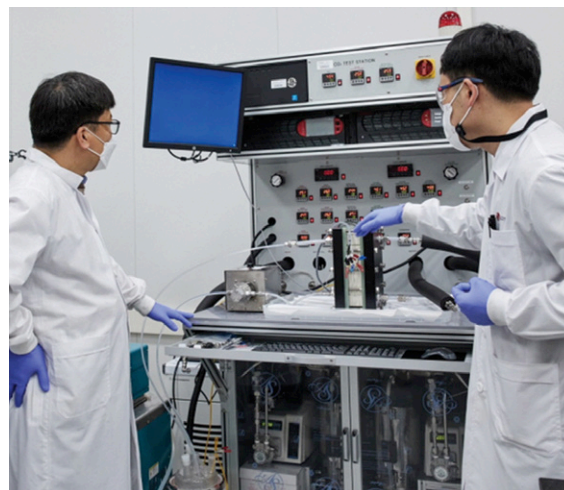
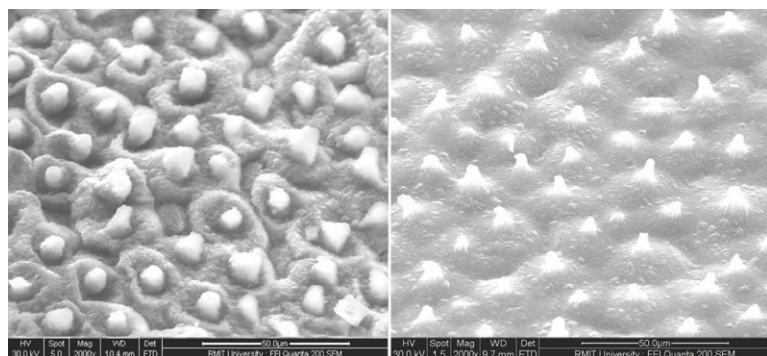


IMAGE: LG CHEM

“This has the potential to increase the degradability of PLA without significantly affecting its material properties,” he said.

The mechanism behind the degradation needs to be studied in more detail, and testing needs to be performed on ‘real life’ objects. So far, it has only been done on powders. The work was published in the journal *Chem. Comm.*

Cooking wood

Earlier this year, Swiss scientists produced a PET-like material from sugars derived from biomass. They transformed “lignocellulosic biomass” into a di-ester-containing monomer with an 83% yield. This monomer can be polymerised using a variety of aliphatic diols to produce a polymer that is tough, heat-resistant and has a good oxygen barrier – with potential use in packaging.

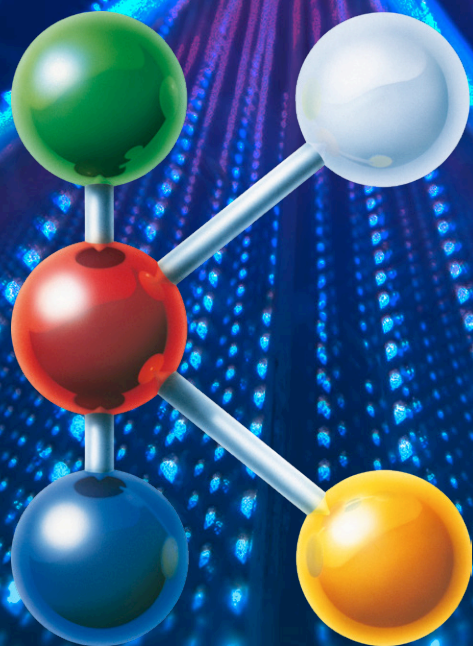
“We essentially ‘cook’ wood or other non-edible plant material – such as agricultural waste – in inexpensive chemicals to produce the plastic precursor in one step,” said Jeremy Luterbacher, associate professor at **EPFL** in Switzerland. “By keeping the sugar structure intact within the molecular structure of the plastic, the chemistry is much simpler than current alternatives.”

The polymer can be processed via extrusion and has been used to make packaging films, among other products.

“What makes the plastic unique is the presence of the intact sugar structure,” said Luterbacher. “It’s easy to make, because you don’t have to modify what nature gives you, and simple to degrade because it can go back to a molecule that is already abundant in nature.”

Although biodegradation studies still need to be performed, the polymer can be chemically recycled at 64°C and eventually depolymerised in room-temperature water. The research was published in *Nature Chemistry*.





AS DI GI TA LI SA TI ON

k-online.com/digitalisation

The World's No.1
Trade Fair for
Plastics and Rubber

19-26 OCTOBER 2022
Düsseldorf, Germany

Messe Düsseldorf GmbH
P.O. Box 10 10 06 _ 40001 Düsseldorf _ Germany
Tel. +49 211 4560 01 _ Fax +49 211 4560 668
www.messe-duesseldorf.de



Messe
Düsseldorf

Right: Cortec's Eco Film has been used in a number of composting programmes

Self destruction

Another 'natural' approach has been taken by US-based researchers – who have devised a polymer that will 'self-destruct' under UV light.

The crosslinked polymer contains building blocks in its backbone based on vanillin – which can be produced from materials such as lignin, a by-product of cellulose production.

The vanillin derivative developed by the team absorbs light at 300nm and enters an excited state. This causes a chemical reaction that triggers polymer degradation. Because this wavelength is not contained in natural sunlight, unplanned degradation is avoided. The researchers were able to recover 60% of the monomers, which could be polymerized again with no loss of quality.

The research – a collaboration between **Bowling Green State University** and **Dakota State University** – was published in the journal *Angewandte Chemie*.

Cellulose 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 **Woodly** 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.

Woodly 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 Woodly. "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: "Woodly'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."

In addition, Finland-based **VTT** has developed a flexible, transparent cellulose film that it says could replace traditional packaging.

The product, made from regenerated or recrystallised cellulose, is both bio-based and biodegradable, according to VTT.

"The consumer cannot distinguish between the crystal-clear material and traditional oil-based plastic," said Ali Harlin, research professor at VTT. "Cellulose film can resist dampness, but in nature it disappears as completely as a sheet of paper does."

Atte Virtanen, vice president for biomaterial processing and products at VTT, added: "The cellulose film makes recycling easy, as it can be placed in cardboard recycling along with other packages."

VTT has been researching cellulose films for



CUSTOMIZED & RELIABLE EXTRUSION SOLUTIONS PROVIDER



5 Layers Co-Extrusion for Industrial Stretch-Hood

- High efficiency extrusion for multilayer blown film.
- Automatic on-line calibration.
- Data acquisition & analysis system of plastic extrusion plant.
- Minimized energy consumption.
- Automatic feeding system and gauge control.
- IIoT gateway for providing secure access to remote service.

Diing Kuen Plastic Machinery Co., Ltd.
+886-5-221-7410
diing.kuen@hibox.hinet.net
www.facebook.com/DiingKuen
www.diing-kuen.com

2022 Booth:
Hall 16, E71

We take you to the top of extrusion



TEGOMER.IT

Visit us at:

Hall 17
booth 17C20



Macchi S.p.A.
Via Papa Paolo VI, 5
21040 Venegono I. (VA) Italy

Tel. +39 0331 827 717
E-mail: macchi@macchi.it
www.macchi.it



60
1961-2021



IMAGE: CJ BIO

Above: CJ Bio has completed biodegradability testing of its amorphous PHA material - in seawater

more than 10 years - and spent more than six years on regenerated cellulose in transparent films.

The production of packaging from the new material is in the pilot phase - and it could be in extensive industrial use in 5-7 years, says VTT.

Starch blends

US-based **Green Dot Bioplastics** has expanded its Terratek BD line with nine new compostable grades of material for single-use and packaging applications. The expanded range includes grades for film extrusion and thermoforming.

The five new film grades are compostable starch blends that require no tooling or process modifications when run on traditional blown or cast film equipment. They include Terratek BD3003 which exhibits high puncture resistance and tear strength and is heat sealable like linear low-density polyethylene (LDPE) film. Terratek BD3300 is a stiff, high-modulus material with high heat resistance and overall properties similar to HDPE film.

"We've developed materials that have a faster rate of biodegradation in ambient composting conditions and the functional performance that the

market demands," said Mark Remmert, CEO of Green Dot Bioplastics.

The film grades claim to deliver faster rates of biodegradability for home composting, industrial composting and soil biodegradability. They are targeted at applications including produce bags, bubble wrap, agricultural films and other lawn and garden packaging. The materials are completing third-party certification by TÜV Austria.

Green Dot has also developed three new thermoforming grades which provide a range of properties including clarity. Other grades provide higher heat performance and greater flexibility for applications such as food service packaging, takeout containers, deli packages, and straws. They are going through final certification by TÜV Austria.

Plastics 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 commercialisation by applying a stack method - where cells in the reactor are stacked sideways. ➤

Heat exchangers for bioplastics factory

US-based Tranter has won an order to install six NovusBloc heat exchangers at a bioplastics facility in Thailand.

The heat exchangers were delivered directly to the facility from South Korea. The plant will use sugar cane as raw material to produce lactic acid, lactide, and polymer - and claims to be the world's first fully integrated PLA facility.

Although Tranter does not name the customer, it says it is "based in the United States but partly owned by a

large chemical producer in Thailand" and that "construction of the plant will begin as early as 2022, with start-up scheduled for early 2024".

NatureWorks - which is currently building a PLA factory in Thailand - is owned by US-based Cargill and GC International Corporation of Thailand.

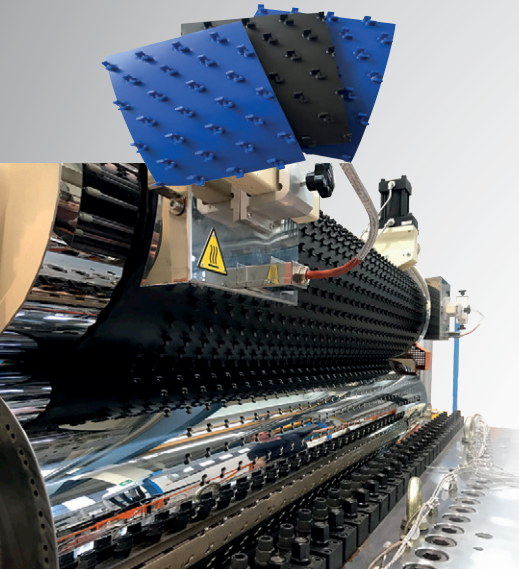
➤ www.tranter.com

Right: Tranter will install six heat exchangers at a bioplastics facility in Thailand



IMAGE: TRANTER

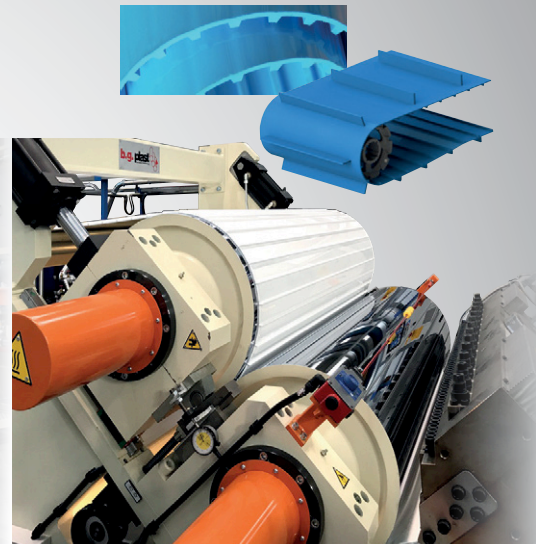
b.g.plast...the right answer to your questions!



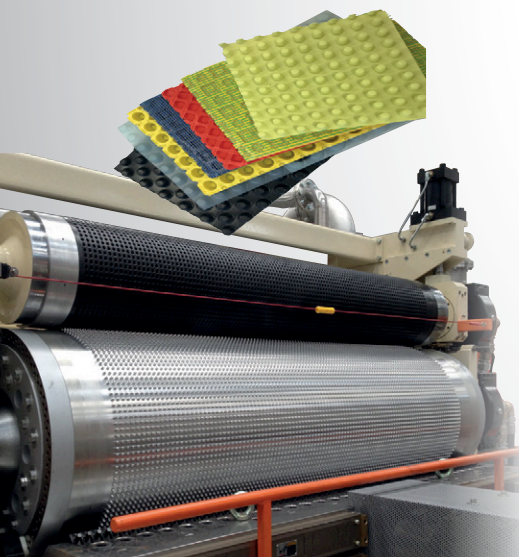
V-STUD SHEET LINES



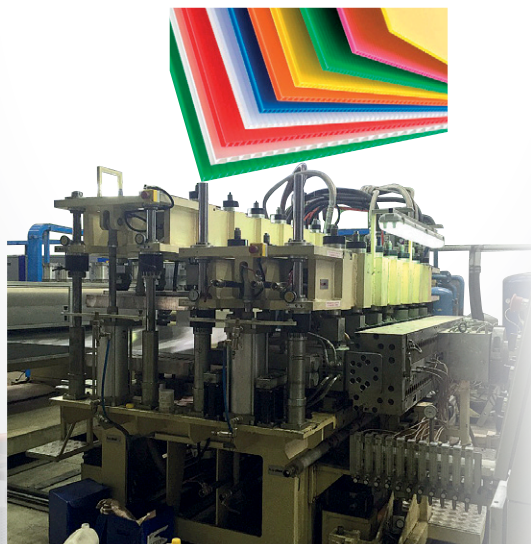
PET - PP - PS
EXTRUSION LINES



POSITIVE BELT
TPU SHEET LINES



DIMPLED SHEET LINES



HOLLOW SHEET LINES
MULTIWALL - PP - PC



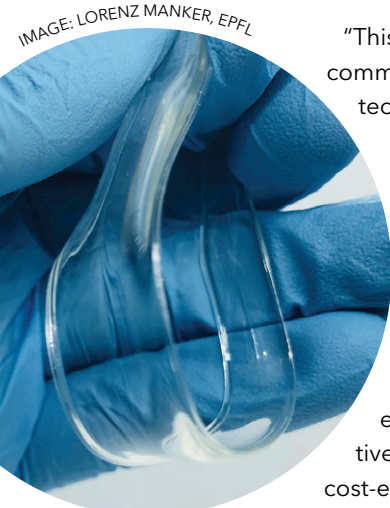
PVC CLING FILM LINES
BLOWN FILM

b.g. plast
since 1987
extrusion technology

Via Venezia 232 - 21050 Marnate - Italy
Phone: +39 0331 365 865



www.bgplast.it
info@bgplast.it



Above: EPFL scientists have produced a PET-like barrier material from sugars derived from biomass

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

Lotus effect

Scientists at **RMIT University** in Australia have developed a self-cleaning bioplastic.

The material repels liquids and dirt – just like a lotus leaf – then breaks down rapidly in soil.

"Plastic waste is one of our biggest environmental challenges, but the alternatives we develop need to be eco-friendly and cost-effective to have a chance of widespread use," said Mehran Ghasemlou, a PhD researcher at RMIT, and lead author of a paper on the research, published in *Science of the Total Environment*.

The bioplastic is made from starch and cellulose, which helps to keep production costs low and support rapid biodegradability. The fabrication process does not require heating or complicated equipment and would be simple to upscale to a roll-to-roll production line, he said.

"We designed this new bioplastic with large-scale fabrication in mind, ensuring it was simple to

make and could easily be integrated with industrial manufacturing processes," said Ghasemlou.

The material does not need industrial intervention to biodegrade, with trials showing it breaks down naturally and quickly in soil.

"Our ultimate aim is to deliver packaging that could be added to your backyard compost or thrown into a green bin with other organic waste – so that food waste can be composted together with the container it came in to help prevent food contamination of recycling," he said.

To make their lotus-inspired material, the team first synthetically engineered a plastic made of starch and cellulosic nanoparticles. The surface of the bioplastic was imprinted with a pattern that mimics the structure of lotus leaves, then coated with a protective layer of PDMS, a silicon-based organic polymer.

Tests showed that the bioplastic not only repels liquids and dirt effectively, but retains its self-cleaning properties after being scratched with abrasives and exposed to heat, acid and ethanol.

Magnified images show distinct similarities between the synthetic material and the 'pillared' structure of a lotus leaf, according to the researchers



Packaging Film Recycling Machine Fast Machine Delivery

Simple Operation. Easy Maintenance.



+886-6-2730889
sales@polystarco.com
www.polystarco.com

 **Hall 9 B46**
19-26 OCTOBER 2022
Düsseldorf, Germany

POLYSTAR

Macro Engineering

is a supplier of film and sheet extrusion systems and components

- Blown Film Systems
- Quadex™ Biax Film Systems
- Foam Systems
- Specialty Sheet Systems
- Cast Film Systems
- Air Rings, Dies, Winders



Visit us at K-Show 2022
Oct 19-26, 2022
Hall 16 Booth A21



MACRO®
ADVANCED EXTRUSION SYSTEMS

Right: Corn cobs were one source of biomass for EPFL's new polymer

Ghasemlou is currently working with a bioplastic company, which is evaluating further development of these novel water repellent materials. The RMIT research team is keen to collaborate with other potential partners on commercial applications for the bioplastic.

Compostable certificate

Cortec has received industrial compostability certification for its Eco Film.

The film is a certified commercially compostable film designed to replace traditional non-degradable films such as LDPE and HDPE. Cortec received the certificate from TÜV Austria, proving that Eco Film conforms to the criteria for industrial compostability under EN 13432 (the European equivalent of ASTM D6400). In a typical commercial composting environment, Eco Film will biodegrade within a few months.

Eco Film has been used in a number of composting programmes such as one at Minnesota Zoo in the USA – where the main goal was greater sustainability by reducing the amount of waste generated. The zoo recycled 370 tonnes of material and composted about 600 tonnes of waste in the first year. The programme generated a large quantity of compost, which was used as a soil mix additive and as mulch on existing turf areas.

Recently, Cortec launched the second generation of film, called Eco Film II Backyard Compostable. It is designed to compost in less than one year at ambient temperatures in a backyard composting environment. Instead of sending used bags to the local industrial composting facility, users of the new film can discard it into a backyard compost bin.

Teaming up

Two leading bioplastics producers are looking to develop 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 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.



IMAGE: IMAGE: LORENZ MANKER, EPFL

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.

PHA degradability

CJ Bio recently completed biodegradability testing of its amorphous PHA material.

Tests conducted by the Korea Conformity Laboratories (KCL) – in Korea’s West Sea – showed a weight loss of 57% after 11 weeks, showing the polymer’s ability to biodegrade in the natural environment.

Initial applications of the technology will be used as a modifier to other compostable polymers and biopolymers to improve functional and processing characteristics, and to help these products achieve faster rates of biodegradation or composting.



DISCOVERY

THE INNOVATIVE AUTOMATIC COOLING RING



a Moretto brand



Hall 11
Stand H56
Stand H66

follow us 

www.contrex.it

Rohm has developed thermoformable PLA films for a range of applications

IMAGE: ROHM



KCL placed amorphous PHA, semi-crystalline PHA and polylactic acid (PLA) films into the sea and measured the weight changes at intervals of two weeks for 11 weeks. While 57% weight loss was recorded for the amorphous PHA, the weight of the semicrystalline PHA declined 28%, and PLA lost 1.2% of its weight.

"The experiments have proven PHA's biodegradability and industrial value outside of the lab and in real-world conditions," said Seung Jin Lee, head of the biomaterials business at CJ Bio. "We expect that mixing our amorphous PHA with other materials – such as PLA and PBAT – will improve the levels of biodegradability in those polymers, and we are continuing to conduct research and development with those materials and others."

CJ Bio continues to analyse the biodegradable properties of PHA in collaboration with KCL. Marine biodegradation experiments on products including packaging and straws made from a mixture of PHA and other biodegradable materials began recently, and the impact on the ecosystem is also being measured.

Production of amorphous PHA has started at CJ Bio's manufacturing facility in Pasuruan, Indonesia, which has a rated capacity of 5,000 tonnes/year, with plans to increase production to meet expected demand.

Bio-based PET plant

US-based **Origin Materials** is to build a world-scale manufacturing plant to make a range of products, including bio-based PET.

The facility, on a 150-acre site in Geismar, Louisiana, plans to convert around 1 million tonnes/year of wood residues into products including PET. It is expected to be operational by mid-2025.

Origin converts cellulose into four chemical building blocks, which are further converted into end products. One of the building blocks, called

CMF, can be converted into para-xylene, which is then used to make PET.

"The demand for 'net zero'-enabling materials is strong, and we believe this plant will be instrumental in addressing demand for our products in the USA and internationally," said John Bissell, co-CEO of Origin.

Thermoformable PLA

Germany-based **Rohm** has developed thermoformable PLA films from renewable raw materials.

Europlex Film LJ 21123/123 is a transparent, high-gloss film. Unlike other PLA films, it has not been biaxially stretched – so can be thermoformed.

The film consists of certified, compostable PLA, which meets the requirements for industrial composting as per the ASTM D6400 US standard and the EN 13432 European standard. If it is not disposed of correctly, its persistence is lower than that of petroleum-based films, says Rohm.

Its properties include: bio-based and industrially compostable; can be thermoformed at 55°C; highly transparent – with a light transmittance of over 92%; high tensile strength and good flexibility; and, can be stamped, cut and printed on.

On request, development samples can be provided in thicknesses of 53 to 500 microns and widths of 200mm.

It is aimed at applications such as packaging for food and non-food items, as well as decorative films for insert moulding decoration processes, or printed products such as graphics panels.

"Our experience in film extrusion enables us to produce PLA films with high optical quality," said Herbert Groothues, head of film and extrusion development at Rohm.

CLICK ON THE LINKS FOR MORE INFORMATION:

- > www.braskem.com
- > www.bham.ac.uk
- > www.bath.ac.uk
- > www.epfl.ch
- > www.bgsu.edu
- > <https://dsu.edu>
- > www.amerplast.com
- > www.woodly.com
- > www.vtt.fi
- > www.greendotbioplastics.com
- > www.lgchem.com
- > www.rmit.edu.au
- > www.ecocortec.hr
- > www.natureworksllc.com
- > www.cjbio.net
- > www.originmaterials.com
- > www.plexiglas.de

NEW

AMI | Market Reports

BOPP Films

Global Market 2022

The BOPP film industry has undergone a transformational couple of years, coming through recent world events with a revived sense of its essential purpose, boosted by strong margins and the renewed ability to invest in its future

Discover the opportunities and threats for your business in one of the fastest growing segments of the packaging market, including:

- impact of the covid pandemic, raw material and current energy crisis on supply and demand
- impact of sustainability commitments and growing body of sustainability legislation
- strong investment wave and consequences for trade and margins
- pricing volatility
- intense competition and strategies adopted by companies seeking differentiation
- **NEW!** the growth of and opportunities in BOPE film

FIND OUT MORE



www.ami.ltd/Global_BOPPFilms_Report

Save \$200*
if you
book before
9 September
2022

AMI | Events

Breathable Films

30 November - 1 December 2022 | Berlin, Germany

Exploring the trends and innovations driving the breathable films industry, creating value for products across multiple end-use applications

Confirmed speakers:



Dr David Whiteman
Senior S&T Development
Manager - Polymers,
Imerys



Oliver Hissmann
Senior Sales Manager
FSP, OCS Optical Control
Systems



Marcelo Milani
Director Roll Coating
Business, Molecular
Plasma Group (MPG)



Natacha Bitinis
TS&D Technical Leader,
Dow Chemical Ibérica

*This discount cannot be used in conjunction with other offers. Offer ends September 9, 2022.

SECURE YOUR PLACE TODAY

Sponsored by:

SML
EXTRUSION LINES - ENGINEERED TO PERFORM

Media supporter:

Film and Sheet
EXTRUSION

IMAGE: IAKOV FILIMONOV



Developments in plastic pouches include measures to reduce their weight, a multi-partner printing project and a high-barrier product that can be recycled easily

Standing firm: latest in plastic pouches

Plastic pouches have found their way into many end markets – from drinks to pet food. However, as with all forms of packaging, there is pressure to improve sustainability – such as by using new – or fewer – materials.

Plasthill Technical Films is using CompresSeal technology – from **Constantia Flexibles** – to reduce the weight of packaging.

CompresSeal film claims to have higher seal integrity than standard polyethylene (PE) films and weighs up to 30% less. It will be available in selected markets from August 2022.

"CompresSeal film is the result of years of research and development by our experts," said Pim Vervaat, CEO of Constantia Flexibles. "With Plasthill's embossing capabilities, we offer it to customers in a broad variety of packaging applications."

"CompresSeal film is the result of years of research and development by our experts," said Pim

Vervaat, CEO of Constantia Flexibles. "With Plasthill's embossing capabilities, we offer it to customers in a broad variety of packaging applications."

The technology consists of a special micro-embossing technology, which can reduce the weight of polyolefinic sealant films by up to 30%, while retaining the same thickness as standard packaging. This helps to reduce the carbon footprint of packaging.

In addition, it reduces the issues associated with migrating slip agents that are usually used in the PE and PP film industry. This means fewer additives need to be used while the coefficient of friction on the packaging line remains constant – independent of conditions such as temperature and humidity. This also leads to higher production speeds. The solution is suitable for use in flow packs for washing detergents, dry pet food and for stand-up pouches for liquids.

Main image:
CompresSeal
helps to cut
packaging
weight in
applications
like petfood
bags

Right: Brookfarm is using OF Packaging's Roll 'n' Recycle - which is easy to recycle - to protect muesli and granola

IMAGE: OF PACKAGING



Initially, the focus will be on PE sealants in thicknesses above 60 grammes per square metre, where weight-saving has the most significant environmental impact.

Pouch printing

A multi-partner project has demonstrated a concept for recycling digitally printed pouches.

Dow and **Reifenhäuser** - along with **HP**, **Cadel**

Deinking, and **Karlville** - have joined forces to recycle PE-based barrier pouches into new PE pouches that are suitable for repeat recycling.

Starting with a PE-based barrier food pouch, the team used mechanical recycling and de-inking to create a dishwasher MDO-PE 1 pouch containing 30% recycled content that was itself suitable for recycling. In a next step, the team is working on a digital product passport pilot to record recycling-relevant packaging properties and make the pouch identifiable for recycling within post-consumer waste management.

"We applied our full expertise and testing capabilities to make our resins work in this proof of concept," said Laura Evangelio, senior technical service and development specialist at Dow Packaging & Specialty Plastics. "The first PE-rich pouch was designed for recyclability with up to 5% EVOH in the total structure for barrier functionality."

The resins provided a high stiffness-toughness balance, low-temperature sealability, adhesion to extruded barrier layers and high bubble stability, she said.

For a second PE-based pouch, a solventless adhesive was used to enable the lamination of the

AUTOMATION FOR YOUR ADVANTAGE THE **XP EXPRESS®-AGT**

DIE TO NIP MANAGEMENT

COOLING & POLISHING CAPABILITIES

SHEET CLARITY & WEB FLATNESS

HEAT TRANSFER & WEB CONTACT

WEB ORIENTATION &
THICKNESS CONTROL

FLOOR SPACE UTILIZATION



SCAN OR CALL US AT
+1 860-809-4712

DAVIS-STANDARD®

2022
HALL 16
BOOTH # A43

MDO-PE film to the PE-film containing recycled resins from the first pouch.

The new resins have been co-extruded on an Evo 9-layer blown film line from Reifenhäuser, to produce PE-based packaging films at fast line speeds.

"We have modified and enhanced our production lines to enable films and packages not just to be economical and functional, but to meet the demand for recyclable packaging based on mono-material structures," said Ralf Wiechmann, head of film innovation at Reifenhäuser.

Kerbside winner

Dow also runs an annual competition - the Packaging Innovation Awards. At the latest version, held earlier this year, the highest award went to OF Packaging - which has developed a high-barrier stand-up pouch that can be recycled in kerbside recycling schemes.

OF Packaging was challenged by its client, Brookfarm, to create a high barrier packaging structure - to protect muesli and granola products - that can be recycled through kerbside recycling. Its Roll 'n' Recycle packaging was created in

collaboration with its partners Prep Design and Results Group.

"Recovery of end-of-life packaging can be challenging," said Joe Foster, managing director of OF Packaging. "Flexible packaging is typically not easily recognised by material recovery machines and hand picking such materials is difficult if not impractical."

Foster added that it took more than 12 months of work and testing to create the new packaging.

"Recycling packaging often starts at home, so our solution enables consumers to transform the empty, 100% polyethylene flat packaging into a 3D shape - suitable for their recycling bin - so it's ready for recycling through existing processes," he said.

All sorted

Mondi has carried out a series of tests to prove its mono-material polypropylene (PP) pouches and roll stock material can be sorted into their appropriate recycling streams.

Implemented with the National Test Centre Circular Plastics (NTCP) in the Netherlands, the tests - which simulate realistic packaging waste management conditions - were designed to

THE BENCHMARK FOR COST EFFECTIVENESS.



EUR 59/tonne

for high-quality recycled pellets 110 µm filtered*

*) Production costs for recycled pellets on an INTAREMA® 2018 TVEplus® with EREMA Laserfilter, input material: washed supermarket film LD/LLDPE 98/2, 8 % moisture, calculation incl. investment costs (ROI 5 years) and variable costs (labour, electricity, water, service and maintenance).

EREMA®
PLASTIC RECYCLING SYSTEMS

**INTAREMA®
TVEplus®**

From post-consumer plastic to high-quality, top recycled pellets for only 59 euros/tonne*. The INTAREMA® TVEplus® sets the standard in terms of production efficiency and cost effectiveness: extremely low energy consumption, high throughput thanks to Counter Current technology, labour-saving through automation and remarkably low service costs.

K22 MAIN BOOTH: Hall 9 / Booth C09
OUTDOOR AREA: FG-CE03

determine the sortability of Mondi's recyclable mono PP packaging.

They were carried out on pre-made retort and standard pouches, spouted pouches, and top web and thermoformed semi-rigid tray material. These are made from mono PP-material and used for demanding applications that require a high barrier protection, such as wet pet food or processed meat.

"The outcome of the tests show that our mono-material PP packaging is recognised and categorised into the correct sorting stream in advanced waste management facilities," said Thomas Kahl, channel manager FMCG & industrial at Mondi Flexible Packaging. "We are proud that we also succeeded for demanding applications such as retort wet pet food pouches."

Mondi has pledged to make all of its packaging and paper solutions reusable, recyclable or compostable by 2025.

Marcel van Eijk, R&D manager at NTCP, added: "By replicating real-life situations for Mondi, we could assess the sortability of its packaging products. We could prove that Mondi's stand-up pouches support sorting strategies that need to be developed and implemented at larger scale."

Conference call

At the recent *Plastic Pouches* conference - organised by **AMI** - Karl Zimmermann, director of sales and marketing at **Bruckner Maschinenbau**, explained how the company has helped to develop a multi-layer pouch using a single grade of material - BOPE.

BOPE is bi-oriented polyethylene and is gaining



IMAGE: MONDI

Left: Mondi's mono-material retort pouches can be effectively sorted during recycling, according to tests done at NTCP in the Netherlands

importance in packaging. Because of its physical strength, it can often be used to replace non-PE materials in a multi-layer film - making it more recyclable. It is typically used in combination with traditional grades such as LLDPE or HDPE.

However, Bruckner has now helped to create an 'all-BOPE' barrier film for stand-up pouches. The three-layer structure comprises: a 20 micron printable base film, made from highly transparent BOPE; a 20 micron barrier film, made from BOPE that is inline coated and AlOx metallised; and a sealing film of BOPE-LLDPE that is 35 microns thick.

Benefits of the pouch include high transparency and sealing strength, superior barrier and high puncture resistance, he said.

BOPE is typically produced on a hybrid BOPP/BOPE line, said Zimmermann - which are seeing increased sales.

Bruckner has sold 13 of these lines, he said, in both Europe and Asia.

PET recycling

Also at the conference, Fabio Silvestri, head of marketing and business development at **GR3N** in Switzerland, said that PET-containing multi-layer packaging can be efficiently recycled using its chemical recycling process.

"It is able to treat what mechanical recycling is unable to do," he said.

A Sophisticated New Design for Your Cast Film Process



Scan or click to learn more about our latest die technology!

AMI | Events

Stretch and Shrink Film

November 30 - December 1, 2022
New Orleans, LA, USA

Save \$300*
when you
book before
September 2,
2022*

Speakers include

Examine the opportunities accelerating the growth of the stretch and shrink film market and gain insight into the latest material, technology and market trends



Alison Keane
President & CEO,
Flexible Packaging
Association



Shawn Cook
Technical Manager
- Plastic Additives,
Dover Chemical



**Patrick R.
Lancaster, III**
Chairman and Co-
Founder,
Lantech



Esteban Sagel
Principal,
Chemical and
Polymer Market
Consultants

Sponsored by:



Media supporter:

Film and Sheet
EXTRUSION

*This discount cannot be used in conjunction with other offers.

BOOK YOUR PLACE TODAY

AMI | Events Specialty Packaging Films

6-7 December 2022 | Bangkok, Thailand

An Asia Pacific event on markets and technology of flexible barrier packaging for retail and industrial applications

Grow your business

- Find out about the latest flexible packaging material, technical and machinery innovations
- Update your Asia-Pacific flexible films market knowledge
- Understand the needs of brand-owners and how best to aid their packaging strategies
- Listen to experts provide insight on sustainable flexible packaging solutions
- Network with industry colleagues to share best practice and understand common challenges

Save \$300*
if you
book before
9 September
2022

*This discount cannot be used in conjunction with other offers.



BOOK YOUR DISCOUNTED PLACE

Metallised polyester films are widely used as a barrier in plastic pouches, while other layers help to improve aesthetics or other physical properties. The company's technology is based on microwave technology, which depolymerises PET into its precursors – TPA and ethylene glycol.

After purification, these can then be used to make PET again.

"Full depolymerisation can take around 10 minutes, allowing a continuous process," according to Silvestri.

The company says that the process uses 67% less energy – and generates 64% fewer carbon dioxide emissions – than making the monomers directly from fossil fuels.

Since first testing the idea back in 2011, GR3N has moved through pilot scale validation – testing batches of 20kg – through demo scale validation, which was completed last year. It has since attracted financing, set up an R&D hub and grown to 16 employees.

This year, it began in-house polymerisation and feedstock preparation.

■ The next Plastic Pouches conference is held in Barcelona, Spain on 22-24 May 2023. More details, contact Emily Nicholson on +44 117 314 8111 (emily.nicholson@ami.international).

CLICK ON THE LINKS FOR MORE INFORMATION:

- www.plasthill.nl
- www.cflex.com
- www.dowpackaging.com
- www.reifenhauser.com
- www.hp.com
- www.cadeldeinking.com
- www.karlville.com
- <https://ofpack.com.au>
- www.mondigroup.com
- www.ami.international
- www.brueckner.com
- <https://gr3n-recycling.com>

Dual registration

US-based **Hudson-Sharp** has upgraded one of its pouch machines for a customer, allowing it to produce pouches with front-to-back registration – while running separate films for each side. It made the modification to its Ares 400-SUP pouch machine, for customer SunDance.

"SunDance purchased an Ares 400-SUP with inserted gusset capabilities," said Thomas Evans, sales executive at Hudson-Sharp. "The customer asked for dual registration, along with the ability to use two different substrates of varying thickness for the front and back of the pouch."

The technology allows the machine to make inserted gusset pouches using a variety of substrates for front and back webs – which makes it very versatile.

John Henry Ruggieri, president of SunDance, said: "With the Ares 400-SUP, we instantly expanded our capabilities. We can now run multiple combinations of pouches utilising up to three different films – so feasibly, you could have a clear front, metallic back and a paper bottom, while staying in perfect register from front to back."

He added: "With this machine, small but growing brands will be able to take advantage of stand-up pouches to better market their product."

➤ www.hudsonsharp.com



Right: Hudson-Sharp has added dual-registration to its Ares 400-SUP machine

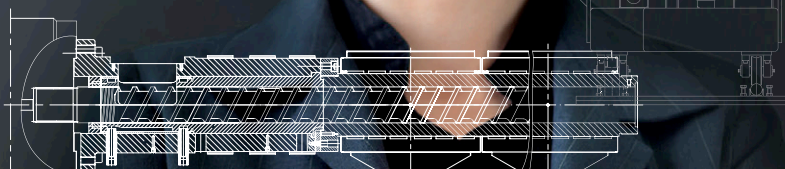
IMAGE: HUDSON-SHARP

each detail matters for unrivalled performance

Only a company who has a constant focus on the productivity of its customers thinks ahead and creates extrusion solutions that leave the rest standing. SML specialises in the development of extrusion lines for film, sheet, coating and lamination as well as multifilament spinning lines.

Extrusion lines –
engineered to perform.

SML
EXTRUSION LINES – ENGINEERED TO PERFORM



www.sml.at



AMI Plastics World Expos NORTH AMERICA



November 9-10, 2022 // CLEVELAND, OHIO, USA

Exhibitors already include:



Swiss antimicrobial expertise since 1935



BOOK YOUR BOOTH HERE



Co-located exhibitions:

COMPOUNDING
WORLD EXPO

POLYMER TESTING
WORLD EXPO

PLASTICS EXTRUSION
WORLD EXPO

PLASTICS RECYCLING
WORLD EXPO

REGISTER FOR FREE HERE

ADDEX Experience
Addex

ZEPPELIN
WE CREATE SOLUTIONS

pinfa North America
Phosphorus, Inorganic & Nitrogen Flame Retardants Association

STEER AMERICA

sesotec

SHAMROCK

APEX
EXHIBITION ONLY

OXFORD
INSTRUMENTS

BREAK
Polymer • Filtering

PSI
POLYMER SYSTEMS INC.

ENTEX
The Planetary Roller Extruder

ARTEC
MACHINE SYSTEMS

APPLIED OPTIX

TROY
The Gold Standard for Performance

BODEN
SPECIALTY SERVICES

ALTECH
Engineering Technology

BERGEN
International

HOSOKAWA MICRON
HOSOKAWA
POLYMER SYSTEMS

Re-cre8
Recycling8

PIXARGUS
AUTOMATION BY VISION

ADITYA BIRLA
BIRLA CARBON

BPM
B&B PLASTICS MACHINERY

SonicAire

BEKAERT
better together

AVAN
Granulator

Una-Dyn
Plovian Group

KISUMA

PrintSafe
Marking and Coding Solutions

NORAC
ADDITIVES
A HYDRO-GROVEN GROUP COMPANY

OMYA

WELSET
Innovation in Compounding

Paulson
Training Programs, Inc.

PRODEX
Nylon Processing

K
KUHNE GROUP

COMBILIFT
LIFTING INNOVATION

STAR
PLASTICS

ex-el
polymers inc.

DREYTEK
performance products

ALOK

VAC-U-MAX
VULCANIZING MODELS
SINCE 1962

ecopuro
GLOBAL SOLUTIONS

Royce
GLOBAL

PALMAROLE AG
Trading & Marketing Consultants

ORLEN Unipetrol

Cardinal
Recycling Company

schenckprocess

Southeast
Machinery

get
recycling
From Recycling Solutions

ZERMA

Herbold
RECHENSTEIN
USA

iD iD Additives™

TOYOTA TSUSHO
AMERICA, INC.

POWDER KING

IMPERIAL INDUSTRIES INC.

J-TEC MATERIAL HANDLING
OUR PEOPLE MAKE THE DIFFERENCE

POLYSTAR

LINDNER

PROGNOST
Intelligence on Duty

株式会社 テクノバール
TECHNOVEL CORPORATION
INTERMEDIATE • SUB-MATERIALS • PLASTIC • BARRIER • TECHNOLOGY

Otsuka
Otsuka Chemical America, Inc.

MDI
MODERN DISPERSIONS, INC.

sāco
AEI
polymers

METTLER
FILTRATION PRODUCTS, LLC

Bronkhorst
USA

Since 1920
Union
OFFICINE MECCANICHE

NASCA
ELASTOMERS

Helluva
CONTAINER
A Balcon Enterprises Inc. Company

NATIONAL BULK EQUIPMENT
AN WBE COMPANY

pmc

RAVIZZA PACKAGING USA
A B&B COMPANY

TOYOTA TSUSHO
AMERICA, INC.

SCIENCES
COMPUTERS
CONSULTANTS

Orbetron

USE
EXTRUDERS

enercon
ENERGY CONCEPTS

and many more. See the full list of exhibitors [here](#).

Brought to you by:

AMI

Proudly supported by:

Compounding
WORLD

Film and Sheet
EXTRUSION

Pipe and Profile
EXTRUSION

Plastics Recycling
WORLD

AMI | Events

Multilayer Flexible Packaging

15-17 November 2022 | Vienna, Austria

Save €200*
when you
book before
16 September
2022

Exploring advances in
multilayer film design and
processing for enhanced
packaging performance

Industry experts include:



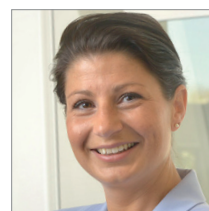
Dr Mark Dawes
European Market
Development Manager
Dupont Teijin Films



Daniele Borin
Product Manager -
Flexible Packaging
EU
Taghleef Industries



**Dr Dimitra
Kapsimali**
Packaging
Specialist
A. Hatzopoulos S.A.



Vivianne Munnix
Engineer Market
Development &
Technical Marketing
SABIC

AGENDA IS OUT NOW! BOOK YOUR PLACE TODAY

Sponsored by:



Media supporter:

Film and Sheet
EXTRUSION

*This discount cannot be used in conjunction with other offers. Offer ends 16 September 2022.

Stretching routines: stretch & shrink film

As with many other parts of the plastics industry, stretch and shrink film is under pressure to become more sustainable.

At the recent *Stretch & Shrink Film* conference organised by **AMI**, Jay Funderburk, director of flexible packaging at **Veritiv** – a US-based packaging manufacturer – told delegates that customers are getting more demanding in terms of product sustainability in stretch and shrink film.

The company has around 8,700 stretch film customers, and almost 1,900 shrink film customers.

According to a customer survey on stretch film, carried out in October 2021, 69% of customers said sustainability was very – or somewhat – important to them when choosing stretch film. However, the “overwhelming majority” (around 80%) were prepared to pay no more than a 5% premium for sustainable stretch film.

Similar figures were seen for shrink film: 65% of customers said sustainability was important. Of these, 75% would not pay more than 5% extra for sustainability.

Washable sleeves

Oscar Xoy, senior global packaging engineer at **Colgate-Palmolive**, told delegates about how the company has introduced crystallisable PET shrink sleeves – with washable inks – in Palmolive washing-up liquid.

“Some of the most commonly used materials for sleeves – such as non-crystallisable PET, PS and PVC – are used in PET bottles and considered problematic in the PET recycling stream,” he said. “They can contaminate PET flakes of the bottles, and cause the container to be sorted into the wrong stream.”

The company worked with a shrink sleeve converter to develop new crystallisable PET shrink sleeves.



IMAGE: SHUTTERSTOCK

Recent sustainability advances in stretch and shrink film include a crystallisable PET shrink for Palmolive washing-up liquid that makes PET bottle recycling easier

These use a substrate that was recognised by the Association of Plastic Recyclers (APR) as a crystallisable PET copolymer film that was compatible with the PET bottle recycling stream. In addition, it uses an ink which can be completely removed by hot caustic soda during the washing/recycling process. Reducing the amount of ink in the sleeve left at least 25% of the sleeve clear – allowing recycling and sorting processes to identify the bottle material.

In 2018, the company introduced the crystallisable PET sleeve to its Palmolive Oxy 20oz product. When used with washable ink, the

sleeve was easily be recycled with clear PET flakes, to increase post-consumer recycling yield and divert packaging waste from landfills and incinerators, he said.

“We continue to explore the use of this type of sleeve in other products that use PET bottles – as it will contribute to increased value in PET recycling,” he said.

Testing times

Testing trucks on the road may seem a long way from stretch film, but it helps to determine how well films perform in transit – where they typically help to keep loads safe on pallets.

Eric Joneson, vice president of technology at **Lansmont**, told delegates that ‘supply chain measurement’ processes help to monitor the

Main image:
Colgate-Palmolive has introduced crystallisable PET shrink sleeves – with washable inks – to improve PET bottle recycling



Above: Cortec has helped a customer replace its stretch film with a compostable version

"movement and health of products within any environment". This includes testing 'shrink and tray' and 'unsupported shrink' loads.

Similarly, Manuel García-Romeu product development manager at **Safe Load Testing Technologies**, explained the effect of sustained forces – during transportation – on the creep behaviour of stretch film.

He said that incidents such as sudden changes in load can destabilise goods during transport. This can be caused by many things, such as accelerating, braking or turning. All of these can put a strain on the stretch film and lead to eventual failure.

To combat this, he said it was necessary to understand the forces and design film correctly to withstand them – or wrap the load according to the conditions.

In an experiment, film was put through creep testing, and measurements taken (at a rate of 50 per second). It also looked at the state of loads after transportation.

"The stretch film should be always pre-stretched

to at least the natural stretch ratio point of the film," he said.

The creep effect can be used to design a correct wrapping scheme. For instance, a link can be established between creep and maximum displacement, he said.

"The greater the strain we can use, the greater the possibility of choosing higher steadying forces – meaning higher stability of the unit load," he said.

■ The next edition of *Stretch & Shrink Film* takes place on 30 November-1 December 2022 in New Orleans, USA. For more details, contact Alexandra Fish (alexandra.fish@ami.international) on +1 610 478 0800.

Stretch replacement

Croatia-based **Cortec** has helped a customer to replace conventional stretch film with its own version – which is compostable.

The customer, which makes soap products, originally used Cortec's Eco Works 10 film – which is industrially compostable – as mould liners during manufacturing. The film could be used many times, which helped to reduce material waste.

In addition, the manufacturer began using Eco

Van Meeuwen®
IMPROVING INDUSTRIES

Improve plastic
sheet and rigid
food packaging

- Anti-block agents
- Anti-static agents
- Anti-fog agents

Wrap on its automated stretch wrap equipment, to palletise boxes of finished goods. Eco Wrap is also 'OK compost Industrial certified by TÜV Austria and can replace conventional stretch film in a variety of applications, including: agriculture bundling (such as hay bales and lumber); pallet wrapping; luggage wrapping at airports; and, transporting furniture.

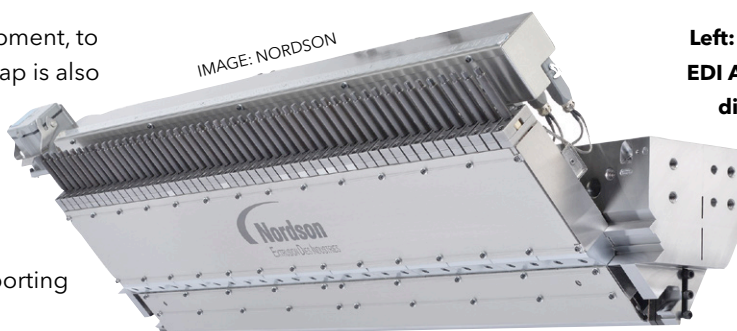
Eco Wrap is highly elastic and works on most existing automated machines, typically by increasing the tension.

Investment in hoods

Coveris has invested in its site in Montfaucon, France to increase production capacity for stretch and shrink hoods made from recyclate.

The company has installed a new five-layer coextrusion line, allowing production of polyethylene shrink hoods and stretch hoods that incorporate post-consumer post-industrial recycled materials.

The technology makes it possible to offer a standard or non-stick shrink hood with optimised thickness that with 50% or more recycled material.



Left: Nordson says its EDI Autoflex cast film die helps maintain film strength during production

The extruder also offers a range of thin stretch hoods featuring 30% recycled content.

"To meet the growing needs of our customers, this equipment also offers in-line printing, water-based ink, up to two colours on both sides, continuous or registered," said the company.

Floatable shrink sleeves

Meanwhile, **Innovia Films** has opened a new 6.2m wide multi-layer co-extrusion line at its site in Plock, Poland.

The line will manufacture LDPE film for shrink sleeve labels and tamper-evident applications.

The film allows the production of floatable shrink sleeves, which can be easily separated from

Optimize the presentation & creation of food packaging

Consumers

Fogging most commonly occurs when there is a temperature difference and can disturb the appearance of the packed food. Van Meeuwen helps you create clear sheet that is less sensitive for fogging to make customers and consumers happy.

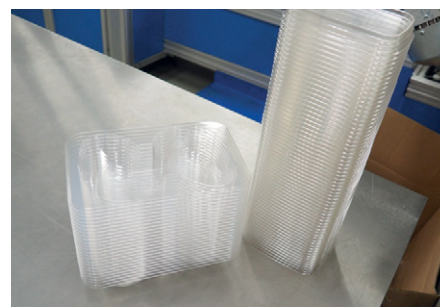
Production process

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.

Want to know more? Let's get in touch!



Top: Partly coated with anti-fog



Bottom: Stacked packaging, coated with anti-block

Van Meeuwen Chemicals
Functional Additives

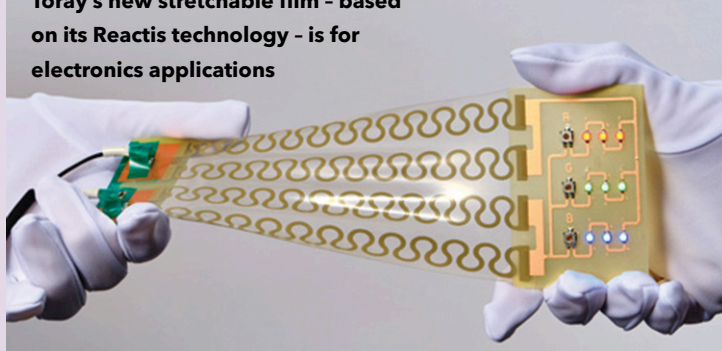
PET, HDPE and PP bottles and containers during recycling.

"The opening of the line concludes our strategic investment into a high-performance shrink film, that enables more circularity when it comes to packaging," said Simon Huber, managing director of Innovia UK and Poland.

The new capacities will allow Innovia to supply floatable shrink sleeve material to label and sleeve converters. For instance, its RayoFloat APO is a clear, uncoated shrink film that floats, as its density is less than 0.93 g/cm³. The film is also glossy, scuff-resistant and printable.

Toray's new stretchable film - based on its Reactis technology - is for electronics applications

IMAGE: TORAY



Stretchable film for electronics

Toray Industries has developed a new grade of stretchable film - based on its Reactis technology - to produce circuit mounts with high resistance stability.

The film is known for its shape recovery and heat resistance properties. Potential applications for stretchable device circuit boards include biological and industrial sensors and robots. Toray has sent samples to users and will push ahead with research and development to begin commercialising the film.

Stretchable devices could also be used in smartwear, which incorporates built-in biometric sensors to manage health and monitor biometric information during exercise. These must be able to bend and handle complex movement. This means that circuit boards must be very flexible and work consistently after repeated use.

Reactis film combines cross-linked and stretchable components. The film is very flexible and recovers its shape between -20°C and 80°C. It also maintains heat resistance even after treatment at 200°C, says Toray.

Combining the new film with elastic conductive materials can accommodate the expansions, contractions and deformations of circuits and 3D curved surfaces, says the company. In test storage for 1,000 hours - with a relative humidity of 85% at 85°C - the film's circuit shape was unchanged, and the resistance value remained stable.

➤ www.toray.com

Günther Birkner, president of Innovia's parent company, CCL, added: "The goal of our investment in Poland is to significantly increase the capacity in polyolefin shrink films. This initiative will enable our customers to boost the recyclability of their packaging."

The film will be converted into shrink sleeves - branded as EcoFloat. Because of their low density, they float - which separates the material from heavier PET flakes during recycling.

Strong stuff

The strength of stretch film is a critical parameter when evaluating its quality, according to **Nordson Polymer Processing Systems**. Customers expect their product to be undamaged, safe, and clean. Film producers can only meet these requirements if they produce a film with a uniform thickness that can secure a load without tearing or puncturing.

The secret is to control polymer flow throughout the extrusion die, according to specified parameters.

Nordson says that its EDI Autoflex cast film die has a versatile flow channel design and can process a broad range of resins and processing parameters. Its robust design makes the operation safe and easy. Combined with a rheologically optimised Multiflow 10 manifold, the die is ideal for flat stretch film production.

Material travels through the die quickly and smoothly. The result is a uniform polymer distribution - and a uniform stretch film - which is something that traditional manifolds cannot easily provide across the full film width, says the company.

Nordson adds that EDI Autoflex dies with a Multiflow 10 manifold can be installed easily on existing cast film lines.

In addition, EDI says an addition such as a BKG EP extrusion pump can be an asset to a stretch film extrusion line. It delivers constant, reliable pressure, which leads to a consistent and well-metered flow rate - to boost end-product quality. Extrusion pumps can help reduce pressure fluctuations and balance out dosing and pulsing issues by the extruder.

CLICK ON THE LINKS FOR MORE INFORMATION:

- www.ami.international
- www.veritiv.com
- www.colgatepalmolive.com
- www.lansmont.com
- www.safeloadtesting.com
- www.ecocortec.hr
- www.coveris.com
- www.innoviafilms.com
- www.nordson.com

AMI | Events

Thin Wall Packaging

6-7 December 2022 | Cologne, Germany

Save €200*
if you
book before
9 September
2022

Identifying opportunities and maximising
returns in plastic tubs, pots and trays industry

Get your industry update

- Discuss the latest material, technical and machinery innovations
- Keep up to date on global trends in thin wall packaging markets
- Learn about sustainability goals and regulations affecting the supply chain
- Understand developments in recycling technology that affect the industry
- Network in person with industry experts and build professional contacts

Sponsored by:

Milliken

 **PROMIX**
Solutions

Media supporter:

Film and Sheet
EXTRUSION

*This discount cannot be used in conjunction with other offers.



BOOK YOUR DISCOUNTED PLACE



AMI | Events Polyethylene Films

January 31- February 2, 2023 | Orlando, FL, USA

The business and technical conference for the
polyethylene films industry

Grow your business network

- Meet up with companies representing over 7 billion lbs. of film production in North America
- Gain insight into the latest innovations in the polyethylene film industry
- Learn about the advancements in extrusion and ancillary converting
- Deepen your understanding of raw material availability and new supply options
- Understand the way consumer industries are rethinking the role of plastics packaging

Save 20%*
if you
book before
29 July
2022

*This discount cannot be used in conjunction with other offers.



BOOK YOUR DISCOUNTED PLACE

Gearing up for K2022

It's that time again: K2022 kicks off in a few short months. In this special section, we look ahead to the global plastics industry's key event - and provide essential links to help you get the most from your visit

In just three months, the world's largest plastics show will open its doors. K2022 runs from 19-26 October 2022 in Dusseldorf, Germany.

The show will fill all 18 halls of the venue - with more than 3,000 exhibitors from over 60 countries expected to promote their raw materials, additives, semi-finished products, machinery, ancillary equipment and services to the plastics industry.

The last K show in 2019 recorded 3,330 exhibitors from 63 countries on 177,000 m² net exhibition space. It also welcomed 224,116 trade visitors - of whom 73% came from outside Germany.

Sustainability is a growing concern within the plastics sector, so the circular economy will feature heavily at the show. As well as machinery - such as

equipment for processing, recycling and waste management - there will also be multiple examples of new materials - such as bioplastics and formulations that include higher levels of recycle.

There is also a return for the Science Campus - which allows business to exchange ideas and information with academia - as well as two special events: 'Plastics shape the future', and the VDMA's Circular Economy Forum.

A new element of the show is the Start-up Zone, which will showcase new and small companies in the plastics sector. This area, in Hall 8b, will feature companies that are less than 10 years old, have fewer than 100 employees and generate a turnover below €10 million (US\$9.5m).

Film & Sheet Extrusion magazine at the show

Film & Sheet Extrusion will be exhibiting at K2022 on stand C11 in Hall 7. By paying a visit, you can find out more about all of our digital plastics magazines and apps.

The stand is run by our parent company AMI, which will be showcasing its latest industry directories and

market reports, and information on our many conferences including Plastics Extrusion World Expo 2022.

In the run up to the K2022 event, *Film & Sheet Extrusion* will be publishing detailed previews of the innovations that will be on show.

Look out for our K Preview issues in

September and October. Follow the news on our @plasticsworld Twitter feed. We will review K2022 in detail in our December edition.

Exhibitors can send press releases to lou@filmandsheet.com. Full details of our special coverage of K2022 are in our [media pack](#).

Dates: 19-26 October 2022 **Venue:** Dusseldorf Fairground, Dusseldorf, Germany
Hours: 10:00 to 18:30 daily **Organiser:** Messe Dusseldorf **Website:** www.k-online.de



knowledge is power

Use our selection of web links to make your visit to Dusseldorf - and K2022 - as productive and enjoyable as possible



IMAGE: SHUTTERSTOCK

BUY YOUR TICKETS

Save queueing - and money - by buying entry tickets in advance. A three-day ticket costs €120, while one-day tickets cost €55 when bought in advance. Order tickets by clicking [here](#). A catalogue is €25: buy a voucher online and exchange it at the show.



IMAGE: MESSE DUSSELDORF, CONSTANZE TILLMANN

GET K ON THE PHONE

Lots of useful K2022 data is now available on your smartphone or tablet - including exhibitor and product databases, exhibition plans, travel information, hotel listings, city guides and restaurant reviews - via the 'The K App'. To download the free app, visit the page [here](#), which has links to both the AppStore (for iPads and iPhones) and Google Play (for Android devices).

BOOK YOUR ACCOMMODATION

Dusseldorf accommodation fills up fast during K and the best options go early. Find out what's still available and make your reservation as soon as possible at the official [website](#).



IMAGE: SHUTTERSTOCK

CHECK OUT THE REST OF DUSSELDORF

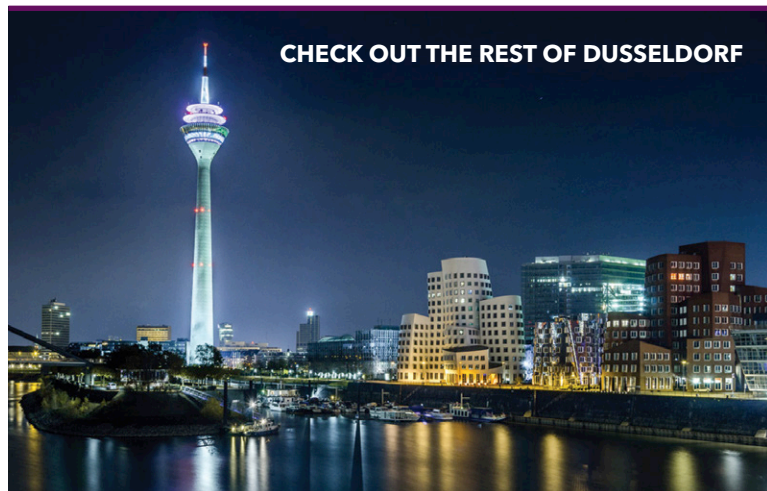


IMAGE: SHUTTERSTOCK

After a hard day at K2022 you will have earned some relaxation time. Make the most of your evenings in the city by checking out the restaurants, pubs, bars, culture and entertainment on offer. This official guide has useful listings, as well as guides to the sights and neighbourhoods: <http://bit.ly/DusseldorfGuide>

Also worth a look is the Wikitravel page on the city: <http://bit.ly/wikiguide>

And if the Altstadt and its 260 pubs get too crowded, try heading to the **Media Harbour**, for its modern architecture and venues, which include restaurants, bars and clubs.



IMAGE: SHUTTERSTOCK

ORGANISE YOUR TRAVEL

Dusseldorf is well connected and getting around the city is easy thanks to its excellent public transport network. There is one important change to note this year: your admission ticket to the show does not include free use of local transport, as it did in the past. Instead, visitors can travel using the **eezy app**, which is like an 'e-ticket'. Details on transport can be found [here](#).

GET ROUND THE EXHIBITORS

With more than 3,000 exhibitors to choose from and a total exhibition area of more than 170,000m², it makes sense to plan your time at the show before you head off. The good news is that you can search for participating companies by name and by product using the online K2022 database.

To search by company, click [here](#)

To search by products, click [here](#)

You can also locate companies using the interactive floorplan which can be found [here](#)

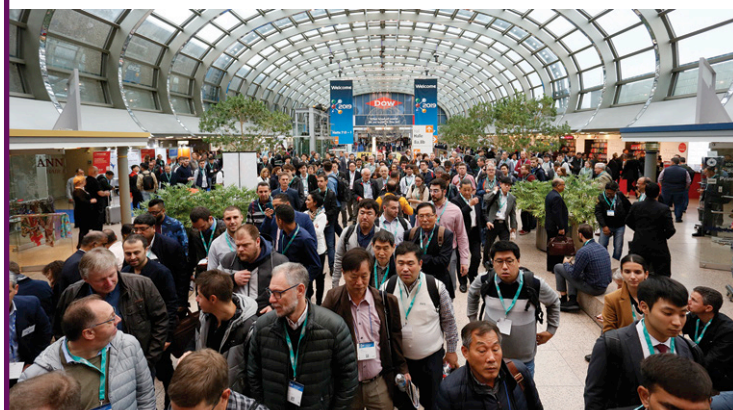


IMAGE: MESSE DUSSELDORF, CONSTANZE TILLMANN



IMAGE: DUSSELDORF TOURISMUS

SOAK UP SOME CULTURE

Dusseldorf is more than just K2022. As the capital of North Rhine-Westphalia, it is home to more than 100 galleries and museums. One celebration is for the artist Joseph Beuys, who spent much of his life in the city. While his centenary fell in 2021, there are still several ongoing events. These include: an augmented reality (AR) experience (at three separate locations); and, if you're feeling fit, a Beuys-themed cycle tour.

[Find out more here](#)

TRY SOME RETAIL THERAPY

If retail is your thing – and especially designer goods – then Dusseldorf will not disappoint. Königsallee – known as 'Kö' to locals – includes many of Europe's leading fashion names and is likened with London's Knightsbridge or New York's Fifth Avenue. However, neither of those locations can boast a setting to match the tree-lined, man-made 'river' that runs through this premium shopping district. Catch the flavour [here](#).



IMAGE: DUSSELDORF TOURISMUS, MARKUS LUGS



IMAGE: DUSSELDORF TOURISMUS, U. OTTE

DON'T FORGET THE ALTBIER!

Regular visitors will already know that Dusseldorf's local brew is the Altbier, a malty copper-coloured ale of around 4.5% strength produced using a special top-fermented lagering method. The name translates as 'old beer' but is actually derived from the Latin word 'altus', which means 'high' and refers to way the yeast rises during brewing. Try it out in one of the city's numerous brew-pubs. Details of these and a short history of Altbier can be found [here](#).

AMI | Events

Single-Serve Capsules

20-21 September 2022 | Barcelona, Spain

Connecting industry professionals to explore
the latest developments and trends in the
single-serve capsules industry

Industry leading speaker include:



Zouhair Yahia

Sales Director
AluSense



Andrea Vittadello

Sustainability Project
Manager
Mérieux NutriSciences
Italia



Claudio Gemmiti

Chief Innovation Officer
Club Coffee LP



Peter Kathriner

Senior Sales Manager
Food & Beverage
Rychiger

Sponsored by:

ALU CAPS



Media supporter:



SECURE YOUR DELEGATE PLACE

Download these new product brochures

Simply click on the brochure cover or link to download a PDF to your PC or smartphone

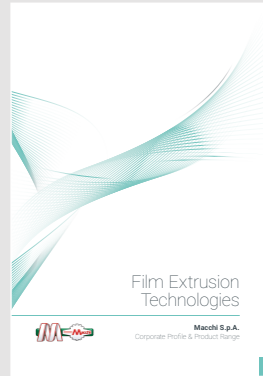
DIING KUEN: BLOWN FILM



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.

[CLICK HERE TO DOWNLOAD](#)

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.

[CLICK HERE TO DOWNLOAD](#)

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.

[CLICK HERE TO DOWNLOAD](#)

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.

[CLICK HERE TO DOWNLOAD](#)

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.

[CLICK HERE TO DOWNLOAD](#)

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.

[CLICK HERE TO DOWNLOAD](#)

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

Plastica

Head office:	Abidjan, Ivory Coast
General manager:	Abbas Badreddine
Founded:	1999
Ownership:	Private
Employees:	Around 1,500
Profile:	Plastica was founded in 1999 and produces woven PP bags for applications including cement production – as well as making polyethylene (PE) films and sacks and injection moulded products. These are used in industries including food, agriculture and cement manufacture. It also operates a recycling facility for industrial and post-consumer plastic waste – and recycles more than 90% of the waste from its production process back into products.
Product lines:	Extruded products form the bulk of the company's output, especially bags made from various grades of polyethylene (PE). It has mono- and multi-layer extrusion capabilities and can produce products – including bags and sachets – in a range of colours, sizes and designs. In addition, the company is a leader in woven polypropylene (PP) bags, which are currently experiencing huge growth, it said. These are used for many packaging and transport applications of dry goods such as sugar, rice and cement.
Factory location:	The company makes all its products at its facility in Koumassi industrial zone in Abidjan. As well as film extrusion lines, the plant houses injection moulding, flexographic printing and recycling machines. It recently installed an Ad Star block bottom sack conversion line from Starlinger of Austria, to increase annual capacity from 45 million to 80m sacks. It plans to buy a third Ad Star line in the near future.

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:

September 2022

Multi-layer packaging
Thermoforming
Plasticisers ● Lab extruders
K2022 Show Preview 1

October 2022

Materials recycling/granulators
Extruder developments
Biaxially oriented film
Mineral fillers ● K2022 Show Preview 2

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

For information on advertising in these issues, please contact:
Claire Bishop: claire.bishop@ami.international Tel: +44 (0)1732 682948

Keep informed: read our latest editions

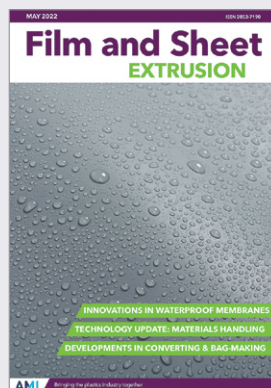
AMI publishes five process-specific FREE plastics industry magazines. Simply click on the cover below to read each magazine. Or download the issue in the relevant Apple or Android app



Film and Sheet June 2022

The June 2022 edition of Film and Sheet Extrusion explores some of the latest innovations in printing technology. It also looks at recent masterbatch introductions for film production, as well as reviewing developments in blown film dies and downstream equipment.

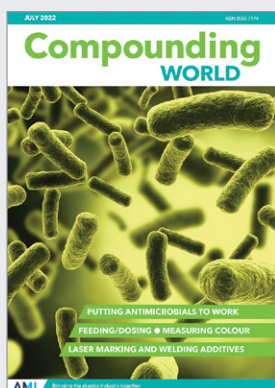
[▶ CLICK HERE TO VIEW](#)



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.

[▶ CLICK HERE TO VIEW](#)



Compounding World July 2022

The July 2022 edition of Compounding World explores developments in the fast moving antimicrobial additives sector. It also looks at some of the newest innovations in colour measurement, laser marking and welding additives, and feeder technology.

[▶ CLICK HERE TO VIEW](#)



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.

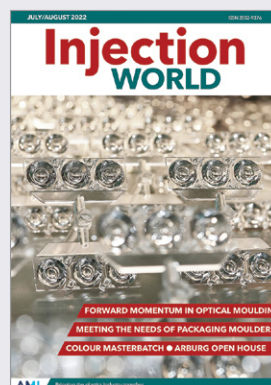
[▶ CLICK HERE TO VIEW](#)



Pipe and Profile July/August 2022

Pipe and Profile Extrusion's July-August edition has its main focus on PVC, with features on the progress made in PVC recycling and developments in PVC stabilisers. Plus a feature on the latest extruder technology and a Visitor Guide to K2022.

[▶ CLICK HERE TO VIEW](#)



Injection World July/August 2022

The Injection World July-August issue contains features covering optical injection moulding, new packaging developments and a colour masterbatch update, plus there is a review of Arburg Technology Days 2022 and a K2022 visitor guide.

[▶ CLICK HERE TO VIEW](#)

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

Compounding
WORLD

Film and Sheet
EXTRUSION

Pipe and Profile
EXTRUSION

Injection
WORLD

Plastics Recycling
WORLD

GLOBAL EXHIBITION GUIDE

2022	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/
	23-26 November	Plast Eurasia, Istanbul, Turkey	https://plasteurasia.com/en/
	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
	28-30 March	Plastic Print Pack Nigeria, Lagos, Nigeria	www.ppp-nigeria.com
	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

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
30 Nov-1 Dec 2022	Stretch & Shrink Film North America, New Orleans, USA
6-7 December 2022	Thin Wall Packaging Europe, Cologne, Germany

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

DON'T MISS A SINGLE ISSUE

Register now for your free subscription at:
www.filmandsheet.com

And don't forget to tell your colleagues, customers and suppliers about the magazine. You can use the share button above (the  symbol in the browser) to help spread the word.

