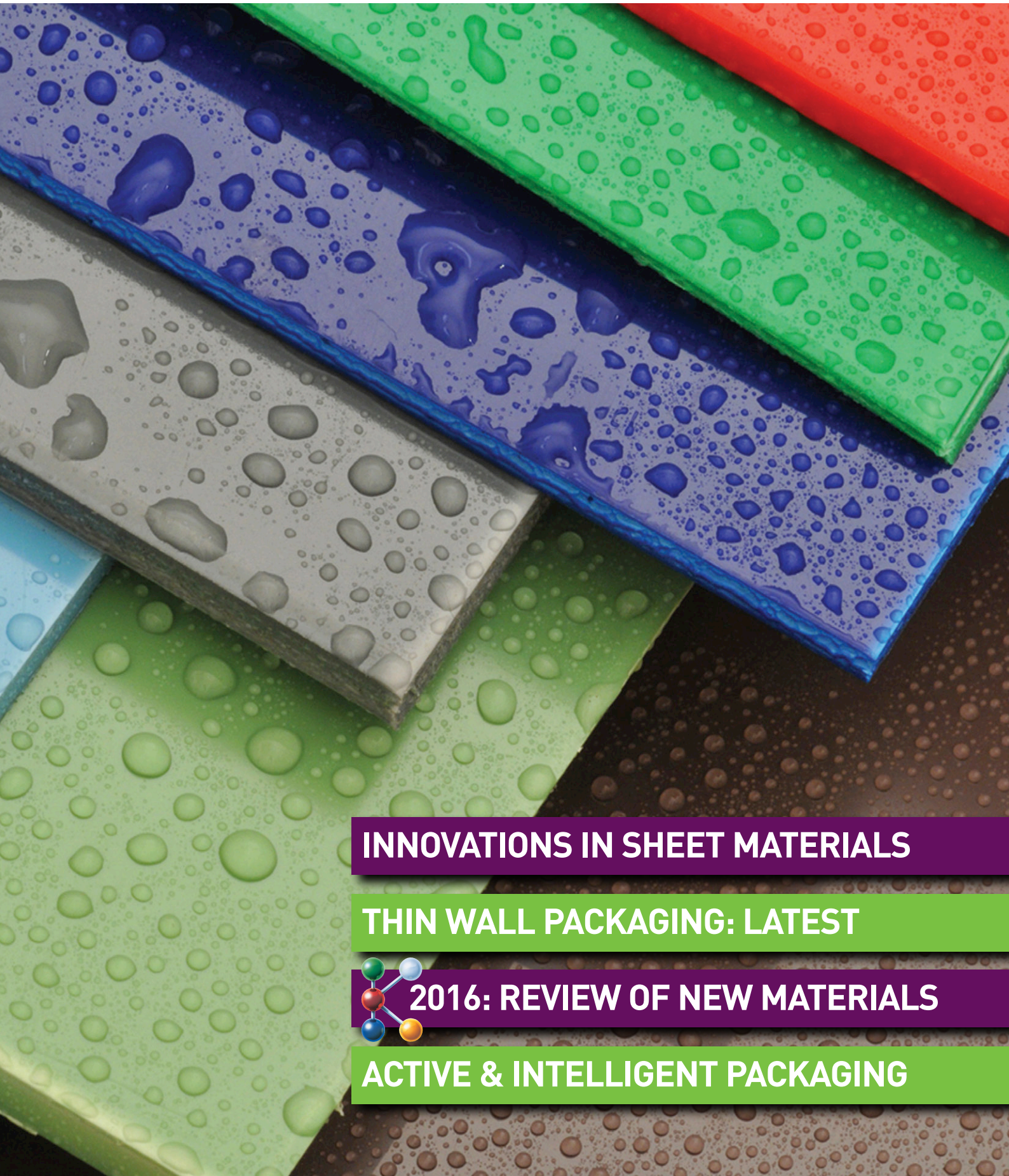
ISSN 2053-7190

film and sheet EXTRUSION

November 2016



INNOVATIONS IN SHEET MATERIALS

THIN WALL PACKAGING: LATEST

2016: REVIEW OF NEW MATERIALS

ACTIVE & INTELLIGENT PACKAGING

6%
More Productivity!

VAREX

The intelligent blown film line with TURBOCLEAN.

Experience „Passion for Innovation“

Windmöller & Hölscher KG
Lengerich/Germany
Phone +49 5481 14-0 · info@wuh-group.com
www.wuh-group.com

WINDMÖLLER & HÖLSCHER
PASSION FOR INNOVATION

film and sheet EXTRUSION

contents

coming next issue

Screenchangers | Foamed sheet | Static control/web cleaning | Recycling/granulators | K2016 review, part two

➤ **Click here to make sure you get your copy**

contact us

Applied Market Information Ltd
AMI House, 6 Pritchard Street,
Bristol, BS2 8RH,
United Kingdom
Tel: +44 (0)117 924 9442
Fax: +44 (0)117 311 1534
www.amiplastics.com
Registered in England No: 2140318

Editor:	Lou Reade	E-mail: lou@filmandsheet.com
Senior editor:	Chris Smith	E-mail: cs@amiplastics.com
Sales & commercial manager:	Levent Tounjer	E-mail: lt@amiplastics.com Tel: +44 (0)117 924 9442
Advertisement manager:	Claire Bishop	E-mail: cb@amiplastics.com Direct tel: +44 (0) 1732 605976/667474
Head of business publishing:	Andy Beevers	E-mail: abe@amiplastics.com

THIN WALL PACKAGING 2016

International conference on market trends and developments in plastics tubs, cups and tray packaging

Images courtesy of: **Verstraete In Mould Labels**

CLICK HERE FOR DETAILS

29th November-1st December 2016

Maritim Hotel, Cologne, Germany

Organised by:
Applied Market Information Ltd.

Sponsored by:

Media supporters:

FINAL REMINDER – BOOK NOW

Maud Lassara – Associate Conference Manager ml@amiplastics.com Ph: +44(0)117 924 9442 Fax: +44(0)117 311 1534

AMI Twitter feed has 15k followers

During the K2016 trade fair, Applied Market Information's @PlasticsWorld Twitter feed notched up its 15,000th follower – confirming its place as the most followed plastics industry news feed on Twitter.

Run by the AMI Magazines team, which includes *Film and Sheet Extrusion* and sister publications *Pipe and Profile Extrusion*, *Injection World*, and *Compounding World*, @PlasticsWorld is the place to find the latest news headlines and novelties from the global plastics industry.

Followers are also the first to hear about our latest editions and conference news.

If you are not already a follower, find out what you are missing at **www.twitter.com/plasticsworld**

California ratifies state-wide ban on plastic bags

California, the most populous state in the USA, has introduced a ban on plastic bags, following a state-wide referendum.

While individual municipalities across the USA – including a number in California – have already passed local bag bans, this is the first to operate at state-wide level.

It means that establishments such as large food retailers, pharmacies and corner shops cannot offer 'single use' plastic bags to customers. Instead, it must provide paper bags, or offer thicker plastic bags for at least 10 cents.

Restaurants and department stores are not affected by the legislation.

The law to ban plastic bags across California – called Senate Bill 270 – first gained approval in 2014, but was sent to a referendum after two amendments were tabled: Proposition 65, which proposed that profits for the scheme should be used for environmental programmes rather than being retained by retailers; and Proposition 67, which proposed scrapping the legislation entirely.

Californians voted to keep the legislation with a 52% majority, and rejected the proposal to create an environmental programme with a 55% majority.

The American Progressive Bag Alliance (APBA), which is backed by the Society of the Plastics Industry and bagmakers such as Hilex Poly, said the result would lead to industry job losses.

Lee Califf, executive director of APBA, said: "Plastic bag bans don't meaningfully reduce overall waste or litter or provide a positive environmental impact, but they do threaten tens of thousands of American manufacturing jobs, hit consumers in the wallet and drive people to use less environmentally friendly carryout options."

He added that the rejection of Proposition 65 would also lead to more profits for retailers.

"Instead of bag fees going to an environmental fund, grocers will keep hundreds of millions of dollars in new profits without providing any public benefit.

"At the end of the day, the only 'green' element of this law was the hundreds of millions of dollars grocers stood to profit from the mandated bag fees."

The vote coincided with that to elect the new president of the USA.

K2016 sets new visitor attendance record

K2016 welcomed 230,000 visitors this year – an increase of more than 5% on the previous event in 2013.

This growth more than compensated for the 2% dip that organiser Messe Dusseldorf recorded between the 2010 and 2013 events.

"For many exhibitors, it was the most successful K of all time," said Ulrich Reifenhäuser, chair of the plastics and rubber machinery section of the German VDMA trade association.

Visitor analysis showed that 70% of visitors came from outside Germany – with European neighbours Italy sending 10,000 visitors, and the Netherlands 9,500. The strongest growth, though, was from Asia (up 26% to 29,000 visitors) and the Middle East (which was up nearly 10% to 11,500).

Messe Düsseldorf has already announced the dates of the next show: 16-23 October 2019.

www.k-online.de

Coca-Cola recycles PET bottle liners in UK plant

Avery Dennison has helped Coca-Cola to reduce its carbon footprint at a UK production plant by recycling PET bottle liners.

In collaboration with supply chain partners Viridor and PET UK, it recycled more than 70 tonnes/year of PET waste that was generated at the Smartwater production plant.

Joe Franses, director of corporate responsibility and sustainability at Coca-Cola European Partners, said: "This shows how we can turn the crisis of resources into a business opportunity, through close collaboration across the value chain."

More than 50 million bottles of Smartwater were produced in 2015. The PET liners used (carrying the self-adhesive labels before dispensing) generated more than 40 tonnes of waste that year, which cost around £8,500 in disposal/handling costs. Under the new recycling scheme, PET UK shreds and extrudes the waste PET liner – then produces a material suitable for making new items such as PET staple fibre, strapping or thermoformable sheets.

As well as material savings, the company expects to reduce CO_2 emissions by up to 200 tonnes this year.

Xander van der Vlies, sustainability director for Avery Dennison Materials Group Europe, said that CCEP wanted to further improve Smartwater production in line with its focus on recycling, sustainability and creating a circular economy.

"We have close relationships with PET UK and CCEP's waste management company Viridor, and together have established a strategy that saves on waste and emissions while giving CCEP business benefits and cost reductions," he said.

He added that Avery Dennison has set a target of eliminating 70% of liner waste from the industry value chain by 2025.

www.averydennison.com

Avery Dennison has helped to recycle more than 70 tonnes/year of PET waste from Smartwater production

Intertape buys into Powerband of India

Intertape Polymer Group (IPG) of Canada has bought a majority stake in Indian film manufacturer Powerband Industries.

Intertape has taken a 74% stake in the company, with the remaining 26% held by the founding Desai family. The deal is expected to close before the end of the year, subject to certain conditions.

Powerband is a global supplier of acrylic adhesive-based carton sealing tapes and stretch films, and is located in Daman, India. In the last fiscal year, it posted sales of US$32m.

The cost of IPG's stake in the company is approximately US$42m.

"We believe it is critical to IPG's growth that we expand from being a primarily North American producer to becoming a greater participant in the global market," said Greg Yull, IPG's president and CEO.

"This furthers our strategy to expand globally due, in part, to Powerband's presence in virtually every significant global market."

IPG already has 12 plants in North America and one in Europe.

Powerband will remain headquartered in Daman and Rajan Desai, the company's founder and managing director, will continue to lead its operations.

www.itape.com

Amcor flexes operations in China

Amcor is to expand flexible packaging production in Northern China by acquiring a local company, Hebei Qite Packing.

The company, which has one plant in Hebei, has annual sales of over RMB180m (US$28m) from the sale of flexible packaging products to large domestic customers within the dairy and food segments. Amcor has acquired the company for RMB185m.

Amcor already has 11 flexible packaging plants in China, including two that are close to Hebei Qite. Once fully integrated, Amcor says it will have a stronger platform to grow the business in this region.

Ron Delia, CEO and managing director of Amcor, said: "China is a very attractive growth market for flexible packaging. This acquisition will enhance our already attractive platform for growth with new and existing customers in the important Northern region."

The acquisition remains subject to regulatory approvals.

In its latest annual results, Amcor posted sales of just over US$9.4bn, a dip of around 2%, while underlying profit rose by 7.5% to US$671m.

www.amcor.com

Over 1.000 kg/h output to maximize your cost savings

Flexible and versatile five layer POD lines

A new way to think coextrusion

Macchi S.p.A.
21040 Venegono Inferiore (VA) Italy
via Papa Paolo VI, 5 • +39 0331 827 717
macchi@macchi.it
www.macchi.it

Sonoco expands base with takeover of PPI

US-based Sonoco has acquired Plastic Packaging Inc (PPI), a privately held flexible packaging producer.

Founded in 1957, PPI specialises in short-run, customised flexible packaging for consumer brands in markets including food, pet products, confectionery and health and personal care. PPI expects 2016 sales of around US$42m. It operates two manufacturing facilities – both in North Carolina – with approximately 170 employees.

Through the acquisition, Sonoco will gain additional lamination, wide and narrow web flexographic printing, and pouch and bag forming capabilities that will allow it to expand its customer base.

"This acquisition grows our flexible packaging assets in the southeast US, adding short-run capabilities that allow us to offer additional speciality and customisation capabilities to our customers," said Rob Tiede, Sonoco's senior vice president for global consumer solutions.

"PPI complements Sonoco's existing technologies and leverages our expertise in flexible packaging, while expanding our customer base in complementary markets."

Previous to this, Sonoco invested in new equipment in order to boost production of high performance film cores – which are used to protect sensitive films in applications including optical, medical and photovoltaics.

"Many customers rely on our highly-engineered cores to protect their investments in delicate, sensitive films," said James Harrell, vice president of Tubes & Cores for the US and Canada. "Our proprietary manufacturing processes reduce film scrap and minimise start-up impressions.

The investment is at the company's plant in Hartsville, South Carolina. Advantages of its QS Series of cores include: smooth surfaces, to reduce material waste; straightness, allowing higher winding speeds; and multiple levels of dust control and cleanliness, says Sonoco.

www.sonoco.com

DuPont Awards now open

The DuPont Packaging Awards are open again – with a closing date of 10 February 2017.

The awards recognise innovation in all types of packaging. Entry is free, and applicants are not required to use DuPont materials. Judges consider technological advancement, responsible packaging and enhanced user experience. Winners will be announced in May 2017.

"The awards help outstanding innovations achieve industry validation and recognition," said Dale Outhous of DuPont Performance Materials.

Forms and information are available here.

Solar cells on board ship use ECTFE

Solvay says that solar cells made using its Halar ECTFE material have been used to develop solar panels for marine applications.

Solbianflex panels, from Solbian Energie Alternative, are integrated directly onto the boat deck – so must withstand harsh marine conditions and frequent foot traffic. It chose frontsheets made by Amcor – using Solvay's ECTFE – because of the material's light weight, durability, textured non-slip surface and resistance to abrasion and mechanical impact.

"Like any solar panel, those designed for the marine environment must be reliable and efficient," said Wojciech Skalbani, sales director, industrials, for Amcor. "These resins enable Amcor's frontsheets to achieve these goals, while offering a lighter, more cost-effective alternative to conventional glass."

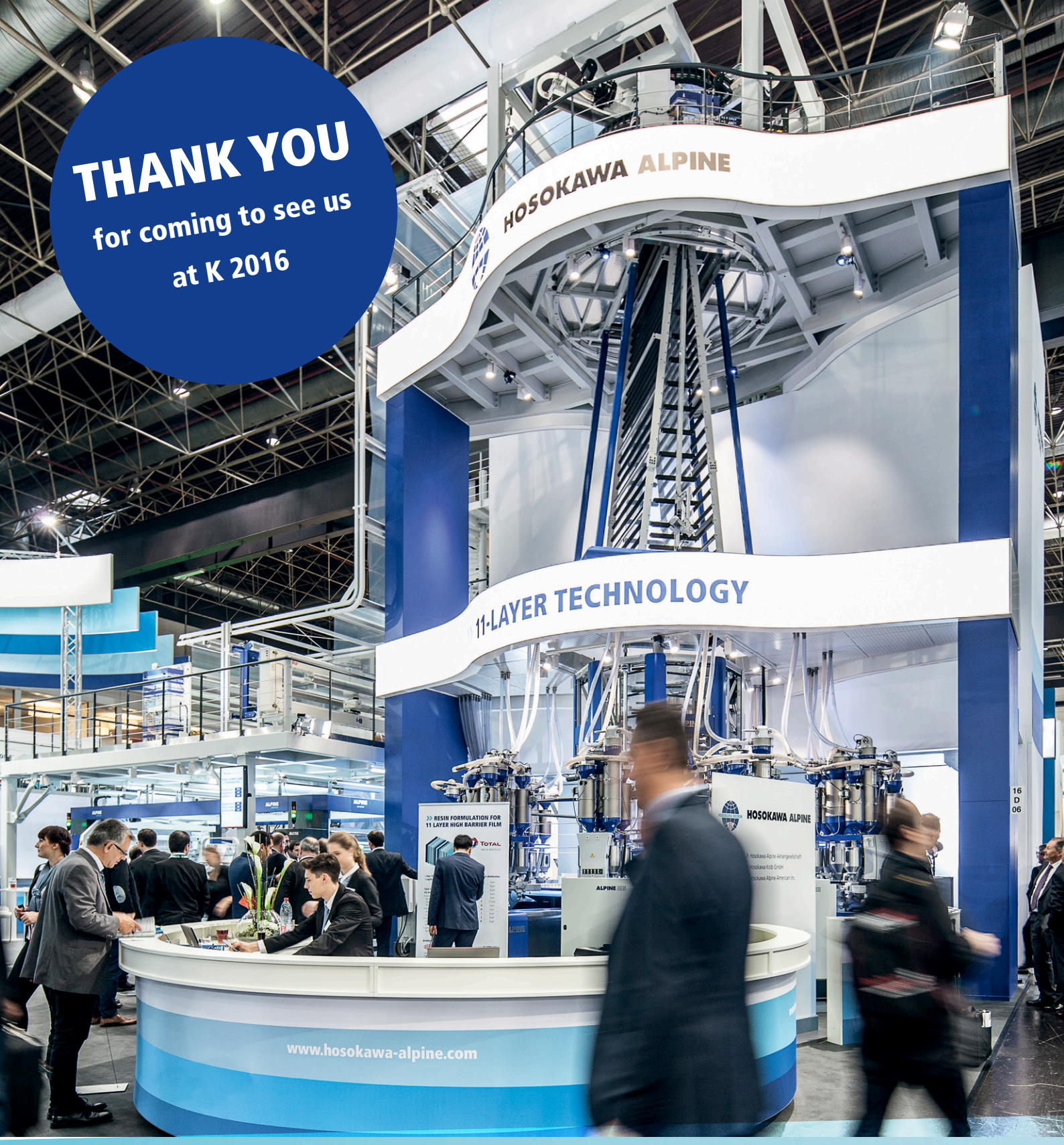
Halar 500 ECTFE is a melt-processable fluoropolymer that can be extruded into high-clarity films. A typical 50-micron (0.002in) film has over 90% light transmission and weighs only 84g/m^2 (0.28oz/ft^2). A similarly sized piece of 3mm thick glass weighs 7.5kg/m^2 (1.5lbs/ft^2).

"Excellent aesthetics are important to this application, and Halar ECTFE-based frontsheets deliver with an attractive glossy finish," according to Luca Bonci, managing director at Solbian Energie Alternative.

www.solvayspecialtypolymers.com

www.amcor.com

www.solbian.eu



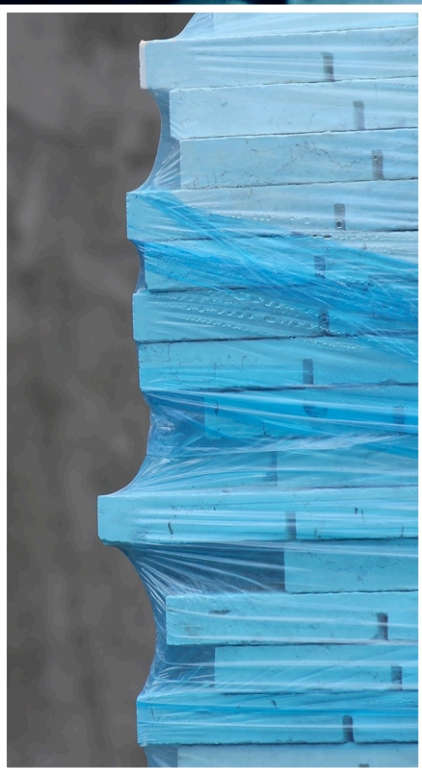
HOSOKAWA ALPINE RUNS FIRST-EVER 11-LAYER BLOWN FILM LINE AT K 2016

www.hosokawa-alpine.com

STRETCH & SHRINK FILM 2016

The business conference and exhibition for the stretch & shrink film industry

CLICK HERE FOR DETAILS



Images courtesy of: Windmoeller + Hoelscher Corporation

December 6-7, 2016

The Sheraton New Orleans Hotel,
New Orleans, Louisiana, USA

Organized by:
Applied Market Information LLC

HEADLINE SPONSOR

CLOEREN INCORPORATED

Also sponsored by:

Braskem

DOW

SML
EXTRUSION LINES – ENGINEERED TO PERFORM

Media supporter:

film and sheet EXTRUSION

FINAL REMINDER – BOOK NOW

Amanda Schaeffer – Conference Coordinator as@amiplastics-na.com Ph: +1 610 478 0800 Fx: +1 610 478 0900

Schur expands with majority stake in Zwart

Austria-based Schur Flexibles has acquired a majority stake in Dutch flexible packaging company Drukkerij Zwart.

Schur produces and distributes flexible packaging solutions for the food, tobacco and pharmaceutical industries. By acquiring Zwart, it says it has added a specialist in packaging production for smaller order sizes. Zwart supplies customers in the tea, coffee and confectionary sectors, in Europe and beyond.

"With the acquisition of Zwart, we strengthen our profile as a supplier of high-quality flexible packaging solutions," said Jakob Mosser, CEO of the Schur Flexibles.

In addition to its main plant in Amersfoort in the Netherlands, Zwart has a production location in St. Petersburg in Russia. The current management will remain in place and continues to be the co-owner of Zwart.

The integration of Zwart will expand the Schur Flexibles Group to a total of 13 companies with 13 production locations.

Mosser: "This strengthens our profile as a supplier of high-quality flexible packaging"

"This is the first purchase under our new owner, Lindsay Goldberg, initiating a new phase of growth by acquisitions," said Mosser.

The takeover, agreed in early November, is subject to the approval of cartel authorities.

www.schurflexibles.com

Sekisui Voltek closes foamed polyolefin plant

US-based Sekisui Voltek is to concentrate manufacturing of its foamed polyolefin products at a single site.

As part of a three-year plan, the company will close its site in Lawrence, Massachusetts and move production to its facility in Coldwater, Michigan.

"Our plan to reinvest $20 million back into our business through a comprehensive, three-year plan will help us be more competitive and position us to better serve our customers," said Neil Beckhusen, president of Sekisui Voltek.

He added that the company will invest in new technologies and products, streamline production processes and expand employee training programmes.

The company will begin the transition in the first half of 2017, saying the move will improve delivery times for many customers, potentially reduce freight and other costs and provide room for on-site expansion.

"By putting this plan into action we are taking the necessary steps to evolve our company in ways that are beneficial to all," he said.

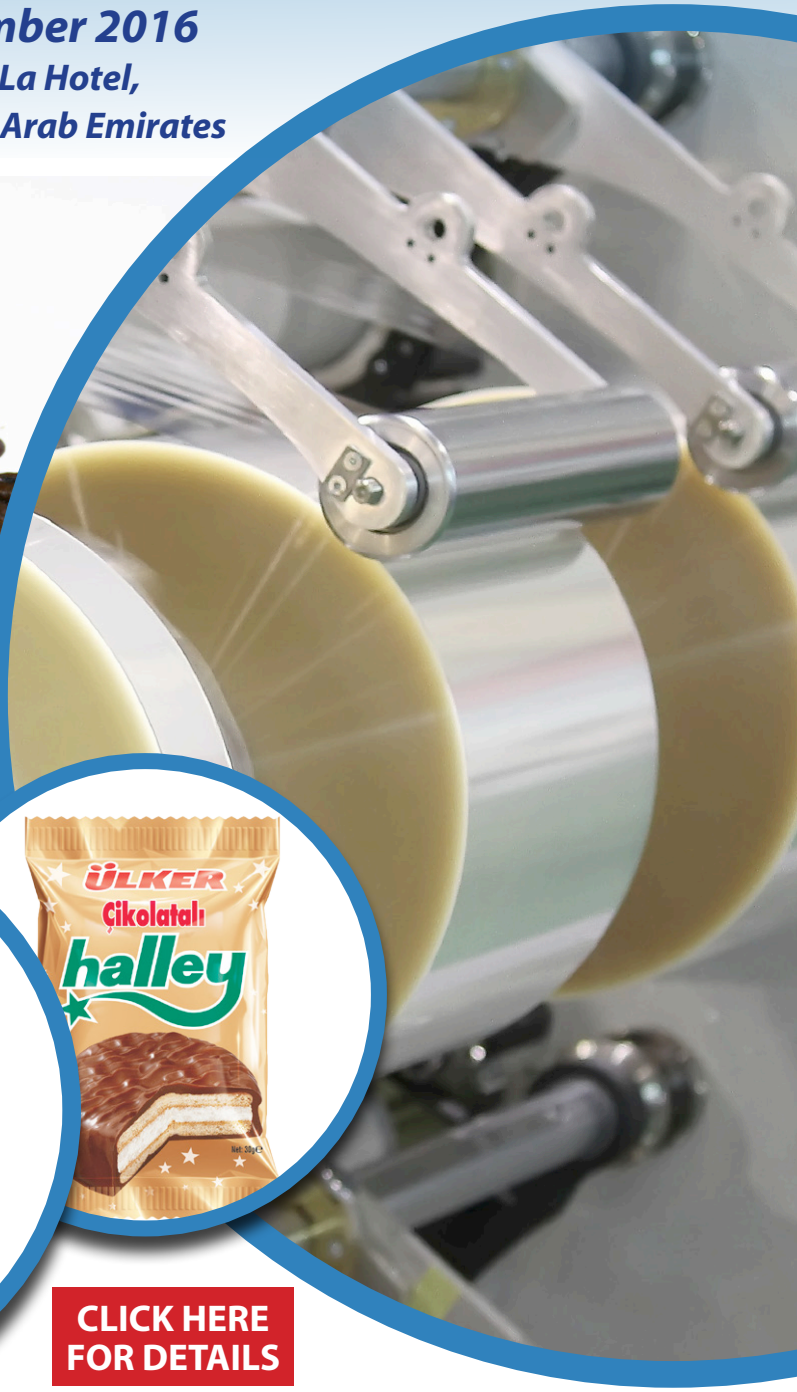
Sekisui Voltek, part of Japan's Sekisui Chemical, makes cross-linked polyolefin foam for a range of industries including automotive and tape manufacture.

www.sekisuivoltek.com

Flexible Packaging Middle East & Africa 2016

Market opportunities for films driven by technical sophistication

6-7 December 2016
Shangri-La Hotel,
Dubai, United Arab Emirates



Images courtesy of: **pladis**

CLICK HERE FOR DETAILS

Organised by:
Applied Market Information Ltd.

Sponsored by:
ExxonMobil

Media supporter:
film and sheet EXTRUSION

FINAL REMINDER – BOOK NOW

Laura Richardt – Conference Organiser lr@amiplastics.com Ph: +44(0)117 314 8111 Fax: +44(0)117 311 1534

PHOTO: EVONIK

Raised performance: advances in sheet materials

Whether it's acrylic, polycarbonate or polyolefin, sheet products cover applications including aerospace, construction and many thermoformed products. **Lou Reade** reports

Modifying the properties of plastic sheet – such as by incorporating a range of additives – is helping to extend their design envelope. And there are also ways to do it that do not involve additives.

Evonik has invested a "double-digit million euro amount" to build a plant that will produce stretched acrylic sheets for the aerospace industry.

The stretching, grinding, and polishing plant for acrylic sheeting will be built at its Weiterstadt site in Germany, with production scheduled to come online in early 2018.

It will be built directly beside the existing production facility for the cast acrylic block that acts as the base material for the stretching process.

Stretched acrylic sheet has enhanced impact and chemical resistance, making it particularly suitable for the extreme requirements of the aviation industry, says the company.

The company says the plant will enable – for the first time – production of the world's largest sizes of stretched PMMA sheets conforming to Mil-P-25690 and EN 4366

Martin Krämer, head of Evonik's acrylic products division in the performance materials segment, said: "The new plant will supplement our product portfolio in this fast-growing sector."

The expansion will help Evonik to produce sheet more than twice the size of current products – allowing it to satisfy the trend toward larger aircraft windows. For more traditional applications, this larger sheet will result in increased yields per stretched sheet while maintaining the highest standards of quality and supply security, according to the company.

Roland Mickal, head of the transportation market segment, added: "Demand is growing in the aviation industry for stretched acrylic sheeting that meets the highest requirements on quality and supply security."

Evonik's stretched acrylic sheets are aimed at the aerospace industry

Colour concentrates from Teknor Apex increase the impact strength of olefin sheet products

Recently, Covestro also exhibited its sheet materials at the American Public Transportation Association's annual meeting – to showcase their abilities in applications including buses and trains. For instance, its Makrolon TG (train glazing) material is highly durable, while also meeting stringent Federal Railroad Administration requirements for impact and ballistic performance, abrasion, and chemical and UV resistance.

Polycarbonate canopy

The Stanton campus at Delaware Technical Community College in the USA has a renovated courtyard that features a protective canopy made of polycarbonate sheet.

Exterior Technologies (Extech) provided the canopy system, for which it needed a lightweight glazing material that met a variety of project specifications, including building code regulations and improved sight lines while reducing metal framing. Makrolon UV polycarbonate sheet in white from **Covestro** met these needs while offering lightweight, durable, light diffusing and glare reduction qualities.

The courtyard canopy was originally designed with glazing panels subdivided by cross mullions.

"By working with Covestro to evaluate materials and selecting Makrolon UV polycarbonate sheet, we could eliminate the cross mullions in the canopy design. The full-length glazing solution improved the aesthetic character and provided leak-resistant protection," said Jim Leslie, general manager of Extech.

The sheet is lighter than laminated glass, which makes it easier to cut and install. The canopy's shape features two large sweeping curves, which required each glazing panel to be cut to a unique angle. Extech used a variety of straight line saws and CNC equipment to cut the sheets and form the end angles.

Thomas Niziolek, architectural segment manager for polycarbonate sheet at Covestro, said: "Many municipal codes for canopies require high impact, wind and snow load resistance. By specifying this grade of polycarbonate sheet, Extech could meet these requirements."

Extech's canopy system uses Makrolon UV polycarbonate sheet in white from Covestro

Covestro says that, compared with acrylic and glass, Makrolon UV polycarbonate sheet has a higher impact resistance for extended service life and exceptional weatherability. In addition, the transparent sheet offers advanced UV resistance technology that assures long-lasting performance.

At the same time, Covestro's polycarbonate sheet forms a key part of a dimmable lighting system at the new US Bank stadium – the home of the Minnesota Vikings football team.

When designing the lighting system, Lumos Custom Lighting and Fabrication needed a lens material that would provide uniform luminance in a fixture that is only 2 inches thick – and used Covestro's Makrolon Lumen XT LC7 polycarbonate sheet.

The sheet allows LEDs to be placed close to the lens, and retains a minimal fixture thickness without LED imaging on the lens surface. From full brightness to low dimmed levels, the lens surface remains evenly illuminated.

Specifically designed for lighting lenses, the material features a combination of high light diffusion and high light transmission. In addition, it offers superior impact strength and toughness compared with other light diffusing products such as glass and acrylic, says the company.

Recently, Covestro also exhibited its sheet materials at the American Public Transportation Association's annual meeting – to showcase their abilities in applications including buses and trains.

Colour with strength

A new range of colour concentrates from **Teknor Apex** increases the impact strength of olefin sheet products, which makes the prospect of downgauging possible.

TekTuff concentrates boost dart drop impact strength by 33% with no change in colour concentrate

THANK YOU FOR VISITING
OUR BOOTH AT K2016!

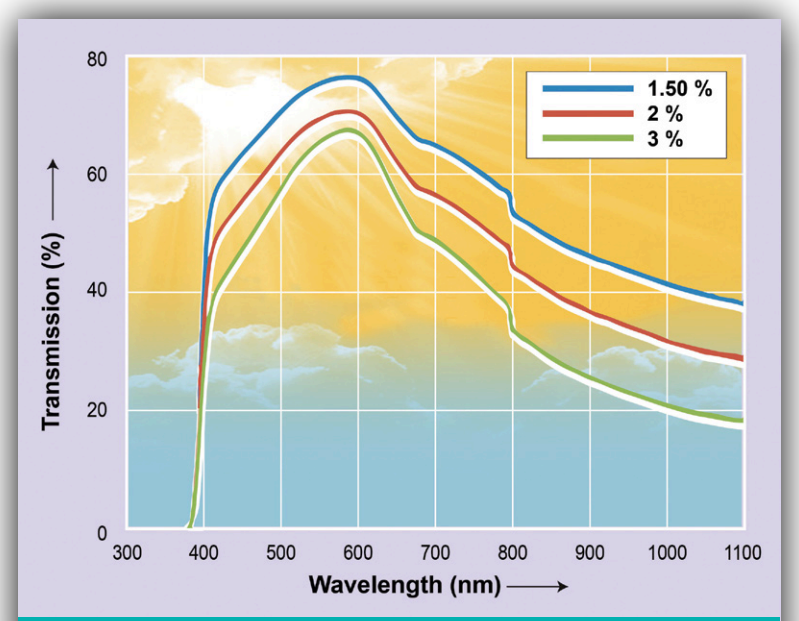
During K2016 we produced films with resins supplied by ExxonMobil

COLINES®

THE **POWER** OF **SYNERGY®**

www.colines.it

COLINES® S.p.A. - Ph. +39.0321.486311 | Fax. +39.0321.486355 - 486356 | info@colines.it | www.colines.it



Tosaf's IR5980PC adds IR selectivity to extruded polycarbonate sheet

let-down ratio, says Teknor – meaning that re-matching is not required. This allows downgauging – and may open new possibilities for metal-replacement, according to John Wood, technical manager.

"Plastic sheet must often be thicker than metal in order to provide similar impact properties, and this has been a limiting factor in applications where space is a concern," he said. "The strength enhancement provided by TekTuff concentrates can help plastics processors achieve the economies and design freedom of metal-replacement while meeting the practical requirements of end use. A metal box, for example, could be replaced by one made with thermoformed PP sheet."

A broad range of polypropylene and high-density polyethylene sheet products could benefit from such impact-modified colour concentrates, including extruded and thermoformed products such as containers and lids, credit cards, toilet seat covers, truck bed liners, and industrial process tanks.

PC modification

Tosaf has developed two new masterbatches, which modify polycarbonate (PC) for applications such as multi-wall and solid sheets for construction and other applications.

FR7607PC increases flame retardancy – even at low sheet gauges – while IR5980PC provides an increased IR selective effect and so acts as an effective heat reduction masterbatch.

LDR (let-down ratio) values of 5-7% of FR7607PC are low enough to achieve a UL94 V-0 classification at 1.6mm, whereas PC modified with Tosaf's established multi-purpose grade FR3997PC only meets the same specifications at 2mm and above. For applications in the construction industry, this means that current fire retardancy standards can now be met with even thinner and lighter PC sheets.

Testing has demonstrated that this new FR additive does not affect transparency to visible light and increases haze by less than 2%. It offers high thermal stability with no impact on extrusion process parameters.

IR5980PC is a cooling masterbatch, developed mainly for PC applications such as lightweight construction sheets. At a loading of 1-6 %, the IR selective masterbatch filters out a significant proportion of near IR (NIR) radiation in the 700-1500nm range and prevents interior spaces from heating up excessively. Masterbatch levels as low as 3% provide a good Cooling Factor (CF) value of 1.17. Sheets containing the masterbatch maintain high transparency to visible light with a light greenish undertone. IR5980PC can be directly added to PC granules in the extrusion process or co-extruded as separate layer.

Click on the links for more information:

- **www.evonik.com**
- **www.covestro.com**
- **www.teknorapex.com**
- **www.tosaf.com**

Sheet extrusion lines in perfection

Sheet extrusion lines from KraussMaffei Berstorff process a wide range of materials and deliver perfect product quality with minimum energy consumption. In addition to our turnkey extrusion lines, we are a reliable and innovative partner who has more to offer: We will support you in product development and process optimization, and supply you with customized solutions ranging from lab and pilot lines up to high throughput production system with superior product quality.

The following options are available for your process:
- Single-screw and twin-screw extruders to run pellets, regrind, powder and liquids
- In-line compounding for high filler content or abrasive additives
- Throughput range from 60 – 6.000 kg/h
- Polishing stacks for thicknesses ranging from 0.05 to 60 mm and widths from 600 to 6.000 mm
- Options for lamination, coating and fabric reinforcement
- Downstream equipment for winding, cutting and stacking the finished sheets

Engineering Value

KraussMaffei
Berstorff

Bimodal technology leads the way for Middle East's heavy duty shipping sack industry

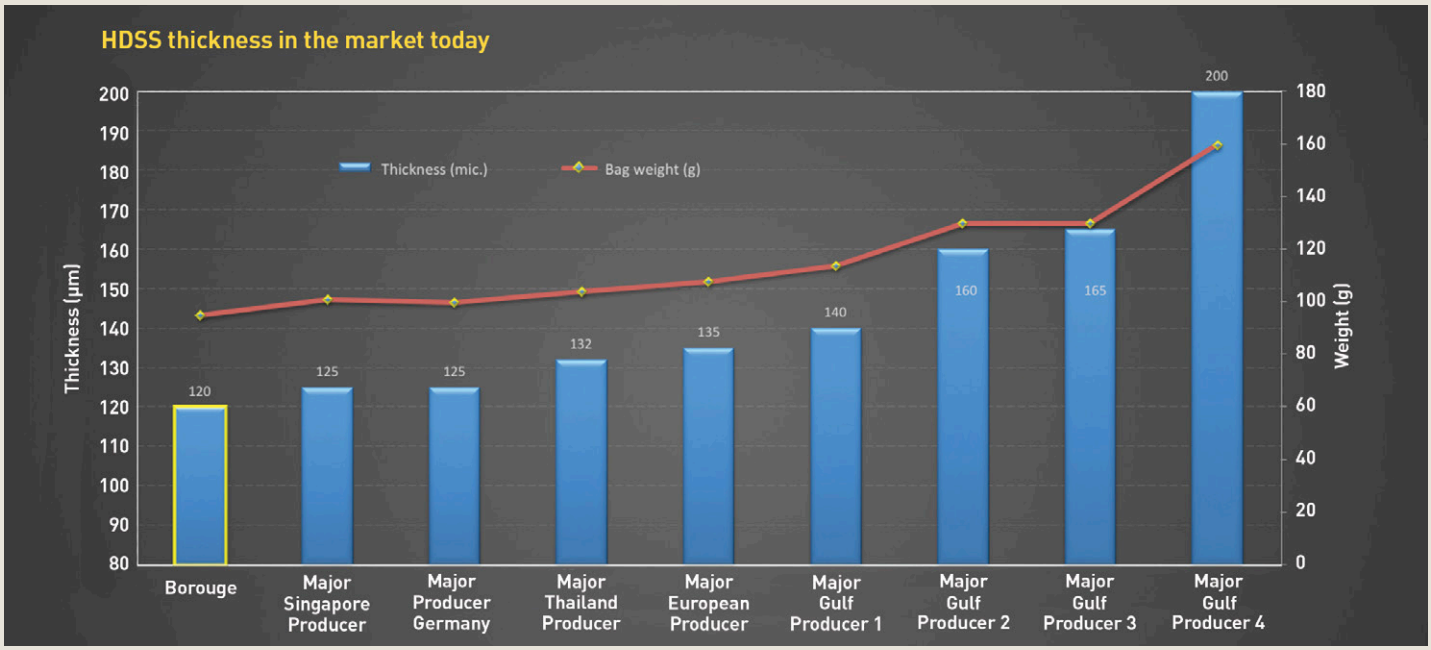
With globalisation came a surge in intercontinental trade, leading to significant growth in the transportation of products and material. This also increases the demand for protective industrial packaging, like the standard 25 kg heavy duty shipping sacks (HDSS), which is a major market segment for film converters.

A key consideration for industrial packaging is the impact on logistics and transportation costs, especially in a highly competitive global market. Packaging has to be thinner and lighter, and producers need to achieve this without compromising the protective performance of the package itself.

Going thin

The 200µm HDSS is now a thing of the past and the industry has seen commercial downgauging from 200µm to 150µm, which is still common in the Middle East regions today. Leading producers have achieved further downgauging to 125µm which, by all standards, is no easy task due to the stringent performance requirements of HDSS.

With the unique Borstar® bimodal technology, Borouge enables film convertors to achieve an industry leading 120µm film thickness in HDSS. This is one of the lowest gauges in the region and will soon be introduced to market. The Borstar bimodal LLDPE and MDPE film solutions combine high impact and seal strength to reduce the risk of breakage. Supported by Borouge's in-depth know-how in film recipes and processing, the downgauged HDSS still meets the stringent industrial specifications, including creep resistance at high temperature, drop test



and puncture resistance, while maintaining high throughput.

Close collaboration towards sustainability

In the industrial packaging field, sustainability efforts focus mainly on downgauging and recycling. The success of the 120 µm HDSS is the result of close collaboration between UAE converters using the latest film converting machinery, and Borouge's state-of-the-art laboratory and innovation resources. The downgauged HDSS will reduce material usage by 20%, which in turn translates to reduced carbon footprint.

The fully recyclable PE film made with the full Borouge solution is produced entirely in the UAE.

The 120µm HDSS, which is now the thinnest in the market, is also used by Borouge to package its products, reinforcing the company's commitment to environmental sustainability.

This development demonstrates Borouge's commitment towards helping HDSS film converters stay ahead of competition and at the same time, provide sustainable, lightweight and cost effective film solutions to meet the end customers' needs.

Advantages for HDSS applications with Borstar® enhanced PE

Compared with conventional alternatives, it has been shown that HDSS PE films, based on Borstar® technology, offer:

- Improved bubble stability with potential increase in output due to its bimodal molecular weight distribution (MWD)
- Superior toughness, puncture resistance and environmental stress crack resistance (ESCR), minimizing bag failures during filling, transport and storage
- Balanced tensile modulus properties and creep for enhanced pallet stability during transportation and storage
- Stiffness even at thinner films for good machinability and easy handling
- Superior product properties offers optimal toughness and stiffness balance that enables downgauging. This reduces material usage and increases cost effectiveness
- More simple film structure formulation without compromising film performance and quality consistency, increasing production efficiency for converters.

For more information visit: www.borouge.com

Polyethylene Films 2017

AMI Conferences

15TH ANNIVERSARY 2002-2017

The business and technical conference for the polyethylene film industry

CLICK HERE FOR DETAILS

January 31 – February 2, 2017

The Shores Resort & Spa,
Daytona Beach Shores, Florida, USA

Organized by:
Applied Market Information LLC

HEADLINE SPONSORS

Ampacet – Managing the Elements of Success™

ABS ADVANCED BLENDING SOLUTIONS LLC

4th Annual Golf Tournament Hosted By:
ABS ADVANCED BLENDING SOLUTIONS LLC

Media supporter:
film and sheet EXTRUSION

Also sponsored by: ENTEC

SPECIAL OFFER: Save $300 if you register before December 16, 2016

Amanda Schaeffer – Conference Coordinator as@amiplastics-na.com Ph: +1 610 478 0800 Fx: +1 610 478 0900

Thermoforming forces its way into thin wall packaging

In-mould labelling has traditionally been dominated by injection moulding, but combining it with thermoforming can be more effective. **Lou Reade** reports

Recent studies have shown that thermoforming is becoming ever-more competitive with injection moulding as a method for making thin wall packaging.

Thomas Cagnazzo, area sales manager for **Illig Maschinenbau**, told delegates at this year's *Thin Wall Packaging Asia* conference that thermoforming is becoming a more popular choice when making thin-wall packaging with in-mould labelling (IML).

The conference was organised by **Applied Market Information**.

IML has traditionally been used in combination with injection moulding: a decorative label is placed into the mould, then the package – such as a yoghurt cup – is moulded over it. This produces a highly decorative package that requires no printing step, and can be recycled if label and substrate are the same material. The combination of the techniques can also reduce manufacturing costs.

Recently, IML has been combined with thermoforming. Cagnazzo revealed details of an Illig study, comparing the manufacturing costs of a 500g polypropylene Euro tub with PP label – using either a 500 tonne injection moulding machine with eight cavities, or an Illig IML-T line with 12 cavities. (The IML-T line combines IML with thermoforming.) In each case, the production run was 70m pieces per year.

Cagnazzo said that while a thermoforming machine was twice the cost of an equivalent injection moulding machine, a smaller cycle time and more efficient use of materials meant that the production costs for IML-T were 15% less than for injection moulding.

As well as part weight and production costs, he also pointed to advantages in lower tool maintenance costs and better barrier properties.

Overall, he said that IML-T offered more flexible

Illig says that its IML-T system can cut costs by 15% compared to injection moulding IML

Table 1: IML production: thermoforming versus injection moulding

Feature	Injection Moulding	Thermoforming
Machine price	€600,000	€1,250,000
Tool price	€600,000	€205,000
Number of lines	2	1
Depreciation	5 years	5 years
Cycle time	5.0s (12c/min)	3.5s (17c/min)
Part weight	14.0g	12.5g
Cost/1000 parts	€51.6	€43.8

Source: Illig

Table 2: IML: relative benefits of thermoforming and injection moulding

Feature	Injection Moulding	Thermoforming
Machine/tool investment with same output	++	++
Low tool maintenance costs	++	+++
Label price	++	++
Part weight	+	+++
Uninterrupted barrier properties	+	+++
Line availability	++	++
Topload pressure monitoring	+++	++
Production costs	+	+++

Source: Illig

decoration – such as in terms of adding wraparound designs to a package. It was also suitable for most shapes of package, and was compact and flexible.

"It also offers the shortest possible tool changeover times," he added.

At K2016, Illig showcased its IML-T line under production conditions.

Illig says it is the only machine manufacturer that can offer IML-T with all relevant, optimally synchronised technology modules from one source. At the show, it combined its IC-RDM 70K automatic roll-fed machine – which has a forming area of 680 x 300mm – with its RDML 70b IML unit, to illustrate the IML-T technology.

The 18-cavity tool has an hourly output of around 17,280 rectangular polypropylene cups. They were decorated in high quality on all four side walls and the bottom directly during forming.

A specifically designed IML unit removes labels from a magazine and places them in the mould cavities in the forming station of the thermoformer. During the subsequent forming process the label bonds true to contour and permanently with the part wall.

A further benefit provided by Illig's IML-T technology is that every mould cavity can be equipped with an individually printed label, and a label change can be performed quickly and efficiently.

Cool performance

Meanwhile, researchers at the **IKV Institute of Plastics Processing** in Germany have devised a way to shrink thermoforming cycle times, using water spray cooling.

The cycle time of automated multi-station thermoforming machines is limited by cooling time, and dissipating heat in negative thermoforming is usually focused on the mould-side cooling. But cooling the inner (non-mould-contact) side of the formed part can also increase total cooling rate.

"The injection of water spray on the non-mould-contact side during the forming step is a promising approach to reduce the cooling time in thermoforming, due to better heat transfer properties or the evaporation potential," said Jonathan Martens, of IKV, in a presentation at this year's Antec conference in the USA.

His paper, co-written with Christian Hopmann, assesses the influence of internal water spray cooling on the deforming temperature of thermoformed cups.

One important factor to note is the balance between part quality and cooling. During water spray cooling, there is a conflict between the maximum cooling effect and having a cup that is free of water-residue. The injected volume of water spray significantly affects the deforming temperature of the formed cup and the water residue.

The investigations were carried out on a single-station thermoforming KD 20/25 unit from **Kiefel**. The machine was equipped with a 105mm tall, 400ml drinking cup mould and plug assist combination. To atomise the water, it was pressurised and pumped through a spray nozzle at pressures up to 100 bar. This high pressure is needed because it creates smaller spray droplets – so a constant amount of water results in a larger volume of spray.

Spray-cooling starts as soon as the water spray is injected into the moulded part and continues until the mould is opened and the remaining water spray leaks out. The researchers analysed the extent to which a cooling effect can be achieved by the water spray without having moisture on the part after demoulding.

Temperatures were measured using a Flir infrared camera. The camera is positioned above the forming station in order to measure the temperatures of the cup's inner side. Water residue after demoulding was checked by wiping the cup with a paper towel until no water drops were seen. If there was no weight gain in the paper towel, it was assumed that no residual water was contained in the cup.

A maximum injection volume of 6ml of water can be achieved for a 400ml large PP-EVOH-PP cup, with negligible residual water containing after deforming in the moulded part. Results show that minimal wetting of the part surface leads to effective cooling. To minimise

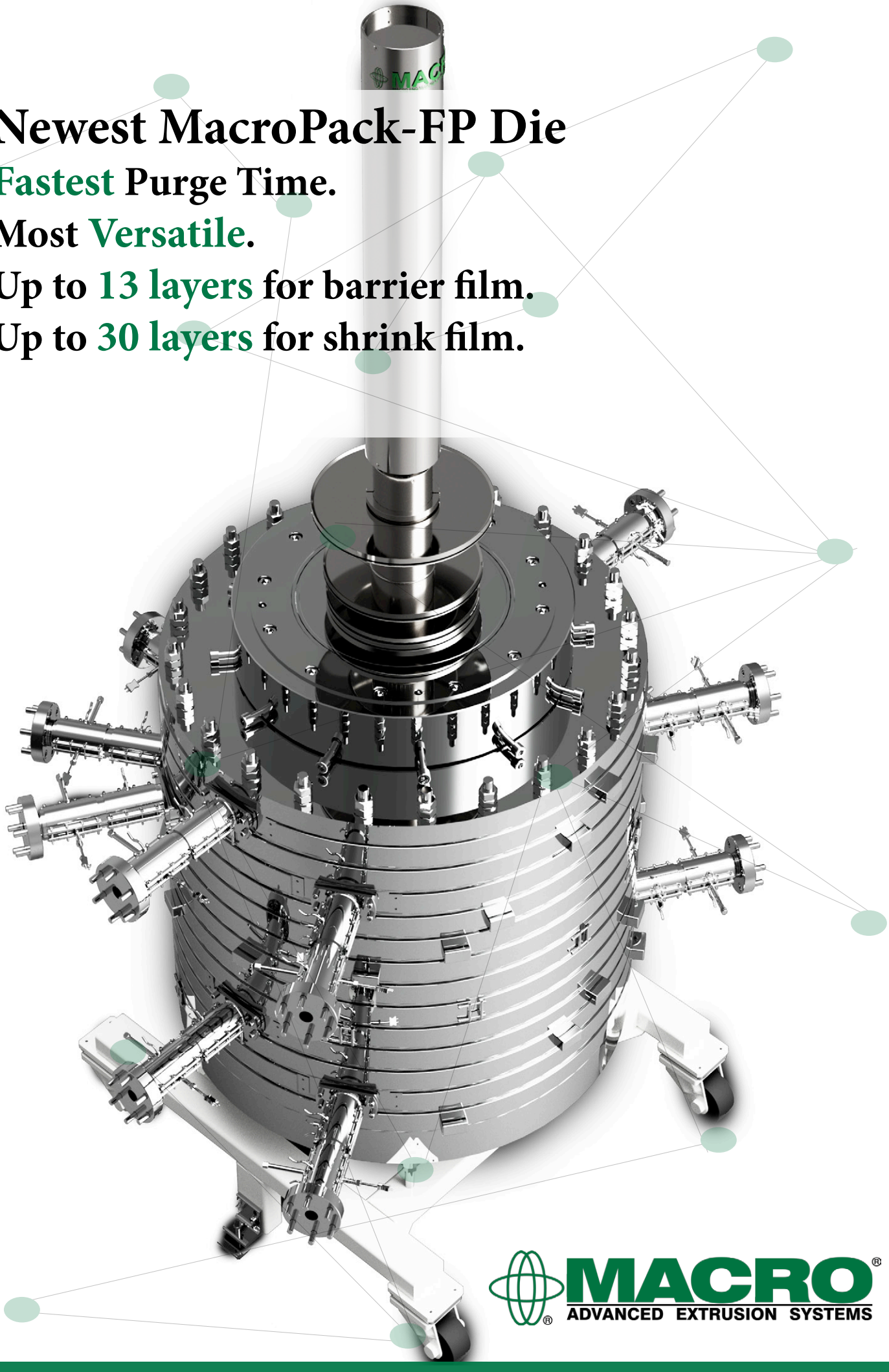
Newest MacroPack-FP Die

Fastest Purge Time.

Most Versatile.

Up to 13 layers for barrier film.

Up to 30 layers for shrink film.



MACRO®
ADVANCED EXTRUSION SYSTEMS

1(905)507-9000 sales@macroeng.com service@macroeng.com www.macroeng.com

At K2016, Illig demonstrated an IC-RDML 70 line with 18-up mould

the amount of residual water, a superposition of the water spray droplets should be avoided, as this will create larger droplets that cannot be removed by evaporation or a blowing process.

Using water spray, cooling can be accelerated up to 6°C/s for the cup demonstrator.

If the part cooling after forming is the rate limiting process step, the water spray cooling leads to a cycle time reduction of about 5%, said the researchers.

Wax boosts non-stick

US-based scientists have developed a 'superhydrophobic' coating that means viscous liquids such as ketchup and honey can be completely removed from containers.

The coatings are made from edible, non-toxic substances including beeswax and carnauba wax – in contrast to typical coatings of this type, which are made from fluorocarbons.

The team of materials scientists – led by Arun Kota at the **Colorado State University** – published their findings in Applied Materials and Interfaces recently. The paper describes synthesising and testing the coatings.

IML-T can be used for a wide range of packaging

The US Food and Drug Administration (FDA) recently banned three perfluorinated compounds (PFCs), which are used in food packaging for grease-proofing pizza boxes and other items.

"Companies are very specific about toxicity levels in these products, which is why they don't get into the market very easily," Kota said of hydrophobic coatings.

One of Kota's students came up with the idea of trying to make such the coatings from beeswax. Its chemical properties are similar to non-sticky fluorocarbons, but even at extremely high doses they are safe to ingest. The researchers came up with a way to spray the coating onto a surface by first dissolving the wax. The coating was tested with a wide range of aqueous liquids – including pancake syrup, orange juice, milk and coffee – using common polystyrene cups.

There is room for improvement in the mechanical durability of their coatings, which cannot currently withstand harsh and abrasive environments, says the paper.

Click on the links for more information:

- **www.illig.de**
- **www.amiplastics.com**
- **www.ikv-aachen.de**
- **www.kiefel.com**
- **www.colostate.edu**

Turn page for the full programme ➤

BOPP FILM 2017

AMI Conferences

10TH ANNIVERSARY

The international conference and exhibition for the bi-oriented polypropylene film industry

PLATINUM SPONSORS

BRÜCKNER MASCHINENBAU
A Member of Brückner Group

ESOPP
Energy Saving Orientation Production Process

Image courtesy of: Brückner Maschinenbau GmbH & Co. KG and ESOPP

March 27-29, 2017

Ft. Lauderdale Marriott Coral Springs Golf Resort, Coral Springs, Florida, USA

Organised by:
Applied Marketing Information Ltd.

Also sponsored by:
KAMPF
ATLAS Rewind to the Future www.atlasconverting.com
GOEBEL IMS
ELECTRONIC SYSTEMS THE POWER OF CONTROL
A. Schulman

Media supporter:
film and sheet EXTRUSION

SPECIAL OFFER: Save $205 if you register before January 6, 2017

BOPP FILM 2017

March 27 – 29, 2017
Ft. Lauderdale Marriott Coral Springs Golf Resort, Coral Springs, FL, USA

In 2017 AMI will be celebrating the 10th edition of its BOPP Film conference, recognized as the leading forum for the global BOPP industry. Held every two years, the 2017 event will take place from March 27-29, 2017 in Coral Springs, Florida, USA. Over two days delegates will have the opportunity to discover the latest developments in raw materials and film technology for BOPP film manufacture as well as understand how the global business is changing and the opportunities this offers.

With the continued switch from rigid packs to flexibles for a wide range of applications, demand for BOPP film continues to advance. BOPP is an extremely versatile material, with flexibility in terms of finish and properties and a strong performance to cost balance. This makes it an attractive choice for converters and brand owners who are demanding more sophisticated packaging structures, enabling BOPP producers to increase supply of margin-boosting speciality films. Industry dynamics are also changing, with a resurgence of in line announcements shifting the focus of investment away from China towards a more global spread. In addition to increasing overall market capacity these investments will bring a step forward in technology, helping manufacturers maintain competitiveness and increase profitability through increased efficiencies.

The extensive programme brings together key players from across the entire supply chain to share their views on the future of the industry and demonstrate the latest innovations that can add value and futureproof your business.

The conference regularly attracts over 200 participants from 30 countries. Delegate companies typically represent more than 50% of the world's output of BOPP film (equal to over 2 million tonnes of PP resin purchase). With many delegates already registered before the programme has even been published, this event is expected to be the event for the global BOPP film industry in 2017.

BOPP Film 2017 will provide a unique business conference and exhibition opportunity for the BOPP film industry. AMI regularly publishes a comprehensive global study of the BOPP film industry as well as Orientate, the newsletter for the industry. This gives us unrivalled insight into the key business and technical issues facing the industry today.

Whatever your involvement in the BOPP film industry, be it raw material supplier, equipment manufacturer, BOPP film producer, converter, packer, brand owner or investor, this event will provide an ideal opportunity to connect with like-minded professionals and explore the latest international business trends.

FIVE GOOD REASONS WHY YOU SHOULD ATTEND:

1. It is the only global conference dedicated exclusively to the interests of the BOPP film industry.

2. The event will give you an up to date view on the latest developments in PP resins, additives and technology for BOPP film and how they will influence film performance and cost.

3. You will hear the views of leading brand owners and converters on the future of the flexible packaging industry and BOPP film's position within it.

4. Gain insight into strategies for developing a successful global BOPP film business in today's business environment.

5. Network with our senior delegates and speakers from around the world.

Save $205

Register before January 6, 2017

PLATINUM SPONSORS

BRÜCKNER MASCHINENBAU
A Member of Brückner Group

Brückner Maschinenbau is the leading supplier of stretching lines for commodity as well as added value specialty films:

- Highest line speeds up to 600m/min, largest film widths up to 10.4 m and biggest outputs of 7,500 kg/h
- Various technologies for all kinds of packaging and technical films, specialized applications and customer requirements
- Worldwide quality standards, easy operation, energy efficiency, low maintenance, high uptime and reliability

The sister company Brückner Servtec accompanies worldwide film producers with services and upgrades during their lines' entire lifecycle.

ESOPP
Energy Saving Orientation Production Process

ESOPP has over 30 years' experience in turnkey biaxially oriented film lines all over the world:

- High output BOPP lines (8.7m, 550 m/min, 7000 kg/hr, 12µ, first jumbo roll on winder 12 months after the signature of contract)
- Twin screw extruders with direct recycling of edge trims and slitter loss in fluffs form
- Sequential line with MD relax during transversal stretching
- Fully adjustable (both MD and TD) simultaneous stretching lines, entirely mechanical solutions. TD stretching suitable for 45° orientation.

ESOPP has also supplied:

- World's smartest new BOPP line, 8700 mm, 10 - 100 µ, 600 m/min
- World's widest, fastest simultaneous BOPA line, 6600 mm, 12-25 µ, 250 m/min
- China's fastest, widest battery film line (LIBS) 4000 mm, 5 - 25 µ, 50 m/min

CONFERENCE HOTLINE
Contact: Sabrina Redl, Conference Organiser
Tel: +44 (0) 117 314 8111
Fax: +44 (0) 117 311 1534
Email: sr@amiplastics.com
Twitter: @AMIconferences #attendAMI

Turn page for booking details ➤

PLATINUM SPONSORS

BRÜCKNER MASCHINENBAU
A Member of Brückner Group

ESOPP
Energy Saving Orientation Production Process

BOPP FILM 2017

Monday, March 27, 2017

5:00 - 7:30 Registration

6:00 - 7:30 Networking Cocktail Reception sponsored by: BRÜCKNER MASCHINENBAU, A Member of Brückner Group

There are no conference sessions on this day

Tuesday, March 28, 2017

8:00 Registration and welcome coffee

9:00 Opening announcements

MARKET OVERVIEW

9:10 **Market growth and opportunities for the global BOPP industry**
Ms. Charmaine Russell, Unit Manager - Consumer Packaging, AMI CONSULTING, United Kingdom

9:40 **Packaging: a consumer's perspective**
Mr. Rodney Weaver, Senior Business Development Manager, SEALED AIR CORPORATION, United States

10:10 **Market trends and innovations driving BOPP demand: a Brazilian perspective**
Mr. Osvaldo Coltri, CEO, VITOPEL DO BRASIL LTDA., Brazil

10:40 - 11:20 Coffee break sponsored by: GOEBEL IMS

SESSION 1 – ADVANCED MATERIALS

11:20 **Differentiation & value innovation - the application of functional masterbatch in plastic packaging**
Ms. Sarah Xie, Sales Manager & Technical Services, SHANTOU BEST SCIENCE & TECHNOLOGY Co., Ltd. China

11:50 **Make a difference with the most advanced BOPP film heat sealant materials**
Mr. Herve Collette, Portfolio & Extrusion Applications TS&D Manager, INEOS SERVICES BELGIUM S.A., Belgium

12:20 - 1:50 Lunch

1:50 **New masterbatch developments deliver functional performance in BOPP films**
Mr. Chris Kerscher, Market Development Manager, A. SCHULMAN, United States

2:20 **Enhanced oriented PP films for improved shelf life and fast packaging operation**
Dr. Sascha Norden, Market Developer EMEAF, EXXONMOBIL CHEMICAL & PETROLEUM BVBA, Belgium

2:50 **Migrating additives in BOPP films**
Dr. Evgeni Zelikman, Film Additives R&D Manager, TOSAF GROUP, Israel

3:20 - 4:00 Coffee break sponsored by: ELECTRONIC SYSTEMS, THE POWER OF CONTROL

SESSION 2 – ENHANCING MANUFACTURING

4:00 **Enhanced services for BOPP film producers worldwide**
Mr. Markus Gschwandtner, Managing Director, BRÜCKNER SERVTEC GmbH, Germany

4:30 **New high barrier BOPP films using triple bubble technology**
Mr. Adolfo Edgar, VP Blown Film Systems – US & Canada, KUHNE ANLAGENBAU GmbH, Germany

SESSION 2 CONTINUED – ENHANCING MANUFACTURING

5:00 **Tailor-made slitter rewinder for the film industry in times of diversification**
Mr. Harald Knechtel, Managing Director Sales & Marketing and Mr. Sebastian Lange, Sales Director Film, GOEBEL SCHNEID- UND WICKELSYSTEM GmbH, Germany

8:00 Conference Dinner

Wednesday, March 29, 2017

8:30 Welcome coffee

9:00 Opening announcements

SESSION 3 – TECHNICAL DEVELOPMENTS

9:10 **Status/update on polymer filtration in BO processes**
Mr. Stefan Vandendijk, Technology Manager, PUROLATOR ADVANCED FILTRATION GROUP, United States

9:40 **The use of BOPP films for IML packaging systems**
Prof. Bohdan Czerniawski, Chief Research Specialist, COBRO-PACKAGING RESEARCH INSTITUTE, Poland

10:10 **Protecting and preserving barrier layers for flexible packaging materials**
Dr. Christof Kurthen, Head of Global Product Management, APPLIED MATERIALS WEB COATING GmbH, Germany

10:40 - 11:20 Coffee break

11:20 **Adding value to BOPP through coating processes**
Mr. Ricky L. Keller, Vice President-Coatings, DAVIS STANDARD LLC, United States

11:50 **Advanced corona technologies for improved adhesion in mono-web solutions**
Dr. Pater Palm, CEO/CTO, PWH PLASMAWERK HAMBURG GmbH, Germany

12:20 - 1:50 Lunch

SESSION 4 – BUSINESS FORUM

1:50 **Emerging trends in PP supply/demand**
Mr. Christopher Ferrell, Managing Editor, Americas Olefins & Polymers, S&P GLOBAL PLATTS, United States

2:20 **CPG brand owner's point of view on BOPP films**
Dr. Lora Liang, Principal Engineer, MONDELEZ INTERNATIONAL, United States

2:50 **Macro Economic & M+A market overview**
Mr. Ken Brooks, Senior Vice President, ERNST & YOUNG, Canada

3:20 Afternoon wrap up and questions

3:30 Conference ends

Conference bag sponsored by: ATLAS Rewind to the Future

Conference lanyard sponsored by: KAMPF

Conference 10th anniversary gift sponsored by: A. Schulman

Conference download page sponsored by: BRÜCKNER MASCHINENBAU, A Member of Brückner Group

AMI reserves the right to alter the program without notice.
The latest program including any new speakers or changes to schedules can be viewed on our website ***www.amiplastics-na.com***

Click here for a PDF of the brochure

CONFERENCE DETAILS

DATE AND LOCATION:
March 27-29, 2017
Ft. Lauderdale Marriott Coral Springs
11775 Heron Bay Boulevard
Coral Springs, FL 33076, USA
Tel: +1 954 753 5598

HOTEL ACCOMMODATION
The conference fee does not include lodging. We have negotiated a special rate of $169 plus tax per night at Marriott Fort Lauderdale for attendees who make their reservations by February 28, 2017. To reserve a room, please see our website for a direct link to book or contact the reservation department and state that you are attending "AMI's BOPP Film 2017".

REGISTRATION FEE
Register before January 6, 2017 for only $1295. Thereafter, the fee will be $1500. Registration includes all sessions, conference proceedings, cocktail reception, luncheons, and break refreshments.

GROUP RATES
For companies wishing to register two or more delegates, group discounts are available. Please contact the Conference Organiser for more details.

SPONSOR THIS EVENT AND PROMOTE YOUR COMPANY
AMI events are more than just arenas for listening and networking. They also represent highly targeted opportunities to enhance your image and promote your products and services to an international audience.

Each event offers the following unique awareness building opportunities: sponsorship of the networking cocktail reception, lunches, coffee breaks, and much more. For further information please contact the Conference Organiser at +44 (0) 117 314 8111

EXHIBITION PACKAGE
This package includes an exhibition space in the conference room where we will be hosting registration, the cocktail reception and coffee breaks, giving exhibitors maximum exposure. It also includes 1 free delegate place. Exhibitors may either use tables provided by the hotel or bring their own stand or display. A limited number of tables are available and are assigned on a first come, first serve basis. The cost of this package is $2950.

SOCIAL EVENTS
The social events organised for BOPP Film 2017 will provide an ideal setting for delegates and speakers to mix business with pleasure.

- **Networking Cocktail Reception**
  A networking cocktail reception will be held on the first evening. All delegates are invited to attend and it will offer an excellent opportunity to meet speakers and other colleagues. The Networking Cocktail Reception will run approximately from 18:00 to 19:30 and is included in the delegate fee.
- **Conference Dinner**
  All delegates are invited to attend the Conference Dinner, which will take place on the evening of March 28, 2017. The additional cost is USD120.

SUBSTITUTIONS / CANCELLATIONS
Delegates may be substituted at any time at no charge. We ask that you provide ample notification of substitution in order that materials can be prepared. Full refunds, less an administrative charge of $200 will only be made on cancellations received prior to February 17, 2017 We regret that we cannot make refunds on cancellations received after this date or for no-shows at the conference. Please note that refunds cannot be made on table top bookings, sponsorship packages or dinner places.

FAX FORM TO: +1 610 478 0900

CONFERENCE HOTLINE

Ms. Sabrina Redl, Conference Organiser

Applied Market Information Ltd.
5-6 Pritchard Street, Bristol, BS2 8RH,
United Kingdom

Tel: +44 (0) 117 314 8111
Fax: +44 (0) 117 311 1534
Email: sr@amiplastics.com

Follow us on Twitter: @AMIconferences #attendAMI

Please make copies of this registration form for others to use or download a PDF file copy of the brochure from our web site at **www.amiplastics.com**.

REGISTRATION FORM

BOPP Film 2017
March 27-29, 2017
Ft. Lauderdale Marriott Coral Springs
Coral Springs, FL, USA

Company: _____

Address: _____

_____

Tel: _____ Fax: _____

Company: _____

Delegate Details

If more than one delegate please photocopy form

Title: _____ First name: _____

Surname: _____

Position: _____

Email: _____

Special dietary requirements: _____

Payment Details

Please make payments in US Dollars ($)

❑ **Delegate fee** **$1295**_____
(before January 6, 2017)

❑ **Delegate fee** **$1500**_____
(thereafter)

❑ **Exhibition package** **$2950**_____
(includes exhibition space and one delegate space)

❑ **Conference Dinner** **$120**_____

Total:_____

Method of Payment

Payment terms are NET 30

❑ Bank Transfer: Please call or email for banking information. Note: You are responsible for any bank charges involved with the transaction.

❑ Visa/Mastercard/Amex

My card number is:

Name of cardholder: _____

Expiration date: _____

Security code: _____

Billing address: _____

_____ Zip code: _____

Cardholder's signature: _____

Date: _____

Invoice email *(if different from above)*: _____

Building a future:
construction industry applications

Large construction projects are an ideal showcase for plastics technologies – which also find their way into more everyday applications. **Lou Reade** reports

Grand projects are an ideal place to showcase cutting edge technologies – and one of the best known examples of this is sports stadiums.

For instance, the US Bank Stadium in Minneapolis – home of the Minnesota Vikings football team – is the first sports stadium in the USA to feature a transparent roof using ETFE films from **3M Dyneon**. According to the architect, HKS, the film roof is $100m cheaper than the retractable roofs that are commonly seen in the US.

Around 75 three-layer ETFE film cushions cover the total roof and facade area of 22,000 sq m – making the stadium the largest ETFE film project in the US. Some of the individually air-filled cushions are more than 110m long and around 3m wide. The top film is printed with a geometric pattern, which scatters the sunlight and prevents a greenhouse effect in summer. In winter, the film roof protects the interior from the cold outside temperatures.

The film cushions allow 95% of the daylight to pass through, but they weight only about 5% of glass. As a result, the supporting steel structure can also be much lighter.

The entrance consists of five giant glass doors, which are over 30m tall. Vector Foiltec built the film construction that joins onto them. The films are extruded from 3M Dyneon ETFE by Nowofol of Germany. Its Nowoflon ET 6235Z films are available in thicknesses of 80-400 microns. The films are available in a range of colours – including transparent, and a new infrared-absorbing variant. The films conform to fire protection class B1 (according to DIN 4102).

The roof is also designed for high snow loads – and is inclined towards the north in order to fend the snow off. The films are so smooth that snow can hardly get a grip at all and slides off.

ETFE also forms a central part of the new Canary Wharf station in London – which is being built as part of the huge Crossrail project. The new station has adopted a timber construction look, with a 30m high, 310m long roof made of wood and lightweight film cushions – which are extruded from ETFE. The new station was designed by the architects Foster & Partners. Three floors are situated below water level, while above the waterline the building rises up like a ship.

The curving support structure of the roof construction, manufactured by Wiehag Timber Construction of Austria, consists of visible glued laminated spruce timbers. Curving over it in an arch are 780 triangular air-supported ETFE film cushions. The films are highly

The US Bank Stadium in Minneapolis is the first sports stadium in the US with a transparent roof using ETFE films

ETFE forms a central part of the new Canary Wharf station in London

transparent and allow the sunlight with the UV-A radiation – which is important for plant growth – to pass through virtually without hindrance.

Seele Cover of Germany began installing the triangular ETFE cushions even before the assembly of the timber construction was complete. The cushions were assembled in Seele's production facilities. Seele was also responsible for the development, design, manufacturing and assembly of the aluminium clamping profiles, the made-to-measure cover plates to protect against the weather and the four air supply stations.

Cool performance

Huntsman Pigments & Additives has launched a new heat-reflecting pigment for light-coloured exterior plastics applications.

Its Altiris W400 pigment, launched at K2016, is a near infrared reflecting TiO_2 pigment that can improve the thermal stability and durability of white, bright and light colored plastics in exterior applications such as window and door profiles, sidings, decking, soffits and fascias.

It is the most recent introduction to Huntsman's Altiris portfolio, which give solar reflective properties across a broad colour palette. Available for use in cool white, near-white, bright colour and pastel shade plastics, the patented pigment combines large crystal size, narrow particle distribution, high crystalline purity and dense silica coating.

With a primary crystal size of 400nm, the product consists of a macro titanium dioxide (TiO_2) core, dense silica shell and alumina outer coating with an organic treatment. This larger crystal size shifts the reflectance emphasis across the solar spectrum, ensuring that a greater proportion of near infrared light is reflected compared to a typical grade of titanium dioxide.

Huntsman says it can boost the solar reflectance of white and light coloured plastics by up to 25%.

"In some countries, new building standards are coming into force – and specifiers are actively searching for solar reflecting pigments to build into their product ranges to improve performance and durability," said Russell Evans, business development director at Huntsman Pigments & Additives.

Dynactiv Power is a PVC sheet laminated with flexible solar cells, which prevents water evaporation while harvesting solar energy

Water and power

Benecke-Kaliko has developed a PVC sheet that prevents evaporation of water from reservoirs – while simultaneously harvesting solar energy.

Dynactiv Power has been developed for semi-arid countries, and comprises a special opaque, foam-backed PVC sheet that is laminated with flexible thin-film CIGS solar cells. It is typically installed on cut-and-fill and embankment reservoirs, and can result in a 70% capital cost reduction compared to concrete reservoirs, says the company.

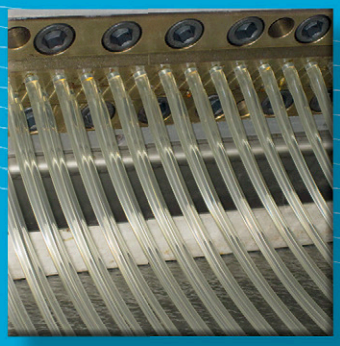
With the product, up to 40% more service water is retained, which can be used to cultivate large agricultural areas. In addition, the solar cells supply energy – which can be used for surrounding houses and to operate pumping stations.

The composite sheet produces around 500kWp of electricity per 10,000m². This means that a reservoir of 100,000m² can be used to run a small power plant with 5.0MWp.

"There is enormous demand for a water and electricity supply that is independent of the grid," said Tobias Haarburger, programme manager for Dynactiv Surfaces at Benecke-Kaliko. "Dynactiv Power compensates for the lack of water and electricity in a very simple way."

Engineers at Benecke-Kaliko and Israeli company Haogenplast developed the system together with water managers, high-voltage specialists, photovoltaic manufacturers, and scientific institutes. A pilot project proved that the technology was market-ready. Over a period of three years, a test system ran on an area of water covering 1,200m² with peak performance of 8.5kWp.

Polymer Plants – Redefined.



We create polymer together with our customers.

We develop and build Polyester and Polyamide production plants according to our own modern technology and equipment design.

We update existing polymer plants to reach today's production standards, quality and better economics.

We are your reliable and steady partner since 1988.

INNOVATION
EXPERIENCE
QUALITY

Polymer Plants
Polyamide
Polyester
Masterbatch

Recycling Plants
Polyamide
Polyester
Enviroment

Drying Plants
Polyamide
Polyester
Masterbach

Equipment
Dosing Unit
Viscometer
Polymer Filter
Gas cleaning

AQUAFIL ENGINEERING

AQUAFIL ENGINEERING GMBH
D-13469 Berlin-Germany
Düsterhauptstrasse 13
Phone +49-30-40 30 03-0
Fax +49-30-40 30 03-99
www.aquafileng.com
polymer@aquafileng.com

The energy-efficient ICEhouse uses several types of Lexan sheet from Sabic

"Previously, there were no systems that consistently combined water protection with climate-friendly energy generation," said Haarburger.

Dynactiv Power is easy to install thanks to its high degree of prefabrication. An excavator is enough to dig the reservoir. There is no need for expensive concreting or large construction sites, and the sheets (25m long, 1.5m wide) can be simply laid and connected. The tear-resistant sheets can bear the weight of both people and vehicles, allowing maintenance work to be performed with little effort.

Efficient performance

Sabic says that its tough, energy-efficient Lexan sheets were a key factor in the success of the ICEhouse – a structure that can be easily assembled, disassembled and reused.

The ICEhouse – where ICE stands for Innovation for the Circular Economy – was designed and built by architect William McDonough in collaboration with Sabic.

It was first constructed in January this year, at the World Economic Forum in Davos, Switzerland. It was recently reassembled in the Circular Valley in Hoofddorp, the Netherlands' national hotspot for the circular economy.

"The ICEhouse is a unique example of our belief in innovative circular economy thinking," said Ernesto Occhiello, Executive Vice President Specialties for SABIC. "This is a structure that can be rapidly constructed, disassembled and used time after time.

The ICEhouse uses an aluminium frame structure and several forms of Lexan sheet, including highly insulating, nanogel-filled Lexan Thermoclear multiwall sheet for cladding – which can lead to energy savings of up to 50% compared to monolayer glass.

The company has also developed a new version of its Lexan Cliniwall sheet – which was seen at K2016. The latest version is for clean room surfaces and interior wall cladding applications in public facilities and hospitals.

This opaque, low-gloss PC/ABS blend solid sheet portfolio delivers high strength and stain resistance to blood, iodine, rubber gasket marks and other common stains in hospitals and public facilities. It also offers excellent chemical resistance to most of the cleaning agents including disinfectant Isopropanol (rubbing alcohol), helping save significant maintenance costs.

PFA liners

At K2016, **Simona** of Germany focused on its portfolio of semi-finished parts made of PFA.

PFA is available as a backed and non-backed sheet for tank lining. Owing to the sheet's special width of 1,500mm, the number of weld seams can be reduced significantly. This helps to improve tank reliability and safety for operators. Simona also unveiled its PE 100 AP-Line, a new product range encompassing multilayer pipes, sheets and fittings designed to deliver improved wear protection.

Among the new products to be introduced within the Agriculture segment was the third generation of its Twin-Wall Sheets. This lightweight product has been further refined and combines the benefits of an isotropic core structure and reduced thickness with high stability – now also for use as a component in air scrubbers and livestock pens.

The product can also be used for tank construction. Featuring a new lattice structure within its core, it offers the benefits of high quality and durability.

Within its Construction market segment, it focused on next-generation Simowood products – extruded sheets made from Resysta, a hybrid material that incorporates rice husks, and have the look and feel of wood. New products include a new IMO-certified product targeted at the shipbuilding industry.

In the Mobility business, the company showcased its Boltaron 9815 product line – developed by subsidiary Boltaron – which is available as a calendered, extruded or press-laminated sheet product for aircraft interiors, and is compliant with strict FFA and EASA standards regarding flammability, smoke generation and heat release. Boltaron 9815 offers high impact strength as well as superior abrasion and chemical resistance and is easy to thermoform.

Antarctic greenhouse

Evonik says that its Plexiglas Alltop has helped scientists in the Antarctic to build a greenhouse – so they can grow fresh vegetables.

It means that the crew of the Chinese Great Wall

High barrier flexible films for food packaging – The global market

This brand new report from AMI is an independent assessment of the growing global market for high barrier films for food packaging.

Included is a summary of activities of 100 supply chain participants, including resin suppliers, film manufacturers and converters.

- Substrates : BOPET, BOPP, Cast PP, Blown PE, & BOPA.
- Market segmentation: Dehydrated foods & cereal, snack foods, beverages, meat & fish, dairy, bakery, other foods.
- Geographic scope: Europe, North America, South America, Middle East & Africa, China, Japan, Indian subcontinent, other Asia Pacific

For further information and a copy of our proposal please contact Elizabeth Carroll: ec@amiplastics.com

www.amiplastics.com; email: consult@amiplastics.com; Tel: +44 117 9249 442

Plexiglas Alltop has helped scientists in the Antarctic to build a greenhouse

Station can now exist without some of the supply flights that provide them with food.

"Among the materials we researched, Plexiglas Alltop proved to be most suitable as a covering material for greenhouses in Antarctica," said Le Lu, an engineer at Shanghai Dushi who was involved in developing the greenhouse at the Great Wall Station.

The greenhouse needed a material that would let through the maximum amount of light, while being strong enough to withstand the high winds – and sub-zero temperatures. Because of its 91% light transmission, the PMMA material guarantees that the plants get sufficient natural sunlight. The greenhouse was built from 600 square metres of 16mm-thick multi-skin sheets – providing good insulation and UV transparency, to help grow plants including tomatoes, cucumbers, peppers lettuce.

The material shows no visible yellowing – even after 30 years – which helps it to retain maximum light transmission.

Weimin Wang of Evonik, who was responsible for building the greenhouse, added: "We now want to build a second greenhouse in the Antarctic. It's already in the planning phase."

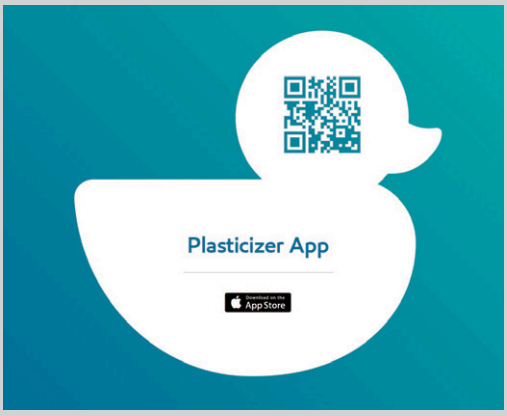
Click on the links for more information:

- **www.dyneon.eu**
- **www.huntsman.com**
- **www.benecke-kaliko.com**
- **www.sabic.com**
- **www.simona.de**
- **www.evonik.com**

POLYMERS IN FLOORING 2016

New developments and opportunities in resilient flooring

HEADLINE SPONSOR:
PLASTICIZER APP



6-7 December 2016

Sofitel Berlin Kurfürstendamm,
Berlin, Germany

Organised by:

Also sponsored by:

Galata Chemicals

Supported by:

ERFMI
EUROPEAN RESILIENT FLOORING MANUFACTURERS' INSTITUTE

Media supporters:

film and sheet EXTRUSION
compounding WORLD

FINAL REMINDER – BOOK NOW

Sabrina Redl – Conference Organiser sr@amiplastics.com Ph: +44(0)117 314 8111 Fax: +44(0)117 311 1534

PLASTIC POUCHES 2017

International conference and exhibition exploring the latest market, technical and commercial developments in plastic pouch formats

21-22 February 2017

Imperial Riding School Renaissance Hotel, Vienna, Austria

Images courtesy of: **Ella's Kitchen, Mars Chocolate Europe** and **Scholle IPN Europe BV**

Organised by:

Media supporters: Mitsui Chemicals

Media supporters: film and sheet EXTRUSION

SPECIAL OFFER: Save €100 if you register before 16th December 2016

Emily Renshaw – Conference Organiser er@amiplastics.com Ph: +44(0)117 314 8111 Fax: +44(0)117 311 1534

PHOTO: ROBERT KNESCHKE/SHUTTERSTOCK

Making packaging active

Packaging can do more than provide passive protection for the goods it holds and instead actively extend shelf-life or improve quality—particularly for food—by using additives to change the environment inside the package. Additive technologies embedded in the polymer or in coatings can include antimicrobials, flavour absorbers, oxygen scavengers, moisture scavengers, and additives that scavenge or emit (depending on the need of the packaging) ethylene or carbon dioxide. Active packaging can also include temperature-controlled packaging. And as the Internet of Things expands and provides greater connectivity, intelligent packaging using radio-frequency identification (RFID) tags and smart labels (among other technologies) may help improve quality and traceability or enhance a consumer's interaction with a brand.

Demands from the food industry for longer shelf-life and reduced product wastage are driving development of active packaging. **Jennifer Markarian** reviews how additive technologies are being used

Targeting waste

Reducing global food waste is one of the foremost challenges of today. Increasingly, people are beginning to recognise that packaging can play a role in reducing waste and improving food safety. In addition, changes in the food industry are driving a need for improved packaging. "The trend is for foods made with more natural ingredients and fewer preservatives, less sugar, and unsaturated fatty acids rather than saturated. Because these foods are more sensitive to oxidation and microbial growth, packaging must provide greater protection," says Sven Saengerlaub, business field manager for packaging at **Fraunhofer IVV** in Germany.

Organic wine, for example, cannot be stabilised with sulphides as is the case with traditional non-organic product, so the packaging (a bag-in-a-box, for instance) must be more protective, says Roland Schultz, Global

Main image: Barrier films are a prime potential application area for active additives such as scavengers

PHOTO: NILOO/SHUTTERSTOCK

Above: Antimicrobial additives could further extend MAP performance

Director of Marketing for Packaging at **Albis Plastic** in Germany. In addition to this "clean label" trend towards fewer preservatives, consumers want longer shelf life and more convenience. And in Europe, regulations are driving the need for recyclability. "Material mixtures, such as metal and plastic or multiple types of polymers, are difficult to recycle, and this will drive use of mono-material packages—which may still be multiple-layer structures," says Schultz. These packages may rely more on embedded additive technology to provide protection.

Controlling oxygen

Oxygen scavengers are one of the largest segments of active packaging additives, Schultz noted at AMI's recent Smart Packaging Conference. Albis Shelfplus O_2 is an iron-based oxygen scavenger, which is widely used in conjunction with a passive oxygen barrier layer. The oxygen scavenger absorbs oxygen that is in the headspace of the package, entrained in the product, or coming through the barrier layer. The technology is activated by moisture (for example, humidity within the pack or packaged liquid).

"While oxygen scavenging technology has been used for more than 15 years in rigid packaging, it has been expanding into thinner films in the past two to three years," says Schultz. Bag-in-box film is a key application with oxygen scavengers incorporated in the middle layer, which can be as thin as 55 microns. In other, even thinner applications, oxygen scavengers can be used in a 20-micron film layer or even in a tie layer that is less than 7 microns thick. "The iron particle might poke out of the 7-micron tie layer, but would still be covered by the adjacent layer," explains Schultz.

Good dispersion, however, is crucial because agglomerates of oxygen scavenger particles can cause holes in thin films. "Good dispersion starts with high raw material quality; we have tight control on incoming iron powder to check for agglomerates. A highly controlled compounding process is also important. We produce a film containing a 50% loading of the oxygen scavenger masterbatch as a quality control check," says Schultz.

In addition to iron-based scavengers, other technologies include sodium sulphide (used in closures in particular) and polymeric-based oxygen scavengers, which can be used with wet or dry products because they do not require moisture to function.

Antimicrobial options

Modified atmosphere packaging (MAP) is an established solution for extending shelf life and improving quality in foods such as fresh meat. However, because microbes can still grow inside the MAP, adding an antimicrobial additive to the film used to wrap the meat package can further improve food quality (reducing odour, for instance) and safety, said Veronica Cornini, R&D Project and Application Manager at Italy's **Coopbox Group**, in a presentation at AMI's Smart Packaging conference.

She said the company has investigated three

Protecting pharmaceuticals

US-based CSP Technologies has introduced Activ-Blister materials, which use silica gel and molecular sieve technology to absorb tailored amounts of water vapour and/or oxygen to control the internal atmosphere of individual blister cavities in various types of blister packaging made on thermoform-fill-seal or fill-seal equipment. The materials are used for packaging moisture and oxygen-sensitive solid-dose pharmaceuticals. According to the company, products that are normally packaged in bottles with desiccant sachets can be packaged in blister cards with Activ-Blister without reducing moisture protection.

The company has also developed Pharmapuck, a scavenging device that can be integrated into the top or placed inside a container to counteract the introduction of VOCs in the headspace. The scavenger is incorporated into the moulded part, which overcomes the risk of breakage or spillage associated with alternative sachet formats, according to CSP. The parts can also be custom coloured or laser marked.

I www.csptechnologies.com

CSP Technologies' Activ-Blister absorbs moisture and/or oxygen

PLASTICS REGULATIONS 2017

Responding to new and future regulatory developments that will impact on the plastics supply chain including REACH and food-contact legislation

CLICK HERE FOR DETAILS

28 – 29 March 2017

Maritim Hotel,

Cologne, Germany

Organised by:

Media supporters:

compounding WORLD | injection WORLD | film and sheet EXTRUSION | pipe and profile EXTRUSION

SPECIAL OFFER: Save €200 if you register before 13th January 2017

Kaja-Marie Beiswanger – Conference Organiser kmb@amiplastics.com Ph: +44(0)117 314 8111 Fax: +44(0)117 311 1534

PHOTO: CLAUS MIKOSCH/SHUTTERSTOCK

Above: Reducing waste and spoilage is becoming a top priority for the food industry

methods for supplying the antimicrobial. One solution was to use an inorganic filler dispersed in an organic, lamellar clay as a controlled-release carrier for an antimicrobial. In the initial experiment the filled system was applied as a coating, but Cornini says the possibility of using it as a masterbatch, compounded into the film, is being investigated. A second solution used a natural trace element incorporated into the film. A third solution used PVOH as a carrier for an antimicrobial, with the PVOH applied as a coating. Under high humidity, the PVOH swells and releases the antimicrobial into the product contact surface.

All three solutions were successful in reducing microbes on contact. However, the company is seeking a solution that would be active in the headspace of the MAP packaging, rather than just at the contact surface. "Existing solutions for the headspace, like essential oils, have an odour that is acceptable for some fruits and vegetables but not for meat," says Cornini, who plans to conduct further research in this area.

Recycling pressures

The EC's December 2015 revision to its directive on packaging and waste set goals for recycling, requiring 75% of all packaging by weight to be "prepared for use and recycled" by 2030. Flexible barrier films today are not recyclable because of their multi-material, multi-layer structures (for example, an outer layer of high-gloss PET, an aluminum barrier layer, an OPP rigid layer, and a PE food-contact seal layer). "But one day, the bar for the amount of material recycled will be set so high that it will need to include flexible packaging," predicts Schultz. "More easily recyclable films might eliminate aluminum and replace this with oxygen scavengers, but brandowners don't want to pay for the increased cost," he says.

Whether film structures will change remains to be seen, but a recent Fraunhofer study that examined the effect of oxygen scavengers on the recyclability of polypropylene (PP) films concluded with the good news that oxygen scavengers do not have a detrimental effect on PP degradation. "Residence time and temperature were the largest effects on degradation," reports Saengerlaub. "Iron-based oxygen scavengers had no effect on degradation, which was somewhat surprising, because iron is known to increase the auto-oxidation process. However, iron is known to protect polyamide (PA). This result means that processors can run recycled PP with oxygen scavengers at standard temperatures without being concerned about catalysing degradation."

The researchers also found that some of the additive's activity is retained through multiple extrusion passes, which might allow formulators to reduce the additive level in the virgin material if regrind contains oxygen scavengers.

Fraunhofer's research team is also investigating oxygen scavengers in recycled PET. "Initial results indicate that there is little effect on degradation due to the oxygen scavenger," says Saengerlaub. "In clear PET, oxygen scavengers sometimes cause 'fisheyes'. We hope to improve processability to address this issue. We also plan to investigate how polymeric oxygen scavengers behave, and we would like to see if oxygen scavengers have any effect on the taste and quality of food."

Multifunctional packaging

AITIIP Centro Tecnologico, based in Spain, has developed smart, multifunctional, bio-based, biodegradable packaging through its Dibbiopack project, which was conducted in collaboration with 18 other European university and industry partners. Berta Gonzalvo, the coordinator of the Dibbiopack project who presented the group's research at AMI's Smart Packaging conference, explained that PLA was chosen as a readily available material that is both bio-based and biodegradable. The project investigated using clay-based nanofibres to improve PLA properties. Researchers also used a bioORMOCER biodegradable coating material (developed at Fraunhofer ISC), which increases barrier properties and can be designed to have a humidity-triggered release of zinc oxide-based antimicrobials. The researchers developed prototypes for potential use of these technologies in food, cosmetics, or pharmaceuticals [possible image if space – slide 9 from presentation].

Click on the links for more information:

- **www.ivv.Fraunhofer.de**
- **www.albis.com**
- **www.coopbox.com**
- **www.aitiip.com**

HEAVY DUTY SACKS 2017

The international conference and exhibition on industrial bags and sacks

27-28 June 2017

Maritim Hotel, Cologne, Germany

Pre-programme special offer

SAVE OVER 25%

If you register before 13th January 2017
Don't miss out on this amazing offer!

JOIN US & BE PART OF THE EXHIBITION

AMI is pleased to announce the 1st edition of the Heavy Duty Sacks conference.The event will take place from 27-28 June 2017 at the Maritim Hotel in Cologne, Germany.

Heavy Duty Sacks will provide a unique forum to debate the technical and market developments in the industrial bags and sacks industry, whilst networking with experts from the industry.

The plastic heavy duty sack sector has always made good use of newly developing raw materials: first butene linear resins, then the higher alpha olefins and more recently, metallocenes to allow a continual process of product improvement and material down-gauging. Advances in form-fill-seal (FFS) film technology will continue to create further opportunities for plastic industrial sacks to displace multi-wall paper sacks in their existing stronghold areas, such as fine powder products, food ingredients and pet/animal feed and significantly reduce cost to brand owners and producers of those products.

The Heavy Duty Sacks conference will discuss the above issues and present research findings and possible innovative solutions to the problems faced by today's industry in the area of manufacturing, packing, transportation and storage of heavy duty bags and sacks. It will bring together players from across the supply chain including brandowners, plastic film and sack manufacturers, raw material producers, machinery suppliers and researchers; and will provide a forum to network with those professionals active in this sector.

Sponsorship and exhibition places are also available. Details of the pre-programme table top exhibition price are on the attached registration form.

If you would like further information about this important event please visit our website: www.amiconferences.com or contact Agata Swietek:

Tel:**+44 (0) 117 314 8111** Email: **aas@amiplastics.com**

GREAT SPONSORSHIP OPPORTUNITIES AVAILABLE

If you would like to present a paper at this conference
CLICK HERE FOR MORE INFORMATION

Organised by:
Applied Market Information Ltd.

Media supporter:

film and sheet EXTRUSION

Polymer Testing & Analysis 2017

The international conference on the testing, characterisation and analysis of polymer materials and products

CLICK HERE FOR DETAILS

4-5 April 2017
Maritim Hotel,
Cologne, Germany

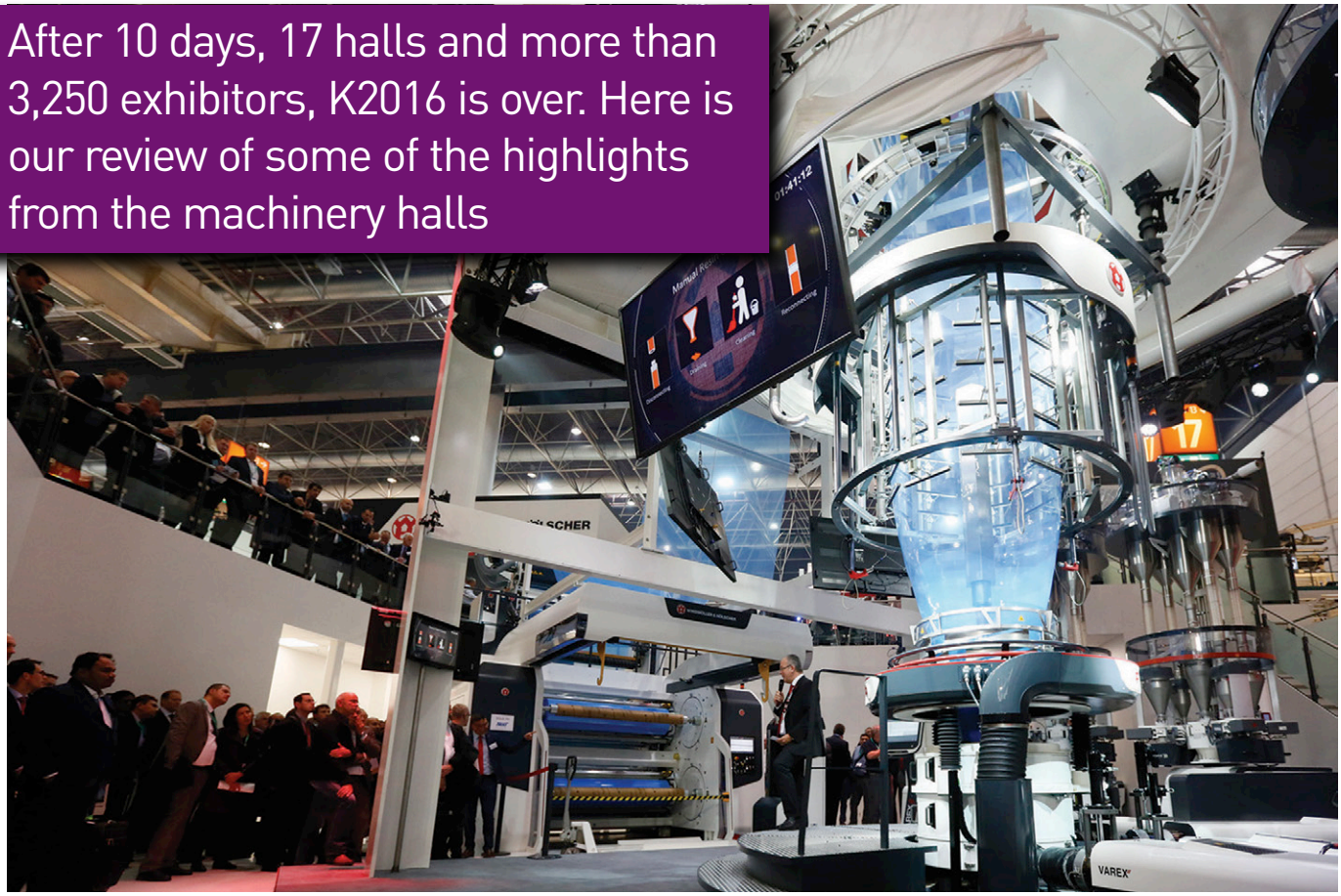
Organised by:

Media supporters:

compounding WORLD | film and sheet EXTRUSION | pipe and profile EXTRUSION | injection WORLD

SPECIAL OFFER: Save €200 if you register before 27th January 2017

After 10 days, 17 halls and more than 3,250 exhibitors, K2016 is over. Here is our review of some of the highlights from the machinery halls



Finished in 10 days: K2016 show review

There's always a great sense of relief when a K show finishes – but it's the calm before the storm, as exhibitors and visitors sift through leads in an attempt to turn them into solid business.

But then there is the welter of information that you didn't manage to collect at the show – including details of the latest product launches. Here, we round up some of the new technologies in plastics extrusion machinery for both film and sheet.

In our next issue, we will cover more – as well as rounding up innovations in materials.

Intense cooling

Addex says it has taken air ring technology to a new level, with the launch of its Intensive Cooling Experience (ICE) system.

The company says that multiple high velocity air jets – which flow in opposite directions – cool the blown film bubble very efficiently, allowing the line to be run at higher speed. Addex has developed a 'full blown' version – which will be sold to machinery manufacturers – and a smaller version, which can be retrofitted to existing machinery by film extruders.

The full version comprises four cooling elements stacked together, and topped by a conventional air ring. Each element creates a low pressure zone, which holds the film in place with high stability. A critical element is that the speed of the airflow in the lower zone is much higher than normal.

"It's around 30 times the velocity than you normally get in lower lips," said Bob Cree, president of Addex. "This gives cooling all along the melt region before it gets to the primary air ring, which helps to boost output."

He says that the more efficient cooling can help lines to run up to 60% faster. The full-blown system has a total of eight high-velocity air streams.

The smaller version, called ICE-enhanced, replaces a

K2016 welcomed 230,000 visitors – a 5% increase on the last edition

Addex says its ICE system takes air ring technology to a new level

conventional lower lip with its new 'high velocity' version.

"We guarantee a 10-15% increase in rate, but usually get 15-20%," said Cree.

ICE-enhanced helps to bring blown film lines to their maximum capacity, he says.

ICE technology can be combined with the company's other technologies, such as its auto profile systems – which Cree says will result in both higher output and better quality.

The company is still working out the exact details of how the technology will be sold, but expects to conclude this by mid-2017.

Fast metalliser

Bobst says that its new K5 Expert metalliser can run at speeds of up to 1,200m/min, and applies its coating more efficiently.

Because it has a larger coating drum – which is 700mm in diameter – Bobst says that the machine uses 10-15% less aluminium during the coating process.

At the same time, a larger chill drum helps to remove the heat of the hot aluminium spray more effectively.

Bobst says it has also spent three years improving the machine's reliability and serviceability – so that it is quicker to fix in the case of breakdown.

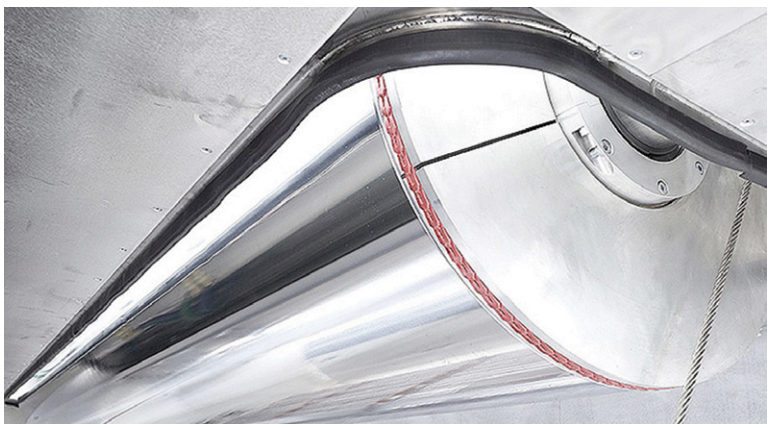
It will typically be used for BOPP film, and in wide-web PP or polyester film plants.

The K5 Expert is available in widths of 2.45-3.65m, and can house increased roll diameters of up to 1,270mm. Bobst says that the total cost of ownership (TCO) of the machine is reduced by 25% compared with other metallisers on the market.

The company also demonstrated its AluBond process at K2016 – which it says overcomes some of the traditional shortcomings of metallisation.

The K5 Expert from Bobst features a larger cooling drum, which allows higher throughput

Traditional metallisation can result in poor metal to polymer substrate bonding, which eventually leads to de-lamination, says Bobst. Part of the problem is low surface energy on the metal side which also contributes to poor lamination bonding.



The company says that its AluBond process promotes chemical anchoring (chelation) of the first aluminium particles – creating a metallising 'seeding' layer that provides superior bond strength. Very high adhesion is achieved when there are direct chemical bonds between the aluminium coating and the polymer surface, says Bobst. Increased chemical bonding by the creation of the seeding layer increases lamination bond strength and leads to high performance during lamination, extrusion and coating processes – to prevent failure of the packaging.

AluBond can also increase dyne level retention, which translates into improved ink wettability during printing and enhances structure stability during lamination.

Liquid advantage

NGR of Austria has already begun selling its PReact system to end users, to help them improve the quality of recycled PET.

The company says that the system converts PET scrap into food-grade PET in a single step.

"We are already running one line in the US for PET sheet," said Michael Heinzlreiter, chief marketing officer at NGR.

The system works by performing polycondensation – the removal of water molecules – from waste PET.

"When PET breaks down, you have water molecules at the end of the chain," said Heinzlreiter. "By applying a vacuum, you can suck out this water. The polymer chain then gets longer, as the ends combine."

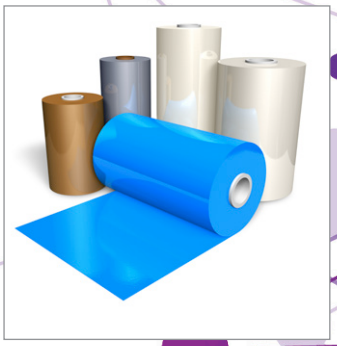
When the chains get longer, the intrinsic viscosity (IV) also increases.

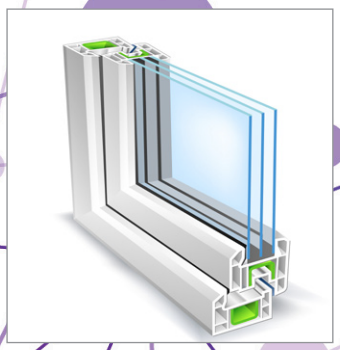
PVC Formulation 2017

International conference on the PVC industry, compounding, recipes and market trends

CLICK HERE FOR DETAILS

27 February-1 March 2017
Maritim Hotel,
Düsseldorf, Germany




HEADLINE SPONSOR

Perstorp
WINNING FORMULAS

Also sponsored by:

BASF We create chemistry
RheinChemie Additives
BUSS excellence in compounding
pmc organometallix
heubach COMPETENCE IN COLOR
EASTMAN
Mesamoll®

Organised by:

Media supporters:
compounding WORLD
AGPU

SPECIAL OFFER: Save €200 if you register before 9th December 2016

Bobst says that its AluBond process overcomes traditional shortcomings of metallisation

Polycondensation has previously been carried out in the solid phase, but this is the first time it has been done in the liquid phase, he says.

"The solid phase takes hours, while the liquid phase takes minutes," he said. "This is good for decontamination."

The company has teamed up with Kuhne to supply a system that combines a shredder-feeder-extruder for producing the plastic melt, PReact to improving PET quality, and a sheet production system from Kuhne.

Four units have so far been sold into the market – with a fifth due to come onstream in Asia this year.

At the same time, its T-Cracker helps to reduce landfill costs by converting hard-to-recycle materials into a mixture of gas and oil, and coke.

The gas and oil can be used for heating within a facility, while the coke can be sold on the market, said Heinzlreiter. NGR initially developed the technology on its own, but improved it with help from Linz University.

Fast licence

Processing Technologies International (PTI) has licensed its FastSelect technology – which allows fast colour changes in co-extrusion processes – to **Nordson Extrusion Dies Industries**.

Nordson EDI will now incorporate the technology into its dies for flexible packaging applications, while PTI will supply the technology directly for rigid packaging applications.

PTI launched the technology at K2013, when it was aimed at three-layer thermoformed cups. Now, in collaboration with Nordson EDI, it has adapted the technology for use in co-extruded film applications.

"Since this technology accompanies the sheet die and feed block, it is a natural fit to align ourselves with a global tooling leader like Nordson EDI," said Dana Hanson, president of PTI.

The technology works by using a diverter valve to alter the flow paths within the die. It means that colour changes can take seconds – rather than the usual 30-45 minutes, says Hanson.

"Nordson will now offer it as part of their tooling, after we licensed it to them earlier this year," he added.

Separate to this, PTI plans to add a high speed extrusion machine to its portfolio, for production of polypropylene (PP) sheet. While the company traditionally offers machines with screw rotation speeds of 100-200rpm, the new machine will be 600-1200rpm, with a 75mm screw.

"It's aimed at rollstock manufacturers and thermoforming customers, mainly in North America," he said.

PTI's plan is to offer a 'home grown' high speed machine – as Hanson says the only option is currently to import these from abroad.

"It will be ready before the middle of 2017," he said.

Extrusion advances

Bandera of Italy showcased a number of new technologies at K2016, including its TechnoFlex Plus five-layer blown film line.

The line, for producing packaging film, used LDPE – including a number of blends – as well as barrier materials such as EVOH and nylon. It had a lay-flat of up to 2,400mm trimmed. Thickness range for the film was 20 to 200 microns, while output was 700kg/hour for polyethylene film and 500kg/hour for barrier film.

The line featured two 75mm extruders for intermediate layers, and three 65mm extruders for the core and outer layers.

It also included eight ultrasound sensors, for bubble control, a triple-flow cooling ring and a rotating haul off with 2,600mm roller width.

Brückner Maschinenbau is now including its Heat

NGR's PReact system improve the quality of recycled PET by raising its intrinsic viscosity

Single Serve Beverage Capsules – Global Market Overview • August 2016

A brand new report by AMI Consulting to assist industry participants in facilitating change, formulating response strategies, directing R&D investment, and proactively managing market threats.

The report:

- Analyses global market opportunity and maps out the complex supply chain structure
- Quantifies current and future demand for capsules in million units, metric tonnes, and market value.
- Segments the market by moulding technology, moulding material, products filled and type of system (proprietary vs. compatible)

CLICK HERE FOR MORE DETAILS

To find out more, please contact Martyna Fong
mf@amiplastics.com or +44 (0)117 924 9442

compounding WORLD | film and sheet EXTRUSION | injection WORLD | pipe and profile EXTRUSION

Follow us on...

twitter

Be the first to know when we publish a new edition, plus updates on our conferences and useful links.

www.twitter.com/plasticsworld

Bandera showcased its TechnoFlex Plus five-layer blown film line at K2016

Recovery System as an integral part of its film extrusion lines – without additional charge.

In the system, fresh air is heated by the hot exhaust air of the oven via an air/air heat exchanger. This reduces the temperature of the exhaust air and retains the energy in the stretching oven system.

Air/air heat exchange is done via flexible hoses in a stand-alone unit. The condensate is collected in easily exchangeable condensate pans. Exhaust air from the transverse direction orienter unit (TDO) can be directed through a bypass in order to change the filters and to empty the condensate pans during production, says Brückner.

The company says that lines equipped with the Heat Recovery System have annual savings (in Euros) that can reach "high five-figure dimensions".

Easy control

Battenfeld-Cincinnati says that its new BCtouch UX control system is designed to be easy to use.

The user interface uses the concepts of tablets and cell phones, and offers multi-touch zoom as well as move and slide functions. As well as the central operating terminal, additional terminals can easily be added.

Thanks to a new type of cockpit view, the process status of the whole line can be viewed at a glance. The design of the overview page and the navigation through the menu are derived directly from the line configuration, says the company.

Additional features of the terminal are: an RFID access control system, which enables easy identification by chip card; and a context-sensitive help system.

With the BCtouch UX control, all process parameters are monitored centrally. This enables line operators not only to carry out energy monitoring, but to calculate energy diagrams over time. This makes it possible to find an operating point where the line can be run with optimal resource efficiency in terms of both material and energy consumption. Since maintenance intervals for all line components are recorded in the control system, it supports the necessary preventive maintenance actions, thus increasing line uptime and consequently overall efficiency.

Windmöller & Hölscher's latest cast film line, Filmex II, was designed for the production of stretch, CPP and barrier films

Line improvements

Windmöller & Hölscher introduced a number of film extrusion technologies at K2016 – including new cast and blown film lines.

Filmex II, its latest cast film line, was designed for the production of stretch, CPP and barrier films. Thanks to integrated processes, it can achieve consistent and reproducible film quality, says the company. Integrating the newly-developed film performance monitor (FPM) – which combines inline quality monitoring with a connection to downstream converting machinery – enables feedback from the final application.

This linking creates a transparent overview of the production, allowing for optimization during production with the goal of consistently superior quality film, says the company.

At an in-house event at its Lengerich headquarters – which took place during K2016 – the line ran a 13-layer barrier film.

At the show itself, W&H ran live demonstrations of its five-layer Varex II blown film line, with its Turboclean automation module for quick resin purging. The company says that Varex II is an intelligent machine because the Turboclean can manage a resin change on its own. By

Unbeatable deals for 2017

Book your 2017 advertisement campaign now and take advantage of our value-for-money package deals. They include discounts of up to 25% on our already competitive series rates, plus free Brochure Showcase entries.

Our focused digital magazines and apps provide cost-effective platforms for promoting products and services to a truly global audience of plastics industry professionals in your target markets.

Hurry!

Adverts must be reserved before the end of January 2017 to take advantage of these very special deals.

They can be booked in any one of our four magazines, or in a combination of the titles.

Contact:
Levent Tounjer, sales & commercial manager:
lt@amiplastics.com
Tel: +44 (0) 117 314 8183

Claire Bishop, advertisement manager:
cb@amiplastics.com
Tel +44 (0) 1732 605976

4

Four-pack
Four full-page adverts plus one free Brochure Showcase entry. **Total cost: €6,290 / $7,055**
Four half-page adverts plus one free Brochure Showcase entry. **Total cost: €4,420 / $4,930**

6

Six-pack
Six full-page adverts plus two free Brochure Showcase entries. **Total cost: €8,540 / $9,560**
Six half-page adverts plus two free Brochure Showcase entries. **Total cost: €5,990 / $6,630**

8

Eight-pack
Eight full-page adverts plus three free Brochure Showcase entries. **Total cost: €10,720 / $12,000**
Eight half-page adverts plus three free Brochure Showcase entries. **Total cost: €7,520 / $8,320**

10

Ten-pack
Ten full-page adverts plus four free Brochure Showcase entries. **Total cost: €12,560 / $14,000**
Ten half-page adverts plus four free Brochure Showcase entries. **Total cost: €8,810 / $9,750**

12

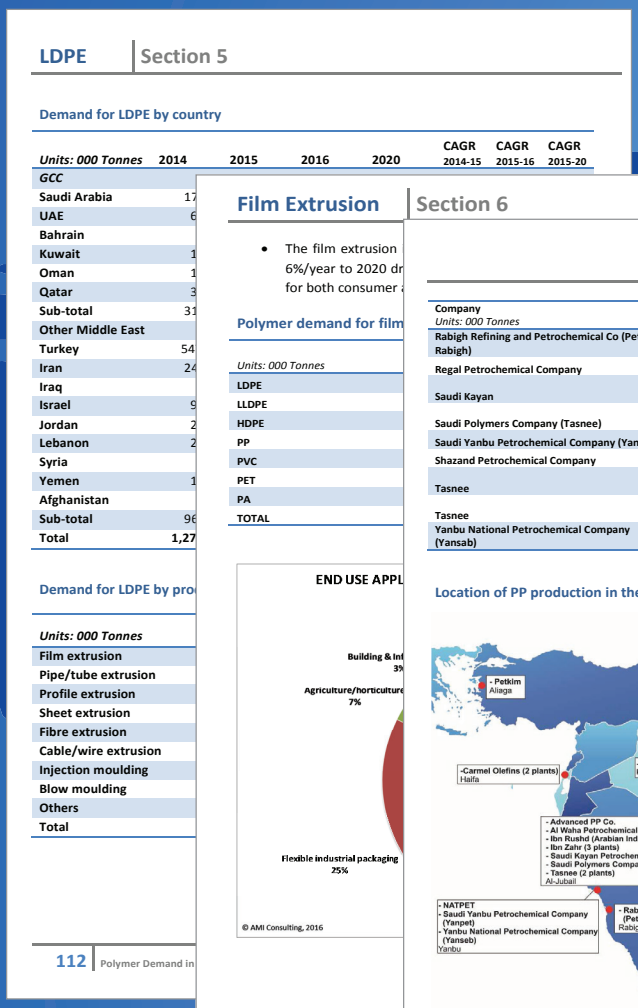
Twelve-pack
Twelve full-page adverts plus six free Brochure Showcase entries. **Total cost: €13,040 / $14,430**
Twelve half-page adverts plus six free Brochure Showcase entries. **Total cost: €9,160 / $10,270**

Click on the logos to download our 2017 media packs with updated features lists and distribution figures:

compounding WORLD | film and sheet EXTRUSION | pipe and profile EXTRUSION | injection WORLD

POLYMER DEMAND IN THE MIDDLE EAST

An AMI Consulting Data Report



LDPE | Section 5

Demand for LDPE by country

Units: 000 Tonnes	2014	2015	2016	2020	CAGR 2014-15	CAGR 2015-16	CAGR 2015-20
GCC							
Saudi Arabia	17						
UAE	6						
Bahrain							
Kuwait	1						
Oman	1						
Qatar	3						
Sub-total	31						
Other Middle East							
Turkey	54						
Iran	24						
Iraq							
Israel	9						
Jordan	2						
Lebanon	2						
Syria							
Yemen	1						
Afghanistan							
Sub-total	96						
Total	1,27						

Demand for LDPE by pro

Units: 000 Tonnes
Film extrusion
Pipe/tube extrusion
Profile extrusion
Sheet extrusion
Fibre extrusion
Cable/wire extrusion
Injection moulding
Blow moulding
Others
Total

112 | Polymer Demand in

Film Extrusion | Section 6

- The film extrusion 6%/year to 2020 dr for both consumer

Polymer demand for film

Units: 000 Tonnes
LDPE
LLDPE
HDPE
PP
PVC
PET
PA
TOTAL

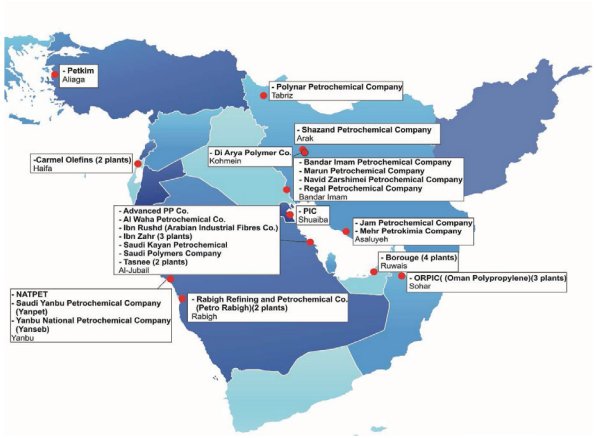
END USE APPL

© AMI Consulting, 2016

Section 5 | PP

Company Units: 000 Tonnes	Location	Capacity 2015	Capacity 2020
Rabigh Refining and Petrochemical Co (Petro Rabigh)	Rabigh, Makkah Province, Saudi Arabia	350	350
Regal Petrochemical Company	Bandar Imam, Khuzestan, Iran	150	150
Saudi Kayan	Jubail Industrial City, Al Jubail, Saudi Arabia	350	350
Saudi Polymers Company (Tasnee)	Jubail Industrial City, Al Jubail, Saudi Arabia	400	400
Saudi Yanbu Petrochemical Company (Yanpet II)	Yanbu Al Sinaiyeh, Yanbu, Saudi Arabia	260	260
Shazand Petrochemical Company	Shazand, Arak, Iran	75	75
Tasnee	Jubail Industrial City, Al Jubail, Saudi Arabia	270	270
Tasnee	Jubail Industrial City, Al Jubail, Saudi Arabia	450	450
Yanbu National Petrochemical Company (Yansab)	Yanbu Al Sinaiyeh, Yanbu, Saudi Arabia	450	450

Location of PP production in the Middle East



AMI CONSULTING

Published: February 2016 This brand new report draws on AMI Consulting's unique, in-depth knowledge and understanding of the downstream plastics processing value chain and provides unrivalled detail in quantifying the volume of polymer materials used across all the major plastics processing technologies on a country-by-country basis.

Also available in the data report series:

POLYMER DEMAND IN SOUTH & CENTRAL AMERICA

CLICK HERE FOR MORE DETAILS

POLYMER DEMAND IN AFRICA

CLICK HERE FOR MORE DETAILS

Who should buy these reports?

- **Suppliers of polymers, compounds and masterbatch**
- **Plastic processors**
- **Manufacturers of machinery**

Countries included:

- **Saudi Arabia**
- **UAE**
- **Bahrain**
- **Kuwait**
- **Oman**
- **Qatar**
- **Turkey**
- **Iran**
- **Iraq**
- **Israel**
- **Jordon**
- **Lebanon,**
- **Syria and Yemen**

All reports are available in printed & .pdf format

CLICK HERE FOR MORE DETAILS

The global plastics industry specialists

integrating all processes of the machine and the intuitive touch screen user panel, resin changes can be completed in just a few minutes and uptime is increased by 6%. This is possible thanks to the combination of an intelligent algorithm with the automatic cleaning of gravimetric and vacuum conveyers.

Battenfeld-Cincinnati says its BCtouch UX control system is easy to use

Three new lines

Colines of Italy showcased three new products – two extrusion lines and a packaging line.

It used a seven-layer Allrollex-2000 line to extrude a cast stretch film using a range of resins from ExxonMobil. The 2m wide line has a net output of 1500kg/hr and produces films in thicknesses of 6-30 microns. The line ran in combination with an AllSpeedy winder.

"The maximum speed for this is usually 450m/min, but our new winding unit allows speeds of over 700m/min," said Francesco Peccetti, communication manager at Colines.

At the show, the company also used a PreRollex-1000 line to make a five-layer pre-stretched hand wrap film, which was 7 microns thick.

"Demand for this type of pre-stretched film is increasing," said Peccetti.

Colines also showed its new AllWrapper high-speed wrapping technology, which uses a thin, high tenacity stretch film to bundle a range of products – from bottles and cans to carton drink bricks.

Click on the links for more information:

- **www.addexinc.com**
- **www.bobst.com**
- **www.ngr.at**
- **www.ptiextruders.com**
- **www.extrusiondies.com**
- **www.luigibandera.com**
- **www.brueckner.com**
- **www.battenfeld-cincinnati.com**
- **www.wuh-group.com**
- **www.colines.it**

INDUSTRY 4.0

FOR PLASTICS PROCESSORS 2017

Creating a "Smart Factory" - exploring potential and identifying key challenges

CLICK HERE FOR MORE INFORMATION

7 March 2017

Maritim Hotel, Cologne, Germany

Organised by:
Applied Market Information Ltd.

Media Supporters:

compounding WORLD | film and sheet EXTRUSION | pipe and profile EXTRUSION | injection WORLD

CLICK HERE FOR MORE INFORMATION

Tuesday 7th March 2017

08.00 Registration and welcome coffee

09.00 Opening announcements

SESSION 1 - INTRODUCING INDUSTRY 4.0

09.10 **Managing transformation towards Industry 4.0**
Dr. Oliver Krause, Associate Director,
ARTHUR D. LITTLE, Germany

09.40 **Digital transformation, Industry 4.0, smart services - to reduce costs and increase revenue**
Mr. Thomas Vorhauer, Head of Industrie 4.0 / IoT Germany,
ATOS, Germany

10.10-10.50 Morning coffee

SESSION 2 – CASE STUDIES: INDUSTRY 4.0 IN ACTION

10.50 **Industry 4.0 - hype or reality? People as a key player**
Mr. Denis Barrier, Product Manager,
BOSCH REXROTH, Germany

11.20 **Smart connectivity as the building blocks for IoT**
Mr. Mark Maas, Sr. Manager Innovation Platforms and Ventures,
TE CONNECTIVITY, Netherlands

11.50 **Applying Industry 4.0 in real world plastics compounding operation**
Mr. Sven Wolf, Managing Director,
LEISTRITZ EXTRUSIONSTECHNIK GmbH, Germany

12.20 - 13.50 Lunch

SESSION 3 – WHAT INDUSTRY 4.0 MEANS FOR THE PLASTICS SECTOR

13.50 **Intelligence applied to moulds - predictive maintenance to achieve zero downtime**
Mr. Antonio Molina Coleto, Sales & Marketing Director,
IML SOLUTIONS, Spain

14.20 **Understanding the benefits of Industry 4.0 in everyday plastics processing**
Mr. Benjamin Sutch, Chief Marketing Officer,
MORETTO S.p.A., Italy

14.50 **OPC UA: A global standardisation for industrial interoperability-adoption from sensor to cloud and plastics industry**
Mr. Stefan Hoppe, Global Vice president OPC Foundation,
OPC FOUNDATION, Germany

15.20 - 16.00 Afternoon tea

SESSION 4 – EXPLORING CONNECTIVITY AND SECURITY

16.00 **Establishing a secure web of smart factories - achitecture, standards and technologies**
Dr.-Ing. Thomas Uslaender, Head of Department ILT,
FRAUNHOFER IOSB, Germany

16.30 **Protecting the intellectual asset in the digital manufacturing process**
Ms. Susan Reiblein, Consultant,
SUSAN REIBLEIN CONSULTING, United Kingdom

AMI reserves the right to alter the programme without notice.
The latest programme including any new speakers or changes to schedules can be viewed on our website ***www.amiconferences.com***

Featured speakers:

IML SOLUTIONS, Antonio Molina Coleto

Mr. Antonio Molina is the Sales & Marketing Director at IML Solutions. He is an MBA professional with over 10 years' international experience in general management and business development.
After leading successful projects in five different countries, he joined the company in the first quarter of 2016 to consolidate the international expansion. IML Solutions is established in Spain (headquarters), USA, Colombia and Peru.

TE CONNECTIVITY, Mark Maas

Mr. Mark Maas has a Mechanical Engineering (BSc) and Innovation Management (MSc) degree. From 1995 to 2014 he has been employed at Surface Mount Technology pick and place machine OEM Assembleon in various roles including: System Test Engineer, Product Manager, Manager Requirements Applications & Process group, Director High Volume Solutions. Since 2014, he has been at TE Connectivity within the Industrial Business Unit as Senior Manager Innovation Platforms.

FRAUNHOFER IOSB, Thomas Uslaender

Mr. Thomas Uslaender holds a degree in Computer Science from the University of Karlsruhe, Germany, and a PhD in Engineering of the Karlsruhe Institute of Technology (KIT), Germany.
He is head of the department "Information Management and Production Control" and speaker of the business unit "Automation" at Fraunhofer IOSB.
He was IOSB project leader in several international research projects and large environmental information system supply projects for German Environmental State Agencies.

OPC FOUNDATION, Stefan Hoppe

Mr. Stefan Hoppe has been the OPC Foundation Vice President since 2015, coordinating the OPC expansion into the Internet of Things and Industry 4.0.
He has been the President of the OPC Europe organisation since 2010 and the been the catalyst for initiating liaisons with other industrial consortiums that has resulted in OPC working groups developing companion specifications for the organisations respective information models.
Since 1995, he has worked for BECKHOFF Automation. He started as a software developer in the TwinCAT Automation team, becoming a lead Product Manager. His focus was on connectivity and embedded software products. He has studied electrical engineering at the Technical University of Dortmund, Germany.

ATOS, Thomas Vorhauer

Mr. Thomas Vorhauer has been with Atos since 2013. Since October 2016 he has been the Head of Industry 4.0/IoT for Atos Germany.
In this function, he is responsible for the complex topics of Industry 4.0 and IoT in Germany and develops, with the Atos Scientific community, approaches, solutions, use cases and services for the fourth industrial revolution.
In addition, he is actively engaged in Bitkom and further initiatives for the progress of the digital transformation. Since 1997, he has held functions at various companies – always with the focus to progress the digital business transformation.

CLOSING DOWN SALE

After 25 years of bringing you the latest and most comprehensive plastics-related books, we're closing our online bookstore to explore new ventures, but still in the world of plastics!

Save 75% on ALL books at www.pidbooks.com

Includes recently published books as well as "hard-to-find" specialist textbooks, classic reference works and older editions.

Enter voucher code 75CLOSE at checkout to claim your 75% discount

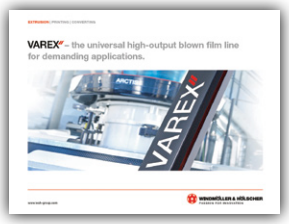
This offer is on a first come, first served basis. Once stock is gone, it's gone.
In some cases, we only have 1 copy of certain titles. Postage rates will be added.
Offer expires 23/12/2016 when pidbooks.com will go offline.

www.pidbooks.com

This month's free brochure downloads

Simply click on the brochure cover or link to download a PDF of the full publication

W&H: Varex II film systems



Varex II is Windmöller & Hölscher's latest universal system for high output blown film production. This publication details the critical Varex II system features that ensure production of the highest quality films with minimal scrap and highest plant efficiency.

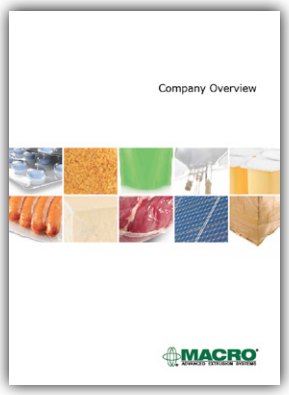
➤ **Click here to download**

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**

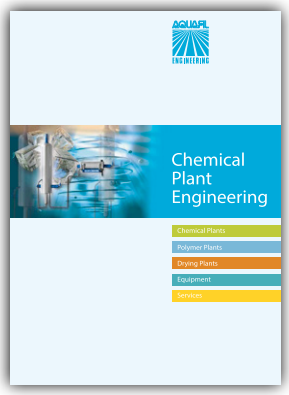
Macro: extrusion systems



This 20-page brochure from Macro provides an overview of the company, which manufactures film and sheet extrusion systems plus web handling systems. It also offers process development and optimisation services.

➤ **Click here to download**

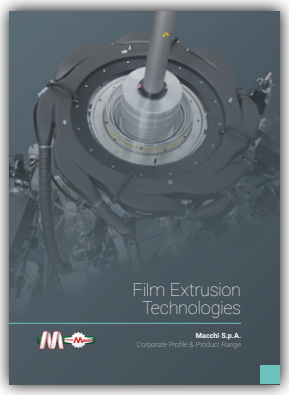
Aquafil: plant engineering



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

➤ **Click here to download**

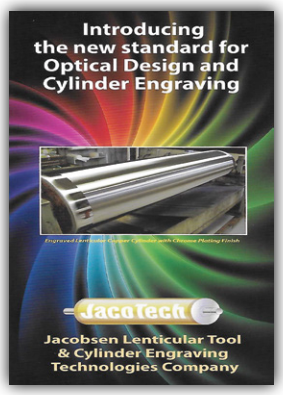
Macchi: film extrusion



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**

JacoTech: microstructured rolls



Find out more about JacoTech's globally-available scientific solutions for the development and production of cylindrical plastic material processing, including manufacturing of microstructured optical roll surface mould components for use in the management of light.

➤ **Click here to download**

If you would like your brochure to be included on this page, please contact Claire Bishop (cb@amiplastics.com) or Levent Tounjer (lt@amiplastics.com)

Download the programmes for these forthcoming conferences

Simply click on the brochure cover or link to download a PDF of the full publication

Thin Wall Packaging 2016

Now in its 11th year, Thin Wall Packaging 2016 takes place in Cologne Germany on 29 November to 1 December. This established international event brings together brand owners, retailers and producers to explore innovations in the European packaging market.

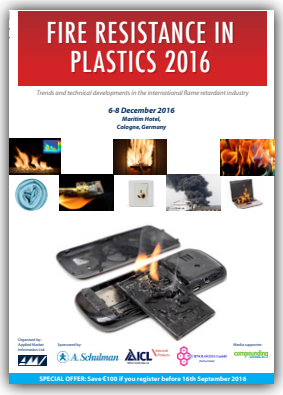
➤ Click here to download

Plastics in Africa 2016

Dubai, UAE, hosts the second Plastics in Africa conference on 5 December 2016. The event will deliver expert insight into the key consumption trends and business developments in this fast growing marketplace for polymers.

➤ Click here to download

Fire Resistance in Plastics



The 11th Fire Resistance in Plastics conference takes place in Cologne in Germany on 6-8 December 2016. This international event explores the latest regulatory and technological developments in the flame retardants sector.

➤ Click here to download

Stretch and Shrink Film 2016

The 11th North American edition of Stretch and Shrink Film takes place on 6-7 December in New Orleans, LA, USA. This high level event brings together users, designers and producers to hear the latest stretch film material, technical and market developments.

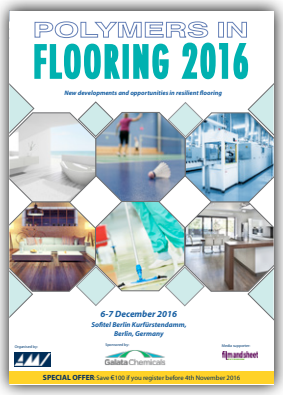
➤ Click here to download

Flexible Packaging ME&A

Newly expanded to include Africa, AMI's Flexible Packaging MEA takes place from 6-7 December in Dubai providing the ideal opportunity to explore technical and commercial developments in these fast growing markets.

➤ Click here to download

Polymers in Flooring 2016



This brand new conference takes place in Berlin, Germany on 6-7 December. It brings together an international line-up of expert speakers to discuss the latest innovations in polymers, additives and compounds used in commercial, residential and healthcare applications.

➤ Click here to download

To see our full line-up of more than 30 plastics industry events over the next 12 months, please visit www.amiconferences.com

Download the programmes for these forthcoming conferences

Simply click on the brochure cover or link to download a PDF of the full publication

Thermoplastic Concentrates 2017

AMI's 20th Thermoplastic Concentrates conference takes place in Coral Springs, Florida, USA, on 24-26 January 2017. This well established event is the place to explore the technical and business developments impacting the North American concentrates sector.

➤ Click here to download

Polyethylene Films 2017

The 15th Polyethylene Films conference will be held at Daytona Beach Shores, FL, USA on 31 January to 2 February. It will explore the business challenges and technical developments impacting on the North American film production sector.

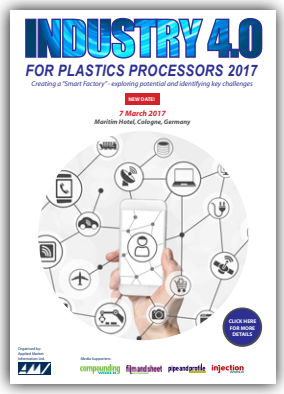
➤ Click here to download

Plastic Pouches 2017

AMI's third Plastic Pouches conference takes place in Vienna, Austria, on 21-22 February 2017. Its high level programme takes a detailed look at key pouch market trends, as well as the latest design, material and processing innovations.

➤ Click here to download

Industry 4.0 for Plastics Processors



This new one-day event will take place in Cologne, Germany, on 7 March 2017 and will provide an invaluable introduction to the use of Industry 4.0 principles to design and operate a plastics processing "Smart Factory".

➤ Click here to download

Specialty Plastics Films Asia

Taking place in Singapore on 23-24 March 2017, the fourth Specialty Plastics Films Asia conference brings together expert international speakers from across the full films supply chain to detail the latest technical and commercial developments.

➤ Click here to download

BOPP Film 2017

Taking place in Coral Springs, Florida, in the USA on 27-29 March 2017, the 10th anniversary edition of BOPP Films remains the leading forum for the BOPP films industry, drawing a high level audience of end users, film producers and material and technology suppliers.

➤ Click here to download

To see our full line-up of more than 30 plastics industry events over the next 12 months, please visit www.amiconferences.com

Winpak

Head office:	Winnipeg, Canada
President/CEO:	Bruce Berry
Founded:	1977
Ownership:	Public (listed on Toronto Stock Exchange)
Turnover (2015):	US$797m
Profile:	Winpak, founded in 1977, manufactures and distributes a wide variety of rigid and flexible plastics packaging for sectors including food and healthcare, as well as making thermoformed products such as cups and trays, and flexible lidding.
Product lines:	In healthcare, the company offers a variety of products, including blister and foil pouches, draping films and other products using co-extruded film up to 11 layers. In the industrial sector, it offers rollstock and speciality films, as well as biaxially oriented polyamide (BOPA). Its food packaging covers a wide range of food types including dairy, dry food and meat. A recent launch is its Hi-Bar condiment packaging system, which are made without the use of PVDC yet have more than three times the barrier properties.
Factory locations:	The company has 10 manufacturing facilities in North America – in Canada, the US and Mexico. These are arranged into three divisions: flexible packaging; rigid packaging and lidding; and packaging machinery. Winpak has two flexible plants in Winnipeg – including one that makes BOPA film – and one in the USA. The company recently spent around $25m to double production of barrier film in Winnipeg. It also has four rigid/lidding plants in the USA, and two in Canada.

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:

December 2016
Screenchangers and melt filtration
Foamed sheet technologies
Static control & web cleaning
K2016 – show review part two

January/February 2017
Developments in bioplastics
Materials testing & quality control
Polyolefins for film and sheet
Medical materials & applications

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

For information on advertising in these issues, please contact Claire Bishop: cb@amiplastics.com Tel: +44 (0) 1732 605976

Catch up on our recent issues for FREE

Simply click on the cover to see the full magazine, or download the issue in the relevant Apple or Android app

Film and Sheet – Oct
The October issue of Film and Sheet Extrusion magazine looks at new additives for polyolefins and the latest developments in extruder design. It also examines recent innovations in multi-layer packaging applications. Plus, coverage of the K2016 show.

➤ Click here to view

Film and Sheet – Sept
The September issue of Film and Sheet Extrusion looks at new developments in the production of BOPP films and reviews innovations in plasticisers and heavy duty sacks. Plus, we preview the materials and downstream equipment on show at K2016.

➤ Click here to view

Compounding World – Nov
The November issue of Compounding World takes a look at the latest innovations in coupling agents and surface modification technology. It also explores developments in batch mixing and carbon black. PLUS, breaking compounding news from K2016.

➤ Click here to view

Compounding World – Oct
The October edition of Compounding World examines the latest developments in fibre reinforcements for plastics. It also looks at active packaging and TiO_2 developments. Plus, we preview the machinery innovations to be launched at K2016.

➤ Click here to view

Pipe and Profile – Oct
The October edition of Pipe and Profile Extrusion explore the latest innovations in oriented PVC pipe production and reviews some of the latest developments in test methodology. This edition also includes our K2016 machinery and equipment preview.

➤ Click here to view

Injection World – Oct
The October edition of Injection World magazine looks at new innovations in E&E moulding, materials handling and product development. Plus, we review the machinery introductions to watch out for at K2016 and take an exclusive look at the plastic coffee capsule market.

➤ 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 injection WORLD pipe and profile EXTRUSION film and sheet EXTRUSION

Global exhibition guide

14-17 Nov 2016	Emballage, Paris, France	www.all4pack.com
16-19 Nov 2016	Plastics & Rubber Indonesia, Jakarta	www.plasticsandrubberindonesia.com/
8-10 January 2017	Arabplast, Dubai	www.arabplast.info
19-23 January 2017	Plastivision India, Mumbai, India	www.plastivision.org
24-26 January 2017	Swiss Plastics, Lucerne, Switzerland	www.swissplastics-expo.ch
24-27 January 2017	Interplastica, Moscow, Russia	www.interplastica.de/
22-24 February 2017	Plastics Vietnam, Ho Chi Minh City, Vietnam	www.plastics-vietnam.in/
27-Feb-2 March 2017	Saudi Plastics & Petrochem, Jeddah, Saudi Arabia	www.saudipp.com/
7-11 March 2017	Koplas, Goyang, Korea	www.koplas.com/
20-24 March 2017	Plástico Brasil, São Paulo, Brazil	www.plasticobrasil.com.br/
4-7 April 2017	Feiplastic, Sao Paulo, Brazil	www.feiplastic.com.br
3-6 May 2017	P4 Expo India, New Delhi, India	www.p4expoindia.com/
4-10 May 2017	Interpack, Dusseldorf, Germany	www.interpack.com/
16-19 May 2017	Chinaplas, Guangzhou, China	www.chinaplasonline.com/
23-26 May 2017	Plastpol, Kielce, Poland	www.targikielce.pl/
13-16 June 2017	FIP, Lyon, France	www.f-i-p.com
21-24 June 2017	Interplas Thailand, Bangkok	www.interplasthailand.com
1-3 August 2017	Plasti & Pack, Karachi, Pakistan	www.plastipacpakistan.com

AMI conferences for film & sheet extruders

15-17 November 2016	Multilayer Packaging Films, Vienna, Austria
29 Nov-1 Dec 2016	Thin Wall Packaging, Cologne, Germany
6-7 December 2016	Stretch & Shrink Film, New Orleans, USA
6-7 December 2016	Flexible Packaging Middle East & Africa, Dubai, UAE
31 Jan-2 Feb 2017	Polyethylene Films, Daytona Beach, Florida, USA
21-22 February 2017	Plastic Pouches, Vienna, Austria
23-24 March 2017	Specialty Packaging Films Asia, Singapore
27-29 March 2017	BOPP Film, Coral Springs, Florida, USA

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

www.amiplastics.com

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 e-mail button above (the envelope symbol in the browser) to help spread the word.

Turn page for the full programme ➤

Specialty Packaging Films Asia 2017

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

Images courtesy of: **Mondelēz International, Nestlé, Reifenhauser**

23-24 March 2017

Grand Copthorne Waterfront Hotel, Singapore

Organised by:

Sponsored by:

Media supporter:

SPECIAL OFFER: Save USD230 if you register before 16th December 2016

Specialty Packaging Films Asia 2017

23-24 March 2017,
Grand Copthorne Waterfront Hotel, Singapore

Join local and international experts at the fourth **Specialty Packaging Films Asia**, a technical and market conference focused on innovation in the development and production of flexible packaging.

Taking place from 23-24 March 2017 at the Grand Copthorne Waterfront Hotel in the bustling city of Singapore, the diverse programme covers the latest material and technological advances in films, raw materials, production techniques and applications that are setting the new standards for packaging excellence in Asia.

Packaging is critical for protection and preservation and is becoming more sophisticated and tailored to specific market requirements, offering a wealth of opportunities for flexibles. The Asia Pacific region encompasses a wide spectrum of packaging markets from mature, developed countries like Japan and Singapore, where consumers are willing to pay for high quality, safe and convenient products, through fast growing markets including Indonesia and Thailand, to developing economies such as Laos and Myanmar, which require creative packaging solutions that merge essential functionality into affordable everyday items.

Across the region, flexible packaging suppliers and producers are exploring ways to further enhance packaging performance, improve processability and drive sustainability. Furthermore, innovations in areas such as barrier polymers, additives, adhesives and active and intelligent technologies are allowing flexible packages to play a significant role in reducing food waste through the protection and preservation of goods, as well ensuring product safety and extending shelf life.

Whatever your involvement in the Asian flexible packaging industry, be it material, equipment or technology supplier, film producer, converter, brand owner or investor, **Specialty Packaging Films Asia 2017** will provide an ideal opportunity to meet with like-minded professionals, get expert opinions and debate the key issues.

FIVE GOOD REASONS WHY YOU SHOULD ATTEND:

1. **Get an up to date view on the latest trends in Asia Pacific flexible packaging markets**
2. **Learn about the latest material and technology developments to maximise productivity and add value**
3. **Understand your customers' views on their future needs**
4. **Benchmark your company against other leading players**
5. **Network with other professionals in the flexible packaging industry**

Save USD230

Register before 16th December 2016

EARLY BIRD REGISTRATION OFFER

Register before 16th December 2016 and pay USD1320 saving USD230 on the full price of USD1550. There are additional discounts for group bookings. The registration fee includes attendance at all conference sessions, the Networking Cocktail Reception, lunch and refreshment breaks on both days and a set of conference proceedings.

EXHIBITION SPACE

Make it easy for the delegates to find you at this busy event with your own table top exhibition space. Bring your own display stand, banners or use the space to showcase samples of your products and ensure that you make an impact. The table top exhibition will run throughout the conference in the spacious lobby next to the main meeting room.

The exhibition package includes 1 delegate place!

Space is limited so to avoid disappointment please register for this service as soon as possible.

SPONSOR THIS EVENT

A variety of sponsorship opportunities are available at this conference to help to promote and enhance your company's products and services to this highly targeted international audience. Contact the Conference Hotline for further information.

HOTEL ACCOMMODATION

Delegates are responsible for arranging their own hotel accommodation whilst attending the conference. However, AMI have reserved a limited number of rooms for delegates at the Grand Copthorne Waterfront Hotel, at the rate of S$250 (plus taxes) for a Superior room and of S$280 (plus taxes) for a Deluxe room including breakfast and Wi-Fi until the 17th February 2017

To make a reservation, please contact Sabrina Tan on:
Tel: + 65 6233 1301
Fax: +65 6233 1166
Email: sabrina.tan@millenniumhotels.com or grprsvns.gcw@millenniumhotels.com

Please state that you will be attending "AMI's Specialty Packaging Films Asia 2017" and note that after the 17th February 2017 the above rates and conditions might not be available, so please book early.

CONFERENCE VENUE

Unravel a world of adventures in the dynamic city of Singapore. Bursting with culture, entertainment, cuisine and businesses, Singapore presents the finest of East and West with a multitude of possibilities for you to explore. Overlooking the historic Singapore River, the Grand Copthorne Waterfront Hotel Singapore is located near Boat Quay, Clarke Quay and Robertson Quay. It is also close to the Central Business District and the Marina Bay Financial Centre.

CONFERENCE HOTLINE

Contact: Rocio Martinez, Senior Conference Organiser
Tel: +44 (0) 117 314 8111 Fax: +44 (0) 117 311 1534
Email: rmm@amiplastics.com
Twitter: @AMIconferences #attendAMI

See the latest programme and confirmed speakers at **www.amiconferences.com**

Turn page for booking details ➤

CONFERENCE PROGRAMME

Thursday 23rd March 2017

09.00 Registration and welcome coffee

10.00 Opening announcements

MARKET OVERVIEW

10.10 **Change and market opportunity in the flexible packaging industry**
Mr. Andrew Reynolds, Research Director,
AMI CONSULTING, United Kingdom

10.40 **Packaging environmental sustainability strategy for a brand owner**
Mr. Philippe Roulet, Head of Global Packaging Material & Training,
NESTLÉ, Switzerland

11.10 **Surviving the overcapacity: polyethylene**
Ms. Hui Heng, Senior Editor,
S&P GLOBAL PLATTS, Singapore

11.40 - 12.20 Coffee break

SESSION 1 – IMPROVING PERFORMANCE

12.20 **Flexible packaging in Vietnam – Development status of bio-degradable products in Vietnam**
Mr. Nguyen Nhu Khue, Managing Director,
LOTUS CHEMICAL TECHNOLOGY Ltd., Vietnam

12.50 **Permanent and temporary surfaces modification of polyolefin packaging**
Mr. Adi Afriat, Product Manager – Special Additives,
TOSAF COMPOUNDS, Israel

13.20 **PP talc compounds for packaging films**
Mr. Frans Venema, Technical Support Manager Plastics,
MONDO MINERALS B.V., Netherlands

13.50 - 15.20 Lunch

15.20 **The industry's new film star bringing excellent combination of stiffness, toughness and efficiency**
Ms. Ng Mei Yen, Technical Manager, Value Chain,
DOW CHEMICAL PACIFIC (SINGAPORE) Pte. Ltd., Singapore

SESSION 2 – BARRIER TECHNOLOGIES

15.50 **Biobased flexible packaging solutions with high barrier and film downgauging performance**
Mr. Stefano Cavallo, Films Segment Leader,
NATUREWORKS LLC, United States

16.20 - 17.00 Afternoon tea

17.00 **High barrier packaging applications of biobased PEF Films**
Mr. Nathan Kemeling, Director Business Development YXY,
AVANTIUM, Netherlands

17.30 **Specialty ethylene copolymers for high value meat packaging**
Mr. James Wei, Application Development Manager,
DUPONT CHINA TECHNOLOGY CENTER, China

18.00 **High gas barrier resin & film**
Mr. Yoshio Yamamoto, Technical Manager ,
KURARAY ASIA PACIFIC Pte. Ltd., Singapore

18.30 - 20.00 Networking Cocktail Reception

Friday 24th March 2017

09.00 Welcome coffee

09.30 Opening announcements

SESSION 3 – MATERIAL INNOVATIONS

09.40 **Flexible packaging: the continuous journey of innovation**
Mr. Saksit Borrisuttanakul, Chief Operating Officer (HVA),
TPBI PUBLIC COMPANY LIMITED, Thailand

10.10 **Bioplastics for flexible packaging - why and where?**
Mr. Andy Sweetman, Marketing Manager,
FUTAMURA, United Kingdom

10.40 **Resin solutions to enhance performance in consumer & industrial packaging film**
Mr. Chee Siong Lim, Technical Service Manager,
BOROUGE Pte. Ltd., Singapore

11.10-11.50 Morning coffee

11.50 **Printed technologies: packaging for a better living**
Mr. Björn Heilhecker, Product Manager Flexo Inks,
Printing Inks Product DIC Corp. Japan,
DIC (CHINA) Co., Ltd., China

SESSION 4 – ENHANCING MANUFACTURING

12.20 **Discovering specialty film coextruders**
Dr. Flavio Sesia, Area Sales Manager,
MACCHI S.p.A., Italy

12.50-14.20 Lunch

14.20 **Earn more money by cleaning smarter!**
Mr. Henning Lyager, Sales Manager
Distribution Channels - Asia,
COLD JET LLC, Denmark

14.50 **Simultaneous manufacturing technologies for advanced packaging materials**
Mr. Ricky L. Keller, Vice President - Coatings,
DAVIS-STANDARD LLC, United States

15.20 **Game changing machinery for the plastic film extrusion and converting industry**
Mr. Juergen Rehkopf, Managing Director,
REIFENHAUSER Pte. Ltd., Singapore

15.50 Afternoon tea and conference ends

Conference lanyard sponsored by: Tosaf

AMI reserves the right to alter the programme without notice.
The latest programme including any new speakers or changes to schedules can be viewed on our website ***www.amiconferences.com***

REGISTRATION FORM

Company: _____

Address: _____

_____

Country: _____

Tel: _____ Fax: _____

VAT No.: _____

(Must be completed by all EU Companies)

Company activity: _____

Purchase order No. *(if applicable)*: _____

Invoice address *(if different from above)*: _____

_____

_____

DELEGATE DETAILS

If more than one delegate please photocopy form

Title: Mr/Mrs/Dr/Other _____

First name: _____

Surname: _____

Position: _____

Email: _____

Special dietary requirements: _____

Signature: _____ Date: _____

PAYMENT DETAILS

All payments to be made in USD

Please tick box and write amount:

❑ Early bird admission fee: *(Until 16th December 2016)*	USD1320	_____
❑ Admission fee thereafter:	USD1550	_____
❑ Table top exhibition package (includes 1 delegate place)	USD2500	_____
	Total:	_____

METHOD OF PAYMENT DETAILS

You will be sent an invoice in 7-14 working days.

❑ **Bank transfer quoting:** "Applied Market Information Ltd. – Specialty Packaging Films Asia 2017' to: National Westminster Bank Plc. Thornbury Branch, 16 The Plain, Thornbury, Bristol, BS99 5HD

Account number: **140 0 03420760** Bank No. **55 61 38**
IBAN: **GB62 NWBK 6073 0103 420760** SWIFT: **NWBKGB2L**

❑ **Pay by Credit Card**

We accept: Visa / Mastercard / Maestro/ JCB

Please provide your contact details and we will send you a link to a secure payment gateway via email.

Name: _____

Email: _____

SPECIALTY PACKAGING FILMS ASIA 2017

CONFERENCE INFORMATION

Date and location
23-24 March 2017
Grand Copthorne Waterfront Hotel
392 Havelock Road
Singapore, 169663

Tel: +65 6733 0880
Fax: +65 6737 8880

Registration fee
The registration fee includes attendance at all conference sessions, the Networking Cocktail Reception, lunch, refreshment breaks and a set of conference proceedings.

- ***Early bird registration:*** Register before 16th December 2016 for only USD1320. Thereafter the cost is USD1550.
- ***Group rates:*** For companies wishing to register two or more delegates, group discounts are available. Please contact the Conference Organiser for more details. (Please note to qualify for the group discount delegates must be booked at the same time, otherwise additional delegates may be charged at full price.)

Table top exhibition
A limited number of table top exhibition spaces are available in the lobby next to the main meeting room. The table top exhibition fee is excellent value for money and **includes 1 delegate place.** Exhibitors may either use tables provided by the hotel or bring their own stand or display.

Sponsor this event
A variety of sponsorship opportunities are available at this event that can help to promote and enhance your company's products and services to this highly targeted international audience. For further information, please contact the Conference Organiser on: +44 (0) 117 314 8111.

Networking Cocktail Reception
A networking cocktail reception will be held on the first evening. This offers an excellent opportunity for delegates to meet with speakers and other colleagues. All delegates are invited to attend and admission is included in the delegate fee.

Hotel accommodation
Delegates are responsible for arranging their own hotel accommodation whilst attending the conference. However, AMI have reserved a limited number of rooms for delegates at the Grand Copthorne Waterfront Hotel, at the rate of S$250 (plus taxes) for a Superior room and of S$280 (plus taxes) for a Deluxe room including breakfast and Wi-Fi until the **17th February 2017**.

To make a reservation, please contact Sabrina Tan on:
Tel: + 65 6233 1301
Fax: + 65 6233 1166
Email: sabrina.tan@millenniumhotels.com or grprsvns.gcw@millenniumhotels.com

Please state that you will be attending "AMI's Specialty Packaging Films Asia 2017" and note that after the **17th February 2017** the above rates and conditions might not be available, so please book early.

Cancellations
Full refunds, less a cancellation charge of USD300 will only be made on cancellations received prior to 24th February 2017. Thereafter we regret that no refunds can be made. Delegates may be substituted at any time. Please note that refunds will not be given on table top bookings or sponsorship packages at any time.

CONFERENCE HOTLINE

ROCIO MARTINEZ, SENIOR CONFERENCE ORGANISER
Applied Market Information Ltd.
6 Pritchard Street, Bristol, BS2 8RH, United Kingdom
Tel: +44 (0) 117 314 8111 Fax: +44 (0) 117 311 1534
Email: rmm@amiplastics.com
Twitter: @AMIconferences #attendAMI

The latest programme, including any new speakers or changes to the schedule can be viewed on our website: **www.amiconferences.com**