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PLASTISCOPE

The Official Journal of the Organization of Plastics Processors of India

Volume No. 13

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• Mumbai

• August 2024

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FROM THE PRESIDENT'S DESK

Mr. Dilip Parekh



Dear Members,

Greetings from Organization of Plastics Processors of India!

On 9th August 2024, 40th Annual Meet of OPPI was held at Jio World Convention Centre. I was looking forward to meet large number of our Members at the event. However, many of you could not reach the venue in view of extremely heavy traffic in BKC.

A detailed report and photographs of the 40th Annual Meet held on 9th August 2024 are given in this Issue of PLASTISCOPE.

On 16th August 2024, India eased cross-border share swaps, allowing issue or transfer of equity instruments of a local company in exchange for those of a foreign firm in a significant rejig of foreign investment norms. Investments by an overseas citizen of India (OCI) on a non-repatriation basis would not be counted as indirect foreign investment, as per the changes, which were announced.

The amendments in the Foreign Exchange Management (Non – debt Instruments) Rules follow the budget pledge by Finance Minister Mrs. Nirmala Sitharaman to simplify overseas investment rules.

The latest changes have aligned the provisions governing downstream investments by overseas citizens of India with those for non-residents. These experts said, would encourage greater participation of NRIs in the country's economy. Easier share swap rules will “facilitate global expansion of Indian companies through mergers, acquisitions and other strategic initiatives”, the Finance Ministry said.

In view of the above I appeal to all Members to think beyond the shores of India and establish Plastics Processing Units in countries where there is a big demand for value added Plastics Products.

With Best Wishes,

Dilip Parekh
President

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Editor: **DEEPAK LAWALE**



OPP
Organization Of
Plastics Processors Of India

Seminar On

**“CRUCIAL ROLE OF SMART AND EFFICIENT
MAINTENANCE IN PLASTIC PROCESSING
INDUSTRY”** On Friday 20th September 2024

At The Park Hotel, 17, Mother Teresa Sarani,

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From 8:30AM To 5:30 PM

SEMINAR OBJECTIVES

- Practices to achieve Zero breakdown
- Maintenance Cost Reduction
- Good Maintenance practices
- Reduction in servicing cost for Machinery Manufacturers
- Factors to be considered by designers of processing Machines

PRESENTATIONS

- Adding Life to Your Machines: The trends to best practices
- Best maintenance practices for improving the productivity and reliability of injection moulding machines
- Adding New Lease of Life to Old Machines with Energy Conservation - Alternatives for conventional systems
- Increase your Uptime and Profitability by Automatic & Accurate Dosing
- Managing Ageing Plants
- Mould Maintenance
- MobilSerV Solutions – Beyond Lubrication
- Elevate Manufacturing - Operational Excellence through Digitalization
- Advancements in the Ease of Robot Programming For Injection Molding Machines
- Selection and Sizing of Power unit with Servo System for Injection Molding machines

* The titles of the presentations may change depending on the Speakers

Participants Shall Include

Plant Heads, Design Engineers of Machinery, Operations and Maintenance In-Charge, Maintenance Engineers, Production Heads.

Participation Fees

- Fees per participant – Rs. 2500/- +GST @ 18%.
- Registration fee includes training documentation, lunch, tea/coffee during the training.
- Payment is required with registration.

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- If 5 delegates register from the same company, 6th delegate registration is FREE.

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WHY SAUDI ARABIA?

Investing in the plastics, printing, packaging, and petrochemical industry in Saudi Arabia is amply supported by the country's abundance of raw materials. With proven oil reserves of approximately 266 billion barrels and estimated natural gas reserves of 293 trillion cubic feet, the petrochemical industry has become a major contributor to Saudi Arabia's economy, accounting for around 67% of the country's non-oil exports. Additionally, the Saudi government has established economic zones to support the industry's development, making it an attractive destination for investors looking to establish manufacturing facilities in the region.

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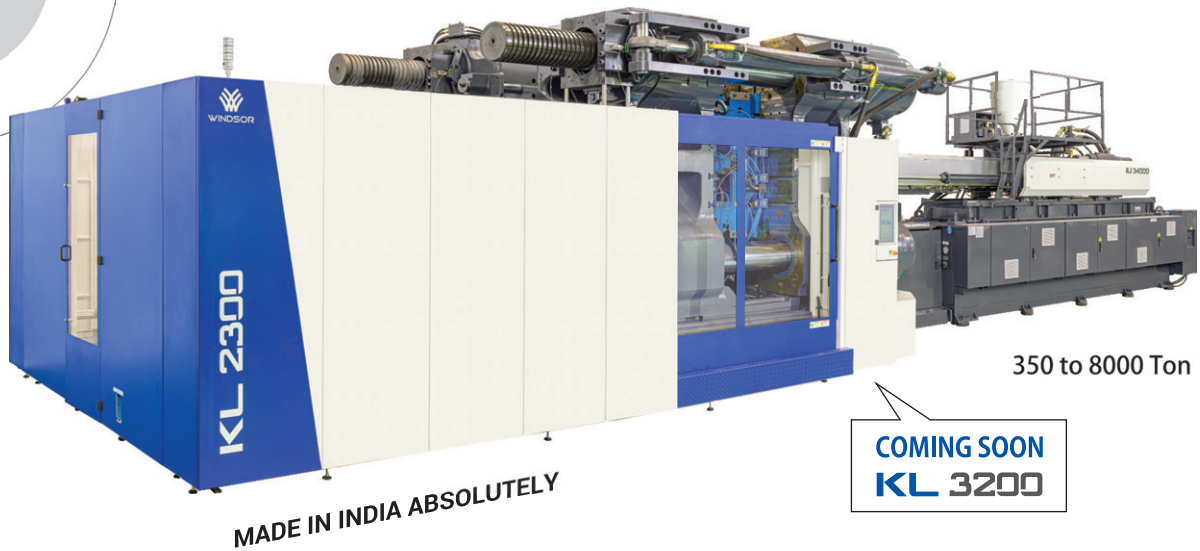
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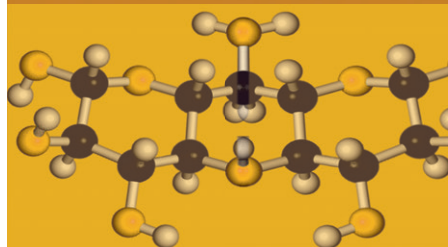
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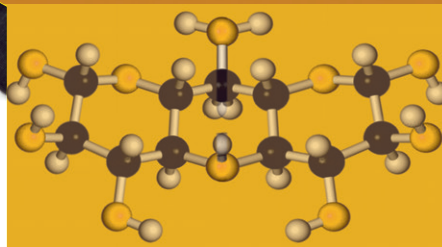




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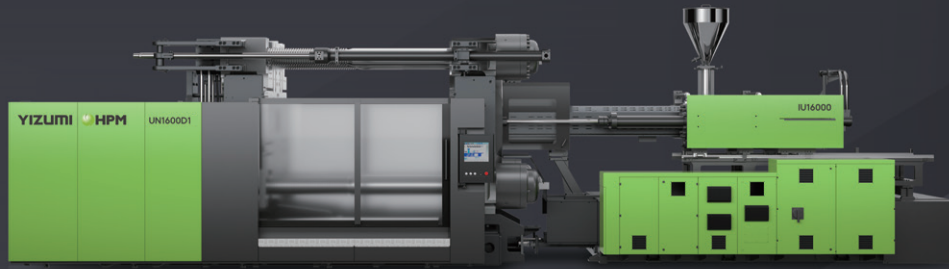
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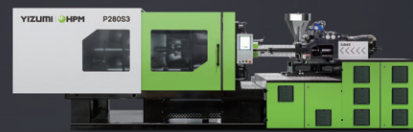
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Venue: Int'l Convention City Bashundhara (ICCB)
 Organizers: Yorkers Trade & Marketing Service Co., Ltd. Bangladesh Plastic Goods Manufacturers & Exporters Association

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- **Machinery Parts and Accessories**
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- **Printing:** Printing Machinery & Accessories, Packaging Print & Process Systems, Printing Materials & Supplements, Post-Printing Machinery & Equipment, Coating Equipment.

PLASTIC

- ✓ Local annual sales is around TK28,000 crore (US\$3.25 billion)
- ✓ Export in the first 5 months of FY22 is 29.8% higher compared to the same period of FY21
- ✓ New investments focus on personal protective equipment, medical equipment and toys
- ✓ Government promotes industry-friendly policies to develop skilled manpower, attract foreign investment, ensure technological advancement and the overall development

PRINTING

- ✓ Printing market size in Bangladesh is around TK12,000 crore (US\$1.39 billion)
- ✓ Earnings from paper sector in the July - November period of FY22 is 15.3% higher than that of FY21
- ✓ Workplaces and educational institutions reopening after pandemic make the demand for paper and paper products increase
- ✓ The country's first printing industrial park will come into operation in 2024, expected to propose more new investments

PACKAGING

- ✓ Export surges bring in new possibilities for Bangladesh packaging market
- ✓ The budding e-commerce accelerates digital economic growth and supports corrugated packaging
- ✓ Packaging paper market revenue size is projected to grow at a CAGR of 5.2% during 2021-2027
- ✓ International leading packaging enterprises such as Tetra Pak and ALPLA plan to build factories in Bangladesh to seize market share and provide innovative packaging solutions in food & beverage, personal-care, and pharmaceuticals sectors

BOOTH PRICES

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● ● ● SHOW REPORT 2023

GROSS SPACE	23,000 M2
EXHIBITORS	625
BOOTHS	1,100
COUNTRIES & REGIONS	22
VISITOR	18,507
EXHIBITOR SATISFACTION	94%
VISITOR SATISFACTION	93%

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OPPI DIRECTORY 2023 IN PEN DRIVE

With the fast changing business environment and the growing competitive world, it becomes important for all those connected with the Plastics Industry to have data of Plastics Industry with them.

Organization of Plastics Processors of India Membership Directory 2023 is now available in Pen Drive Format.



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OPPI ANNUAL MEET – 9TH AUGUST 2024 – JIO WORLD CONVENTION CENTRE

40th Annual Meet of OPPI was held at Jio World Convention Centre on 9th August 2024.

Mr. Sasha Mirchandani, Founder & Managing Director at Kae Capital and Co-Founder of Mumbai Angels was the Chief Guest. He made Presentation on “Ecosystem of Start-ups In India”.

During his Welcome Address Mr. Dilip Parekh, President, OPPI introduced Mr. Sasha Mirchandani as follows:-

“Mr. Mirchandani heads early-stage investment fund Kae Capital. He is a pioneer in India's angel financing ecosystem and an entrepreneur. In 2006 over a cup of coffee with a friend, the idea for an investment fund was floated and Mumbai Angel Network was founded. It is one of India's earliest angel investing platforms for early-stage ventures. Over the years, the platform has made more than 200 investments and seen over 100 exits. His notable investments include Inmobi, Tata One Mg, Myntra and Porter. Mr. Mirchandani sits on the Board of Hathaway Cables, Datacom Limited, Nazara Technologies, and YPO Mumbai Chapter among others”.

The Presentation by Mr. Sasha Mirchandani focused on the following:-

- The Evolution of the Indian Startup Ecosystem
- Understanding Early-Stage Investment: Angel to Series D
- Key Players and Valuation Metrics
- Exit Stories and Successes
- Introduction to Kae Capital
- Kae's Performance and Highlights

KEY FACTS

- 4th Largest Startup Ecosystem in the world
- ~400 startups (2016) to 120k+ startups (2024)
- 111 unicorns (privately owned; valuation exceeding \$1bn) with combined valuation of \$350bn+
- \$151bn+ raised by startups (since 2014)

SHORT-TERM TRENDS

- Venture funding in India softened between 2022 and 2023 but surged in H1 2024
- Unicorn minting eclipsed by IPO Boom in 2023-24
- Macro headwinds: India tightening monetary policy, inflation, geopolitical uncertainty

PROMISING LONG - TERM TRENDS

- Structural tailwinds favor tech + consumer: digital-savvy consumers, top 2% opportunity, latent demand
- GDP, stock market growth + supportive government policies
- Demographics: young, skilled population; low - cost labour

EARLY - STAGE INVESTING : AN OVERVIEW

STAGE	CHEQUE SIZE	COMPANY CHARACTERISTICS
PRE-SEED/SEED	\$100k to \$3M	Initial financing for new enterprises to gain traction, build a consumer base, initial scaling and start selling.
SERIES A/B	\$3M to \$15M	Early-stage financing for companies with a proven revenue model, product-market fit and minimum viable product (MVP).
GROWTH/PE	\$15M to \$50M	Funding for a company seeking out scalability, repeatability, profitability and increased share of a market.
LATE-STAGE	\$100M+	Occurs after a company has established itself (post-Series C) for further expansion, optimized operations and a clear path to exit.

The Presentation by Mr. Sasha Mirchandani was very interesting and was followed by lively Q & A session. Mr. V.K. Taparia moderated the Q & A session.

Mr. C. Bhaskar was the Master of Ceremony and also proposed Vote of Thanks.



Sections of the Audience



Mr. Dilip Parekh delivering Welcome Address



Mr. Sasha Mirchandani being presented bouquet by Mr. V. K. Taparia



(L to R) Mr. Dilip Parekh, Mr. Sasha Mirchandani and Mr. V. K. Taparia



Mr. Sasha Mirchandani during his Presentation



The audience in rapt attention



Mr. Haresh Pillay, Welspun Corp Limited presenting a Memento to Mr. Sasha Mirchandani on behalf of OPPI



Mr. C. Bhaskar proposing Vote of Thanks.



OPPI Executive Committee members with Mr. Sasha Mirchandani.



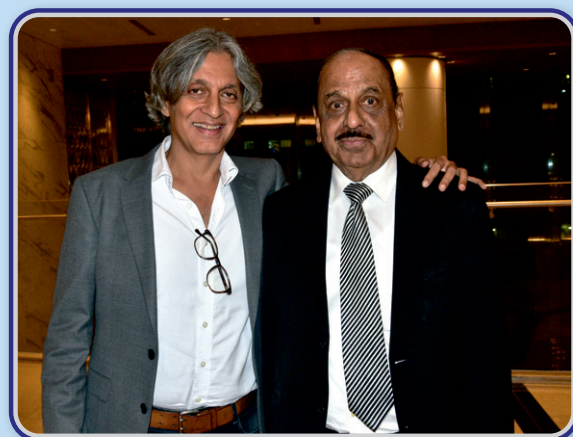
Supreme Industries Group with Mr. Sasha Mirchandani



Sintex BAPL-Welspun Group with Mr. Sasha Mirchandani



Cello World Group with Mr. Sasha Mirchandani



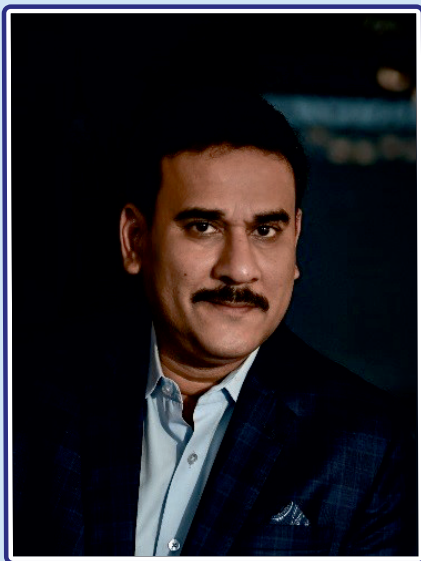
Mr. Sasha Mirchandani with Mr. Deepak Lawale

Fellowship





Pradeep Rathod Takes Over as Chairman, National Advisory Board for PLASTINDIA 2026



Pradeep Ghisulal Rathod

Chairman & Managing Director - Cello World Limited

Mr. Pradeep Ghisulal Rathod, Chairman & Managing Director - Cello World Limited, has been nominated as Chairman of National Advisory Board of PLASTINDIA 2026.

In his speech at the Launch of PLASTINDIA 2026 held on 23rd August 2024 at Grand Hyatt, Mumbai, he spelt his vision of the plastic industry as given below :-

- **Sustainability:** One of our foremost priorities will be to champion sustainable practices. We must lead the charge in developing and promoting eco - friendly materials and processes that reduce our environmental footprint. By investing in research and fostering collaborations, we can drive innovations that align with global sustainability goals.
- **Innovation:** Embracing technological advancements is crucial for our growth. We will focus on harnessing emerging technologies, such as digital manufacturing, AI and advanced recycling techniques, to enhance the efficiency and effectiveness of our operations. Our aim is to position Plastindia as a beacon of innovation in the global plastics industry.
- **Collaboration:** Building strong partnerships within the industry and with external stakeholders will be pivotal. We need to work closely with government bodies, academic institutions, and other organizations to address regulatory challenges, promote best practices, and drive industry - wide improvements.
- **Education and Training:** Investing in our people is essential. We will implement programs that enhance skills, foster talent, and ensure that our workforce is well-prepared to meet the demands of a rapidly changing industry. A knowledgeable and skilled workforce will be our greatest asset in achieving our goals.

- **Global Presence:** Expanding our global footprint and strengthening our position on the world stage will be a key focus. We will work to enhance our international collaborations and showcase the capabilities and contributions of the Indian plastics industry to a global audience.

He further said that, "I want to reiterate my gratitude for this opportunity. I am excited about the work ahead and am committed to serving you and our industry with dedication and integrity and want to take this exhibition to a very high level. Let us move forward with a shared vision and a collective commitment to excellence.

Ministry of Chemicals and Fertilizers (Department of Chemicals and Petrochemicals)

Notification

New Delhi, the 23rd August, 2024

POLY VINYL CHLORIDE (PVC) HOMOPOLYMERS (QUALITY CONTROL)

Amendment Order 2024

S.O. 3595 (E). — In exercise of the powers conferred by section 16 read with sub-section (3) of section 25 of the Bureau of Indian Standards Act, 2016 (11 of 2016), the Central Government, after consulting the Bureau of Indian Standards is of the opinion that it is necessary or expedient so to do in the public interest, hereby makes the following Order further to amend the Poly Vinyl Chloride (PVC) Homopolymers (Quality Control) Order, 2024 namely: -

1. Short title and commencement. – (1) This order may be called the Poly Vinyl Chloride (PVC) Homopolymers (Quality Control) Amendment Order, 2024.

(2) It shall come into force on the date of its publication in the Official Gazette.

2. In the Poly Vinyl Chloride (PVC) Homopolymers (Quality Control) Order, 2024, in paragraph 1, for sub-paragraph (2), the following sub-paragraph shall be substituted, namely: —

* (2) It shall come into force on the 24st day of December, 2024."

[F. No. PCT-59011/44/2022-PC.TECH.-CPC]
DEEPAK MISHRA, Jt. Secy.

Note: The principal Order was published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section. (ii) vide number S.O. 920(E), dated the 26th February, 2024.

(Source: The Gazette of India / 23.08.2024)

Ministry of Chemicals and Fertilizers (Department of Chemicals and Petrochemicals)

Notification

New Delhi, the 23rd August, 2024

Polypropylene (PP) Materials for Moulding and Extrusion (Quality Control)

Amendment Order 2024

S.O. 3594(E). — In exercise of the powers conferred by section 16 read with sub-section (3) of section 25 of the Bureau of Indian Standards Act, 2016 (11 of 2016), the Central Government, after consulting the Bureau of Indian Standards is of the - opinion that it is necessary or expedient so to do in the public interest, hereby makes the following Order further to amend the Polypropylene (PP) Materials for Moulding and Extrusion (Quality Control) Order, 2024, namely:

1. Short title and commencement. – (1) This order may be called the Polypropylene (PP) Materials for Moulding and Extrusion (Quality Control) Amendment Order, 2024.

(2) It shall come into force on the date of its publication in the Official Gazette

2. In the Polypropylene (PP) Materials for Moulding and Extrusion (Quality Control) Order, 2024, in paragraph 1, for sub-paragraph (2), the following sub-paragraph shall be substituted, namely: —

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[F. No. PCT-59011/43/2024-PC.TECH.-CPC]
DEEPAK MISHRA, Jt. Secy.

Note: The principal Order was published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii), vide number S.O. 921(E), dated the 26th February, 2024.

(Source: The Gazette of India / 23.08.2024)

Epigral Commissions CPVC Compound Manufacturing Plant in Dahej

Epigral commissioned a CPVC compound manufacturing plant with a capacity of 35,000 TPA for chlorinated polyvinyl chloride compound at its Dahej facility in Gujarat. Previously known as Meghmani Finechem Ltd, Epigral Limited (Epigral) was established in 2007 and stands as one among the prominent integrated chemical manufacturer in India.

The Dahej facility of Epigral is a comprehensive and automated complex featuring both backward and forward integration, supported by meticulously designed infrastructure.

Epigral announced the successful commissioning of an additional 45,000 TPA (Tonnes Per Annum) capacity of CPVC (Chlorinated Polyvinyl Chloride) resin plant at its Dahej facility in Gujarat starting today. With this expansion, Epigral's total CPVC resin capacity reaches a remarkable 75,000 TPA, positioning it as the largest CPVC resin facility in the world at a single location.

In addition to the CPVC resin capacity expansion, Epigral is also venturing into CPVC compound production, with a projected capacity of 35,000 TPA. The project is under progress and is expected to be commissioned in the first quarter of the financial year 2025.

(Source: Business Standard / 03.04.2024 / JOHN BOZZELLI)

Andhra Government and BPCL Planning Petrochemical Complex



The Andhra Pradesh government and officials from Bharat Petroleum Corporation Limited (BPCL) met to discuss the potential establishment of an oil refinery

and petrochemical complex in the state. The project is likely to attract investments amounting to ₹70,000 crore.

The government is preparing a detailed feasibility report, emphasizing on the state's strategic location on the east coast and its significant potential in the petrochemical sector. The project would require up to 5,000 acres of land, and the state government has pledged to assist in securing the necessary land.

(Source: Chemical Industry Digest / 11.07.2024)

Bhansali Engineering Polymers Board Announces Update on ABS Production Capacity Enhancement

The Board of Bhansali Engineering Polymers provided updates on the proposed expansion of ABS production capacity from 75,000 tons per annum (TPA) to 2,00,000 TPA at the company's existing facilities in Abu Road, Rajasthan and Satnoor, Madhya Pradesh.

(Source: Chemical Industry Digest / 15.07.2024)

LINDNER Recyclingtech Bharat Setup Office in India

LINDNER continues its expansion with the foundation of Lindner Recyclingtech Bharat (India) LLP with its headquarters in Delhi. Together with Chirag Verma, Co-owner of LINDNER Bharat, and Ganesh Karankal, Sales director of plastics recycling, the aim in this dynamic environment is to develop sustainable recycling solutions for the waste and plastics industry.

(Source: Plastics Insights / 09.07.2024)

RAJOO ENGINEERS Launches PROEX Series at Exclusive Industry Event

RAJOO ENGINEERS LTD. hosted an exclusive event showcasing their PROEX Series, highlighting Indian innovation in high-performance blown film technology.

On July 9, 2024, RAJOO ENGINEERS LTD. informed the stock exchanges about hosting an exclusive, invite-only event on July 4 and 5, 2024. This

prestigious gathering brought together processors, innovators, and leaders from the flexible packaging industry. Held in Rajkot, India, the event featured a blend of cultural and industry - focused activities, catering to a global audience.

The company stated that the second day of the event was marked by the grand debut of the PROEX Series, the latest in high-performance blown film extrusion technology.

They added that the unveiling of the PROEX series captivated the audience with its remarkable performance. The line, now in commercial production, demonstrated its capability to produce film at an impressive rate of 900 kg/hr, with a 22-micron thickness and a 2800 mm layflat width. The RELEX 4.0 extruders, known for their low shear heat design, showcased optimal energy efficiency and high yield. The CSD 4.0 die, the heart of the line, is capable of delivering film thickness from 20 to 200 microns across a wide 2800 mm layflat width with low gauge variation. The system achieved unprecedented line speeds of 150 m/min.

This milestone signifies a substantial advancement in manufacturing capabilities and exemplifies RAJOO'S steadfast dedication to achieving excellence throughout their journey. The event not only highlighted the technological prowess of the PROEX series but also underscored the collaborative spirit and innovative drive within the flexible packaging industry, promising a future of enhanced productivity and sustainable growth.

(Source: Angel One / 16.07.2024)

DIYANI Presents Integrated Solution for the Compounding Industry

DIYANI Engineering presents the RM, FG conveying and packing solutions. This cutting-edge system offers a comprehensive approach to the process, seamlessly integrating material conveying, storage, weighing and packing functionalities. It includes built-in capabilities for bag closing, sealing, stitching, coding and robotic bag stacking right up to pallet wrapping.

With a proven installation worldwide, DIYANI offers a complete scope from concept to product delivery. Built-in data logging, remote monitoring over the

internet, online 3D and real-time viewer and event traceability are the latest technology features with added AI modules to match Industry 4.0.

More than just a traditional conveying and packing machine, DIYANI represents a paradigm shift for compound, master batch manufacturers, empowering them to achieve unprecedented levels of efficiency, precision and profitability in their operations.

(Source: Polymers Communique)

Desiccant Master Batch WATER - SUKKER by KANDUI

KANDUI Industries Pvt. Ltd. has developed an extremely efficient desiccant master batch WATER-SUKKER used to eliminate moisture at dosage as low as 0.5% from plastic material which is mainly accumulated in polymers / filler master batches during transportation and due to high humidity.

This next generation desiccant master batch can be used in all types of polyolefin processing applications.



(Source: Polymers Communique)

Wonder Dryer from BRY-AIR: Revolutionizing Polymer Resin Drying

BRY-AIR (Asia) Pvt. Ltd. introduces the 'Wonder Dryer', a waterless plastic dryer designed to meet the drying needs of next generation plastic materials. This innovative dryer delivers a dew point as low as (-) 40 °C, even with high return air temperatures, ensuring optimal drying performance.

PLASTIC PRODUCTS AND NEW TECHNOLOGIES



PET Bottle with Premium Look and more Volume for Mineral Water by ALPLA. The New Pet Bottle for the Polish STAROPOLANKA

Safe, affordable and sustainable: the new PET bottle for the Polish mineral water brands STAROPOLANKA and KRYSZYŃKA embodies what ALPLA stands for and impresses with its high-quality look based on the existing glass version.



PET bottle with premium look and more volume for mineral water. The new PET bottle for the Polish brand STAROPOLANKA.

Same shape, familiar feel, but lighter and more spacious? ALPLA's premium PET bottle makes it possible. Weighing only 32 grams, it is only a sixth of

the weight of the glass version. What is saved in material enriches the enjoyment. With 380 milliliters of water, the plastic bottle holds a whole 50 milliliters more with the same external dimensions. In addition, the new bottle is fully recyclable.

At first glance, PET and glass bottles look like two peas in a pod. The visual similarity is intentional and was also a challenge for the ALPLA development team. Step by step, the premium PET bottle for STAROPOLANKA and KRYSZYŃKA mineral water in Poland came closer to land came closer to the original design. About a year after the launch, the pilot phase was successfully completed in autumn 2023. The high-quality plastic bottle will soon grace the shelves of Polish supermarkets.

The tried-and-tested bottle shape guarantees high quality and can be filled on existing lines without additional investment. Even the distinctive aluminium cap is a perfect match for the bottle, complementing the shape and label to ensure brand recognition. There were many good reasons for launching the PET bottle: rising glass prices, logistical advantages due to lower transport weight and an expected significant CO₂ reduction of roughly two thirds compared to glass.

Partnership for Premium Quality

STAROPOLANKA offers mineral water from the spa town of Uzdrowisko Kłodzkie. KRYSZYŃKA is bottled in the spa town of Uzdrowisko Ciechocinek.

The mineral water brands of the two traditional spas are among the most renowned in Poland. 'By launching in the premium segment, we are emphasizing quality and demonstrating the value of plastic. The many positive reactions and high praise for the lightness and stability of the PET bottles confirm our joint approach,' says Mariusz Musiał, ALPLA Country Manager Poland.

Unlike the disposable glass bottle, the premium PET bottle can be used in the future Polish deposit system for beverage packaging from 2025. The ALPLA team is already focusing on 'design for recycling' in the development phase, setting the course for future recycling. After use and return, the packaging solution can be fully recycled. The potential for the Polish circular economy is enormous, as Musiał points out: 'The PET bottle already meets all the requirements and criteria to be used in bottle-to-bottle-recycling. With this visionary project, we want to set an exclamation point in the beverage industry and a new standard for environmentally conscious packaging.'

(Source: ALPLA/07.08.2024)

BERRY Helps Aquafigure Deliver Reusable 'Bottle for Life'

Eye-catching bottle supports hundreds of uses and showcases interchangeable, 3D artwork.

Global packaging leader, BERRY Global Group, Inc., partnered with Norwegian brand, Aquafigure, to deliver a new line of reusable water bottles with a unique design for interchangeable, 3D bottle cards to encourage young people to drink more water.

Global packaging leader, BERRY Global Group, Inc., partnered with Norwegian brand, Aquafigure, to deliver a new line of reusable water bottles with a unique design for interchangeable, 3D bottle cards



to encourage young people to drink more water.

Intended to provide a 'bottle for life,' the 330-millilitre container is made from BPA-free Tritan™, a widely recyclable, food

-approved co-polyester that can endure hundreds of dishwasher cycles. The cap is manufactured from widely recyclable, mono-material Polypropylene (PP).

The bespoke bottle design allows Aquafigure's proprietary range of patented PET bottle cards to be easily inserted and swapped as consumer tastes and trends change. Precise internal measurements ensure the bottle cards are self-supporting and remain in place regardless of angle. The cards are currently available in over 50 different designs including elite football clubs, The Smurfs, and a limited-edition set featuring superstar striker (and Aquafigure ambassador), Erling Haaland.

"Through our innovation expertise and technical resources, we are delivering cutting-edge solutions that help our customers bring exciting, sustainable concepts to market," said Joe Horton, Sales and Marketing Director for Berry Agile Solutions. "Aquafigure's commitment to a reusable bottle highlights the endless possibilities to optimize the consumer experience while advancing a circular economy."

The bottles and caps are manufactured at Berry's plants in Etten Leur and Market Rasen. Team members at the facilities worked together to ensure the bottle and cap provided a tight seal while still being easy to open for children.

"It has been amazingly helpful to have a single supplier like Berry to partner with us in the development of the bottle and the cap," said Ørjan Asbjørnsen, Founder and Managing Director of Aquafigure. "Berry Agile Solutions provided us with full-service, expert support from day one. And with the knowledge, expertise, and reach of a global market leader, we can be reassured of the capability to scale up as Aquafigure enters new territories."

(Source: BERRY/01.08.2024)

From Aviation to Orthopedics: Polymer Patch Made From Dynamic Polymer Networks

Researchers at the FRAUNHOFER Institute for Manufacturing Technology and Advanced Materials IFAM have developed a new polymer patch that can significantly accelerate and simplify previously laborious, expensive, and time-consuming repair processes on damaged lightweight aircraft components. The thermo formable, recyclable repair

patch is pressed onto the damaged area and fully sets in just 30 minutes. The innovative fiber-reinforced plastic is so versatile that it can be used in a wide range of different industries, from aviation to orthopedics.

Repairing lightweight fiber composite components like those used in aircraft wings, fuselage sections, tail surfaces, and doors is a time-consuming and costly process with multiple work steps. The damaged area is typically repaired using a painstaking wet lamination process or by applying fiber-reinforced polymers (FRPs) or aluminum structures known as doublers to the surface. However, these methods involve a long curing time and require additional adhesives. Researchers from FRAUNHOFER IFAM have now developed a repair patch made from dynamic polymer networks — also known in the trade as vitrimers — that shortens the previously lengthy and laborious repair process to just 30 minutes. What is really special about the innovative material — which is based on benzoxazines, a new class of thermosetting material known as a thermoset — is that the polymerized plastic does not melt or otherwise behave like a traditional resin system used in wet lamination. The polymer's dynamic networking processes make it possible to heat the material locally. The fully cured patch adapts to the repair site in its heated state. At room temperature, the polymer has thermosetting properties, so the patch is not sticky and is stable when stored. This saves energy, as the patch can be stored at room temperature and does not require refrigeration, which reduces storage costs.

The patch is applied to the lightweight component requiring repair using pressure and thermally induced exchange reactions. It enables rapid repairs, fully setting within 30 minutes. There is no need to work with reactive hazardous materials, as is necessary with traditional resin systems. The vitrimeric properties make it possible to remove the patch as and when needed, without leaving any residue behind. “Our adhesive-free, storage-stable fiber-reinforced patch enables direct repairs to damaged composite materials and hybrid structures. Because the polymer is a vitrimer by nature, the patch behaves like a conventional thermoset composite material during storage, but it also bonds cleanly and easily when simply heated, without any need for additional adhesives,” explains Dr. Katharina Koschek, head of the Adhesive Bonding and Polymeric Materials section at FRAUNHOFER IFAM in Bremen.

Use in aviation: resource-conserving and energy-efficient repairs to lightweight structures extend service life

The innovative material features high mechanical strength and thermo stability, making it especially suitable for mobility applications such as automotive and railway vehicle engineering and in aviation. It can be deformed and has self-healing properties. Once it reaches the end of its service life, it can be recycled, since the polymer network can be dissolved, and both the fibers and the polymer system can be reused. “Conventional thermosets cannot be deformed afterward, and they're not recyclable. Our benzoxazine-based vitrimers, by contrast, exhibit all these properties. The versatile material covers many aspects of the sustainable use of polymers with an eye to the circular economy,” Koschek points out. “Through repair and reuse, it extends the service life of lightweight structures and helps to reduce the new raw materials consumed.” Another advantage is that it can be combined with other materials, making it also suitable for integration into structures made of metals such as steel.

Use in orthopedics: customized reshaping and adjustment of individual patient prostheses and orthoses

The versatility of the benzoxazine-based vitrimers opens up potential applications in various industries, even beyond the mobility sector. In orthopedics, for example, the thermo formable material could be used to realize individually adjustable orthoses and prostheses in the future. At present, custom fabrication of lightweight devices like these is a highly laborious process, as conventional fiber composite materials do not permit much adjustment once the resin cures. “Prostheses are custom - made for individual patients. But they don't always fit. The slightest imperfection in the fit or physiological change can mean that the prosthesis or orthosis causes the patient pain or discomfort, interfering with their treatment. Previously, that meant that a new prosthesis would have to be made, and due to the demand and amount of detailed manual work involved in orthopedics, that can take up to several months,” Koschek explains.

Using thermo formable materials could eliminate the need to remake these kinds of medical aids. In the CFKadapt project, researchers from FRAUNHOFER IFAM joined forces with orthopedics and prosthetics firm REHA-OT Lüneburg Melchior und Fittkau

GmbH, E.F.M. GmbH, and the Leibniz Institute of Polymer Research Dresden (IPF) to develop a novel fiber-reinforced polymers that is based on dynamic polymer networks and can be adjusted in various ways. The key difference between the new material and commercial matrix systems for orthopedic devices made from fiber composites is the possibility of readjusting and modeling the new material to the appropriate pressure or support points, which permits dynamic adjustment to the patient and their changing needs over the course of treatment. The trick is that the new polymer fiber composite mix can be heated locally and individually adjusted. "The benefits lie in the great design and configuration freedom and significant reduction of waste during production, along with longer service life for these devices, as they can be adjusted on an ongoing basis during treatment. For patients, the main factor is that they can get a custom-fitted orthopedic device as soon as possible," Koschek says. Standardized production of components with subsequent individual adjustment also has the potential to yield cost benefits and improve the efficiency of the production process.

(Source: FRAUNHOFER / Research News / August 1, 2024)

nVenia Announces New Line of Open Mouth Bagging & Palletizing Equipment

nVenia has announced a new line of bagging, palletizing and stretch hooding equipment for the North American market. nVenia's new offering of open mouth bagging machines encompasses a range of models tailored to meet the diverse demands of modern packaging operations. Among these, the VLA, VBA and VLR stand out as exemplary solutions, each engineered with precision and innovation. This versatile line is ideal for accurately dispensing and bagging a broad array of both freely and poorly flowing materials including powders (whey, flour, fertilizer), agricultural products (seeds, rice, beans), building materials (sand, gravel, lime) and animal feeds, including sweet feeds. This new line of products is complementary to our existing HAMER Brand line of bagging equipment.

"We are thrilled to be able to leverage our vast manufacturing capabilities and power of Duravant and introduce an advanced portfolio of bagging equipment that complements our industry leading

Hamer offering. With this new addition we can address 100% of the bag packaging needs of our customers across countless industries in the markets that we serve." said Paul Ferrandino, SVP, Sales.

nVenia's portfolio of end-of-line equipment is now even more robust with the addition of three new palletizers and a stretch hooder. Whether a customer is in need of a pallet dispenser, traditional palletizer or needs a robust robotic line, nVenia can provide a solution for perfectly stacked pallets. The new VSH stretch hooder ensures secure and protected shipment and storage of industrial palletized products. nVenia's team of applications professionals can integrate all these solutions into any existing line or develop a new integrated solution from start to finish.

About nVenia:

nVenia, headquartered in Wood Dale, IL, designs and manufactures primary, secondary and end-of-line packaging equipment, featuring the product brands of Arpac, Fischbein, Hamer and Ohlson. Serving targeted end markets including consumer packaged goods, food and beverage, pharmaceutical, agriculture and industrials, nVenia's focus is on delivering next-level packaging equipment, integration and innovation to our customers. Arpac brand equipment includes shrink wrappers, tunnels and bundlers, tray and case formers and packers, and robotic and conventional palletizers. Fischbein equipment is the trusted brand for open-mouth bag sewing and sealing systems. Hamer brand equipment is utilized worldwide and leads the market in large format filling, bagging, and palletizing; operating in some of the harshest production environments. Ohlson brand equipment features rugged solutions for automating weighing and counting operations into primary packaging of flexible and rigid containers. Together, these trusted brands deliver next-level performance through consultative design of integrated fit-for-purpose production lines. nVenia is a Duravant Company and is backed by a complete lifecycle management program for parts, service and support. For more information, visit www.nveia.com

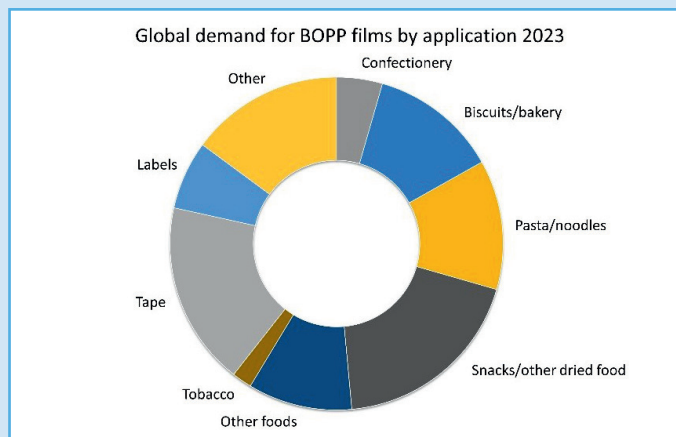
BOPP Film Demand Remains Strong as Consumer Habits Evolve

Despite a slowdown in mature markets, the demand for BOPP film in emerging markets is offering significant opportunities. In the latest market report from AMI, titled "BOPP Films - The Global Market

2024", our expert consultants have combined first-hand industry insight with data analysis to empower businesses to make informed decisions.

The report concludes that direct food packaging is still the most important application for BOPP films as modern retail caters to a market that craves packaged foods more than ever. Food security and convenience remain important drivers for packaged food growth in low-income markets. 58% of BOPP film demand is used for direct food packaging, and if labels are included, this rises to 65%. Snack foods are the most important food category for BOPP films by volume. Snacking and the consumption of packaged snacks for convenience is a growing trend, with busy on-the-go lifestyles encouraging more snacking occasions in all regions.

On the other hand, current inflationary pressures and geopolitical uncertainty have caused consumers to fall back on cheaper food staples such as pasta and noodles, commonly using high volumes of BOPP film for simple and efficient packaging and display. The diversity of markets for BOPP film is illustrated in the large volume in "other foods", which covers a wide variety including frozen food and fresh fruit and vegetable packaging.



Snacks and other dried foods are forecast to provide the biggest opportunity for growth, particularly in emerging markets where per capita BOPP film consumption is lower and where convenient, protective packaging is still an appealing factor in food consumption, despite global commitments to packaging reduction and recyclability. Packaging

converters need to keep abreast of such end-use market trends and understand how they are influencing BOPP film supply and innovation.

A Market Shift towards BOPE

Within the flexible packaging space the latest solution predicted to develop into a viable mass-market option is BOPE film, thanks to the interest in mono-material structures and brand owner recycling commitments.

A key feature of BOPE is mechanical recyclability and now with established PE film recycling streams in place across many countries, this can be truly utilized. Sustainability and mono-material structures remain key drivers within flexible film research and development. A growing body of sustainability legislation, such as the Packaging and Packaging Waste Regulation in Europe, is impacting packaging development.

Investors in BOPE film extrusion are hedging their bets by installing hybrid BOPE/BOPP extrusion lines so that lines can be used for both materials. Others have modified existing lines to be ready to ramp up production when the market demands it, and only one company so far has dived in by investing in a fully dedicated BOPE line. But this opportunity doesn't come without challenges and within this latest market report, AMI assesses the key players, market growth and potential in a chapter dedicated to this fast-developing new material.

The report will also enable users of BOPP films to improve their knowledge of end-use applications, demand and production in each world region and get an independent assessment of the implications for future material sourcing.

Also newly included in this report is a chapter dedicated to Battery Separator Films. With green industry and new energy becoming increasingly important, the use of BOPP in this segment is explored and analyzed for the first time by AMI's market experts.

(Source: AMI / July 23, 2024)

COCA - COLA Opts for Ultra - Lightweight Bottles

Despite unsatisfactory Q2 results, the Coca-Cola Company is set to maintain a nimble bottling approach towards India.



The beverage behemoth has introduced an ultra - lightweight and affordable bottle with an extended shelf life. This allows it to transport the beverage to a wider base of consumers and reduce costs. According to the company, this new stock-keeping unit has added more than 400-million transactions in the first half of the year.

Meanwhile, Coca-Cola announced its sales for the June quarter recently. According to the company, sales in the Asia-Pacific region were led by India and the Philippines. The company's unit case volume grew by 2% overall, and 3% in the Asia Pacific region, led by India and the Philippines. It said that it made progress in price-pack architecture to manage revenue growth.

Kantar's FMCG Pulse report for 2024's second quarter said, "Bottled soft drinks have breached annual penetration of 50%. Following up on a massive 41% household growth in moving annual total (MAT) in March 2023, the category continued to add more households and expanded by 19% in MAT in March 2024." The report indicated that the average household has expanded its consumption by 250-ml in the last two years.

Home In On These Six Variables To Monitor Molding

There are hundreds of variables in molding, but focusing on these six will help you make consistent parts.

There are hundreds of variables in the injection molding process. Which ones are the most important? A guy named Dr. E. Deming taught us that in any process, watch only the minimum number of variables. His theories (14 Points of Management) beat Six Sigma, ISO 9000, Factory 4 and more.

The Six Variables to Monitor in Molding

Variable	Why/Tells	Range
Fill Time	Process Stability	±0.04 sec
Pressure at Transfer	Viscosity	Take Data, Find Range
Screw Run Time	Temp Consistency/ Melt Uniformity	±1%
Cushion	Shot Size	± -1.0 mm
Cycle Time	Process Stability/ Profits	Gate Sealed ±1% Gate Unsealed 0.0
Part Temp Via IR	Melt and Mold Temp	±10°F/5°C

Here are the top six variables to watch for in injection molding and the reasons why. The accompanying chart also shows the allowable range for acceptable parts. If you want your processes to make identical parts, you must duplicate the following processing conditions.

Please note: You do not duplicate set points; you duplicate actual measured values. Use your machine's data table to tabulate and follow these few during production. Keep it simple; you cannot keep track of too many. Yes, a computer can, but you will never make production watch more than roughly six.

- Fill Time:** Fill time determines viscosity of the resin. If the machine is set up properly, it can keep the fill time to this tight tolerance. It is tight because fill time establishes the viscosity of the resin at melt temperature by keeping the shear rate the same. Shear rate is the biggest single influence on viscosity. Keep fill time identical and you keep viscosity identical shot to shot.
- Pressure at Transfer:** This should vary shot to shot, however, it should NOT trend up or down for more than four shots. This is similar to a why a car engine varies output to keep you at set cruise control speed. Output varies as you go up and down hills, but speed stays the same. The set available pressure must be set significantly higher (but not necessarily at the machine maximum) than the actual peak pressure and transfer pressures. Plus, if the pressure at transfer trends, up or down, it

tells you something is changing with the process or plastic. You need to stop saving parts for the client and find out why the process is changing. For example wet resin, new color, contamination or something else?

- **Screw Run Time:** Screw run time controls melt temperature and consistency. The screw turning develops about 80% of the energy to melt the plastic so it is the main mechanism for melting the plastic. The heater bands only start the melting process. If screw-run/rotation time changes, viscosity may change and you will not have a stable process.
- **Cushion:** Cushion ensures the part is packed out properly. Please note, it is not well known or understood but parts made where the gate freezes before second stage (pack or hold) ends versus parts made where the gate is not frozen when second stage ends often have drastically different properties.
- **Cycle Time:** This is straightforward. It is a thermal process and for consistent parts you need a consistent cycle, especially if you run with the gate unsealed.
- **Melt Temperature:** Melt temperature is critical and should be identical run to run. Unfortunately, just setting temperature on the screen does not assure consistent melt temperature. Why? The screw turning along with back pressure develops ~80% of the energy to melt the plastic. Plus, the thermocouples that provide the temperatures on the screen measure only steel temperatures not the actual melt temperature.

I find it strange that in this day and age there is no practical way to measure actual melt temperature in the barrel. Same for mold temperature. We can control the water temperature, but most temperature controllers vary gallons / minute (gpm) output and often have pressure variations which change the gpm going through the mold. Plus, you have the quality/cleanliness issues of the water, such as cleanliness, scale, rust and more.

I have found that few molders monitor gpm, which is critical to keep the Reynolds number above 5,000 for turbulent flow, which in turn provides uniform and consistent cooling.

About the author: John Bozzelli is the founder of Injection Molding Solutions/Scientific Molding in Midland, Michigan, a provider of training and consulting services to injection molders, including LIMS and other specialties. Contact: john@scientificmolding.com.

(Source: Plastics Technology / Published 8/9/2024 / JOHN BOZZELLI)

Deflection Elbows Eliminate Streamers for Large Film Processor

New elbows eliminate troublesome streamers to increase productivity at leading blown film processor.

A leading blown film processor eliminated a problem with streamers in its resin conveying lines by revamping its process and adding a new type of deflection elbow.

Blown film processor All American Poly (AAP) produces approximately 123 million pounds a year of sheeting, liners, bags and shrink-wrap for food, building supply, industrial, agriculture, furniture and textile applications in three locations. At its largest plant in Piscataway, New Jersey, AAP runs 23 blown film lines and produces some 115 million pounds of product a year running 15 different types of PE. These PEs are formulated and compounded to meet AAP's requirements for density, gauge, surface characteristics, color, food contact, shrinkage, printing, UV resistance, anti-fog, flame retardancy and other properties.

Under the leadership of Corporate Project Manager Ed Komoroski, AAP has increased the system's capacity and reliability over the past decade, doubling the number of silos and adding multiple conveying lines. Before he joined the company, material was conveyed pneumatically from rail cars into the plant through flexible hose, and then through pneumatic piping and sweep elbows to holding bins and extruders.

The high-volume conveying, together with PE's relatively low melt temperature of 248 to 266°F, created a problem with streamers (also known as angel hair and snake skins).



Ed Komoroski doubled the number of silos and added multiple pneumatic conveying lines at All American Poly's Piscataway plant. Source: Hammertek

The heat generated when the PE collided with the sweep elbows melted the material inside the conveying lines, forming streamers that jammed downstream equipment. This led to production tie-ups and demurrage charges while rail cars waited to be unloaded.

Upping Transfer Capacity, Efficiency

At the heart of AAP's vastly revised process is a series of plant wide pneumatic vacuum conveying systems with more than 108 bends and 128 separate lines. The lines transfer PE pellets from rail cars to eight exterior silos, then to interior holding bins, and ultimately to mixers on an upper level and extrusion lines below.

To avert PE degradation and production delays, Komoroski turned to HammerTek and the company's 90-degree Smart Elbow deflection elbows. The elbows feature a bulb-like protrusion that extends beyond the 90-degree pathway, creating a ball of material suspended in air that rotates in the same direction as the airstream that powers it. This causes incoming pellets to be deflected around the bend without impacting and heating the elbow wall, thereby preventing elbow wear, material degradation, melting and plugging.

The elbows' short-radius design enabled installation between the rail car siding and the building, and from silos through an exterior wall into the plant at 90 degrees.

AAP has installed more than 100 of the deflection elbows. Komoroski explains that AAP no longer experiences the maintenance issues caused by

streamers, thereby improving production, and notes that Smart Elbow units will be specified on all new vacuum lines added to meet increased demand.



HammerTek's Smart Elbow design prevents PE pellets from impacting/heating the elbow wall, melting and forming streamers.

(Source: Plastics Technology / Published 8/5/2024 / JIM CALLARI)

BERRY Partners with Abel & Cole to Introduce Innovative Club Zero Refillable Milk Bottles

New, refillable milk bottles offer lightweight alternative to glass and support up to 16 uses.

Global sustainable packaging leader, BERRY Global Group, Inc., partnered with Abel & Cole, a pioneer in sustainable food delivery, to supply bottles for its Club Zero Refillable Milk delivery service. The new polypropylene (PP) bottles can be refilled up to 16 times before being recycled.

Made with widely recyclable PP, the new bottles produce fewer transport and processing greenhouse gas (GHG) emissions compared to heavier glass bottles,* challenging the conventional use of glass bottles for home milk delivery.

Research conducted by Abel & Cole suggests that reusing the Club Zero Refillable Milk bottles just four times reduces the carbon footprint of their single-use milk bottles by half compared to heavier glass bottles, which would take over 15 returns to reach similar emissions savings. At the same time, the concept saves 450,000 single-use plastic milk bottles from landfills or incineration per year, equivalent to 23 tons of plastic.

“When it comes to packaging materials, plastic is often seen as the enemy,” explained Hugo Lynch, Sustainability Lead at Abel & Cole. “But we challenged ourselves to ask if it was better to use glass, which is heavier and more energy-intensive to make, or to go against the grain.”

The bottle design is optimized to support Abel & Cole's eight-stage cleaning process, which eliminates the drying stage, reducing the risk of bacterial contamination. Bottles undergo an eight stage washing process when returned, ensuring thorough cleaning before being conveyed to the cleanroom for refilling.

To facilitate superior cleaning with minimal risk, the new bottles were designed without a handle, reducing 'trap points' where bacteria might gather and allowing for easy drainage. Bottles were optimized to suit Abel and Cole's existing factory equipment – for example, the bottle was reverse-engineered to fit the existing low density polyethylene (LDPE) cap used for Abel & Cole milk bottles. This helps reduce costs and eliminates the need for new equipment investments. Similarly, the bottle fits into existing single-use milk crates – making the delivery process a modern spin on the traditional milk round.

BERRY conducted rigorous chemical tests to ensure PP provided the strength and durability to undergo high processing temperatures and prevent breakage that is common to glass. The bottle label contains extensive consumer communication to encourage returns, while the label itself also provides an 'early warning' system for each bottle's end of life. This is because labelled bottles can be washed up to 16 times before the label shows signs of degradation, meaning that Abel & Cole can track bottle life and 'retire' each bottle when it is ready for recycling.

The first samples were 3D printed for migration testing in June 2023, and the first bottles shipped to customers in October. Since launch, the one liter Club Zero Refillable Milk bottle has seen a 20% uplift in sales week-on-week. The current return rate is 64%, with Abel & Cole targeting a minimum of 75%.

“We are committed to delivering innovative, reusable packaging solutions that help our customers make transformative leaps toward their sustainability goals,” said Sue Springett, Senior Marketing Manager for BERRY Agile Solutions. “Through circular partnerships

like these, we unpack complexities and help our customers understand what's possible for the plastic substrate.”

(Source: BERRY / July 22, 2024)

Project for Sustainable Vehicle Structures by CompoTech

At CompoTech, we are dedicated to advancing composite technology to create lighter, stronger, and more sustainable materials. We are excited to provide updates on our involvement in the Božek Vehicle Engineering National Center of Competence (BOVENAC) project, which focuses on enhancing drive shaft technology and exploring the use of eco-friendly fibers.

Composite Joint Shaft for 4WD Vehicles

The BOVENAC project is driving significant advancements in the design and functionality of composite joint shafts, particularly for 4WD vehicles. Our goals include:

- **Enhanced Performance:** The composite joint shaft is engineered to meet or exceed the performance of traditional longitudinal joint shafts used in 4WD vehicles.
- **Weight Reduction:** By incorporating composite materials, we aim to reduce the overall weight of the drive shaft, contributing to better fuel efficiency and vehicle dynamics.
- **Vibration Mitigation:** Special attention is given to minimizing longitudinal and torsional vibrations, which improves ride comfort and reduces wear on vehicle components.
- **Integration and Innovation:** Composite and steel parts will be either seamlessly integrated or connected using unconventional joints, potentially reducing the number or mass of other parts in the original design.

Eco-Friendly Fibers

A significant aspect of the BOVENAC project is the exploration of eco-friendly fibers to replace traditional glass and carbon fibers in composite hollow shafts used in railway vehicle chassis. Key objectives include:

- **Sustainability:** Identifying and optimizing the use of ecological fibers to lower the environmental impact of composite materials.
- **Production Technology:** Developing advanced production technologies and processing techniques to effectively utilize sustainable fibers.
- **Environmental Impact:** The goal is to create composite materials with a reduced ecological footprint, contributing to more sustainable transportation solutions.

Project Details

Project name: Božek Vehicle Engineering National Center of Competence (BOVENAC)
 Project No: TN02000054

Who is funding: Project is co-financed with the support of the Technology Agency of the Czech Republic.

(Source: CompoTech / 23.07.2024)

Toyota Gosei Invests in Letara Ltd., a Startup Developing Engines for Artificial Satellites

Kiyosu, Japan, July 26, 2024: Toyoda Gosei Co., Ltd. has invested in Letara Ltd., a startup out of Hokkaido University that develops engines for artificial satellites.

The engines being developed by Letara will enable satellites to move to a desired orbit after launch. With fuel technology using plastics and oxidizers, these engines provide both safety and propulsion, which are difficult to enhance at the same time in space. This helps to avoid collisions with other satellites and the creation of space debris, which have become problems in outer space, while also aiming to achieve safe and free movement in the future when space stations will be built on the moon and other celestial bodies.

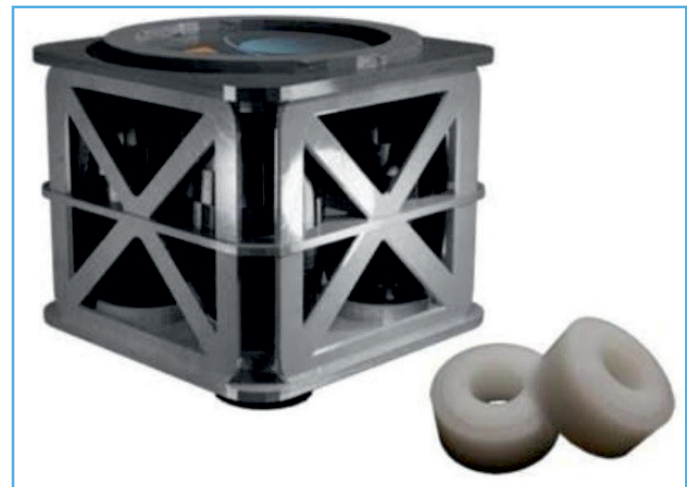
As the automobile industry goes through profound changes beyond traditional industrial boundaries, Toyoda Gosei is exploring new fields that are not tied to the companys existing business with the aim of sustainable growth. The space-related business being advanced by Letara is expected to grow in

the coming years, and Toyoda Gosei, always on the lookout for fields where the companys technology can be leveraged, has invested in Letara to enhance knowledge in this field.

- Investment made in June 2024, through Toyoda Goseis Corporate Venture Capital Dept., an internal organization dedicated to these investments.
- The types of fuel that can be used in the harsh environment of space are limited.

Outline of Letara

Name	Letara Ltd.
Address	Hokudai Business Spring room 307, 2 Kita 21 Jo Nishi 12 Chome Kita-ku, Sapporo, Hokkaido, Japan
Co-CEOs	Shota HIRAI, Landon KAMPS
Established	June 2020



(Source: Toyoda Gosei / July 26, 2024)

Vacuum Assisted Parts Washer Solves Shopfloor Delay

After implementing a new automated rotary basket parts cleaning system, this shop reduced its cleaning time by more than 50% and completely dried parts that previously were not getting dry.

It seems like a simple task: produce clean, dry parts efficiently. However, without the proper equipment in place, this is not an easy mission. Often, manpower is wasted on hand washing parts, or too much manual labor is dedicated to the cleaning process. This

shortsightedness can lead to ineffective cleaning and drying, causing bottlenecks that can be avoided by integrating automatic cleaning machines.



The MAFAC Palma parts washer has reduced the cleaning time at Brenk Brothers by more than 50% and has drastically improved part cleanliness and drying.

Source (all images): Jayco Cleaning Technologies

Brenk Brothers Inc. in Fridley, Minnesota, was suffering from delays in its cleaning process because of hands-on cleaning and drying that produced ineffective results. But after the implementation of an automated rotary basket cleaning system, the shop has improved its overall part cleanliness, drastically reducing its parts handling and improving the time required to move parts to the next process.

“With the old process, one to three operators were needed to keep up with the production schedule,” says Dan Witt, project manager at Brenk Brothers.

With the precision machine shop's new MAFAC Palma cleaning system with Vacuum Assist Clean + Dry technology from Jayco Cleaning Technologies, only one operator is needed to load and unload baskets on and off the machine, push a button and then he or she is free to do other necessary tasks on the shop floor. The system's vacuum technology is designed especially for hard-to-clean parts like the ones Brenk manufactures, and offers fast and thorough drying, as the vacuum pulls water off the parts' surfaces.

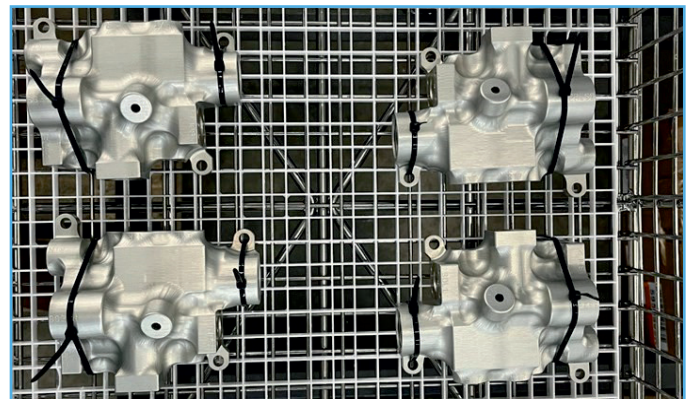
More Than 100 CNCs

Brenk Brothers' facility has more than 100,000-square-foot, providing precision machining, turning, grinding and other services to its customers in industries such as aerospace, defense, medical and hi-tech data storage.

The third-generation company's 145 skilled employees work on a shop floor with 100 CNCs, including high-speed milling machines, turning centers with live tooling and bar feeders, high-precision wire EDM machines, and precision surface grinding and honing equipment. The contract machining facility specializes in close-tolerance machining (less than 0.0005 inch), making parts from 2,000, 6,000 and 7,000 series aluminum, titanium and stainless steels.

Manual Labor Causes Bottleneck

Depending on the type of part and what stage the part is in, machine coolant, NDT fluids, residual plating fluids and other manufacturing debris are present prior to the cleaning process at Brenk Brothers. Therefore, it is critical that thorough and reliable cleaning equipment is implemented at the shop, especially because parts might require more machining operations (multiple times in some cases) after the initial cleaning.



Brenk Brothers has a background in functional design that enables the shop to manufacture completely assembled devices ready for point-of-use delivery. With the use of MAFAC Palma, these components come out of the cleaning machine bone dry.

Before the company found the MAFAC cleaning system, it was using a manual aqueous ultrasonic wash and a two-sink water rinse cleaning process followed by manual drying with shop air to blow the water off and out of intricate parts. This process was ripe with many issues such as inconsistent results, long cycle times requiring operators' full attention and parts not being completely dry before the next manufacturing step.

“The problem with our old cleaning process was that it was all manual work,” Witt says. “The amount of handling and moving of each part through the cleaning and drying process was long, loud and risky.

The risk involved expensive, complex components that required the technician to flip the part in one hand while using an air gun in the other.”

As business continued to grow, these pitfalls were a bottleneck in the overall manufacturing process. Brenk needed a reliable, fast parts cleaning solution with integrated vacuum drying to keep up with the demand. The cleanliness of parts entering the quality control room was also critical, both in-process and at final inspection. The parts must be thoroughly clean and dry to accurately measure, which is important for achieving the high levels of quality and tight tolerances that its customers require.

Bottleneck, Be Gone!

The Brenk Brothers team was on the hunt for a cleaning system that could provide a repeatable and controlled process, and especially deliver completely dry parts. They also wanted to have the ability to automate the process in the future.

The company reviewed the capabilities of several rotary basket washers. The team visited manufacturers and test-cleaned parts in each system. Upon evaluating the various systems, it ultimately selected the MAFAC for its cleaning process.

“At the time we were researching the MAFAC, it was the only machine that encompassed the most processes we needed to perform the required cleaning,” Witt says.

The now-implemented Palma washer has reduced the cleaning time at Brenk Brothers by more than 50% and has drastically improved part cleanliness and drying. With the new equipment, the operator loads parts into a basket, slides the basket into the washer and presses the start button. While the parts are being cleaned, the operator has time to conduct other tasks.

Once the cleaning cycle is complete, the basket of clean, dry parts is removed from the system and moved on to the next step in the process.

The initial manual cleaning process the company used took about 25 minutes per part on average. Now, with the new equipment, it is around 10 minutes per cycle. With the machine's ability to process multiple parts at a time, depending on the sizes, it can further lower the per piece cycle time down to only 30 seconds.



Prior to bringing in the new cleaning equipment, the company was using shop air to dry its newly cleaned parts. However, parts were not getting completely dry, which made it difficult to successfully move the parts through to the next manufacturing step.

Vacuum Assist

While manufacturing complex parts with small and blind holes like the ones Brenk Brothers produces, it was imperative that the MAFAC parts washer helped the shop's parts meet challenging cleanliness specifications.

With Jayco's Vacuum Assist technology, a modulating vacuum during the wash cycle enables the cleaning solution to reach small areas on parts, lifting soils and particulates out via mechanics and chemistry.

Then, during the rinse cycle, the rinsing solution flushes out any remaining cleaning solution and particulates inside the fine crevices. During the drying cycle, the vacuum lowers the evaporation temperature of the remaining rinse solution. The force from the vacuum also pulls water out of hard-to-reach areas on the parts.

Dry as a Bone

Finishing the cleaning process with completely dry parts was another critical goal for Brenk Brothers.

“If all the cleaning functionality of the washer broke, we would still use the machine for drying,” Witt explains. “I can't say enough about its effectiveness and how much this feature saves time. Not having to worry about leaving any rinse water inside the parts that could potentially cause onset corrosion is a game changer. The consistency from part to part compared to our old drying process is night and day.”

(Source: Products Finishing / 29.07.2024 / Lori Beckman)

Novel Air Ring Solves Gauge Variations for Film Processor

Crayex installs Addex gauge-controlling air ring built for rotating/oscillating dies on a problematic line and notices dramatic improvement in thickness variations.

"I would like three more, actually," says David Harrison, plant manager for Crayex Corp.'s operation in McDonough, Georgia, where it primarily makes shrink film. The "three more" he was referencing was the Gen 3 EGC Air Ring for rotating/oscillating dies from Addex, which Crayex installed on one of its four blown film lines last year to help correct gauge variations caused by a cranky die.

Crayex is a family-owned blown film processor that has been in business since the 1970s. It has two plants: one in Piqua, Ohio, where the company has coextrusion capacity for shrink and other films; and one in Georgia which was opened in the 1980s and has strictly monolayer lines. While new blown film lines are typically sold with stationary dies, there are many blown film processors with rotating or oscillating dies in operation that need improved gauge control.

Crayex was one of them. Harrison and Mike Edwards, production manager for Crayex in Georgia, joined the company a day apart in 2022. And it didn't take them long to realize that one of its four lines was underperforming. Says Harrison, "The line performed well when it was new and for years after, but over time one this line, we'd have difficulty managing the thickness profile. When I got here, it reached the point where our operators didn't trust it. They had no confidence in it." Harrison, Edwards and their team worked on fixes of their own to stabilize the line. And, as they recall, these would work for a short time — or even a few days — before the thickness variations returned.

Edwards, who had experience with Addex technology from another blown film producer, and by December of last year the new air ring was installed. Designed specifically for non-stationary dies, this air ring works much like Addex's EGC gauge-controlling cousin for stationary dies, but with additional features. The EGC air ring, well known for its very high-resolution control, has a series of "fingers" that open or close to adjust localized air volume. A 300-mm/12-inch air ring, for instance, includes 168 control zones, with 200-plus control zones on larger systems.

This new rotating die - enabled technology is facilitated by a proprietary mapping algorithm embedded within Addex's latest Gen 3 control technology that corrects for die rotation effects in real time. The new software / hardware system controls not only the auto-profile air ring but also simultaneously controls the physical rotation of the die.

Crayex saw the improvement immediately. Says Edwards, "It was night and day for us. It can't correct everything that you make in a die. But we had an inherent gauge thickness on one portion of our die and this airing completely takes it away."

Edwards adds, "For a long time, we were unable to run certain products on that line. For instance, when we tried to run wider widths, one side of the roll would end up being too soft and the other too stiff and thick. This severely impacted our scheduling. We don't have these problems anymore."



Gauge - controlling air ring at Crayex features Addex's single - inlet plenum design requiring just one hose.

The proof is in the numbers. According to Harrison, the troublesome line generated scrap at a rate of 18-22%. Within the first two weeks after

the EGC air ring was installed, amid what Harrison termed "a learning curve," scrap was reduced to 15%. During the period Crayex spoke with Plastics Technology, the line was generating scrap at a rate of 6%. Notes Edwards, "We've also noticed that the faster we run the line, the quicker the air ring responds."

Initially, the Addex EGC air ring installed at Crayex had a multiple-plenum design feeding eight hoses. Addex has since swapped that out with its single-inlet plenum design, which reduces the number

of hoses delivering air to the unit from eight to one. While Harrison, Edwards and their production group are comfortable with the way their three other lines are running, they see room for improvement and believe the Addex technology is a fit. Says Harrison, "There's a fit for this technology on every one of our lines. I would like to have three more actually."

(Source: Plastics Technology / 29. 07. 2024 / JIM CALLARI)

INNOVIA Launches Dedicated Low Density Film for Ice Cream Flow Wrap Packaging

- White cavitated ultra low density film VL40 with low sealing threshold for ice cream flow wrap applications now available from the Polish site in Plock.
- Film was designed to perform on high-speed flow wrap machines of ice cream manufacturers in Europe and can be easily printed and sealed.



INNOVIA Films, a material science pioneer and major producer of BOPP films, has announced the launch of a white ultra-low density film that was specifically engineered to be a good fit for ice cream flow wrap packaging.

"Nothing screams summer more than ice cream and we are proud to be able to offer our new VL40 white cavitated film that is an excellent partner for one of our favourite summer treats. A typical way to package ice cream is to use high - speed flow wrap packaging that preserves the quality of the product until consumption", explains Alasdair McEwen, who heads up the European Packaging Division of Innovia.

The new film grade was developed and successfully tried and launched by the science material experts at their Innovia Films site in Plock, Poland.

"Our film is a high-gloss white coextruded OPP film with a very wide heat seal range. We made some significant changes to our extrusion lines to be able to deliver this specific film grade that is ideal for ice cream sandwiches and popsicles. The team did a great job in a very short time", comments Piotr Piasny, General Manager at Innovia Films in Plock.

Amongst other features it offers a very high puncture resistance which is important to preserve the valuable product and prevent food waste. The printability of the product means you can achieve a superior graphic appeal, and the film provides an easy - to - open package".

The films are largely unaffected by climatic conditions but should not be stored at temperatures above 104°F (40°C). Under suitable storage conditions, the film can be stored for a period of 6 months without any risk of deterioration.

SIDEL Delivers C'estbon Beverage's Expansion into Large Water Bottle Formats



China Resources C'estbon Beverage Co. Ltd (C'estbon Beverage), China's top two bottled water brand, has chosen SIDEL'S innovative complete line packaging solution to help deliver its expansion in big format water production. Featuring SIDEL'S newest EvoBLOW XL blower in a Combi configuration, the new lines can produce 12,000 4.5L or 6L bottles per hour, supporting C'estbon Beverage's position as leading innovators for packaged water.

C'estbon Beverage has sold over 130 billion bottles of water to date. China is experiencing a strong demand for water packaged in large bottles, and this format is expected to witness a 52.9 per cent compound annual growth rate.

To help deliver the expansion in production needed to meet this consumer trend for large format water, C'estbon Beverage partnered with SIDEL, leading global provider of packaging solutions for beverage, food, home and personal care products, to create a customized solution.

By installing SIDEL'S Combi complete line, comprising EvoBLOW XL, SF100 Filler, EvoDECO labeller, conveyors, packer and PalLinear palletiser, production has increased to 12,000 4.5L or 6L bottles per hour.

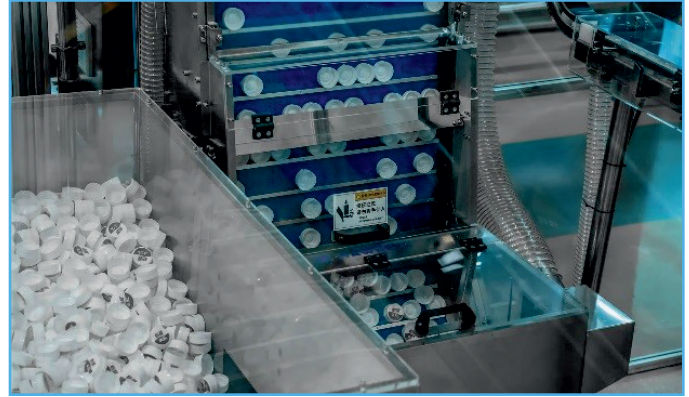
Yan Quan, GM of C'estbon Beverage (Yixing) said, "The collaboration between C'estbon and SIDEL can be traced back to nine years ago. We know SIDEL understands our commitment to delivering better product quality, healthier and more eco-friendly solutions for the entire beverage portfolio. As such, we trusted them to develop a bespoke solution to aid the expansion of our big format water production, and we have been very pleased with the capability and results from SIDEL'S EvoBLOW XL blower in Combi configuration."



Fastest blower for Large PET Containers

With over forty years of packaging and blowing expertise, SIDEL launched its EvoBLOW XL machine for large containers in September 2023, a solution built on SIDEL'S proven performance and designed for multiple markets.

Available as a standalone or integrated combi solution, EvoBLOW XL is a versatile machine that can provide a high level of quality and extended performance for a



wide range of bottle formats for up to 8L to 10L. It features flexible oven configurations with a wide choice of bottleneck dimensions which demonstrates its flexibility to handle many types of large bottles.

EvoBLOW XL also achieves high production efficiency with the highest market blowing outputs, up to 18,000 bottles per hour (bph) and 98 per cent proven Overall Equipment Effectiveness (OEE). The user-friendly functionality is designed to ensure efficient changeovers and offer a high level of flexibility. The ergonomic embedded mold handling tool means that heavy mold positioning is simplified and safe.

Optimum Quality of Complete Lines for Large Formats

C'estbon Beverage selected SIDEL'S complete Combi for water line which features the newest EvoBLOW XL blower, producing 12,000 bottles per hour in two formats: 4.5L and 6L.

The highest quality of water is ensured by the hygienic design of the Combi, which is equipped with a preform de-duster, requires no contact filling, only stainless-steel parts are in contact with the product, automatic dummy bottles for CEP and UV lamps on the cap chutes. Packaging integrity is maintained thanks to the SIDEL Inspection System controlling every step of bottle production.

In addition, the EvoDECO labeller is equipped for two different labelling applications: roll-fed and hot melt. The packer is flexible, handling both cartons and films, and the PalLinear palletiser is a high-level infeed, for maximum space availability.

Strong local Manufacturing Capability in China

This line was assembled and delivered by the SIDEL Beijing plant to highest specification. SIDEL Beijing plant has a strong local production capacity and has been continuously promoting local delivery and sustainable development for nearly twenty years.

The SIDEL Beijing plant integrates the company's global and local resources while strengthening its regionally based research and innovation capabilities, helping to quickly respond to the needs of the domestic market. The team based at the Beijing plant deploy its expertise to support customers to deliver high-quality products rapidly meeting consumer demands.

Karma Huang, SIDEL Sales Director, said, "After many years working in the China market, and by building many of our packaging innovations here in Beijing, we understand the challenges and opportunities facing beverage manufacturers. Thanks to our expertise and existing relationship with C'estbon Beverage we were able to fully understand their requirements for big format water packaging and offer a complete line Combi solution that perfectly met their needs."

POGS Chooses NOVODUR ECO ABS for Children's Headphones

Manufacturer of audio equipment for children will use INEOS Styrolution ABS with 50% recycled content.

POGS has selected INEOS' NOVODUR ECO P2H-AT MR50 for use in its new headsets, an ABS with recycled content. POGS produces headphones specifically for children, designed for durability and safety, and which limit sound levels to between 70 and 85 decibels.



POGS technology is designed to limit sound levels to ranges safe for developing ears. Source: INEOS

According to INEOS, NOVODUR P2H-AT offers easy processing with high impact resistance and a quality surface finish. The material is available in various

sustainable ECO versions containing 30%, 50% or 70% contributions of postconsumer mechanical recycled ABS. NOVODUR ECO P2H-AT MR50, selected by POGS, is the 50% version.

Compared to conventionally produced NOVODUR P2H-AT, the three options offer a CO₂-equivalent footprint reduction of 21%, 38% and 57% respectively. NOVODUR ECO's feedstock is sourced from waste electrical and electronic equipment, mainly comprised of household appliances and tools, televisions and computers that have reached the end of their life.

Adam de Beer, marketing lead at POGS says: "We are dedicated to delivering products that ensure the safest audio experience for young listeners while minimizing environmental impact throughout our manufacturing processes. Our goal is to consistently utilize the highest quality, safest and most sustainable materials in our products. INEOS Styrolution has proven to be a dependable partner in developing robust and durable solutions for our latest products: the Gecko 2, Elephant 2 and Turtle. We are pleased that this partnership has resulted in a plastic solution that aligns with our commitment to safety, durability and sustainability."

The Elephant, Gecko and Turtle are the names of POGS wired, wireless and wireless noise-canceling headphones, respectively.

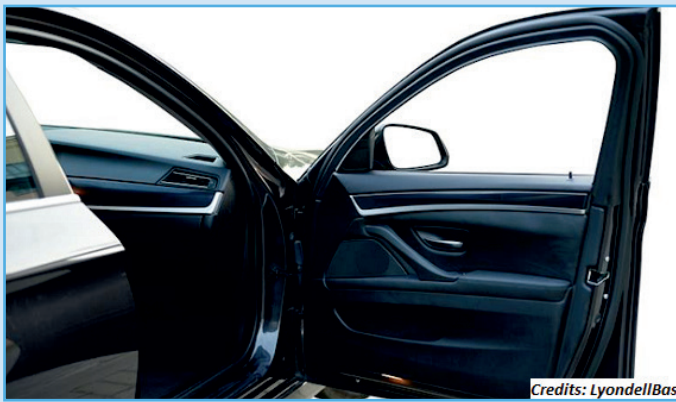
"We are particularly pleased to offer POGS an option that not only ensures a high-class surface appearance but also allows for a variety of colors in the final product," says Dr. Christian Ruthard, product manager ECO specialties EMEA (Europe, Middle East and Africa) at INEOS.

(Source: Plastics Technology/ MATT STONECASH)

LyondellBasell Unveils Polyamide - Based Product Line for Automotive Interiors

LyondellBasell announces the launch of its new Schulamid® ET100 product line – a revolutionary polyamide-based compound product.

Designed for automotive interior structural solutions, such as door window frames, this new technology showcases LYB innovation capabilities in Engineered Polymers.



Credits: LyondellBas

Key Benefits of Schulamid® Et100

- **Enhanced surface aesthetics:** Engineered with excellent melt flow characteristics, enabling easy injection molding and demolding of thin-wall complex parts with significantly reduced surface defects, stress marks and floating fibers on the part surfaces.
- **Improved durability:** Enhanced toughness ensures parts perform well during both manufacturing and long-term use.
- **Suitable rigidity:** Available with various glass fiber reinforcement for suitable rigidity, allowing firm assembly and eliminating noise even when the car is running at high speeds.
- **Customizable style:** Allows for seamless integration into a wide range of colors and visual effects, enabling the creation of visually appealing automotive designs.
- **Sustainability choice:** Features lower density compared to conventional structural materials, opening new possibilities for lightweight vehicle construction and reduced carbon emissions. Additionally, the solution eliminates the need for painting, consequently reducing volatile organic compound (VOC) emissions associated with the painting process.

Sustainable Interiors with Excellent Aesthetics

The Schulamid® ET100 GF15 grade has already been successfully implemented in window frames by renowned Chinese OEM brands. Considering the performance and versatility of the grade, LYB plans to expand the product line's development and promotion to encompass more automakers and applications.

By advancing innovation with Schulamid® ET100, LYB is enhancing the capability of automakers to develop new sustainable high - performance applications, focused on automotive interiors combined with excellent aesthetics.

"We're committed to improve the state of the current technologies to shape the future of automotive interior applications by introducing new solutions to support our customers in addressing the new industry challenges," says Caroline Cathelin, Global Innovation director of Advanced Polymer Solutions at LYB. "The Schulamid® ET100 line exemplifies this dedication by delivering superior performance through differentiated solutions."

Flexible and Reliable – The New Range of PTFE Temperature Control Hoses Z8565/...

Safety and reliability are essential when it comes to hoses for temperature control circuits. HASCO, the leading international supplier of standard components and accessories for tool and mold making, has, with its new PTFE corrugated hose Z8565/..., extended its product portfolio with an innovative and varied range of temperature control hoses.



The core of the new corrugated hoses is made of PTFE, and they are covered with a stainless steel braiding. For better visibility, the hoses are additionally provided with a polyester yarn, which are available in the colors blue, red and black. The corrugated structure of the PTFE core ensures absolute twist resistance without any bending, and it also provides high flexibility. This enables hose routing in very small spaces. The temperature control hoses are resistant to temperatures in the range from -70 °C to +260 °C for the media of water, air and oil, and, depending on the size, can withstand a maximum operating pressure of up to 138 bar.

The innovative hose range complies with the highest requirements with regards to safety at work and process safety and can also be used in sensitive production environments such as medical technology and the food industry. The temperature control hoses Z8565/... are supplied each in three different lengths and in the system diameters of 9 and 13 mm. Through the different coloring, inflow and outflow lines and temperature control, bridges can be unambiguously marked to make them clearly recognizable.

(Source: HASCO / August 2024)

INNOVIA Launches New In-Mold Film

Semi-cavitated labeling film is designed for large format containers typically used in the paint, food and industrial markets.

Semi-cavitated, in-mould labelling film designed for large format containers typically used in the paint, food and industrial markets.

A 5-layer structure with enhanced stiffness for converting and die-cutting large sized labels.

INNOVIA Films, a material science pioneer and major producer of BOPP films, has announced the launch of a new solution for large format in-mold labelling containers. RayoForm™ ELR70 is a 5-layer semi-cavitated, one side matt and one side gloss film offering a reduction in density versus standard white films.

“The high stiffness of the film allows for bigger labels and larger sheet conversion, this product performs excellently on both PP and PE containers” explains Paul Watters, Product Manager Labels at INNOVIA Films.

“The new film grade was developed to support the in-mould labelling markets where sizable labels are the norm. Supporting a range of 5-25 litre containers easily” Paul continues.

The two-side treatment allows for the control of anti-static levels for the high-speed sheet feeding and molding process giving optimal print and molding performance.

LYONDELLBASELL, RENAULT and ANTOLIN Introduce Revolutionary Foamed Material for RENAULT RAFALE

Rotterdam - LYONDELLBASELL (NYSE: LYB), Renault, and ANTOLIN proudly announce the incorporation of LYB's Hostacom TYC 2463F E2 foaming material (Hostacom), an innovative foaming material, in the interior design of the new RENAULT RAFALE.

This cutting-edge polypropylene (PP) compound marks a significant leap forward in producing interior parts with elaborate designs, enhanced surface textures, scratch-resistance, and low emissions - a successful collaboration culminating in the deployment of advanced chemical foaming technology.

'This milestone in material innovation reflects our commitment to help craft vehicles that excel in both performance and sustainability,' says Alexandre Martin, LYB business development manager Transportation. 'The development of Hostacom TYC 2463F E2 foaming material underscores our dedication to pushing the boundaries of material science while meeting the stringent demands of our automotive industry stakeholders.'

This Hostacom foaming material is manufactured utilizing LYB state-of-the-art catalyst technology, enhancing the rheology of the PP polymer matrix.

Key Benefits of this Hostacom grade include: High flow ability, expanded processing window and excellent melt strength ensures optimal cell structure in foamed parts.

Significant weight savings using LYB PP compounds with a chemical blowing agent in core back technology.

The semi-ductile nature of the material broadens its use in various interior trim parts, offering a versatile and sustainable solution.

RENAULT and ANTOLIN, integral contributors to this innovation, affirm the successful culmination of years of concerted effort and collaboration. 'The collaboration between Renault, LYB, and ANTOLIN has yielded a game-changing solution,' remarks Nathalie Etienne-Morange, door-panel component leader at RENAULT. 'The integration of this foamed

material in the new RENAULT RAFALE represents a pivotal achievement in our quest for innovation and sustainability within automotive design.'

'ANTOLIN is proud to be part of this transformative project that exemplifies the convergence of innovation and environmental stewardship,' states Frederic Papi, plastic parts technical director at ANTOLIN. 'Our collaboration with LYB and RENAULT in pioneering chemical foaming technology for door panel applications is a testament to our shared commitment to sustainability and advancing automotive solutions.'

The successful passing of standard specifications in this technology and its use for serial production signifies a significant achievement resulting from over five years of relentless collaboration between LYB, RENAULT and ANTOLIN. The introduction of this Hostacom foaming material marks a new chapter in automotive design, setting the benchmark for innovation, sustainability and performance.

(Source: LYONDELLBASELL / 07.08.2024)

NASA Uses Polyimide to Study Insulation of Electric Engines in Aerospace

NASA's use of Aurum PI showed properties that make it a candidate for electrical wiring for future aerospace transportation.

A thermoplastics polyimide (PI) has been tested by NASA's Glenn Research Center in Cleveland, Ohio, that demonstrates interesting properties, making it a candidate for the electrical wiring requirements for future aerospace transportation technologies. Called Aurum, the material is a semi crystalline PI suitable for powder coating, injection molding and extrusion coating, with the highest glass transition temperature in its class. The extrusion processing of Aurum for wire insulation is said to be highly economical, enabling extremely thin layers and offering high elasticity as well as good compatibility with cooling and lubricating oils.

Produced by Mitsui Chemicals, Aurum PI is sold by BARplast in the U.S., which supplied the material to NASA, and Bieglo in Europe. It boasts one of the highest glass transition temperature (T_g) of 473°F (245°C) of any commercially available thermoplastics. (BARplast is a subsidiary of Germany - based Bieglo Group, a distributor of high -performance plastics serving a wide range of industries, including aerospace, automotive and electrical.)



In a NASA white paper presented at the May 2024 SAMPE conference, researchers pointed out there are “electrical wiring requirements for next - generation air and space transportation engineering designs, with continuous operation temperature requirements of up to 392°F (200°C).” The objective of the study was to assess the potential of thermoplastic polyimides as a high-temperature electrical insulation solution. Furthermore, the white paper highlighted the need for “thermoplastic electrical insulation materials systems to improve thermal management in high power density electric motors.” It also stated that “a melt processable PI with high service temperatures is of interest as an electrical insulation candidate material.” Additionally, melt processing enables facile dispersion of fillers within a polymer matrix which can impart additional functionality such as thermal conductivity, according to the researchers.

(Source: Plastics Technology / 21.08.2024 / LILLI MANOLIS SHERMAN)



ExxonMobil Introduces Enable™ 1617 Performance Polyethylene: A Compelling Potential Solution for High-Performance Thin-Gauge Hand Wrap Applications

ExxonMobil today announced the launch of its Enable™ 1617 performance polyethylene (PE) grade. Ideal for thin-gauge hand wrap applications, the new resin is designed to help provide high tenacity and consistent extrusion, as well as help enable the incorporation of high loading levels of post-consumer recycled (PCR) content.

Key Potential Benefits Include:

- **Incorporation of PCR content:** Can provide the performance boost to help enable the incorporation of high levels of PCR content.
- **Efficiency:** Can help to achieve high production speed, offering a cost-effective extrusion process that can maximize output while maintaining quality, making it ideal for high-volume production environments.
- **Performance:** Can help to deliver high tenacity, strong holding force, and reliable load stability, which can help wrapped products remain secure and intact during transportation and storage and help reduce the risk of damage.

An Enable™ performance polyethylene resin-based solution can help to deliver high tenacity, contribute to high holding force and great load stability. The new Enable 1617 performance PE resin can combine seemingly opposite features: high flow and high tenacity. This unique combination can result in great cast film processing, exhibited by fast line speed, low pressure and low motor load.

With its flow properties, Enable 1617 resins can be run in coextruded structures as discrete layers, contrary to some of the lower melt index high tenacity resins that require blending in order to be processed. The balanced properties can provide opportunities for stiff, thinner gauge film, while offering consistent extrusion and high throughput rates, up to 650 m/min for 8 µm film thickness.

To help support value chain participants' goals of reducing their use of raw materials, ExxonMobil has developed a solution for down gauged, tough hand wrap films that can include the incorporation of PCR content. In high-tenacity hand wrap applications, Enable 1617 resin can make the incorporation of 30+% PCR content possible, while maintaining high processability and good film quality. The incorporation of PCR content can make predicting gel content and quality consistency difficult. Enable™ 1617 performance polyethylene resin is especially well-suited as a blend partner for the incorporation of PCR content. The high melt strength of Enable™ 1617 can contribute to process stability, while the high flow attributes can help

enable the processing of thin gauge film at high extrusion rates. Film properties can be affected by the quality of the incorporated PCR content, however, Enable 1617 resins can be instrumental in helping to maintain acceptable film properties for the application without need to up-gauge.

“ExxonMobil is committed to collaborating with our customers to understand their needs and to help them create compelling potential solutions for the industry. Our new resin not only can enhance performance but also can support the incorporation of recycled content,” said Justin Schmader, Market Development Manager, ExxonMobil. “We believe this product will help our customers achieve their operational objectives more efficiently such as helping support their goals of reducing raw material use.”

(Source: Globe Newswire / 16.07.2024)

Case Study: Creating Machine Wrap Stretch Film Incorporating up to 30% Post-Consumer Recycled (PCR) Content While Maintaining Performance

Data and results presented herein apply specifically to the noted application under this fact sheet. Your results may differ depending on factors such as operating conditions, equipment and materials used.

Challenge:

Incorporate PCR content while maintaining stretch film performance

Traditional LLDPE-based solutions can provide moderate pallet stability, with little to no down gauging possibility without adding a booster such as performance polyethylene. These type of films are often unable to incorporate recycled content while maintaining mechanical performance.

"Customers can struggle to incorporate PCR into their stretch wrap solutions," said Marie-Paule Van Den Eede, PE Technology, Customer and Application Developer, ExxonMobil. "PCR feedstock typically contains LDPE, which can be detrimental to stretch film performance due to a potential reduction in stretchability, which can compromise film end-use properties. In addition, PCR typically exhibits gels, which can be detrimental to stretch film performance

due to the potential creation of holes and reduced stretchability. A C4 - LLDPE - based formulation incorporating PCR may not deliver the film and end-use level of performance required for machine wrap stretch films. We were eager to propose a potential solution that could overcome these challenges.”

Solution:

ExxonMobil performance polymers for improved mechanical performance and improved wrapper consistency

ExxonMobil offers performance polymers that can allow the delivery of high-end Machine Wrap stretch film solutions incorporating up to 30% PCR while maintaining performance.

Exceed™ 3812CB performance polymer as an excellent PCR blend partner and booster grade

- Higher melt index and lower density (vs reference performance PE (0.918 g/cm³; 3.5 g/10 min)), exhibiting improved mechanical performance and processing capability.
- Especially suited as a blend partner with PCR content.
- Acts as a gel grinder, reducing the impact of gels and helping improve wrapper consistency.

Vistamaxx™ 6000 performance polymer functional layer as a consistency booster

- Metallocene catalyzed copolymer that can provide improved ultimate stretch, tear propagation resistance and wrapper consistency.
- Can be used pure in a functional layer of 10-15% (of the overall structure), while maintaining full compatibility with PE flexible film recycling streams.¹

Results:

Incorporating up to 30% PCR into a high-end machine wrap film was achieved with the incorporation of performance polyethylene, which helped to maintain mechanical properties

ExxonMobil testing indicated that C4-LLDPE based formulations with the incorporation of PCR performed poorly. A C4-LLDPE-based formulation may not deliver the film and end-use level of performance required unless high quality recycled content is used.

When testing ultimate stretch force, C4-LLDPE film with 20% PCR broke earlier than the reference solution without PCR. The C4-LLDPE film with 20% PCR also performed poorly in consistency testing.

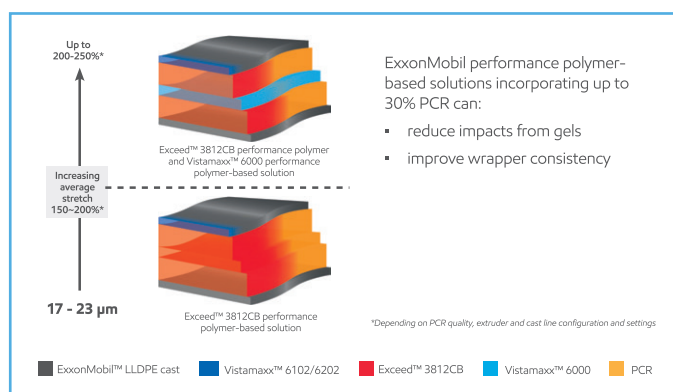
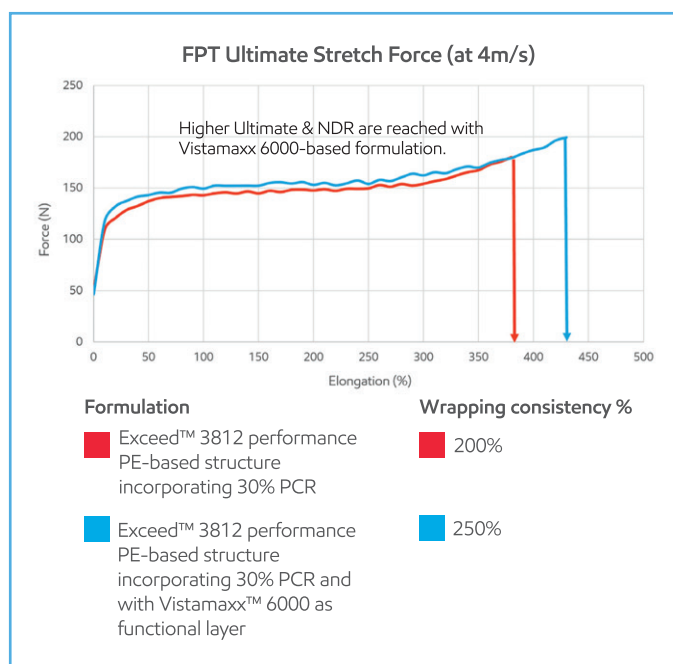
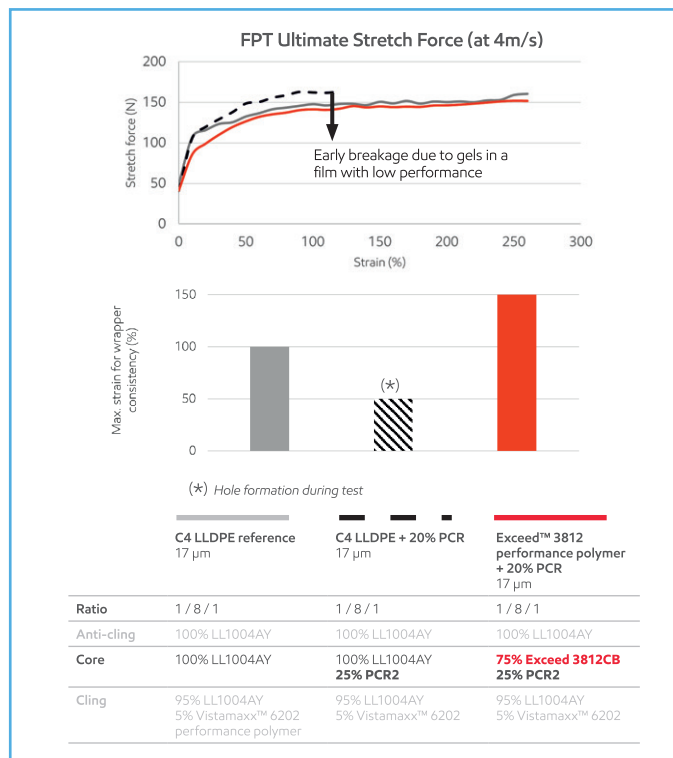
"The results help to emphasize the important role that ExxonMobil performance polyethylene can play when incorporating PCR," said Marie-Paule. "In this example, replacing C4-LLDPE with Exceed™ 3812 as a booster grade and PCR blend partner helped to maintain mechanical performance and wrapper consistency for machine wrap stretch films."

Introducing Vistamaxx™ performance polymer 6000 for higher wrapper consistency, which can be used pure in a functional layer of 10-15% of the overall film structure

"Hole formation is often due to the presence of gels, even if a hole appears during film application (i.e., stretching)," said Marie-Paule. "The functional layer of Vistamaxx™ 6000 can act as a wrapper consistency booster and help prevent further whole tear propagation."

Therefore, Vistamaxx 6000 performance polymer in the functional layer can offer the following potential benefits:

- Wrapper consistency
- Maintained packaging integrity and performance
- Full compatibility with European PE flexible film recycling streams per RecyClass certification in amounts up to 15% of the total structure.1



C4 LLDPE reference 17 µm	C4 LLDPE + 20% PCR 17 µm		Exceed™ 3812 performance polymer + 20% PCR 17 µm
Ratio	1 / 8 / 1	1 / 8 / 1	1 / 8 / 1
Anti-cling	100% LL1004AY	100% LL1004AY	100% LL1004AY
Core	100% LL1004AY	100% LL1004AY 25% PCR2	75% Exceed 3812CB25% PCR2
Cling	95% LL1004AY5% Vistamaxx™ 6202 performance polymer	95% LL1004AY5% Vistamaxx™ 6202	95% LL1004AY5% Vistamaxx™ 6202

Test item	Test method
Ultimate strain	FPT-750 equipment: 30 N unwind force, -4% wind strain, 4000 mm/s line velocity, W stretch pattern
Gel count (by consistency test)	50 m of unstretched film on FPT-750 equipment: 30 N unwind force, 0% pre-stretch, 5% wind strain, 4000 mm/s line velocity, W stretch pattern, gray value 140
Wrapper consistency	50 m of unstretched film on FPT-750 equipment: 30 N unwind force, 5% wind strain, W-stretch pattern. Wrapper velocity of 50 wraps/min at 100% 150%, 200%, or 250% pre-stretch; 3 times no film break is seen as a successful test
Melt index	(190°C / 2.16 kg) – based on ASTM D1238
Density / specific gravity	Based on ASTM D792

All data in this document have been tested by or on behalf of ExxonMobil

(Source: ExxonMobil)

SYENSQO Introduces More Sustainable Polymers on the New Trek Madone Road Bike

SYENSQO'S novel sustainable solutions provide a lower carbon footprint for parts on Trek's new Madone Gen 8 introduced at the 2024 Tour de France

SYENSQO, a global leader in Advanced Performance Materials and Chemical Solutions, introduced new products using recycled materials on Trek Bicycle's latest Madone Gen 8. Trek Bicycle Corporation is a pioneer in bicycle design and manufacturing.

The bike, introduced at the 2024 Tour de France, features small parts in the headset area manufactured using innovative glass - fiber reinforced high-performance polyamide (HPPA) compounds with a very high recycled content. By incorporating these materials, the Trek Madone achieves a lower carbon footprint (PCF 1), helping advance sustainable practices within the cycling industry.

“We are thrilled to embark on this exciting partnership with Trek, as part of our efforts to forge a greener future” says Floryan Decampo Market VP Life Solutions. “Leveraging our expertise, we aim to assist Trek in meeting their ambitious sustainability goals within the rapidly expanding bicycle and e - bike industry”.

“These parts are just one of the many things Trek is doing to reduce the impact of our products. In the future, we'll continue replacing legacy polymers with lower carbon impact options. These materials will help Trek meet our carbon emission reduction goals and help our racers inspire a better world for cycling transportation” says Reggie Lund, Senior Mechanical Engineer at Trek.

The SYENSQO and Trek Bicycle Corporation collaboration exemplifies how innovative partnerships can drive industry progress. By integrating advanced materials into the Madone Gen 8 road bike, SYENSQO is addressing environmental challenges and meeting consumer demand for eco-friendly products.

The bicycle market is witnessing an unprecedented boom, particularly in the e-bike sector, where demand is soaring. In response, manufacturers are looking for innovative solutions that boost performance, cut costs, and lessen environmental impact. SYENSQO's cutting-edge specialty polymers surpass traditional metals and plastics in e-bike manufacturing, delivering cost efficiency, design flexibility, and sustainability. With our strong commitment to sustainability through our ECHO portfolio and our efforts to help customers reduce their carbon footprint, SYENSQO is ideally equipped to support this expanding market.



Parts on Trek Bicycle Corporation's new Madone Gen 8 road bike have a lower carbon footprint with SYENSQO's advanced specialty polymers. (Photo/Photos: SYENSQO, PR027)

About Trek Bicycle: Trek Bicycle is a global leader in the design and manufacturing of bicycles and related products. Trek believes the bicycle can be a simple solution to many of the world's most complex problems and is committed to breaking down the barriers that prevent people from using bicycles more often for transportation, recreation, and inspiration.

(Source: SYENSQO / 30.07.2024)



Brewer Chooses Quick-Change Flexibility to Blow Wide Range of PET Beer Bottles

Beermaster Brewery found a “universal” stretch-blow machine from PET Technologies enables multiple changes per day among four sizes of beer bottles.



Moldovan brewer Beermaster needed this “universal” APF-Max stretch-blow machine from PET Technologies to make five different PET bottles from 0.5 to 3 L with mold changes in as little as 20 minutes. Source: PET Technologies

Operating in Moldova since 1906, Beermaster Brewery was frustrated with its two semiautomatic PET stretch-blow molders equipped with seven blow molds and a maximum capacity of 4,000 bottles per

hour (bph). Frequent production halts, time-consuming mold changes among multiple bottle sizes and inconsistent operation of the older equipment often led to delays in meeting demand for its beers, cider, kvass and other beverages. It solved all these problems with the purchase of one machine, an APF-Max 4L from PET Technologies in Austria.



Beermaster makes its popular 3 L PET beer bottle on the same machine as four other sizes down to 0.5 L. Source: Beermaster Brewery

This all-electric, linear two-stage machine can blow bottles from 0.2 to 3 L with an output of 7,000 bph — and up to 8,000 bph for 0.5 L bottles. Especially

important to Beermaster is its ability to change molds in as little as 20 minutes. Beermaster today produces five different bottle sizes on this machine: 0.5 L, 1 L, 1.5 L, 2 L and a popular 3 L size. Depending on production requirements, Beermaster may change molds several times a day. Also, the machine can also handle heavy preforms needed for PET bottles that resemble beer kegs.

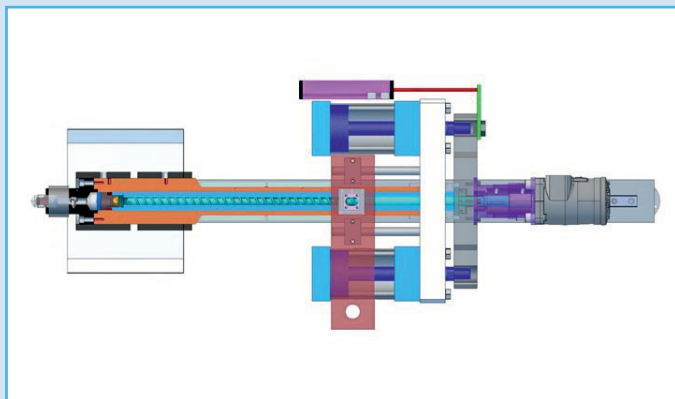
The APF-Max machines (a new model of which was introduced at NPE2024) are described as “universal” due to their flexibility and adaptability. They also

feature NIR heating — said to provide 20% overall energy savings compared with conventional IR heating — as well as air recovery systems and preferential heating.

(Source: Plastics Technology / 15.08.2024 / MATTHEW NAITOVE)

Novel Injection Unit's Commercial Debut

NPE2024: Md Plastics is now offering for sale injection machines incorporating its novel Inject-EX injection - unit design with an inline screw and plunger.



Md Plastics' Inject-EX inline screw/plunger injection unit, shown with two outboard hydraulic cylinders that move the entire unit (with feed hopper) forward to inject. Melt feeds from the screw through a shutoff valve and a channel inside the plunger to the front of the plunger. (Source: Md Plastics)

Md Plastics is now offering for sale injection machines incorporating its novel Inject-EX injection-unit design with an inline screw and plunger. Inject-EX was previewed in prototype form at the last NPE in 2018. Now it is incorporated in servo hydraulic machines from EdeX in Taiwan. The first Inject-EX model available is a 70-tonner with 2.2-oz. (64.23-cc) shot capacity. It's also outfitted with the unique Temp-Sense melt sensor for melt-density verification. Md Plastics has one of these presses at its plant in Columbiana, Ohio.

As explained by Md Plastics president Mike Durina, "The Inject-EX plasticating unit is designed to address the deficiencies of the existing 70-year-old injection molding technology." These include inconsistent shot size due to variable closing of the

no-return valve and inconsistent plastication due to screw retraction, which causes incoming pellets to experience a constantly changing L/D. His design remedies the first flaw by virtue of spring-loaded shutoff valves (based on Md Plastics' Mini-Shut design) between the screw and inline plunger and at the end of the plunger. The second flaw is avoided by having the screw/plunger unit and feed hopper reciprocate together. (For full details, see PT, December 2022).

Durina says, "Instantaneous mechanical shutoff of the plunger head isolates the melt pool from the screw melting chamber, which allows for discrete monitoring and control of the melt pool for improved shot control. Isolation between the melting chamber and melt pool also allow for more precise measurement of the shot volume for good/bad part discrimination using our Melt-Profiler melt-sensing technology." He adds that this plasticating design makes the process more energy efficient, provides a first-in/first-out melt path, requires no melt decompression to seat the no-return valve, and thus avoids breakup of solids-bed compaction from melt decompression. Ultraprecise shot control, especially for small shots, is also claimed, in a simpler design with fewer parts than conventional two-stage units.

Durina says seven Inject-EX injection units have been operating for five years in the U.S. and Canada, providing confirmation of these claims. Versions of Inject - EX are available for conventional thermoplastics, LSR and recycling (with addition of a melt filter, degassing vent and starve feeder). In addition, a variant of the design can be used in large-area, pellet-fed 3D printing.



Md Plastics has introduced a 70-ton Inject-EX machine built by EdeX in Taiwan, which incorporates a novel inline screw/plunger injection unit.

(Source: Matthew Naitove - Contributing Editor, Plastics Technology)

New SPEEDFORMER KTR 6.2 by KIEFEL – up to 50 % Higher Output with the Same Footprint & Quality

KIEFEL GmbH, a market leader in the design and manufacture of polymer and natural fiber processing machines, automation and tools, has launched the new tilting machine SPEEDFORMER KTR 6.2 SPEED for the mass production of polymer cups and coffee capsules. This technology solution provides higher productivity and production versatility while offering 10% energy savings due to optimized heating.

Increased Output thanks to Optimized Technology and Design

The new SPEEDFORMER KTR 6.2 is designed for large-scale production of high-end thermoformed polymer cups, offering up to **50% higher output at the same footprint & quality** compared to other machine manufacturers.

“This increased output is possible thanks to its **larger forming area** combined with **faster forming time** due to an improved tooling cooling process. Additionally, the filling time is drastically reduced owing to the optimized forming air system”, emphasizes Alexander Donabauer, Director Sales of the Polymer Packaging Division at Kiefel.

Stronger Punching Force and Taller Polymer Cups

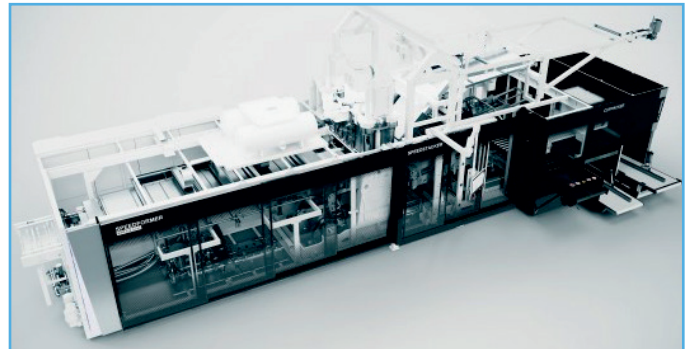
The KTR 6.2 features a more powerful drive system at the Trim-in-place station, offering an impressive punching force of 900 kN. Therefore, this cutting-edge tilting machine can **easily punch a wide variety of materials**, including thicker films, such as PET, which usually require stronger punching forces. Furthermore, the machine technology is enhanced to produce **higher cups** up to 250 mm.

New Advanced Stacking & Automation Solutions for Faster Production

Additionally, customers can achieve even higher production speed and enhanced product transfer with two innovative modules: the optimized and integrated SPEEDSTACKER for more efficient stacking, which can handle a greater number of products and a wider range of geometries, while using real-time monitoring to guarantee maximum speed. Moreover, the new

downstream automation CUPPACKER for cup packaging can be optionally integrated into the KTR 6.2.

“The KTR 6.2 also includes a new intuitive user interface, KMI 2.0, which facilitates thermoforming processes, supporting customers from a short training period and fast recipe optimization to efficient error handling and a targeted maintenance system”, adds Alexander Donabauer.



SPEEDFORMER KTR 6.2 SPEED for efficient thermoformed polymer cup production. © KIEFEL GmbH



Variety of high-quality polymer cups manufactured in the SPEEDFORMER KTR 6.2 SPEED. © KIEFEL GmbH



Cups and coffee capsules made of various polymers produced on the KTR Series. © KIEFEL GmbH

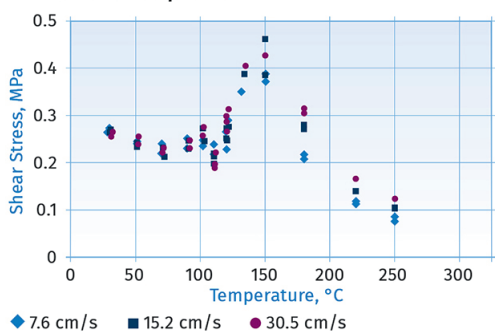
(Source: KIEFEL Technologies / 24.07.2024)

Troubleshooting Flow Surging in Single-Screw Extruders

Surging can cause lower production rates, higher scrap rates, material degradation and higher labor costs. Here is a guide to troubleshooting this problem.

Flow surging is defined as the oscillatory change in the rate of the extruder while maintaining constant set point conditions. Moreover, process parameters such as motor current, barrel temperatures and screw channel pressures can also oscillate. Flow surging can originate from many different sources, including improper solids conveying, melting instabilities and improper control algorithms. Surging, in most cases, results in lower production rates, higher scrap rates, material degradation and higher labor costs.

Shear Stress at the Wall as a Function of Temperature and Sliding Velocity at a Pressure of 100 psi for a PS



The most common root cause for flow surging is poor solids conveying due to improper temperature settings or controls on either the screw root in the feed section, feed casing or first barrel zone temperature. For smooth-bore extruders, solids conveying depends on the combination of the forwarding forces at the barrel wall and pushing side of the feed channel and the retarding forces at the root of the screw. Successful solids conveying will occur when the forwarding forces are greater than the retarding forces.

These forces depend mainly on the surface temperature of the screw and barrel, and to a lesser extent on the screw speed and channel

pressure. Proper temperature control of the surfaces will provide acceptable forwarding forces while minimizing the retarding forces. Flow surging can also occur due to improper melting, but this form of surging is very rare. The forwarding forces and retarding forces are directly proportional to the stress at the interface. The stress at the interface is a strong function of the metal surface temperature, as shown by Figure 1 for a PS resin. The forwarding forces at the barrel wall will be the highest at temperatures near 150°C. Thus, the best solids conveying will occur when the barrel wall temperature is near 150°C. Minimum retarding forces will occur at the screw surface at temperatures less than 90°C for PS resins. Low retarding forces can also occur at temperatures greater than 180°C, but if a catastrophic shutdown were to occur, the resin would melt and adhere to the screw. To avoid resin melting on the screw, the screw surface should be maintained at temperatures less than 90°C.

Flow Surging Due to Hot Screw in the Solids Conveying Section

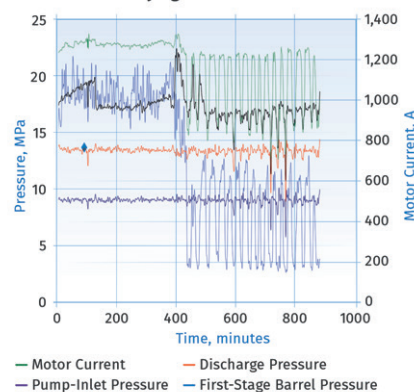


FIG 2 - Metal surface temperatures are rarely known. Instead, temperature sensors are positioned in the barrel wall away from the surface. The sensor temperature and the barrel wall temperature can be significantly different. The feed casing is typically cooled using water, and most of the time the water temperature is not monitored. Screw temperature control or screw cooling is typically not used, especially for extruders with diameters less than 6 inches. Many processes, however, could benefit by using screw cooling. The benefits can include higher specific rates and more stable operations. If any of these temperatures get out of the normal operating range, flow surging can occur.

(Source: Plastics Technology / 19.08.2024)

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Milacron India Reaches a Historic Milestone

Celebrating the handover of its 25,001st machine - a testament to innovation and excellence



We genuinely appreciate our customers' unwavering support and collaboration in helping us achieve this significant global milestone.



Dear Valued Customers,

I am delighted to share with you a significant achievement at Milacron India – the delivery of our 25,001st machine. This milestone stands as a testament to your unwavering support and trust in our brand.

Your partnership has been pivotal in propelling us towards continuous innovation and excellence. Together, we have forged a legacy of quality and distinction in the plastics industry.

Throughout this journey, we have consistently prioritized innovation, quality, and aftermarket support-essentials that matter most to you, our valued customers:

- Innovation is pivotal to our journey at Milacron, driven significantly by your invaluable feedback. One standout example is M-Powered, our suite of IIoT solutions, which can greatly enhance shop performance. Such innovation not only underscores our commitment to excellence but also highlights your integral role in shaping our technological advancements.
- Quality is fundamental to our operations, driven by continuous improvements that are conceived through valuable customer input. One notable achievement is our commitment to rigorous standards, ensuring every product meets the highest benchmarks. This dedication not only exemplifies our pursuit of excellence but also underscores our reliance on your insights to refine and enhance our solutions.
- Aftermarket support is essential to ensuring that your operations run efficiently and effectively. Our industry-leading response times to service requests help you achieve your production targets.

As we look forward, we are excited about the future. Our vision remains resolute – to be the leading plastics processing technology company creating and inspiring a sustainable future.

Once again, I extend our heartfelt gratitude for your patronage and partnership. Together, We **Shape What Matters For Tomorrow™**.



Bill Shukla
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