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PLASTISCOPE

The Official Journal of the Organization of Plastics Processors of India

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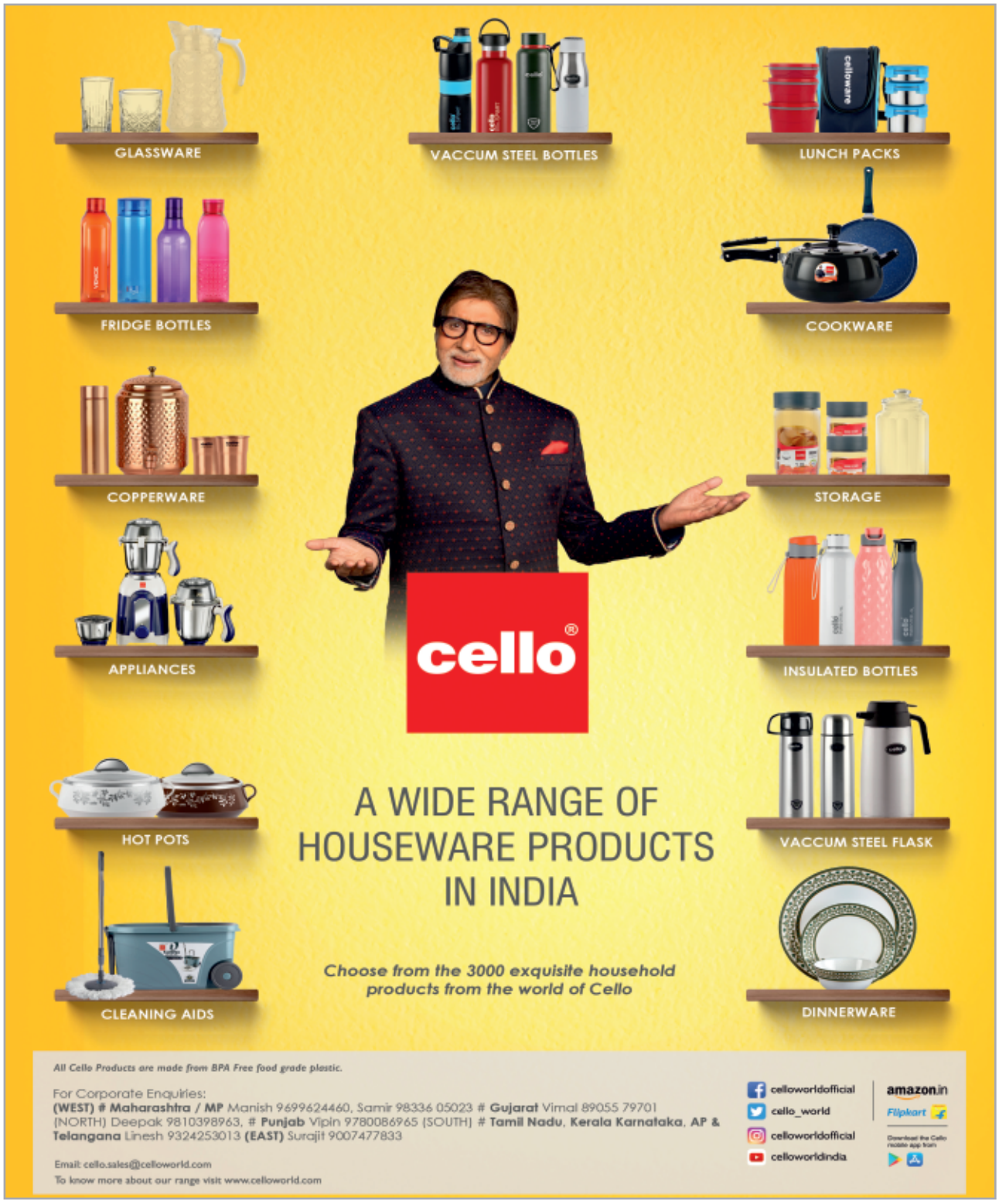

FROM THE PRESIDENT's DESK

Mr. Dilip Parekh

OPP

CONTENTS

Dear Members,

Greetings from Organization of Plastics Processors of India!

The new Government under the leadership of Hon'ble Prime Minister Shri Narendra Modiji has assumed charge.

The union budget, due in the September quarter, will be an early indicator of policy priorities, including short – and long – term responses to some of those key economic challenges. Other key areas to watch include capital expenditure allocated to infrastructure development, manufacturing, indirect taxes etc.

The upcoming Union Budget will indicate the policy priorities for the new Government and decide the growth trajectory for the next 5 years. The Organization of Plastics Processors of India will be submitting Pre - Budget Representation to the Government shortly. All members are hereby requested to mail their suggestions with respect to the New Budget 2024-2025 to OPPI Secretariat urgently. We will take into consideration each and every suggestion received from the members and incorporate them in the Pre – Budget Memorandum depending on its merit. Kindly mail your suggestions to secretarygeneral@oppindia.org

We at Organization of Plastics Processors of India look forward to the reforms and innovations which will further ease the ease of doing business by the Indian Businessmen.

We expect the following from the New Government: -

1) Good Governance
2) Development
3) Quality of Life for Citizens
4) Less interference of the Government in the life of the Middle Class and Upper Class
5) Balancing of the Regional Aspirations and National Objectives

As informed to you, at our 40th Annual Meet scheduled on 9th August 2024, Mr. Sasha Mirchanadani will be delivering a talk on "Ecosystem of Startups". India's strong growth is leading to a trend of "reverse flipping" as Indian Startups that once used to move abroad for capital access and tax benefits are now returning back to India.

Once again I appeal to all OPPI members and the Next Gen to register themselves for the event at the earliest.

With Best Wishes,

Dilip Parekh
President

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Editor: **DEEPAK LAWALE**

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REGISTER NOW

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, Taltala, Kolkata 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.

Group Registration

10% DISCOUNT TO OPPI AND IPF MEMBERS.

- If 3 or more delegates register from the same
- Company, 10% discount will be applied.
  If 5 delegates register from the same company, 6th delegate registration is FREE.

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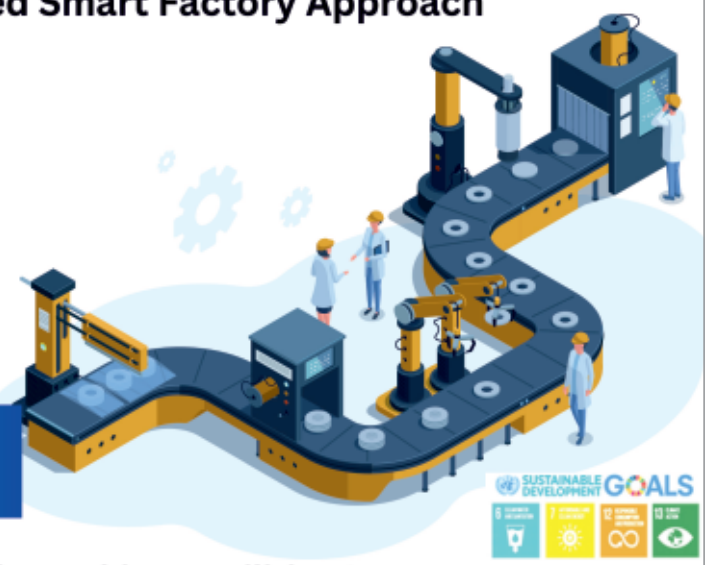
150+	400	30	20
SATISFIED CUSTOMERS	PROJECTS DELIVERED	COUNTRIES	YEARS IN INDUSTRY

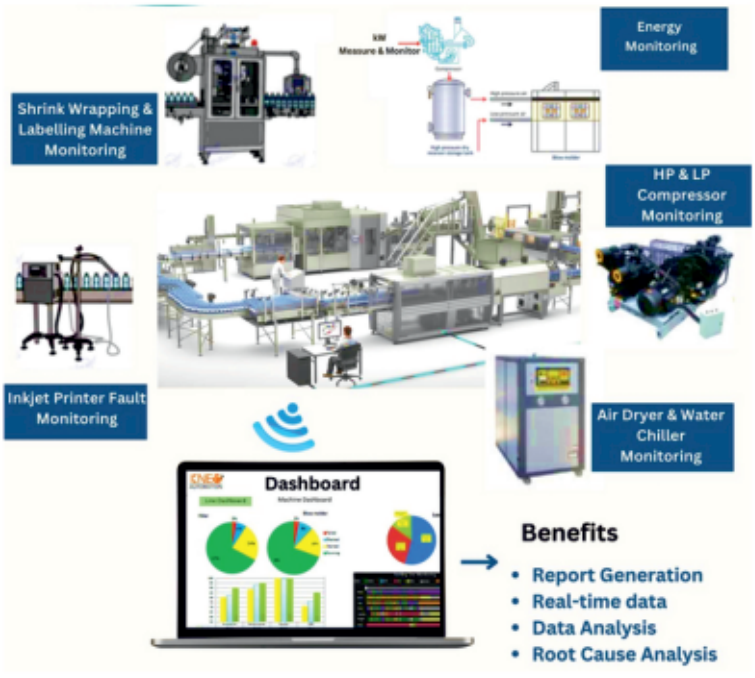


Monitor Plastic Machines, Utilities & Assets -
Blow, Extrusion, Roto Molding Machines,
HP & LP Compressor, Energy, Shrink wrapping & Labelling Machine, Motors, Ovens, Shuttle etc

4.0

KEY BENEFITS

Improvement in efficiency & productivity
Improved availability of Plant to 98%
Achieve Operational Excellence through analytics
Reduce Operation cost



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THE 17TH BANGLADESH INTERNATIONAL

Plastics, Packaging and Printing Industrial Fair

12th ~ 15th February, 2025

Venue: Int'l Convention City Bashundhara (ICCB

Organizers: Yorkers Trade & Marketing Service Co., Ltd. Bangladesh Plastic Goods Manufactures & Exporters Association

2024 KEY FIGURES

18,000 SQM / 800 BOOTHS / 354 EXHIBITORS / 18 COUNTRIES AND REGIONS / 25,974 INT'L BUYERS

- **Plastic:** Plastic Bending Machinery, Blow Molding Machines, Extruding Machines, Plastic Compounding Equipment, Plastic Cutting Machines & Cutters, Die Cutting & Casting Machines, Plastic Dryers & Mold Heaters, Injection Molding Equipment, Mold Cleaning Equipment, Spin Casting Equipment, Thermoforming Machines.
- **Quality Detection Instrument and Equipment:** Measuring & Detection Equipment, Temperature Controller & Components, Electronic Automatic Instrument, Monitoring Device.
- **Machinery Parts and Accessories**
- **Packaging:** Converting Machinery, Packaging Machinery, Packaging Materials, Raw Materials & Auxiliaries, Fiberboard Packages, Paper Bags and Folding Cartons, Rigid Packages, Glass Bottles & Tin Cans. Flexible Packaging, Quality Control Systems, Dosing, Coding & Marking Systems, Physical Distribution Systems, Logistics, Research Centers, packaging Magazines & Associations.
- **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 (US3.25$ 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 (US1.39$ 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 2027-2021
- ✔ 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

✔ **Corner fee: Surcharge 10 %**

✔ **The prices below do not include %5 VAT**

Shell Scheme: USD$ 320/sqm, Min.9sqm=3m x 3m= 9 sqm = USD2880$

9sqm including : carpeting, 3 folding chairs, 1 reception desk (with lock), 1 round table, 3 spot lights, 1 waste basket, wall partitions, fascia name, one -5AMP power point

Bare Space
USD$ 290/sqm, Min. size 18sqm

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VIETNAMPLAS 2024

22nd Vietnam International Plastic & Rubber Industry Exhibition
16th to 19th October 2024
Saigon Exhibition & Conference Center (SECC)
Ho Chi Minh City, Vietnam

We have the pleasure of inviting you to participate in Vietnam Plas 2024 scheduled from 16th to 19th October 2024 at Saigon Exhibition & Conference Center (SECC), Ho Chi Minh City, Vietnam

Subsidy under IC Scheme of Ministry of MSMEs available

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%

PARTICIPATION FEES:

- Shell Scheme (Minimum 9 sqm): USD 330
- Including Needle Punch Carpet: Wall Partitions, Carpet, Company Fascia, 3
- Folding Chairs, 3 Spotlights, 1 Reception Table, 1 Round table, 1 Dustbin, 1 Single Phase 5 amp/ 220v Plug.
- Raw Space Only (Minimum 36 sqm): USD 300/sqm

Please fill up the contract form attached herewith and Email scanned copy of filled Application form to secretarygeneral@oppindia.org

GET IN TOUCH **Deepak Lawale, Secretary General,** ORGANIZATION OF PLASTICS PROCESSORS OF INDIA

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Plastics Exports Reach USD 1,113-mn in March 2024

At USD 1,054-million in March 2023, India's plastic exports surged by 5.6% taking it to USD 1,113-million in March 2024. FIBC, woven sacks, woven fabrics, & tarpaulin showed a positive growth of 16.1%

India's plastic exports saw a 5.6% surge, reaching USD 1,113 million in March 2024 compared to USD 1,054 million in March 2023. The cumulative value of merchandise exports from April 2023 to March 2024 was USD 437.1 billion as against USD 451.1 billion during the same period last year, reflecting a decline of 3.1%.

The robust growth across vital sectors like cordage, FIBC, woven fabrics, laminates, and composites reflects our commitment to innovation and quality.

The export of FIBC, woven sacks, woven fabrics, and tarpaulin showed a growth of 16.1% due to higher sales of sacks and bags of plastics and flexible intermediate bulk containers. The export of leather cloth, laminates, and floor coverings increased by 19.0% in March 2024 due to increased sales of vinyl chloride polymer floor coverings, Floor coverings, leather cloth and laminates, and textile fabrics impregnated, coated, covered, or laminated with plastics. India closed this financial year with record-high exports of decorative laminates. There was an 18.4% increase in the export of FRP and composites.

The sales of syringes, catheters, cannulae and spectacle lenses contributed to a 10.4% increase in medical plastics exports in March 2024. India closed this financial year with record-high exports of spectacle lenses, contact lenses, syringes, and catheters. Flexible and rigid packaging items had a 20.2% increase in exports due to increased sales of plastic sacks and bags, plastic caps and closures, and other articles used for packaging or transporting goods. The export of plastic films and sheets increased by 14.3% in March 2024 as a result of higher sales of self-adhesive plastic films and sheets, propylene films and sheets; flexible polyethylene terephthalate films and sheets, and other plastic films and sheets for sun and dust control. Exports of plastic pipes and fittings rose by 30.2% as a result of increasing sales of vinyl chloride polymer tubes and pipes as well as fittings, including elbows, flanges, and joints for pipes. India closed this financial year with record-high exports of tubes and pipes of polymers of vinyl chloride; and fittings like joints, elbows and flanges of plastics. Plastic raw materials increased by 2.2% in March 2024 as a result of higher sales of polyethylene having a specific gravity of 0.94 or more; other acrylic polymers; other polyether's polyethylene terephthalate.

COSMO First Reports Improvement in March' 24 Quarter Results.

COSMO First Limited recently declared its financial results for the quarter and financial year ended 31st March 2024.

The improvement in EBIDTA has been made possible with higher specialty sales as well as improvement in domestic BOPP film margins (effective March 2024). The industry margins for BOPET film (about 8% of Company's FY24 sales) continued to remain in negative zone. For BOPET film, the Company is focussed on profitable specialty films / shrink films to achieve EBIDTA breakeven.

The Q1, FY25 outlook for BOPP margins remains steady at March 2024 month level. Further, the Company is expecting improved sales of speciality BOPP films as well as reduction in costs.

During the quarter, the Specialty Chemical subsidiary's EBITDA has also improved due to enhanced realization of chemical coatings. The Cosmo Specialty Chemical should deliver double digit EBITDA and 20%+ ROCE in FY25.

During the quarter, the Company's credit rating has been re-affirmed by CRISIL as AA- with stable outlook.

The Board has recommended a dividend of Rs.3 per share.

Commenting on Company's performance Mr. Pankaj Poddar, Group CEO, Cosmo First Ltd said "The Company's focus remains on its specialty business. It shall be further strengthened with launch of high-value-added sun control film, Cosmo Sunshield, in FY25. In Zigly, we are focussed on the same store sales growth."

HUHTAMAKI Khopoli Factory gets ISCC Certification

HUHTAMAKI India, the leading provider of primary consumer packaging and decorative labelling solutions in India, and part of Huhtamaki Oyj, a Finnish global food packaging major, received the International Sustainability and Carbon Certification (ISCC) for its Khopoli Plant. This significant achievement marks the first ISCC Plus certification for any site of Huhtamaki India and positions the facility as the fourth flexible packaging manufacturing unit in India to attain this prestigious certification.

The ISCC certification emphasizes Huhtamaki's commitment to sustainability and its dedication to implementing environmentally responsible practices on a global scale. The audit scope, focusing on the Control of Mass Balance of ISCC Plus Material, particularly polyethylene (PE), polypropylene (PP), and polyethylene terephthalate (PET), encompasses both resins and films, ensuring a comprehensive evaluation of the plant's sustainability efforts. Moreover, it also helps ensure transparency in the use of circular raw materials that will also help the sustainability and regulatory needs of the customers.

Dhananjay Salunkhe, managing director, Huhtamaki India, said, “The ISCC certification reflects our strong commitment to sustainability, transparency, accountability, and environmental stewardship. By achieving this certification, we are not only meeting the highest sustainability standards but also building trust with our stakeholders.”

ISCC PLUS is a recognised certification scheme for bio-based, renewable, and circular raw materials, aligning with Huhtamaki's overarching sustainability goals. With this certification, the company can provide customers with verifiable materials that contribute to the circular economy, help them meet sustainability commitments, and more broadly support the expansion of the recycling infrastructure.

The ISCC is an independent multi-stakeholder initiative renowned for its rigorous standards and commitment to promoting sustainable, traceable, deforestation-free, and climate - friendly supply chains. Huhtamaki's adherence to these standards further reinforces its position as a leader in sustainable packaging solutions.

Huhtamaki India's Khopoli Plant's achievement of ISCC certification sets a new benchmark in the flexible packaging industry, demonstrating its leadership in sustainability and commitment to driving positive change within the sector.

Tamilnadu Petroproducts Posts Revenue of 1697 Crores for FY 2023-24 and 447 Crores in Q4 of FY 2023-24

Tamilnadu Petroproducts Limited (TPL), Chennai based Petrochemical manufacturing company, announced its Audited Financial Results for the Fourth Quarter FY24 and for the year ended FY 2023-24.

Financials:

During FY2023-24, the Company earned ₹ 1696.86 crore in revenue as compared to ₹ 2169.50 crore during FY2022-23. Net profits registered at ₹ 42.78 crore as compared to ₹ 89.31 crore in FY2022-23. During the last quarter of the year, on gross revenue of ₹ 447.03 crore, the operating profits were ₹ 21.61 crore, and net profits were ₹ 10.96 crore.

The operating performance reflects improved contribution amidst intense competition from cheaper imports and higher input costs.

The Company has incurred ₹ 18.61 crore during the year towards Plant restoration activities and ₹ 1.52 crore towards Asset Damage (Michaung cyclone – Dec'23). An amount of ₹ 4.59 crore has been received from the insurers as an adhoc amount pending assessment report from surveyor. This is recognized as an exceptional item.

Celanese Expands Presence in India

New Technical Center and Shared Service Center to Expand Opportunities and Support in the Region SILVASSA AND HYDERABAD, INDIA

Celanese Corporation, a global specialty materials and chemical company announced the opening of two new facilities: the India Technical Center in Silvassa and a new Shared Service Center in Hyderabad. Both facilities will allow the employee teams in India to better support both local customers as well as global employees through a range of capabilities. The India Technical Center brings together state of the art application development, testing and analytics capabilities designed to support the growth of its customers in India and provide services to Celanese global teams. "The India Technical Center will not only effectively support Indian customers, but also provide support to Celanese internal teams and customers outside of India as part of Celanese global lab network," said Owen Liu, Asia Pacific Technology and Innovation Leader. "This center will also help speed up development of new and emerging applications while enabling quick responses to our customers' new product development and application related queries. We encourage our customers to visit the India Technical Center and take advantage of its capabilities to help them achieve their business objectives."

The new Shared Service Center in Hyderabad, India is housed in a modern building designed with emphasis on providing a bright and ergonomic workspace for its employees. The almost 20,000 square foot office features collaborative spaces, facilities that foster inclusion and can seat nearly 450 people, including the 290 colleagues already employed there. "India has a strong pool of capable and experienced talent that can serve our global needs very effectively," said Nico Scialdone, Site Director, Hyderabad. "We are confident that the Celanese work culture, values and growth opportunities for employees will enable the center to attract and nurture the right talent and become an integral part of our global shared services network."

Nearly 20 Million Kg Waste Collected in a Year: how these Mumbai-Based Founders are Tackling the City's Waste Problem

The founders of ViaGreen in Mumbai, Akshay Surana and Nikunj Jaisalmeria, came out to solve the waste management Issues facing the city. They faced several challenges beginning in 2015, including early business model failures. But they persisted because of their desire to change things. When the Municipal Solid Waste Management (MSW) guidelines were introduced in 2016, they took advantage of the opportunity to require trash segregation at the home level. ViaGreen began by assisting housing societies and companies with waste segregation, recognizing the lack of public awareness and understanding of waste management. They provided solutions and services to facilitate waste segregation, ultimately collecting and recycling approximately 59,000 kg of waste per day.

Their Innovative approach includes distributing bags with QR codes to track waste generation and segregation, leading to the collection and recycling of nearly two crores of garbage annually. Through their initiative, ViaGreen goal is to solve the problem of obtaining segregated waste volumes for municipalities, enabling more effective waste management strategies. Additionally, they have also expanded their efforts beyond housing societies and companies to include beach and mangrove cleanups, recycling old clothes and materials, and providing job opportunities to rag-pickers. The founders highlight the Importance of individual actions in addressing the waste problem, urging people to reconsider their consumption habits and prioritize reuse and donation over disposal. By promoting conscious consumerism and waste reduction, ViaGreen is making significant impacts towards a cleaner and more sustainable Mumbai.

Kerala: CITIIS 2.0 DPR Proposes Rs 31 Lakh Monthly Income from Waste Management

A detailed project report (DPR) for the CITIIS 2.0 program has been finalized by Smart City Thiruvananthapuram LI (SCTL). The aim of the program is to promote climate-oriented reform and integrated waste management, with a particular focus on circular economy concepts. The DPR outlines forth strategies for turning trash into cash by establishing RDF (Refuse-Derived Fuel) planet, organic waste converters, and recycling centers.

One of the primary objectives outlined in the DPR is the construction of RDF (Refuse Derived Fuel) plants, which essential for turning non-recyclable trash into energy. Thiruvananthapuram wants to reduce the amount of garbage that is dumped in landfills and the pollution that comes with using conventional methods of disposing of waste. The DPR also calls for the use of organic waste converters, which make it easier to tum organic waste into compost or biogas that is rich in nutrients. These converters aid in the effective management of organic waste and also contribute to the production of valuable resources for agricultural purposes.

The goal is to turn waste into resources that can generate income, with an average monthly production of about Rs. 31 lakh. Among the projects that are being considered are the construction of RDF facilities, automatic baling units, advanced waste management solutions and organic waste converters in market. Under CITIIS 2.0, the state and the center both will contribute Rs. 103.7 crore and Rs. 25.9 crore. For a total allocation of Rs. 129.58 crore. The DPR focuses to achieve zero - garbage status for Thiruvananthapuram by ensuring 100% scientific handling of waste, leveraging advanced waste-to-wealth solutions.

The proposed projects include the deployment of waste management technologies, such as incinerators for the use in various schools, colleges, and senior living facilities, with the creation of IT-enabled garbage collection control systems. These technologies contribute to the enhancement of waste management operations' efficiency by guaranteeing adherence to environmental regulations and legislation. The goal of the initiative is to promote circular economy ideas and make money from waste. It might help to improve the overall economic growth, standard of living in the city, and will promote environmental sustainability.

Indian Exports up in 115 Nations out of 238 Destinations in 2023-24

India's exports have surged to as many as 115 countries out of the total 238 destinations during 2023-24 despite the global economic uncertainties, according to a recent report by the Ministry of Commerce.

These 115 export destinations, which account for 46.5 per cent of India's export basket, include the US, UAE, Netherlands, China, UK, Saudi Arabia, Singapore, Bangladesh, Germany and Italy.

The country's merchandise exports decreased by 3 per cent to $437.1 billion in the last fiscal. However, services exports rose to $341.1 billion in 2023-24 as against $325.3 billion in 2022-23.

According to the report, despite persistent global challenges, overall exports (goods and services together) hit the highest level in 2022-23.

Overall exports reached $778.2 billion in 2023-24 as compared to $776.4 billion in 2022-23, registering a marginal growth of 0.23 per cent.

Aptar Beauty Introduces the First Fragrance Pump Available With PCR Content

Global leader in dispensing systems Aptar Beauty has released a new plastic fragrance pump made with post - consumer recycled resin (PCR). Color Code PCR is the first fragrance pump on the market to include up to 67%* of mechanical PCR Plus material without compromising on customization options and aesthetics.

A Sustainable Pump

By integrating up to **67%* of mechanical PCR Plus** content during manufacturing, Aptar reduces the product's **CO2 emissions by up to -39%** versus the version using conventional resin. This number has been verified by a comprehensive Life Cycle Analysis (LCA) of the raw materials using Aptar's internal Eco Design tool**. By choosing Color Code PCR over a conventional plastic equivalent, brands can **reduce their Scope 3 carbon emissions**, while benefiting from a ready-to-use PCR content claim. Depending on the region, using this pump may also help brands avoid some extra plastic packaging tax.

The use of recycled material for Color Code PCR underscores Aptar Beauty's strong commitment to circularity. In fact, Aptar is a proud member of the Ellen MacArthur Foundation's Circular Economy 100 (CE100) Network, the world's leading circular economy network. Additionally, Aptar is a signatory of the New Plastics Economy Global Commitment to address plastic waste and determine new ways to design our products to be more recyclable and keep materials in use.

At the end of its life, our Color Code PCR fragrance pump can be recycled together with the bottle in the glass waste stream.

A Creative and Chic Pump

The made-in-Italy, snap-on pump dispenses an 80 mcl dosage. Color Code PCR is fully customizable to achieve on-brand designs thanks to the versatility of plastic allowing for a wide variety of colors in a glossy finish.

"Color Code PCR is a stylish step towards sustainability: it is our very first plastic fragrance pump integrating PCR. This pump not only adds a touch of color and differentiation to fragrance launches but can also help brands achieve their sustainability goals by committing to packaging circularity," Giuseppe Barletta, Regional Platform Manager EMEA for Fragrance Lifestyle, Aptar Beauty.

25 Percent Material Savings: Reifenhäuser Launches The World's First 18 Micrometer Thin MDO-PE Film

Reifenhäuser Blown Film has produced the world's first MDOPE film just 18 micrometers thick which meets or exceeds all previous market standards in terms of mechanical properties, appearance, and further processing. The film has been produced on Reifenhäuser EVO blown film lines using the patented EVO Ultra Stretch MDO technology and has been developed and tested for practical suitability in collaboration with raw material manufacturer LG Chem and printing specialist BOBST. The new 18-micron film reduces the amount of material used by around 25 percent compared to previous film thicknesses of 25 microns. This makes the production of fully recyclable mono-material structures significantly more economical.

Christoph Lettowsky, Senior Product Manager at Reifenhäuser Blown Film, explains: "Machine builders and manufacturers have been pursuing the same goal for some time: not to use more material in fully recyclable AllPE solutions than in conventional PET-PE laminates. Technically, this is achieved due to the different densities of PET film and MDO-PE film by replacing the 12 μm PET film with a 16 to 17 μm MDO-PE film. With the reduction to 18 μm, we have taken a significant step in this direction - with further downgauging potential for the future."

High process stability thanks to EVO Ultra Stretch This leap in development was made possible by the combination of MDO Ultra Stretch technology with suitable raw materials. Thanks to the patented position of the Ultra Stretch unit directly in the system's haul-off, the film is stretched from the first heat. This makes the process particularly reliable: Reifenhäuser has produced the 18-micron MDO-PE film stably and reproducibly over many hours in the test runs.

Mechanical and optical properties reach or exceed market standard Despite the low film thickness, producers do not have to make any compromises when it comes to optical and mechanical properties. With a modulus of elasticity MD exceeding 1,400 Mpa and a modulus of elasticity TD exceeding 1,100 MPa, the 18-micron MDO-PE film achieves the current market standard for stretched PE films. With a haze of less than 5 percent, the 18-micron MDO-PE film performs even better in terms of optical properties than the market standard, which is 6 to 7 percent.

Print results impress BOBST
The 18-micron MDO-PE film also performed excellently in the converting process and exceeded all expectations of printing specialist BOBST. Davide Rossello, Head of Competence Center and Process Manager Gravure at BOBST says: "The way this extra-thin 18-micron MDO-PE blown film behaves on our printing machines is unique on the market. We have printed the film at high speeds of up to 500 m/min with excellent results in terms of printing quality and register performances. But even more impressively, we were able to demonstrate the quality of our machine when printing in the BOBST oneECG process, achieving excellent print results at 300 m/ min (and above)."

Samples will be exhibited at drupa 2024 in Dusseldorf (Germany) Printed samples of the new 18-micron MDO-PE film will be on display at drupa 2024 from May 28 to June 7 at the BOBST stand B30-1 in hall 10. Mohamed Timol, expert for MDO processes and applications, will be present at the stand as Reifenhäuser's contact person. Interested parties are cordially invited to see the quality of the film for themselves.

The development project from the partners LG Chem, BOBST and Reifenhäuser shows what is possible when outstanding machines, processes and materials come together. The result is an MDO-PE film which, thanks to downgauging, lowers the manufacturing costs of fully recyclable packaging, reduces its product carbon footprint, and enables more sustainable further processing thanks to its outstanding product properties.

Newly Developed "ReCrysta™," A PET Film for Shrink Labels, Receives Recognition for APR Design® for Recyclability

"ReCrysta™," a polyethylene terephthalate (PET) film for shrink labels newly developed by Toyobo Co., Ltd., has been recognized as meeting or exceeding the voluntary requirements for APR Design® for Recyclability. In announcing the recognition, the Association of Plastic Recyclers (APR), a US-based international industry organization for plastic recycling, noted that the Toyobo product meets or exceeds the strictest guidance criteria of its Critical Guidance Recognition pathway.

ReCrysta™ is an eco-friendly film and can be manufactured using over 50% materials sourced from recycled PET resins. It avoids the use of monomers*1 found in traditional PET films for shrink labels, opting instead for the same constituent monomers found in PET bottles. Leveraging Toyobo's expertise in film material production, which the company has developed over many years, the product has achieved shrinking performance equivalent to conventional products. PET films for shrink labels using conventional monomers had to be sorted separately from PET bottles, because such monomers compromise the properties of recycled PET bottles. On the other hand, PET films for shrink labels using ReCrysta™ that contains the same monomers as PET bottles, eliminate the need for separate sorting when producing PET resin flakes for recycling*2, thus enhance recyclability.

Based on third-party testing results of the PET film manufactured using ReCrysta™, APR determined that the product meets or exceeds the strictest guidance criteria of the Critical Guidance Recognition pathway, enabling it to receive the APR recognition.

Toyobo has long been in the forefront of offering eco-friendly film products. In 2012, the company began marketing "CYCLE CLEAN®" for packaging films, achieving the highest percentage in the industry of recycled material use at 80%, and the thinnest thickness in the industry: 12 micrometers. Toyobo also introduced "SPACECLEAN®", a slim shrink film that aids in volume reduction.

As environmental awareness increases worldwide, Toyobo will strive to introduce ReCrysta™ in countries where demand for recycled PET films is expected to increase, particularly in Southeast Asia. The company is committed to supporting the development of a circular economy by offering an extensive selection of eco-friendly film products.

- Neopentyl glycol, cyclohexanedimethanol, etc.
- Inks on films were removed before use

About the Association of Plastic Recyclers A US-based international organization representing the plastic recycling industry, it offers its own recognition to ensure recycled plastic is of high quality, along with assessment methods to evaluate its recyclability. Additionally, it supports a circular economy through educational activities. Toyobo joined APR as a member in 2023.

Coveris Invests Millions in Production Capacity

In response to the growing demand for high-quality packaging solutions for the medical sector, the Coveris Group is investing considerably in production capacity for medical device packaging at its Rohrdorf and Halle sites in Germany.

Leading packaging manufacturer Coveris is investing more than eight million euros in the coming months to upgrade and expand its medical device production lines.

The state-of-the-art facility in Rohrdorf has been in operation since May 2021 and meets the highest medical packaging production requirements and standards including ISO Class 7 certification. Two new pouch lines and one headerbag line will be installed in autumn 2024 to deliver an even better service level and meet growing market demands. The new pouch and bag lines are technologically similar to the site's existing capabilities, assuring fast and seamless integration into the machine park. In parallel, a new cast extrusion line will be installed at the company's sister medical site in Halle to further support the growth of Coveris's medical packaging capacity.

In Rohrdorf, all three new lines will be in operation by 1st October 2024, and the first commercial production in Halle using the new extrusion line is expected at the start of 2025.

SEE Launches Liquibox® Universal Self-sealing Cap to Advance Hygienic Milk Dispensing

In response to growing demands for closed dairy dispensing systems in the Foodservice industry, Liquibox, now part of SEE (Sealed Air), has introduced the Liquibox® Universal Self-Sealing Cap. Using this innovation in closed milk bag-in-box and bag-in-tray systems represents a significant advancement in milk dispensing technology, reducing food waste and providing enhanced hygiene, extended freshness, and streamlined cost efficiency compared to pour-out packaging solutions such as bottles and cartons.

The Liquibox® Universal Self-Sealing Cap is a hygienic self - closing fitment for 2 to 20 - liter professional dairy dispensing systems. Tailored to the evolving needs of restaurants, convenience stores, petrol stations and catering institutions, it is designed for numerous applications such as milk dispensers and frothers for bean- to-cup coffee machines, smoothie and frappe dispensers, and soft-serve ice cream dispensers. Plus, it is Cyclos-certified for recycling within existing PE streams*.

Unlike alternative market offerings, the Universal Cap stands out with a multitude of advantages, such as complete compatibility with all dairy, coffee machine, and frappe/smoothie dispenser connectors, resealability ensuring product integrity, and plug-and-play functionality for seamless changeovers. With a recycle-ready design, it stands out as the only PP- and silicone-free alternative in the market, which means there is no need to separate the components prior to recycling. This hygienic closed-loop milk dispensing fitment is suitable for fresh, ESL, hot fill, and aseptic processes, and seamlessly integrates with existing bag-in-box equipment, ensuring ease of implementation.

Yazaki and Toray Jointly Develop Recycled PBT Resin Grade for Automotive Wiring Harness Connectors Contributing to Carbon Neutrality

Yazaki Corporation and Toray Industries, Inc. announced that they have jointly developed a recycled polybutylene terephthalate (PBT) resin grade that uses scrap materials from manufacturing processes to make connectors for automotive wire harnesses. This resin can lower connector production-derived carbon dioxide emissions while offering the same performance properties as virgin materials.

One of the biggest lessons I have learned in troubleshooting for injection molding, is that identifying the real issue is sometimes not as easy simple as looking at the parts in hand. Just because we are looking at parts with flash on them, doesn't mean that we have a mold with damaged shutoffs nor does it mean we have a machine with a clamp issue.

The injection molding process is what I have referred to as a "connected process," which means that every parameter impacts all the others. So even though we are looking at parts with flash, we may have a mold that isn't filling easily enough. One might automatically assume that a part with too much plastic would mean the exact opposite. Excess resin is a possibility, but if you pull a mold to have a toolmaker fix the shutoffs and they find nothing wrong with them, there could be a problem.

You set the mold again, you're still dealing with flash, and now the parts will be delivered late to the customer, causing an even bigger problem. So, what could make a part flash but not be related to the condition of the mold shutoffs or an issue with the machine's clamp?

Never make assumptions about common defects like flash. The root cause might not be the commonly accepted one.
Source: Plastics Technology

If we look at the very basics of injecting plastic into a mold, before plastic can fill the cavity, air must be allowed to escape from it. This is done through vents cut into the parting line of the cavity-forming steel, which evacuate air from the cavity into the atmosphere. Typically, when these vents are obstructed, you may see burns or shorts on your parts, but in some cases, a blocked vent can cause conditions that result in the part flashing.

How? The increased resistance to the plastic entering the cavities can cause an increase in cavity pressure due to the surge of injection pressure required to fill, resulting in flash. This can also cause the melt temperature to increase due to the increase of shear, which can also result in flash.

Accounting for Normal Process Variation

This is just one example of how a common defect can cause you to make assumptions about what steps to take to resolve it, but what if the defect itself isn't really the issue at all? Let's say we have our same part, but this time we are having sporadic issue with shorts or underfills. Remember: even the most robust processes will have some amount of process variation — there is no such thing as zero variation in an injection molding process. Even when running the exact same lot of material, we still see process variation, a lot of which comes from the cycling of the machine and/or hot runner heaters.

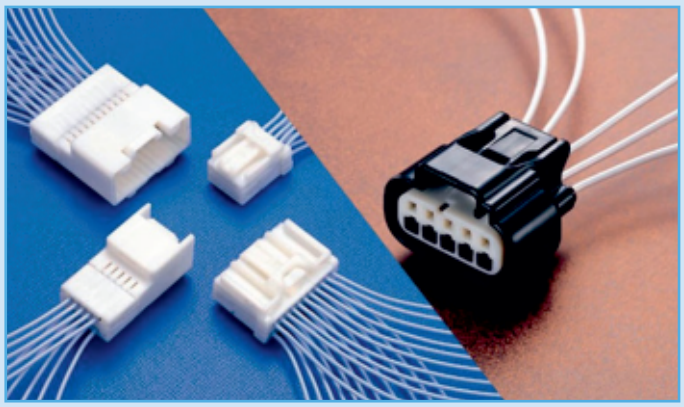
This is normal process variation and it's what causes your process to produce short shots in this particular example, but it is not the root cause of our shorts. Calling it normal process variation, means exactly that, it is normal, so our process should be optimized with this variation in mind. Often the root cause of the problem is whatever is causing the flash on our parts. Yes, flash.

I can't tell you how many times I have gone to a machine to help with a shorting issue, only to find out the real issue is flash. I find that process parameters have been changed due to flash, but these changes have decreased the process window enough to cause normal variation to result in sporadic shorts to be produced.

The real action we should be taking is finding the root cause of the flash so the process can be returned to the optimal settings established during process development. There are many cases in which I discover these adjustments were made during process development, and the process was established without considering the normal variation inherent to it.

This typically means that the mold was never right from the start, and it cost more time and money-making adjustments after we are in production. For processors, it is critical that we challenge a process when we are troubleshooting an issue. This will help ensure we are chasing the correct problem. When we do have to make changes to a process, it is critical to verify that it is still robust enough to not cause us other problems later in the run.

In a perfect world without customer due dates and a limitless budget, we could shut a job down when the mold has worn to a point that our process is no



Toray offers Ecouse TORAYCON™, a chemically recycled PBT resin made by depolymerizing and repolymerizing scrap from manufacturing processes. The downsides of recycling resins include contamination from foreign substances and degraded material quality. Through chemical recycling, the company provides recycled PBT resin that matches the quality of virgin material. This process includes rigorous quality control from depolymerization to compounding. One challenge for Yazaki has been to stabilize the quality of recycled materials in highly functional parts, such as automotive wire harness connectors. It addressed this by optimizing the material properties and moldability of Toray's chemically recycled PBT resin.

It collaborated with Toray to develop a recycled PBT resin grade for connectors that matches the quality stability of existing PBT resin grades. Through this joint effort, Yazaki and Toray will contribute to realizing a carbon-neutral, circular economy in the automotive industry.

Features

- Lower carbon dioxide emissions during material production, compared to conventional PBT resin grades
- Equivalent material properties, moldability and quality stability, compared to conventional PBT resin grades

Yazaki and Toray exhibited automotive wire harness connectors employing Toray's chemically recycled PBT resin, at their booths at the Automotive Engineering Exposition 2024 YOKOHAMA, at Pacifico Yokohama HELD from May 22 through 24.

Syensqo Launches Two-Part Adhesive for Aerospace Manufacturers

Key Highlights:

- Syensqo is launching AeroPaste 1003, a new grade of its epoxy-based structural paste adhesives which already includes AeroPaste 1006 and 1100.
- The aerospace adhesive is set to increase part assembly efficiency and offer great processing flexibility, making it ideal for Advanced Air Mobility, Commercial Aerospace and Defense.
- AeroPaste 1003's easy application means it can be used in automated processes supporting industrialization requirements in the aerospace industry by increasing manufacturers' efficiency and output.

Syensqo is launching AeroPaste 1003, a new grade of its epoxy-based structural paste adhesives which already includes AeroPaste 1006 and 1100. This aerospace adhesive will not only increase part assembly efficiency but also offers great processing flexibility, making it ideal for targeted high production rates in markets such as Advanced Air Mobility, Commercial Aerospace and Defense.

AeroPaste 1003 can be used in automated processes supporting industrialization requirements in the aerospace industry by increasing manufacturers' efficiency and output thanks to its fast and easy application.

Diagnosing Defects: Determine True Root Cause Before Adjusting a Process

Author: Mr. Robert Gattshall

Common defects can have common causes — flash equals worn mold shutoffs, right? Except when they don't. Trust your eyes, but verify the root cause before adjusting a process.

longer capable, but we all know that isn't the world we are in most of the time. We also can't afford to produce scrap, which can result in more downtime, at a higher cost and that cost could be to our reputations if our customer is sent defective product.

When we are forced into a position where a process needs to be adjusted, we must understand what is causing us to need to make those changes. “What is the defect?,” “Why is it defective?” and “How do we fix it?” are questions we have to answer before we make adjustments. Then we must challenge those adjustments to understand what impact they could have on the process and part quality as well.

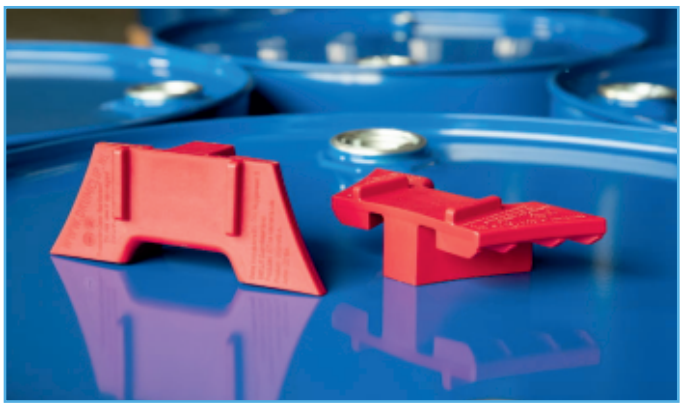
Making process changes strictly based on what we see on the part we have in our hands will cause more harm than good in most circumstances. We should take the time and identify the root cause, even if we may need to delay implementing the corrective action until that is possible. In these cases, I see making controlled process changes as the containment step of the corrective action process. Make sure to document the issue and what actions need to take place when it is possible to address the root cause.

New Rock-solid Drum - securing Clip Made of TECHNYL® 4EARTH® Sustainable Polyamide

Thanks to a joint project between DOMO Chemicals, Ultrapolymers and Gebaplast B.V., the drum distribution chain now has a new, secure and sustainable method of preventing damage and loss. Sometimes a simple solution can change the game for the better. That's the case with the new Drumclip solution. Powered by TECHNYL® 4EARTH® sustainable polyamide, the new Drumclip is an innovative and certified solution to fasten drums to a pallet, trailer or container and is used to transport them by road, rail and sea.

“Until today safe transport of drums preventing movement and spillage has been achieved by using all kinds of strapping, but the solution has not been optimal. We have developed a brand new solution to an old problem in transportation of chemicals, inks, adhesives or food concentrates.” says Wouter Geldhof - owner of Gebaplast B.V. and the brains behind the

Drumclip innovation. A complete mold flow analysis (Moldex 3D) was performed on the TECHNYL® 4EARTH® solution to prevent mechanical failure and to optimize the injection molding process. Fiberglass is another very important aspect that has been taken into account to design the new application and ensure that the part achieves maximum strength.



The sustainable solution was proven to meet all mechanical specifications of the applications, in addition to a relevant environmental benefit compared to a fossil alternative of approximately 78% CO2 reduction.

"Thanks to Ultra polymers and DOMO's expertise, we were able to identify the best materials for our needs very quickly”. Wouter Geldhof concluded.

“Our TECHNYL® 4EARTH® line represents the broadest range of sustainable polyamide solutions available on the market today,” said Andrea Rizzo, Distribution Sales Manager at DOMO. “At DOMO, we use a variety of recycling technologies to meet our customers' needs and process the widest variety of waste. The solution developed for Gebaplast B.V. is a mechanically recycled grade, which is the most efficient recycling option in terms of CO2 reduction, and it's natural, allowing the customer to color the final part according to its classification code.” Rizzo added.

The computation is provided by the LCA software Simapro 9.5 in combination with Ecoinvent V3.9.1 database, following the international standards ISO 14040–44 recommendations following the cradle-to - gate approach. Comparisons are made with equivalent virgin-based materials produced in the same plant with total GWP value of 4.7 kg Co2 eq. including PA6 virgin polymer data from our DOMO Leuna plant.

New Production Facility for Carbon Fiber Reinforced Plastics in Gardelegen Officially Opened

MOCOM celebrated the grand opening of its new production hall for carbon fiber reinforced plastics in Gardelegen. Philip O. Krahn (CEO of the Otto Krahn Group) and Norbert Nieder (District Crafts Master) joined Jens Kaatze (CEO of MOCOM), Horst Raasch (Plant Manager Gardelegen), and Norbert Scheinert (Head of Production in Gardelegen) to symbolically cut the ribbon, officially inaugurating the state-of-the-art facility. The new hall, constructed on a 39,000-square-meter site, will enable MOCOM to produce high-quality carbon fiber reinforced plastics. The use of recycled carbon fibers significantly reduces the CO2 footprint of these lightweight and highly durable materials. The Otto Krahn Group, MOCOM's parent company, invested a total of 10 million euros in the Gardelegen site. Jens Kaatze (CEO MOCOM).

Multilayer Solutions to Challenges in Blow Molding with PCR

For extrusion blow molders, challenges of price and availability of postconsumer recycled resins can be addressed with a variety of multilayer technologies, which also offer solutions to issues with color, processability, mechanical properties and chemical migration in PCR materials.

Monolayer PCR bottles in back are dull gray, while multilayer ReCo bottles in front show off coloring flexibility. Cross-sectional view shows how multilayer technologies can hide even very contaminated PCR. Source: W. Müller GmbH

With each passing year, governments worldwide enact new legislation dictating the extent to which postconsumer plastics must be recycled and how much of that PCR should be incorporated into new plastic products. This regulatory landscape presents a formidable challenge for converters who must navigate the complexities of acquiring and processing these materials.

At W. Müller, we are known for our production of extrusion heads for blow molding machines. What many may not realize is that we operate two technical centers that have provided us with early access to recycling materials in collaboration with material manufacturers and recyclers to conduct comprehensive tests under varying conditions. Over the years, we've evaluated more than 50 different recycled materials from over 15 manufacturers globally, testing them across all our technologies, from one to seven layers, in bottles from 70 ml to 1 L. This research has also enabled us to observe the evolution of commercially available PCR materials over time.

Despite advances, blow molders still face numerous challenges in processing these materials. This article explores key challenges such as processability, odor, topload strength, migration, drop-test results and black specks, differences in color and material availability. The relevance of these challenges varies greatly depending on the regional infrastructure for material separation, collection, sorting and processing.

The Best Case Scenario

Some PCR materials stand out for their excellent processability. They are typically colored white, ivory or a very light gray. In our tests with those materials, we started molding virgin HDPE into bottles and then changed to the good-quality PCR. We continued making bottles, adjusting the die gap to achieve

the same bottle weight. Processing was very easy, there were no parison length variations, and the process ran stable. Some bottles had a couple of dark specks, but nothing to worry about. These materials still had a characteristic PCR smell — however, it was more the smell of a not too overpowering cleaning agent. These materials ran well even in monolayer bottles.

Nonetheless, this high-quality PCR has two big problems: price and availability. A big effort goes into sorting, cleaning and removing volatiles from waste to make that PCR material.

All this takes energy and resources, which are reflected in a high price per pound. If price is not an insurmountable obstacle, then you will face the next problem: After sorting so much waste out of the stream to get pure HDPE, the yield of high-quality material is relatively small. If everyone decides to make a 100% PCR bottle out of these premium PCR materials, there will only be enough material available for a few customers.

The Worst Case Scenario

FIG 1 – On left is a monolayer bottle of 100% PCR whose contaminants caused foaming and bottle distortion. On right is a three-layer ReCo bottle with the same PCR in the center main layer, while inner and outer virgin layers provide processing and mechanical stability and aesthetic appearance.
Source: W. Müller GmbH

Conversely, some recycled materials present formidable challenges. In one case, we tested a PCR material for a recycler. We started with monolayer construction. As soon as the material came out of the die, it was obvious that that was not a material for blow molding. It produced a foamed, black/green parison with a lot of fumes, a horrible smell and some sort of oil dripping out and sticking to the die, pin and blow pin. The bottle? Nonexistent. The rough foam structure would not allow a bottle to be formed. What was supposed to be a 1 L round bottle looked like an ugly flower vase instead (see Fig. 1).

Adding coextruded outer and inner layers did not contribute much. This PCR material had some nylon in it, which has a higher melting point than HDPE. The unmelted nylon, together with the rough foam structure, still caused big holes in the bottles. After many tries with drying, filtering and changing processing parameters, it was possible to make three - layer bottles with 50% of this material in the center layer.

The good news is that the average real-world scenario lies somewhere in between the best and worst case scenarios described above. However, if it was possible to make the worst case scenario processable with three-layer technology, then there is a lot of hope for most recycled blow molding materials out there.

Multilayer Technologies: How to Choose?

There are many multilayer blow molding technologies out there. We often hear about coextruding 11 layers or more in the film industry. But in blow molding, seven layers is the practical maximum. It is possible to make a head with more layers, but we haven't found an application that actually needs more than that.

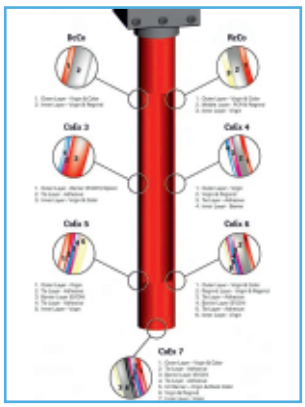


FIG 2 – A variety of multilayer technologies are available to provide specific functions – aesthetic, functional and/or processing - related. Source: W. Müller GmbH

At W. Müller, we offer, in addition to our single-layer technology (Mono), a diverse array of multilayer technologies (Fig. 2). Among these are DeCo and ReCo, comprising two (DeCo) or three (ReCo) layers of an identical material type (such as all-HDPE with layers of virgin and PCR). Additionally, our portfolio includes CoEx technologies, which entail coextrusion of different material types to achieve specific performance functions or properties, such as coextruding HDPE with EVOH or nylon for UV barrier, chemical barrier or oxygen barrier.

Many of you hear “multilayer” and immediately think that multilayer is bad for recycling. That is only true if you combine different polymers with a fairly large proportion of the minor component — for example, more than 6% EVOH oxygen barrier in an

HDPE bottle. However, W. Müller heads are capable of making bottles with EVOH layers under 6%, which give you a fully recyclable bottle with a barrier.

Furthermore, DeCo and ReCo are multilayer technologies that use only one polymer type (such as only HDPE or only PP), which makes the bottle 100% recyclable in any recycling stream.

Multilayer Technologies for PCR Processing

DeCo and ReCo offer monomaterial multilayer solutions for processing PCR, ensuring recyclability while maintaining product integrity. DeCo consists of two layers, usually a thicker PCR inner layer and a thinner outer layer with virgin material and color master batch (Fig. 3). This enables you to color your bottle and hide the PCR while minimizing the use of master batch. The layers are easily customizable, so you can vary the thickness depending on your needs.

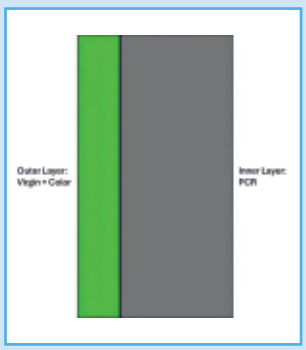


FIG 3 – W. Muller's two-layer DeCo technology facilitates coloring the bottle at minimum cost while hiding the PCR layer. Source: W. Muller GmbH

ReCo is a three - layer technology with a thinner outer layer, usually virgin with master batch; a thicker main or center layer, usually PCR with regrind; and an inner layer, usually just virgin (Fig. 4). The goal here is to save master batch, cover the PCR material, avoid contact between your product and the PCR, and improve the mechanical properties of the bottle.

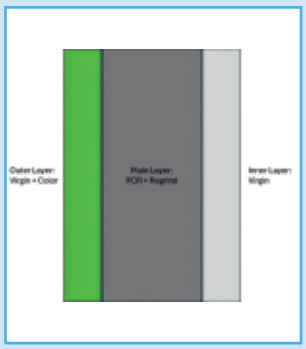


FIG 4 – Three-layer ReCo technology can save master batch costs, avoid contact between a bottle and its contents, and improve mechanical properties of the bottle.
Source: W. Muller GmbH

The good thing is that if you have a machine running with monolayer, you can retrofit this machine with a new W. Müller head to process with DeCo or ReCo. With a multilayer head from W. Müller, you have the flexibility to run either multilayer or monolayer bottles with that same head.

Processability Enhancements

Many customers have complained about stability problems while processing PCR materials. Changes in parison length can cause problems such as fluctuation in bottle weight and changes in the position of the thickness profile, which lead to poor topload results.

The goal was to recognize and capture these differences objectively, and see if it is possible to reduce them. This project was a cooperation between the additive producer Baerlocher, recycler PreZero (active in Europe and the U.S.) and W. Müller. Baerlocher provided the additive Baeropol RST, which is made from a combination of commonly used, nonantioxidant polymer additives that together support polymer stability. This additive was compounded into a batch of PreZero PCR HDPE material. Then, batches of PCR HDPE with and without additive were sent to W. Müller for testing.

On our lab machine, cameras were installed on the front and on the side to take a picture of the parison at the same point during each cycle, which software analyzed to calculate the parison length. The gross and net weight of each bottle were measured, and the melt pressure in the extruder was controlled.

The process with the least variation in gross weight, melt pressure and parison length was that of the virgin bottle. The process with the most variation was monolayer PCR material without additive. When comparing the process variation for the PCR with and without additive, it was observed that the additive reduced the process variation when using the monolayer and ReCo technologies. It was also noted that using ReCo improved process stability for both the stabilized and unstabilized material. The variation in the parison length and melt pressure of the stabilized ReCo bottle was only slightly higher than that of the virgin bottle. This means that processing PCR with three layers can improve the stability of your process when compared with processing monolayer PCR.

FIG 5 – When HDPE waste arrives at a sorting facility, white bottles are segregated into one stream that becomes white or ivory PCR pellets (left), while all other colors are combined into a stream that becomes gray pellets (right). Source: W. Muller GmbH

Addressing Color Variation and Impurities

Have you ever thought about how materials are sorted and why a lot of PCR materials are gray? When used plastic arrives at the sorting facility, white HDPE bottles usually will be sent to the white HDPE stream and colored bottles will be sent to the colored stream. Because all colors sent to the colored stream are mixed together, the resulting color of this mixture is gray. Depending on the colors sent, you get different shades of gray, but gray nonetheless. Because of the different shades of white and natural-color bottles entering the white stream, the result is a whitish ivory material (Fig. 5).

It is tempting to buy those ivory colors and then add some color to make a nice PCR bottle.

This is not the best approach to close the loop because you are taking material from the limited white stream and on the next product life cycle returning it to the gray stream, which few will want. If you buy the ivory PCR and mix in some white, then the bottle will end up again in the white stream and the loop is closed.

The only way to achieve widespread circularity is to find a place for those gray materials in PCR bottles. Does that mean that on your next trip to the drugstore you will only find gray PCR bottles? Not with our ReCo technology adding a virgin layer with color on the outside to cover the gray PCR material. With the DeCo and ReCo technologies, it is possible to use those gray PCR materials in nicely colored bottles. How much PCR can you use in this way? It depends on the technology and regrind use, but normally up to 80% in DeCo without regrind and up to 70% in ReCo without regrind or about 60% with regrind.

It is of course possible to use a gray PCR material in a multilayer bottle and color the outer layer white. This is not recommended because the bottle would end up contaminating the white stream with gray materials.

Some of you might think you can just color the gray PCR materials. This is possible, but the resulting color of the bottle will be nowhere near your original color, even if you increase your master batch use level from 4% to 8%. You will have a colored bottle, but it will still have a grayish tone and you will be spending double the money on master batch. Better to make a three-layer bottle and just color the outside layer. You are free to increase the amount of master batch in the one layer; you will still be saving money. The best thing? Your color will be either the same as your original bottle or a lot closer to it.

FIG 6 – Compare colors of a monolayer PCR bottle with 6% master batch (left), monolayer virgin bottle (center) with the same amount of master batch, and ReCo bottles with different three-layer structures and equal or lower master batch levels in just the outer virgin layer. Source: W. Muller GmbH

Let's compare monolayer bottles (Fig. 6). Suppose your bottle weighs 70 g and you used 4% master batch in your virgin bottle. If you double the master batch level to 8% when using a gray PCR, you will be going from 2.8 g master batch to 5.6 g. If you make that same bottle in three layers, where the outer layer is 20% of total thickness, and you add 4% master batch only to that layer, you will be using only 0.56 g of master batch. Even if you double the amount of master batch in that outer layer, it is still 1.12 g, which is 60% less than you had in your virgin bottle. Imagine saving 60% in master batch costs and still getting a

better color match than using monolayer? And you have an added benefit when using ReCo: Any black specks are covered by the outer layer (Fig. 7).

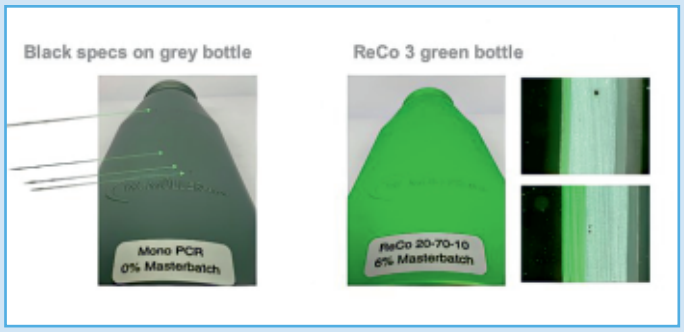


FIG 7 – Monolayer PCR bottle (left) shows black specks, which are hidden in multilayer ReCo bottle (right). Source: W. Muller GmbH

Enhanced Mechanical Properties

For the topload test, three bottles were produced: a virgin monolayer bottle, a PCR monolayer bottle, and a ReCo three-layer bottle with 70% PCR in the main (center) layer.

This same test has been done with different bottle geometries and sizes.

Depending on the virgin material and the PCR material being used, the virgin bottle will most likely have the highest topload strength and the PCR monolayer bottle will have the lowest topload. With the ReCo structure you will see an improvement in the topload strength.

This test was also performed with the bottles made with PreZero PCR HDPE material and the Baerlocher additive. The additive also improved topload. Interestingly, the topload for the three-layer stabilized bottle was higher than the topload of the virgin bottle. That means that the ReCo technology alone already improves the topload, but material stabilization together with the ReCo technology could help reach or even improve topload results while using PCR.

Also, when comparing results of using monolayer with PCR and regrind and ReCo with PCR and regrind, improved topload was observed on the ReCo bottles (Fig. 8).

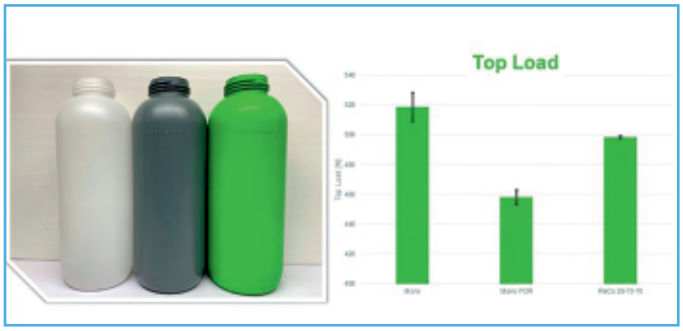


FIG 8 – Topload strength comparison of virgin (left), monolayer PCR (center) and ReCo bottle with PCR (right). Source: W. Muller GmbH

These results depend highly on the virgin and PCR materials being used. Bottle size and geometry also play a role.

Some cheaper, more available HDPE PCR materials will have some PP in them. This comes from, for example, caps that were not sorted out properly. PP in HDPE will cause problems with the welding seam, which will not close properly. This will cause problems in the drop test, where the bottle will probably break at the welding seam.

A test was performed where a virgin bottle, a PCR monolayer bottle, and a ReCo bottle were each dropped a maximum of five times from 6.5 feet. The virgin bottle survived all five falls without breaking, while the PCR monolayer bottle broke after about two falls. The inner and outer layers of the ReCo bottle helped stabilize the bottle, and thus the bottle survived all five drops, just like the virgin bottle (Fig. 9).

FIG 9 – In drop tests, monolayer gray PCR bottle (left) split at the weld seam after two falls, while white ReCo bottle with PCR in main layer (right) survived five falls intact. Source: W. Muller GmbH

Reducing Migration

The Regulation (EC) No 1935/2004 is an EU legislation that governs the general requirements for materials and articles intended to come into contact with food. It establishes the principles and procedures for assessing the safety of such materials and articles, and includes provisions for labeling and traceability. Our tests were performed according to that legislation. They measure the migration of substances from the plastic material into the contents of the container. These results were evaluated for use in cosmetics containers.

One test measured global migration in a monolayer PCR bottle and a ReCo PCR bottle. Even though both bottles had a global migration under 10 mg/dm^2 (which is the legal limit), it is important to notice that the monolayer PCR bottle had a global migration of 4 mg/dm^2 while the ReCo bottle had a global migration under 1 mg/dm^2. This was repeated with a different PCR material, and the results were similar — the monolayer PCR bottle had a global migration of 3 mg/dm^2 while the ReCo bottle had a global migration under 1 mg/dm^2.

We also observed that fewer substances migrated from the ReCo bottle. Many of the substances migrating from the monolayer bottle could not be found in the test of the ReCo bottle. The substances that would still be found migrating from the ReCo bottle had, in most cases, a lower concentration. Only two substances were found in higher concentrations from the ReCo bottle than the monolayer bottle. These substances were additives that migrated from the virgin layer.

Migration tests with four different materials and two different bottle sizes/geometries showed that the migration in the ReCo bottles is under the legal limit and therefore safe to use in cosmetic products, both leave-on and rinse-off.

It is important to mention that the inner layer is not to be considered a functional barrier and will not allow you to use a non-food-grade PCR material for a food-grade application. However, it can help make your product safer. If you are making a cosmetic product and are using a substance that has a concentration limit, you would not want that substance to migrate from the PCR into your product in amounts sufficient to cause you to exceed the regulatory limit.

Choice of Head and Extruder Matters

Depending on your chosen technology (be it DeCo, ReCo or CoEx), the required head and extruder setup can vary significantly. Furthermore, the selection of a head producer can significantly impact the outcomes of your operations.

When processing PCR, precision in the design of both the head and extruder is paramount to accommodate the necessary multilayer configurations. This precision ensures exceptional tolerance for MFI fluctuations, which is crucial when transitioning between materials and colors. Ensuring that settings remain valid across transitions minimizes downtime spent adjusting parameters, thereby maximizing productive output.

At W. Müller, our team meticulously optimizes the channels of the head to streamline plastic flow, preventing the accumulation of deposits and abrasions. Neglecting this crucial step can lead to the introduction of additional black specks that may be erroneously attributed to the PCR material itself.

To effectively reduce master batch and plastic consumption, it's counterproductive to utilize a head with prolonged color and material changeover times, as each transition results in waste. Rapid changes in color and material not only bolster flexibility but also enhance overall productivity.

When processing multilayer materials, achieving uniform material distribution is vital. Poorly designed heads lead to inconsistencies in distribution, which lead to variations in layer thicknesses, resulting in either overuse of more expensive materials or localized thinning of inner layers in the final product, potentially leading to increased migration risks. Therefore, meticulous attention to material distribution is essential to ensure both cost-effectiveness and product quality. This is achieved through the use of simulation software, which enables us to model the flow channels and identify potential design issues before manufacturing begins. By simulating the flow dynamics, we can pinpoint and address any problematic areas, ensuring optimal material distribution and minimizing the risk of uneven layer thicknesses. This proactive approach not only enhances product quality but also saves valuable time and resources by mitigating issues before they arise during production.

With multilayer technologies, it is possible to improve the mechanical properties of bottles while using PCR materials. A colored outer layer enables you to cover gray and black PCR materials, black specks and impurities, while saving in master batch and getting a color closer to your original color.

The inner layer can help you reduce the substances that migrate into your products. The easy adjustment of the layers, depending on availability of the PCR materials, can help you to stay flexible.

It is important to make an informed decision when switching to PCR. Therefore, it is helpful for you to send us your virgin and PCR material ahead of time. We can (depending on the size) help you adapt your mold to our machine, and we can sample and test the bottles for you. That way, you can pick the technology and materials that are best suited to your application.

Litescout Chooses PLEXIGLAS Moulding Compound for Therapeutic Learning Tool

Key Highlights:

PLEXIGLAS was chosen for LiteScout due to its unsurpassed light transmittance and light-guiding properties, making it ideal for creating a bright and evenly lit surface.

LiteScout is a light-up magnetic board system with learning games designed to improve visual perception, hand-eye coordination, and mental development in children with multiple disabilities.

Tokens are now thicker and have a matte finish to prevent glare, and injection molding creates a textured surface for better grip, making LiteScout more user - friendly and effective for visually impaired children.

With their luminous colors and rounded edges, the circles, triangles and squares made of PLEXIGLAS molding compound are true eye catchers and invite little hands to touch and play with them. And this is precisely the intention, as they are designed to encourage the early development of children with visual impairments and multiple disabilities. They form part of the LiteScout system, which consists of a light-up magnetic board, transparent tokens and a variety of learning games. Glare-free light, colors

and contrasts promote children's residual visual function and improve their visual perception, hand-eye coordination and mental development.

Today, LiteScout is an effective therapeutic learning tool used in 30 countries – and it's all thanks to a chance encounter between the plastics and lighting specialist Hagen Glass and a therapist for early visual development. The insight into her work inspired the owner of Plastolight to replace conventional light boxes using frosted glass and fluorescent tubes with modern light technology and lighter materials.

PLEXIGLAS impresses with unsurpassed light-guiding properties

An automotive supplier advised Glass to use PLEXIGLAS, as the brand PMMA from Röhm is also a proven material for lighting applications in vehicle construction. “The light transmittance and light - guiding properties of PLEXIGLAS are simply unsurpassed. It is very easy to process and lightweight,” comments Glass, listing the properties relevant to him. “In addition, all materials need to be safe for children and therefore free from harmful substances.”

The name LiteScout, a play on the words “light” and “lightweight,” names two advantages of the therapeutic tool: Light stimulates visual perception, while lightweight refers directly to the fact that LiteScout weighs much less than older light box designs. For therapists there is a very noticeable difference between carrying ten kilograms or just three when visiting the children they support.

PLEXIGLAS Softlight for soft light and a matte effect

The very bright and homogenously illuminated white surface is made of backlit PLEXIGLAS sheet material, while the translucent colored tokens are made of a PLEXIGLAS molding compound.

Chase Plastics Launches Sustainable Product Line Card

Clarkston, Mich. — Chase Plastics, a leading North American distributor of specialty, engineering, and commodity thermoplastics, proudly announces the launch of its Sustainable Product Line Card, showcasing its commitment to environmental stewardship and meeting the evolving needs of their customers.

Chase Plastics highlighted its sustainable product offerings within their exhibit during 2024 NPE trade show in Orlando, Florida. The newly released Sustainable Product Line card features a comprehensive array of circular solutions from various global and domestic suppliers on the cutting edge of sustainable plastics. It includes Chase Plastics' own CP PRYME® ECO thermoplastic resins. In August 2023, Chase Plastics announced the expansion of its CP PRYME® product line to include CP PRYME® ECO thermoplastic resins. “We are thrilled to introduce our Sustainable Product Line Card, reflecting our dedication to sustainability and innovation. In partnership with various domestic and global suppliers, we offer a diverse range of thermoplastic offerings crafted with recycled content or bio-based materials,” said Chase Plastics' President Adam Paulson. “We hope to serve as a consolidated resource to provide environmentally friendly solutions to applications across numerous markets, supporting our customers' growing desire to drive sustainability initiatives.”

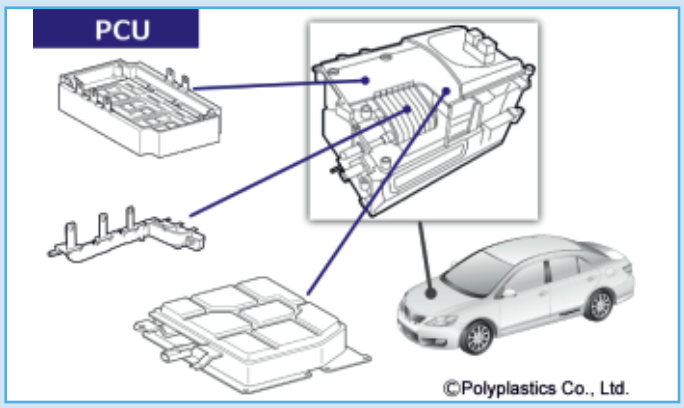
Sustainable business practices are nothing new to Chase Plastics. In addition to product development, Chase Plastics is further elevating its service offerings to support sustainability initiatives. Paulson elaborated, “We have taken significant strides towards sustainability, including the creation of a dedicated Sustainability Specialist role within our team. This individual will spearhead our sustainability efforts, including carbon footprint reduction, and pursue the prestigious ISCC+ certification to meet the escalating demands for sustainable materials throughout the supply chain.” For years, Chase Plastics has implemented in - house recycling programs, used recycled materials, and reduced energy consumption in their facilities with resource -efficient lighting, water, and HVAC solutions.

They have also applied source reduction initiatives, such as a paperless work environment and fleet management software, to reduce their environmental

impact and leave a smaller carbon footprint. In 2016, Chase Plastics began the implementation of Operation Clean Sweep®, a program of best management practices to reduce accidental pellet, flake, and powder loss in their South Bend warehouse facility. In 2021, they joined Operation Clean Sweep® Blue to enhance their commitment to managing, measuring, and reporting unrecovered plastic releases into the environment. To date, they have had zero reported incidents.

Polyplastics Launches New Glass - Filled PPS Grade with Improved Thermal Shock Resistance

Polyplastics, a global leader in engineering plastics, has announced the launch of a next-generation polyphenylene sulfide (PPS) grade that boasts significantly improved thermal shock resistance and can be easily recycled during post-consumer recycling (PCR) without sorting. DURAFIDE® PPS 1140HS6, a 40% glass-filled grade, meets the requirements for metal insert molding, particularly busbars for electric vehicles (xEVs).



DURAFIDE® PPS 1140HS6 can be easily collected without being separated from other PPS components during recycling. Polyplastics has employed a material design technique to ensure thermal shock resistance by minimizing residual strain during molding and homogenizing linear expansion to mitigate internal stress. As a result, thermal shock resistance has been improved while retaining mechanical and other essential properties.

DURAFIDE® PPS 1140HS6 eliminates molding imperfections and enhances performance without the need for impact modifiers in xEV busbar applications. Insert molded xEV components conduct high-voltage currents in various electrical parts and their complex shapes make them susceptible to cracking. They are usually made up of a metal that conducts electric power and PPS resin that functions as a coating for insulation. This cracking problem is caused by repeated heating and cooling and subsequent rapid temperature changes. This is a significant issue, leading to insulation failure, particularly in the critical parts of xEVs that conduct high-voltage currents. The typical solution is to add impact modifiers to PPS. Still, this approach has drawbacks, such as a reduction in material strength and the tendency for gases and mold deposits to emerge during molding. Additionally, materials containing impact modifiers are incompatible with the growing trend of material recycling. The newly developed DURAFIDE® 1140HS6 PPS resin offers better flowability during injection molding than standard materials. This makes it an ideal choice for molding both thin - wall and large products.

Cabot Corp Launches Eco - certified Universal Circular Black Masterbatches

Key Highlights:

- Cabot Corporation launches its new REPLASBLAK universal circular black master batches with certified sustainable material.
- The new materials come in two types: one with 45% recycled content and another with 20% recycled content.
- This launch helps the auto industry meet sustainability goals and aligns with Cabot's commitment to developing more sustainable materials.

Cabot Corporation announced the launch of its new REPLASBLAK universal circular black master batches with certified sustainable material. With this launch, Cabot has introduced two new products which will be sold as the industry's first - ever universal circular black master batches with International Sustainability & Carbon Certification (ISCC PLUS) certified content. The new REPLASBLAK universal circular black master batches are powered by EVOLVE Sustainable Solutions and will enable Cabot to continue to deliver the high-performance, quality and reliability that the plastics industry requires at scale for certified circular solutions.

The global transition toward a lower carbon future is driving the need for advanced sustainable solutions that support a circular economy and reduce greenhouse gas (GHG) emissions. As such, automotive plastic compounders and converters are seeking third-party certified black master batch products that leverage circular value chains and recycled feed stocks in the product manufacturing process. Cabot is positioned to enable a more sustainable future with its new universal circular black master batch products that are made from mechanically recycled polymer. These solutions offer customers an ISCC PLUS certified single master batch for use in a wide range of automotive applications for coloring polyolefin and many engineering plastics.

The two new products, REPLASBLAK reUN5285 universal circular black master batch and REPLASBLAK reUN5290 universal circular black master batch, are powered by EVOLVE Sustainable Solutions under the recovered category. These solutions enhance Cabot's well-established range of universal black master batches recognized for the coloring of a wide range of polymers with the added benefit of sustainability. The solutions offer superior versatility by enabling the use of a single master batch at a low addition rate, resulting in material management efficiency in the product manufacturing process.

Furthermore, both grades enable high gloss and high jetness pigmentation, offering superior color performance and mechanical properties similar to a standard universal black master batch. This makes the solutions suitable for use in various applications in the automotive segment, including interiors, exterior parts and under-the-hood applications.

- **REPLASBLAK reUN5285 universal circular black master batch** leverages a 45% ISCC PLUS mass balance certified material made from mechanically recycled polymer. The solution is suitable for compounding applications in the automotive industry.

- **REPLASBLAK reUN5290 universal circular black master batch** leverages a 20% ISCC PLUS mass balance certified material made from mechanically recycled polymer. The solution is suitable for compounding as well as direct injection molding and sheet extrusion applications in the automotive industry.

EVOLVE Sustainable Solutions is Cabot's technology platform for delivering sustainable reinforcing carbons and other performance materials. Products powered by EVOLVE Sustainable Solutions offer sustainable content with reliable performance at industrial scale by leveraging circular value chains and/or materials recovered from end-of-life tiers and/or recycled materials, and/or renewable and bio-based materials, and/or processes that reduce GHG emissions.

Biodegradable Breakthrough: Plastics that don't Create Microplastics or make us Sick

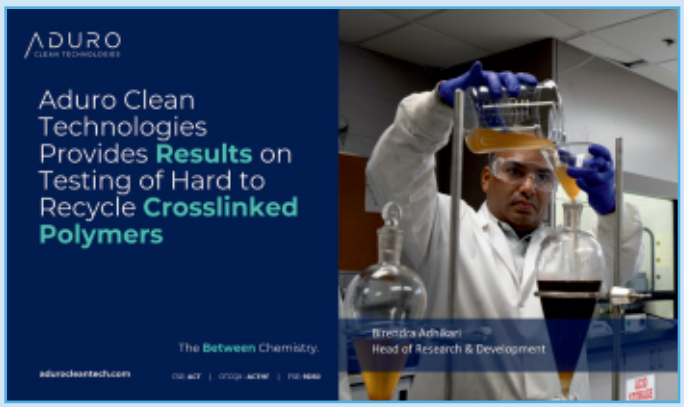
The University of Califomia San Diego's study, which was carried out in conjunction with Algenesis, emphasizes the importance of biodegradable polymers in tackling the worldwide problem of plastic pollution. Urgent action is required in response to microplastics, which have detrimental consequences on ecosystems as well as human health. Plant-based polymers that fully biodegrade in less than seven months-even at the microplastic level-are the ground - breaking solution that the research presents. This invention not only slows the buildup of microplastics but also paves the way for the development of environmentally friendly material substitutes.

Under the direction of Professors Robert Pomeroy and Michael Burkart, the group stresses how crucial it is to create plastics that don't produce persistent microplastics over the course of their lives. Their polymers made of algae are put through a testing process, which confirms their exceptional biodegradability as compared to plastics made of petroleum. Knowing the science underlying biodegradability emphasizes how crucial it is to choose materials that support environmental objectives. Although biodegradable plastics have potential,

appropriate disposal circumstances are necessary for them to reach their full potential. People can help create a more environmentally friendly future by adopting biodegradable products and making sure that proper waste management procedures are followed.

Aduro Clean Technologies Provides Results on Testing of Hard to Recycle Crosslinked Polymers

Aduro Clean Technologies Inc. ("**Aduro**" or the "**Company**") (CSE: **ACT**) (OTCQX: **ACTHF**) (FSE: **9D50**), a Canadian technology company using the power of chemistry to transform lower value feed stocks, like waste plastics, heavy bitumen, and renewable oils, into resources for the 21 century, is pleased to share exciting results from preliminary tests achieved with deconstructing cross-linked polymers, using the Company's Hydrochemolytic™ Technology.



Cross-linked polymers are pivotal to numerous industries, thanks to their exceptional durability, chemical resistance, and mechanical strength. They are integral to many products ranging from automotive tires to household adhesives, protective coatings, and medical devices. Their critical applications span sectors such as aerospace, automotive, construction, and electronics, where their unique properties are indispensable. Roughly 2.5 million metric tons of XLPE is produced annually representing a $6.4 billion industry growing at 6.5% CAGR to $8.7 billion by 2028.

However, the same characteristics that make cross-linked polymers so valuable also create significant recycling challenges. Unlike thermoplastics, these materials do not melt under heat, making them difficult to recycle by traditional technologies. High-temperature technology processes typically result in char and fuel gas, which are unsuitable for repurposing into new materials. This challenge underscores the pressing need for innovation in chemical recycling technologies.

On March 27, 2024, Aduro announced it engaged with a building materials manufacturing company to investigate the fate of cross-linked polymers under Hydrochemolytic™ conditions. The client provided a sample of cross-linked polyethylene (XLPE), a waste stream from its local production facilities, on which Aduro investigated the application of its proprietary technology for chemical recycling of this difficult-to-recycle material.

Aduro is excited to report promising results from the preliminary tests with yields up to 84% of lower-molecular-weight hydrocarbons, predominantly in the C8 to C28 range. These results confirm the effectiveness of HCT in breaking down complex polymers like XLPE, which have high thermal stability and complex decomposition pathways, into valuable hydrocarbons.

This work not only solidifies the Aduro pathway into the building materials sector, but also opens the door to very sizeable markets for cross-linked polymers to be recycled. Now Aduro considers tire rubber and elastomeric materials as additional potential feedstock to demonstrate the versatility of HCT in chemical recycling of polymeric materials.

Accordingly, the Company is actively engaged in discussions with potential engagements in these sectors. "This milestone confirms our preliminary assessment that we can provide customizable solutions tailored to industry specific requirements. We were able to transform XLPE waste into high-quality liquid hydrocarbons, with an impressive conversion yield, enhancing the material's lifecycle and providing a reliable feedstock for refineries. This development addresses a critical challenge in the industry and opens new avenues for sustainable material management," commented Eric Appelman Chief Revenue Officer at Aduro.

"We established our customer engagement program to work directly with our clients to investigate and develop solutions for their specific needs," commented Ofer Vicus, Chief Executive Officer at Aduro. "The results from the cross-linked polymer tests are very exciting. It is another example of the ability of HCT to deconstruct and create value from hard to recycle materials which have proven to be challenging for traditional approaches."

Formosa Plastics Corporation, U.S.A. Unveils the Largest Horizontal Polypropylene Reactor in North America

LIVINGSTON, NJ (May 17, 2024) – Formosa Plastics Corporation U.S.A. is thrilled to announce the launch of its groundbreaking Polypropylene production unit at our Point Comfort, Texas facility, marking a significant leap forward in our commitment to innovation, and customer satisfaction. With a capacity to produce an impressive 550 million pounds of premium-quality polypropylene annually, the new unit represents a milestone achievement in our journey towards meeting the evolving needs of our customers across diverse industries. Capable of producing a full grade slate of polypropylene; including homopolymer, random copolymer, and impact copolymer. Adding to our innovation will be a side feeder, capable of incorporating up to 20 percent additional recycled content and impact modifiers. with a commission date third quarter 2024.

Small Batches, Big Success

Author: Jim Callari (Editorial Director, Plastics Technology)

With no minimum order and an impeccable record of on-time delivery, Precision Color Compounds is becoming a force in the color master batch business.

It's been said that he who hesitates is lost. Ten years ago, Erik Grotness didn't hesitate, and now he isn't lost. Grotness, at the time a partner of an automation company he co-founded, saw an opportunity to buy a fledgling color compounder and pounced.

Today, Precision Color Compounds, Fort Wayne, Indiana, is an ISO-certified operation that produces color master batches to specification and focuses on speedy turnarounds and low-volume orders. Erik Grotness and his wife, Christiane, are equal partners in the business.

Grotness, the company's president and CEO, recalls, “At the automation company, I started a division for plastics and plastics machinery in 2003, and so I knew the industry. The original founders of the company had backgrounds in polymers and compounding, but they were unaccustomed to how startups work. It can take a long time before you get that first paycheck, so nine months in, the original owners were looking for a way out. It so happened that one of the original owners approached one of my best friends and he made me aware of the opportunity. Basically, I saw a young company that really hadn't gotten started yet, and it interested me a lot because I really loved the people that had I met up to that point in the plastics industry.”

Initially, Grotness had four partners, but over time he bought them out. But the real challenge he faced at the onset was to how to make the company he just bought successful. “The funny part is that I thought I'd be approaching it from an engineering point of view, and once I realized all the chemistry that's involved, I thought, 'Oh boy.'”

Erik Grotness and his wife Christiane got into the color master batch business about 10 years ago with the purchase of Precision Color Compounds. Source: Precision Color Compounds

Fortunately for Grotness, the former owners brought with them seasoned technical people, including key personnel in the lab and in production. And many are still with him. “I remember one of our first meetings with the technical staff,” he says. “One of them was talking about an order and mentioned the LDR. I said, 'Ok, what's LDR?' I learned it stood for letdown ratio. And then I learned what that meant. And that's, to this day, the great thing about people here and about people in plastics in general. They love what they're doing, and they love to share their knowledge.”

Grotness adds, “Being smaller, it wasn't like I had to walk 200 yards to the next office to try and get this kind of information. At the beginning especially, the team was all within a stone's throw of each other, so we talked a lot and I got a lot of education from people that have been in the business 25-40 years.”

What Grotness also found to his liking was Precision Color's value proposition serving that portion of the market that needed high-quality, small-batch orders delivered quickly. It's a good thing because, at the time, the company had smallish (three 34-mm twins, one 89-mm single screw), refurbished machines that Grotness says, “were old as rock,” and weren't positioned to run high volumes anyway.

“I quickly realized that was a good place to be, selling service, quality and speed. The automation company I was at worked that way, so I was comfortable with that mindset and knew it did well in good time and tough ones. And, in the color master batch business, I figured I can't get a patent on this red or that orange, so let's position the company as one that delivers a great product, made to the customer's precise specifications and only the amount needed, and deliver it as promised.” Not only is there a value in that proposition but Grotness soon realized there was a need.

“Before I bought Precision Color, I spent a lot of time in the field talking to customers,” he recalls. “And the more I spent, the more I heard that service was a problem in the industry. The color master batch business was changing. Bigger companies were buying smaller ones, and they were buying bigger and bigger machines so they could focus on the high-volume markets. We joked that most of our competitors would do a small order 250- or 500-pound order as a favor to a customer. The only small line they had was maybe in the lab. Everything else was churning out maybe 2,000 pounds/hr.

“On a big line, on a 250-pound order you'll probably make 250 pounds of scrap, just to get those big screws turning, before you make your first sellable pellet. So, right off the bat, the bigger companies are going to lose money on an order of that size. But that's our sweet spot.” Precision Color offers 7 - 10 business day lead times; 48 - hour color matching (upon request); and no order minimums.

Notes Grotness, “Think about it. With our location, we are in the epicenter of the plastics processing market. There is a lot of prototyping going on in the Midwest. A company in prototyping is not going to want to buy 500 pounds of material because it will be sitting on the shelf for a very long time. The good thing about concentrates is that they are easy to transport. There have been times where we've had a 100-pound order for a customer as much as a couple hundred miles away, but their delivery needs suddenly changed and they've called us and let us know they really need all or at least a partial of the order ASAP.

Over the past two-and-a-half years, Precision Color has expanded the capacity of its master batch production by adding new lines.

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Most times we've been able to squeeze in what they needed in production because of our frequent color rotation, put it in a car or truck and say 'ok, you drive toward me, I'll drive toward you, and we'll meet halfway.” Notes Tom Gavinski, Precision Color's national sales and marketing manager, “So many of our customers tell me 'we really enjoy the fact that, when we call, somebody picks up the phone.' Or 'I always hear back from you guys within an hour.'”

At Precision Color, the company changes orders an average of 3-4 times a day. On some occasions, though, that could amp up to 2-3 times per line, depending on the order quantity. In a perfect world in the color master batch business, Grotness notes, product runs would be scheduled light to dark to help streamline the changeover process. “If our

customers gave us their orders three months ahead of time, we could stagger them that way, but that's not reality."

So, Precision Color takes another approach, tackling product changeovers with a pit crew mentality. Grotness explains: "In earlier years, I was fortunate to have a friend who was a sponsor for (legendary driver) A.J. Foyt, so I spent a lot of time with IndyCar racing. On our plant floor, we have a large photo of A.J. Foyt's pit crew in action to remind us of our pit crew mindset. But just like in IndyCar racing, in color master batch production, not only do you have to be fast in color changeovers but you also have to be right. We know that if you leave one little speck of red hanging in the machine and you want to start running a white, well you just made pink, and now you're just throwing the whole thing away. And we focus a lot on training so that all of our operators can work interchangeably on all the machines we have."

As part of this training, which involves in-house instruction from Leistritz Extrusion, the company's primary supplier of twin - screw compounding machines, one of Precision Color's operators is a "floater" who is cross-trained so that he/she can help execute a change on any machine the company has. Grotness explains, "A color change involves not only the extruder but everything downstream — the feeder, pelletizer (Precision Color runs both strand and underwater) and the classifier. Having a floater be familiar with all this equipment on all lines has allowed us to cut color-change times in half in some cases.

Changes typically involving purging and complete screw pulls. Says Grotness, "We have evolved to where we're testing purges and verifying which purges work best on each machine. And it's not always the same purge. On some lines, it might be a mechanical purge, and other a chemical purge. And we're evaluating hybrids now and we're getting close to choosing one. But then in six months, we'll reevaluate."

The pit crew mentality also enables Precision Color to handle those last-minute requests that are typical in the master batch business. Says Grotness, "Our business model is not, for example, looking for orders that will constitute a three -, two - or even one - day run. Our business is being nimble and shifting quickly from one order to the next. Our manufacturing staff understands the mentality and they'll always figure out ways to sandwich in that 50 -, 100 - or 200 - pound order that the customer needs right away and make suggestions during our daily production meeting. We can do a lot of things like that because we're in and out of so many different colors during the day."

Adding Capacity

Precision Color has invested more than $2 million over the last two and a half years to expand, to the point where when asked about his manufacturing footprint, Grotness noted that it's changing so quickly that even he has issues putting a number on it. He did divulge that the company just added 15,000 square feet of manufacturing capacity and is now in talks to add more. Precision Color's capacity these days is around 9 to 11 million pounds, but that would be in 'ideal' situations, and those don't exist. "In our position in the market, realistically stating an accurate capacity is not possible.

We run so many orders with multiple different compounded additives, speckles, pearls, fluorescents, etc., all with different LDRs, so depending on the order you may or may not be able to run at the machines 'stated capacity,' Grotness says. "In order to always have enough flexibility, however, our goal is to never use more than 80% of our capacity on a regular base. Meaning, if our lines continually are full, we add more capacity."

Precision Color still runs one of the older machines Grotness inherited when he bought the company, but it has added two new 27-mm twin-screw lines from Leistritz Extrusion, as well has an 18-mm lab line. This year, it is considering adding either another 89-mm and/or perhaps a smaller machine. It also has a single-screw extruder that is uses for PETG color master batch. Says Grotness, "We're now more successful, so that we're planning to continue to buy new, not possibly buying somebody else's problems and then trying to keep it running. We've settled on Leistritz as our primary supplier. We're very happy with their technology and especially their support and service."

Precision Color will integrate the extruders in - house with all upstream material handling and downstream, most likely underwater pelletizing and classifying equipment. "We have also added an ECON NWA400, a hybrid pelletizer which can shift from underwater to air pelletizing, in order

to process bio resins which are hydroscopic in nature in order to make sure we have the capability to handle most anything our customers might need," Grotness adds.

In terms of adding the bigger machines, Grotness notes that two is better than one. He elaborates, "For those orders in the 5,000-10,000 range, while we don't get that many of them, we get enough so that we don't want to risk a larger order monopolizing a smaller machine. So, we'll put them on the bigger machines and keep those machines sacred for the larger orders." The color concentrate compounder runs one shift, though Grotness anticipates that could change over time.

A fully instrumented lab ensure color master batch is compounded to specifications.In the view of Gavinski, a seasoned sales professional who has worked in the sheet and profile extrusion business in his career, these larger orders are usually made possible by successfully executing a smaller one. "Typically, when we go in and talk to a new customer, they will tell us that they work with three or four different color concentrate houses, and we'll say that's great because our spot is the small applications. But a lot of these small applications tend to be unusual.
We might get asked if we can do 25 pounds of a yellow in acetal. The answer is yes. But over time, when you perform like you said you would, these kinds of orders graduate to more and more business. So that's the journey we're on now. If we can get the 25-pound order, it's amazing how quickly 25 becomes 50 becomes 100 pounds, and it kind of goes up like that and suddenly we're running a new material that five years ago we didn't even know how to spell."

While Precision Color has the expertise to compound using any type of polymer system, most of its business to date has been polyolefin-based. In the last year, though, it has added capabilities to handle biopolymers and can run a wide range of engineering resins. Its customers range from custom molders to profile extruders to prototype operations. Gavinski notes that the company's growth can be attributed evenly from new and existing customers. "There have been some decisions made by some of our competitors that have caused the customers to just shift more business to us because we are not difficult to work with. There are customers we got where the bigger color houses didn't want to fill their 50-pound order. They'd give them the price for their 250-pound minimum order. When they come to us, not only do they get the 50 pounds they need but they also get it the next week. So, with a molder, for instance, they are not only getting color quicker but are able to produce parts quicker.

"We're in the high 90% in terms on-time delivery, and it's really remarkable for plastics because 8 - to 10 - week lead times just don't work for a lot of people. We rarely miss a delivery date."

Adds Grotness, "Color is so important, yet it's generally the last thing people think about. In molding, the customers think about the machine, the tool and a lot of other things. No one in plastics gets to work and turns on the computer first thing and says, 'Let me call Precision Color and see what they are up to today.' But we are going to be there when you need us. It is 100% the people, our team, and we get everybody involved. Sometimes one of our lab people will make a delivery because we want our customers to feel comfortable with multiple people in the company. Our most important asset walks out the door every night."

Biomass-balanced PBAT for Compounding of Bioplastics for Packaging

Renewable feedstock has replaced fossil feedstock in BASF's 'industry-first' biomass-balanced ecoflex PBAT.

Said to be an industry-first is BASF's latest expansion of its ecoflex, polybutylene adipate terephthalate (PBAT) portfolio of certified compostable bioplastics for the packaging industry, often used in the compounding of bioplastics, which increases the use of renewable feedstocks. The new biomass-balanced (BMB) ecoflex F Blend C1200 BMB, is produced with renewable feedstock versus the fossil raw materials that are typically usually used in the production process at the beginning of the value chain.

Finally... a Dryer that Learns Resin Moisture for Perfect AI-Drying

New AI Powered DryerGenie takes the Guessing Game out of Resin Drying.

The drying process has been a guessing game all because we never knew the resin's starting moisture point... until now. The all new **DryerGenie resin-moisture analyzer** sits above the dryer hopper and measures the moisture level of the incoming material in real time, then adjusts drying time based on the dryer being used.

The DryerGenie now goes a step further by placing a drying process scanner within the hopper to measure temperature and intergranular humidity within the hopper to pinpoint efficiency of the dryer.

Image 01: DryerGenie calculates the starting moisture level of the resin to more accurately determine the time it will take the material to dry.

Image 02: A process scanner inside the drying hopper constantly monitors the process and makes AI-powered adjustments as needed to airflow, dew point and temperature.

Break Free From Time-Based Drying's Wasteful Grip
The DryerGenie takes aim at long-held industry "cookbook" practices of drying resin based on time. Throwing away the resin company cookbook and instead relying on real-time moisture readings and dryer adjustments could very well result in **increased capacity** utilization of molding machines.

Introducing a Completely New Way to Dry Resin

- Automates your drying process
- Assures perfectly dried resin
- Dries in the least amount of time
- Dries with the least amount of energy

COLLIN Lab & Pilot Solutions Present Flat Film Line with Coextrusion at NPE 2024

Key Highlights:

- At NPE 2024, COLLIN presented a flat film line capable of producing 2-layer films with additional features like extruded strips.

- The brand - new COLLIN FI film inspection system uses advanced software to continuously detect optical defects in up to 10 error classes.

- The COLLIN P Professional Roll Mill series is ideal for complex testing and battery production, offering high reproducibility with motor-driven gap adjustment.

"At the NPE 2024, as exhibition highlight, COLLIN Lab & Pilot Solutions presented a flat film line with numerous features in live operation. With this line, our customers can produce 2-layer films plus extruded strips. Moreover, showed the COLLIN Roll Mill W 150 P, which is perfectly suitable to produce batteries," said DI Dr. Friedrich Kastner, CEO / managing partner COLLIN Lab & Pilot Solutions GmbH.

"A TEACH LINE flat film line as well as a TEACH LINE blown film line can also be seen at our booth, and, of course, also machines and components of our affiliated companies of the NGA group."

One of the central parts of the COLLIN flat film line is the 400 mm multi-manifold die of the affiliated company COMELT. This die convinces by high flexibility – that means, different materials with different viscosities resp. with different melt temperatures can be processed.

Further essential modules of the flat film line are a horizontally or vertically adjustable Chill Roll CR 400 with smoothing roll, two winders, edge cutting, tempering devices, additional heating packages as well as a completely new COLLIN camera inspection FI.

New, COLLIN film inspection with practical post-processing tool

The COLLIN FI film inspection by camera and software is used for continuous film defect inspection. As high - quality test line, it detects optical defects via a definition of up to 10 error classes by means of up to 14 error criteria in a running flat film line.

"The COLLIN film inspection is brand-new. It mainly convinces by the practical post-processing resp. the software, which was programmed especially for this purpose. Thus, our customers can modify the evaluation criteria even if the run has already been finished and can evaluate the existing data," explained Corné Verstraten, CSO / joint partner COLLIN Lab & Pilot Solutions GmbH.

The height adjustment as well as the modular design of the flat film line are further advantages for COLLIN customers.

Testing roll mill COLLIN LAB LINE Roll Mill W 150 P ideal for battery production

The COLLIN P Professional series roll mill – which is also shown at the booth – is characterized by high reproducibility and is designed for more complex tests in the laboratory. Used for mixing, plasticizing, kneading, or sheet forming, the COLLIN testing roll mills are equipped with a motor-driven gap adjustment. The machines can be used as stand - alone unit or as downstream equipment. Among other things, COLLIN rolls mills are ideal lines for the development as well as the production of batteries.

TEACH LINE blown and flat film line – very compact, easy to handle table - top machines

The COLLIN TEACH LINE blown film unit BL 200 is a compact and easy to handle unit for the production of blown films made of all standard polymers. The machines are primarily used for training, quality assurance, tests and trials as well as in pre-development. “The advantage for our customers is that these compact table systems can be operated with minimal material input. The blowing system is available with a mono or multi - layer die and impresses with the smallest, extremely uniform blown film.”

In compact design, the TEACH LINE flat film line unites the well-known functions of a cast film line with those of a small smoothing calender. The system is ideally suited for smoothing or laminating films and casting low-viscosity masses with a vertical die. Via pneumatic cylinders, the upper of the three rolls is designed to be moveable and enables to smooth films. The gap width can finely be adjusted. If the upper roll is swivelled up, the unit can be used for casting of thin films.

The table systems also impress with their modularity; they can be easily combined with other TEACH LINE machines or extended by them. Raw material or masterbatch manufacturers, compounders and

refiners, processors, universities and institutes as well as companies in the medical, pharmaceutical or recycling sector rely on COLLIN TEACH LINE systems.

Shibaura Machine, NFM Extend License Agreement on Twin-screw Compounders

Japan's Shibaura Machine Co., Ltd. and NFM Welding Engineers Inc. have extended their license agreement concerning the former's TEM Series compounding extruder technology.

As a result, the machines will be manufactured and sold by NFM for a 10 years. The deal was announced during NPE2024. The TEM technology includes co - rotating intermeshing twin - screw extruder models designed around the industry standard 1.55 D/d ratio, including the TEM-S, TEM-SS, and TEM-SX providing specific torque values of 10.0, 13.1, and 18.1 Nm/cm3 respectively.

Additionally, Shibaura and NFM also offer the TEM-DS model offering an increased 1.8 D/d ratio for higher volume applications. Shibaura Machinery is a long-established machine tool manufacturer that celebrates its 75 year anniversary this year. The company originated from Shibaura Seisakusho, the predecessor of Toshiba Corp.

Ohio-based NFM is an industry leader in the design and configuration of extrusion equipment, specializing in custom engineered turnkey systems for the plastic and rubber industries. In addition to the TEM Series co-rotating intermeshing twin-screw extruders, NFM offers their WE Series of counter-rotating non-intermeshing twin-screw extruders as well as their HSX-II and HRX-II single-screw extruders for plastics and rubber applications.

NFM also provides parts, repair and refurbishing services for any OEM extruder and their components, global field service, and an in-house pilot plant for process development and lab trials.

How AI is Revolutionizing Resin Conveying

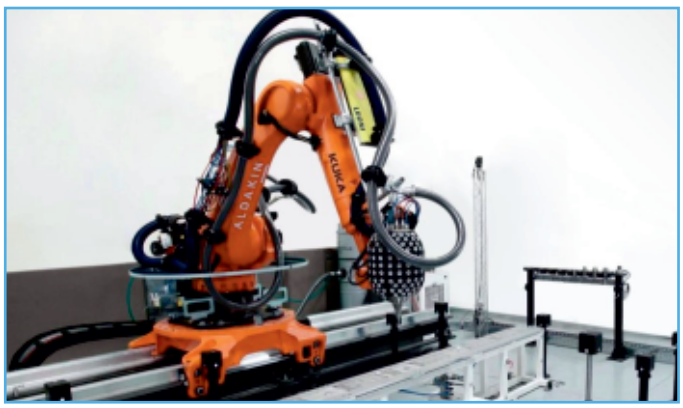
Conair's patented Conveying with Optimizer system, which utilizes artificial intelligence (AI) to overcome resin conveying issues automatically. Conveying with Optimizer uses valves, remote sensors and AI to eliminate conveying challenges that operators face daily throughout the plant.

With this new fully - retrofittable solution, interruptions like clogged filters, air leaks, changes in density or distance, moisture changes, and operators making manual adjustments can all be eliminated with Conair's Conveying with Optimizer.

IDEKO Introduces Robotic Solution for Precise Machining of Composites

Key Highlights:

- The Spanish research centre IDEKO has developed a technology that aspirates harmful particles generated during cutting processes of carbon fibre or glass composite materials.
- Designed in the European Fibremach project, the equipment provides an increase in precision and efficiency in machining and integrates a monitoring system that acts during the process to guarantee the quality of the parts.
- The European Association for Manufacturing Technologies (CECIMO) has awarded the project in the first edition of the Machine Tools Innovation Award.



Manufacturing Technologies (CECIMO) has awarded the project in the first edition of the Machine Tools Innovation Award.

Carbon or glass fibre composite parts are becoming increasingly common in sectors such as aeronautics, automotive, construction and wind power due to their lightness and high strength. For example, in electric vehicles, these composites allow the car to be lighter in order to reduce consumption.

For precise assembly of these parts, it is necessary to cut and drill the composite parts. However, during these machining processes a large amount of dust is generated which is harmful to health and can cause respiratory difficulties, dermatitis, conjunctivitis and some of the chemical components are even classified as potentially carcinogenic.

There are currently two methods for carrying out these machining processes. One is by milling machines, which offer high precision but require considerable investment. The other method involves manual operations, with a consequent reduction in precision and increased exposure of the operators to toxic dust, noise and vibration.

With the challenge of limiting this exposure as much as possible and offering the European manufacturing industry a cleaner and safer machining alternative, the IDEKO Spanish research centre has developed and validated within the framework of the European Fibremach project a new robotic solution capable of machining composite parts with the required precision and with a reduced investment.

The equipment also incorporates a patented technology by IDEKO in the workhead that allows 100% of the toxic dust particles to be sucked from the tool itself, preventing them from floating in the air.

"The dust produced in these processes is not only harmful to people, but also to the useful life of the machines themselves due to its abrasive and electrically conductive properties. In the long term, this dust ends up damaging the mechanical components of the machines and can cause faults in the electronic systems, which is why it is essential for these manufacturers to have a solution with these characteristics," highlighted Asier Barrios, IDEKO's project manager.

Precision and control

The chip and dust extraction technology is just one of the innovations developed during the project, which has resulted in a more precise and highly productive robotic cell for machining composite materials.

IDEKO's four research groups have also worked on improving the precision and control of the robot machining process to meet the needs and demands of the manufacturer of composite parts. IDEKO developed an artificial vision system that increases the robot's precision, using various cameras and photogrammetric algorithms.

"The developed robot continuously and at high speed corrects its position and orientation based on camera measurements. This allows machining with an accuracy of between 0.1 and 0.2 millimetres over the robot's entire working area, which improves the robot's accuracy by a factor of four times its original capacity," added Asier Barrios.

In addition, to guarantee the quality of the machined parts, a continuous vibration monitoring and control system has been developed. The vibrations generated during machining are measured and analysed by means of sensors integrated in the robot. If excessive vibrations are detected, which can be caused by poorly clamped tools or worn tools, the robot automatically modifies its feed and rotational speed of the cutting tool to reduce vibrations and prevent damage to the workpiece.

All the information on the status of the robot and the machining process is thus recorded in the cloud. This information can be consulted to analyse exactly how each part has been machined, and even allows the integration of Artificial Intelligence functions that work on the data in the cloud to optimise productivity.

This robotic architecture offers the possibility of easily scaling the solution by adapting the created systems to robots of different sizes to meet the need to machine parts of varying volumes. "This will enable companies that manually mill, rechamfer, and drill composite parts, to adopt a robotic solution that protects their workers and increases productivity," concluded Barrios.

Top 5 All-electric Injection Moulding Myths: Reliability and Repairs

Source: Interplas Insights - Dated 21st May 2024

Key Highlights:

- Mean Time Between Failure (MTBF) is one of the simplest reliability measurements for polymer processors, measuring machine availability, and helps with the planning of maintenance schedules, as well as capacity planning.

- The savings when switching to all-electric are instant and can often be significant. Because each axis of an all-electric injection molding machine is independently controlled, parallel functions are possible.

- Regular thermal imaging checks of electrical cabinets can give an early indication of impending component failure and are a quick and cost-effective way to spot potential issues early on.

All-electric injection moulding machines have many excellent qualities, including greater precision, higher power density and lower carbon emissions. Yet there's a preconception that these systems are more expensive to repair. Ashlee Gough, area sales manager at Sumitomo (SHI) Demag UK delves into and discredits the top five myths regularly encountered.

1. Capacity planning is a moving target

Struggling to stay on top of everything is one of the greatest challenges for production engineers. Yet, Mean Time Between Failure (MTBF) is one of the simplest reliability measurements for polymer processors. It is also probably the most valuable KPI for equipment-reliant operations as it provides an accurate method for measuring machine availability, and helps with the planning of maintenance schedules, as well as capacity planning.

This MTBF metric is not just attributed to the machine design, but also how well an operative repeatedly handles or interacts with this valuable asset. A poorly executed repair job or implementing a quick fix and running the machine until it finally goes bump can just as easily result in a low MTBF result.

2. Same or similar service time

Electric machines are less mechanically complex. With no flexing of hoses, no sensitive valves, perishable seals or hydraulic fluid, the risk of an emergency callout is significantly lower.

Studies conducted by Sumitomo (SHI) Demag revealed that a 130 ton hydraulic machine operating 24/5 needed 39 hours of routine service work, compared to just six hours for an equivalent IntElect2 model.

Analyzing and treating oil in order to maintain its optimum properties, as well as changing the oil filter, are essential routine maintenance task on hydraulic systems. The timing of these tasks are critical and any delay or neglect can drastically increase the risk of machine failure. Performing a filter change to the proper standards realistically takes a couple of hours. If an oil change or complete flush through is required, this not only results in unplanned downtime but also comes at a great expense.

Additionally, hydraulic hoses should be regularly inspected. It is recommended that they are replaced every ten years. Contamination and airlocks are always a danger when replacing hydraulic hoses. Because of this, it is recommended that this work should be undertaken by a professional.

Hydraulic machines with accumulator technology should ideally have the bladder replaced periodically. Inspecting the accumulator housing for cracks every ten years using x-ray is equally advisable.

3. Drives are expensive to repair

Typically, all-electric machines have the reputation of being expensive to repair when they go wrong. This view is often based on the cost of replacing an entire drive system. Many molding machine suppliers source their all-electric drives from external OEMs, which makes it more challenging to source component replacements, exchange or access service support.In the best-case scenario, molder's might be able to source and switch out a power or control module. Yet in most instances, sourcing a new complete drive is the reality, which of course, runs at a premium cost.

That's one of the key reasons why Sumitomo (SHI) Demag has an R&D center dedicated to drive development and designs and builds its own drive motors, designed purely for injection molding machines, in-house. Being able to source individual replacement boards is a more sustainable solution for customers. Spares are also held for immediate shipment.

Drives that are designed to be modular are also much more cost efficient. Why replace three power modules, when you can replace just the one that's failed? It can be the difference between several hundred pounds and a quick fix, rather than a complete drive replacement which could run into a few thousand.

4. Infrastructure savings takes a long time

The savings when switching to all-electric are instant and can often be significant. Because each axis of an all-electric injection moulding machine is independently controlled, parallel functions are possible. This means that they can perform multiple tasks at once, for example ejection during mold opening or ejector retraction during mold closing. Resulting in faster cycle times which significantly increases productivity, output and component quality.

The increased efficiency delivered by direct drives means that they use considerably less energy than hydraulic machines – in the case of the IntElect between 40% and 85% less than conventional solutions. As electric drives generate less heat than their hydraulic counterparts, they require less cooling than conventional machines of a similar size. Additionally, the recovery of kinetic energy while the clamping unit is braking generates energy which can be used for plastification.

This not only reduces the burden on existing infrastructures but also lessens the investment when building or relocating to new premises.

5. Wear and tear is a guessing game

Reducing costs, risks and disruption are high on the priority list of many molders aiming to achieve optimum processing efficiency, with machine reliability being the most influential factor.

Regardless of machine type, it is imperative to monitor and routinely service moving parts, e.g. toggle systems, seals or bearings, which are subjected to varying degrees of wear and tear. It is often easy to identify wear on mechanical components via sensory diagnosis - surfaces may appear worn/scored, it may sound out of place or it may smell "hot". However, electrical systems can often be overlooked as it can be very difficult to diagnose wear on electrical components such as electrical drives, motors, contactors, relays and PCBs. A molder often won't be aware of an issue until the machine stops. Thermal imaging offers a big advancement in this area.

Regular thermal imaging checks of electrical cabinets can give an early indication of impending component failure and are a quick and cost-effective way to spot potential issues early on.

The use of thermo graphic equipment for condition monitoring is included in Sumitomo (SHI) Demag's annual activeCare check. Rather than a 'best guess' diagnosis, activeCare engineers can assess the collected data and determine when equipment or parts are likely to fail in service.

The biggest mistake molder's can make is discounting high-performance all-electric machines on price alone. The price difference between hydraulic and all-electric injection molding machines has dropped considerably over the past 15 years. When considering the potential energy savings, productivity improvements and prolonged reliability, further total cost of ownership savings can be realized.

For all-electric machine service costs, the studies speak volumes with the facts outweighing the fiction.

How to Clean and Maintain Molds with Intricate Conformal Cooling Channels

A water-based, eco-friendly plastic mold cleaning system helps Rankine - Hinman Manufacturing restore flow rates and avoid big-ticket failures on complex and costly molds.

The custom cart at Rankine designed for transporting molds and connecting to Eco-Pro for cleaning. Source (All Images) | iD Additives

Mold cleaning is one of the most essential steps in making plastic products. When those products include sensitive medical devices created via molds featuring intricate conformal cooling channels, those molds require a cleaning system that is just as precise. That's why Rankine - Hinman Manufacturing, based in St. Augustine, Florida, which services the unconventional molds of a leading plastics healthcare molder among other customers, relies on the Eco-Pro XL system of mold cleaning carts and cleaners from LaGrange, Illinois' iD Additives. Initially used to restore the function of clogged molds, the Eco-Pro system is now used for preventive maintenance (PM).

Addressing Zero Flow - Through

Rankine-Hinman owner and President Bryan Hinman explains that clogged cooling lines can cause parts to stick in the mold. To make matters more challenging, the molds used to produce a tiny, thin, curved part also feature uniquely shaped cooling channels that surround the part in hard-to-reach areas to ensure heat is removed evenly.

Rankine's healthcare customer puts flow meters on all of its mold cooling channels and found several channels with zero flow-through. The customer researched solutions and purchased two iD Additive Eco-Pro carts in 2018 and the results were immediate. Using flow rates of up to four to five gallons a minute, the benefits became obvious quickly. “One mold took 16 hours to break free, but Eco-Pro did the job,” Hinman says.

The customer demonstrated the Eco-Pro on six molds before turning the system over to Rankine, which has supported various production needs for this customer for more than 25 years. Hinman adds that the customer sends molds to Rankine when a mold's flow rate falls below a certain threshold. “They tell us it is a significant improvement each time Eco-Pro is used.”

3GT molds (three-plate, gated, threaded) were the customer's main pain point prior to introducing Eco-Pro into the maintenance regimen. The customer initially attempted to clean the mold channels using ultrasonic baths and other methods but was unsuccessful due to a hairpin turn that made it impossible to insert a brush — or even a drill — manually. Eco-Pro saved the customer money by preventing corrosion in these molds, which are prone to leaking through a hot runner plate or a crack in the face plate. This prevention averted a $70,000 failure.

Moving from Repair to Prevention

Hinman explains that the use of the Eco-Pro system has recently evolved. “Setting up and running it right out of the box was easy,” he explains. “We just needed to ensure we had the correct fittings for the molds. We would attempt to flush and open up some channels. Before and after this process, we'd take measurements to verify the mold's function.” Rankine-Hinman has seen what the Eco-Pro system can do to clean molds. With this technology, the customer is even performing more PMs to prevent restrictions in the lines.

Flow meter readings: Gallons per minute (GPM; flow rates) are displayed on top, showing a 114% increase in flow. The bottom number is the user-set target GPM, adjustable to any desired value. Upon reaching the target, the light on the right turns green.

Over time, Eco-Pro's ease of use has greatly streamlined cleaning times for this customer.

“They've reduced the amount of attention they give to cleaning to the point where they can hook it up and trust that the chemical will do its job. It may require monitoring, but they no longer have to constantly monitor it,” Hinman explains.

The company will revisit it after it's been running for 45 minutes to an hour, then run water through and check to see if there's any difference. If they don't see a significant improvement or the numbers they want, they hook it back up and let it run a little longer.

"We've flushed two or three molds a week now. We have a truck going back and forth to that customer and I know they can count on us and the chemical to service all of their molds."

The customer also periodically checks the filters to monitor the contents of the discharged water. During the flushing process, they open a line and inspect the water to identify any changes. This enables them to distinguish between what has been broken up in the channels and what is coming out of the molds.

"While they trust that the chemical is effective, they also rely on visual inspections to ensure that the discharge and water are being cleaned properly," Hinman says. "They tell us they even put their hands on the hoses and feel everything running through the channels to ensure that everything is running smoothly."

Cleaning System and Service

The Eco-Pro system consists of an air-operated cart that uses the Eco-Pro 360 chemical and can accommodate injection molds, blow molds, feed sections, Thermolators (TCUs), chill rolls and more.

The system is equipped with an air diaphragm pump, ensuring that every shop has accessible air and providing safety by allowing the system to pause during pressure builds, thereby avoiding downstream line ruptures. The key advantage of this chemical is its ability to be reused; some current users have been able to flush with the same chemical for up to five years, thanks to the built-in filtration feature of the cart.

Eco-Pro can also clean customers' heat exchangers, enabling them to be reused instead of thrown away. Because the Eco-Pro flushing chemical is water-based, environmentally friendly, non-aerosol and nonflammable, it even removes and prevents rust by providing a protective nanocoating. It works on all metal surfaces without etching.

Notably, training operators on how to use the machine doesn't take long. While there is some training involved, it's for a relatively simple machine and doesn't require extensive time.

The iD Eco-Pro 360 System is a preventative maintenance (PM) cleaning system featuring a pump and filter combination unit. It effectively removes, protects and helps prevent rust in various components including cooling passages, heat exchangers, waterlines, TCUs/Thermolators, chill rolls, chill rails, feed sections, tools and more.

When consumables like filters and chemicals are required, Hinman and his customers can count on prompt customer service from iD Additives. "They pull up our information, and the product is usually on the truck the next day — sometimes on the same day, depending on how early they get the call."

Rankine-Hinman performed a complete hose replacement about a year ago due to the amount of chemical they ran through it, and a package of hoses of the correct lengths arrived quickly. "We essentially got a new machine after replacing all the hoses," Hinman says.

Ultimately, Eco-Pro has been a most welcome addition to the mold cleaning partnership between Rankine and its top-tier healthcare customer. "We've flushed two or three molds a week now," Hinman adds. "We have a truck going back and forth to that customer and I know they can count on us and the chemical to service all of their molds." Hinman believes that Rankine-Hinman will be expanding this operation soon, and anticipates an additional system to keep up with demand.

PepsiCo Plant in Spain to go Net-zero Globally by 2025

Key Highlights:

- PepsiCo's beverage plant in Northern Spain aims to become the company's first plant globally to reach net-zero emissions by 2025, thanks to the electrification of its operations, eliminating 1,849 tonnes of CO2 per year.
- EUR 27 million has been dedicated to innovation and sustainability projects in the plant over the last five years.
- This initiative is part of PepsiCo Positive's strategy for a positive value chain and wider end-to-end strategic transformation.

PepsiCo announces that its beverage plant in Northern Spain aims to become the company's first plant globally to reach net-zero emissions by 2025.

The beverage plant, in Álava Basque Country, which produces iconic brands such as Pepsi, as well as local brands KAS and Bitter KAS, aims to reach net zero emissions next year, thanks to the electrification of the plant's operations, leading to the elimination of 1,849 tones of CO2 per year.

The production plant has been using electricity from renewable sources since 2015 and now, thanks to this decarbonisation project, natural gas will be replaced by electric energy to reach the goal of 100% electrification of the facilities following a two-year pilot programme.

In addition to the EUR 5 million that was invested in the electrification project, PepsiCo allocated a further EUR 27 million over the last five years for improvement projects, both in terms of innovation and sustainability. This includes new packaging equipment, closer warehousing to avoid transportation, as well as the implementation of more efficient processes.

This milestone follows the launch of 100% recycled plastic bottles across the entire Pepsi range in Spain in 2021 and a new cardboard solution for grouping cans.

In addition, Spain has been a pilot for tethered caps one year in advance of the European regulation. This initiative is part of PepsiCo's end - to - end strategic transformation, PepsiCo Positive, which aims to reduce emissions globally by 75% in its direct operations and 40% in its indirect operations by 2030. PepsiCo aims for net-zero emissions by 2040.

Pol Codina, general manager of PepsiCo in Southwestern Europe, said: "I am tremendously proud that our beverage plant in Álava aims to become the first in our company worldwide to have net-zero emissions next year. This brilliant news coincides with a very special date for us, our 50th anniversary. We are aware that we still have a long way to go to decarbonize our entire value chain and, to do so, we hope to be able to count on the maximum collaboration of all our partners."

This announcement follows the opening of PepsiCo's most sustainable factory in Europe last year in Poland. The Środa Śloska plant uses new sustainability solutions that demonstrate aspects of a circular economy in action, such as collecting rainwater for reuse and generating its own energy via rooftop solar panels, with the plant set to be climate neutral by 2035.

CARBIOS and Hündgen Enter Supply Agreement for World's First PET Biorecycling Plant

CARBIOS (Euronext Growth Paris: ALCRB), a pioneer in the development and industrialization of biological technologies to reinvent the life cycle of plastic and textiles, and Hündgen Entsorgungs GmbH & Co. KG (Hündgen), a waste management expert in logistics, sorting services and the recycling of recyclable materials from waste mixtures, announce the signing of a non-binding Memorandum of Understanding relating to the sourcing, preparation and recycling of 15kt/year of post-consumer PET waste using CARBIOS' bio recycling technology at its first commercial plant in Longlaville, from end 2026.

The partnership will leverage Hündgen's expertise and network in the sourcing and preparation of light packaging waste collected from German households. This PET waste will be prepared into flakes ready for bio recycling using CARBIOS' enzymatic depolymerization technology, which produces food-grade PTA and MEG, further re-polymerized into PET.

The supply partnership with Hündgen contributes to securing the majority of CARBIOS' feedstock needs for its first commercial plant in Longlaville, France. This plant will have a 50kt/year capacity when it will be fully operational and is currently under construction. This latest sourcing announcement comes in addition to previously announced agreements, such as with Landbell Group for food trays from Germany, and the winning CITEO tender for trays in France. The location of the Longlaville plant is strategically close to nearby waste supplies in Belgium, Germany and Luxembourg.

Through its enzymatic depolymerization process, CARBIOS can process all types of PET waste, including waste that cannot be recycled with current technologies. Multilayered, colored, and opaque packaging waste as well as polyester textile waste now have circular recycling solutions.

ALPLA Joins Forces with Re-Purpose to Strengthen Plastics Cycle in South Africa

Key Highlights:

- The ALPLA Group and Re-Purpose announced a strategic partnership that will advance sustainable packaging solutions and strengthen the feedstock value chain of ALPLA's very first PET recycling facility in Africa.
- The partnership combines the recycling expertise of ALPLA and the innovative reverse logistics of Re-Purpose, creating a large number of jobs in KwaZulu-Natal and its neighboring provinces.

- From the beginning of 2025, the plant is expected to produce over 35,000 tons of recycled PET (rPET) annually.

The ALPLA Group and Re-Purpose have announced a strategic partnership that will advance sustainable packaging solutions and strengthen the feedstock value chain of ALPLA's very first PET recycling facility in Africa.

ALPLA is investing 60 million euros in the construction of a recycling plant in Ballito in the South African province of KwaZulu-Natal. Construction of the plant on the 90,000-square-metre site is well advanced. From the beginning of 2025, the plant is expected to produce over 35,000 tons of recycled PET (rPET) annually. Durban-based Re-Purpose is one of the market leaders in the reverse logistics of post-consumer plastic waste through source-oriented collection programs. With four material recovery facilities around KwaZulu-Natal,

Re-Purpose is developing and empowering local communities and buy-back centers to collect and divert a significant volume of plastic waste. The model is also creating hundreds of jobs and income for previously disadvantaged people.

The partnership combines the recycling expertise of ALPLA and the innovative reverse logistics of Re-Purpose. By joining forces, the two companies aim to develop innovative solutions and promote the circular economy. At the same time, a large number of jobs will be created in KwaZulu-Natal, neighboring provinces and potentially throughout the country.

Circular Economy and Waste Reduction

As part of the collaboration, Re-Purpose will maximize the utilization of its current baling centers and set up new centers to make it easier for people to collect PET bottles. Re-Purpose will also assist ALPLA in building a strategic supplier base for PET bottle bales and work with key stakeholders to expand community reach and separation at source programs. The aim is to contribute to the collection of 5,000 tons of PET per month. This volume is expected to be required for the full capacity operation of ALPLA's recycling plant from 2026.

"We are thrilled to partner with Re-Purpose to accelerate our journey towards a more sustainable future. This collaboration allows us to expand our portfolio of packaging solutions made from recycled PET material, offering our customers in the region innovative alternatives that align with their sustainability goals," said Dietmar Marin, managing director of the Recycling Division at ALPLA.

Re-Purpose brings its expertise in baling with machinery and in developing collection models from the source. The partnership strengthens the company's impact and drives the widespread adoption of collection programs with buy-back canters, waste pickers and schools. "We are excited to join forces with ALPLA to drive innovation and sustainability in the recycling industry. By combining ALPLA's extensive recycling experience with our reverse collection model, we are expanding the circular economy and supporting manufacturers in achieving the required EPR targets," said Bevlen Sudhu, founder and managing director of Re-Purpose.

Together, ALPLA and Re-Purpose are committed to driving the development and introduction of sustainable packaging solutions that benefit businesses, consumers and the environment alike. This partnership marks a significant step forward towards a more circular and sustainable environment.

APR Report Studies Pyrolysis as Possible Complement to Mechanical Recycling for Plastic Film and Flexible Packaging (FFP)

The Association of Plastic Recyclers (APR) released a comprehensive report that models the potential of pyrolysis technologies, as a complement to mechanical recycling, to recycle FFP back into plastic resins to be remanufactured into new plastic products. Prepared by Eunomia Research & Consulting, "How to Scale the Recycling of Flexible Film Packaging: Modeling Pyrolysis' Role in Collection, Quantity and Costs of a Comprehensive Solution," details the opportunities for increased FFP recovery volumes, the logistics and costs necessary to get materials to pyrolysis and other reprocessor markets, as well as the package design and policy necessary for change.