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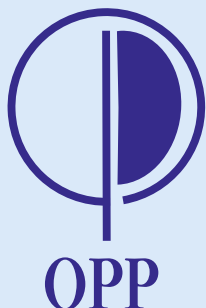
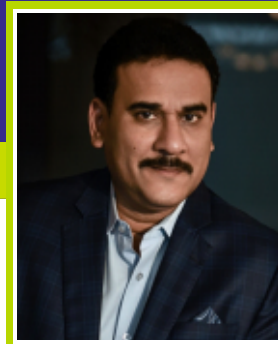


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FROM THE PRESIDENT'S DESK

Mr. Pradeep Rathod



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Dear Members,

Greetings from Organization of Plastics Processors of India!

Initially I will update you the status of the proposals mentioned in my last message:-

- We are communicating with different Gulf Countries about taking delegation of our members, who intend to establish their production units in the chosen Gulf country.
- We have submitted our proposal to the Department of Chemicals and Petrochemicals, Government of India and Principal Secretary (Industries and Commerce), Government of Rajasthan for establishment of Plastic Park in Rajasthan.
- The inauguration of PlastIndia International University is scheduled in January 2025. A visit to PIU will be organized during that period.
- We have included our suggestion to increase Customs Duty on plastic products from 10% to 20% in the Pre-Budget Memorandum.

As you are aware, we organize delegation to ChinaPlas through Tibro Tours and Travels. The next ChinaPlas is scheduled from 15th to 18th April 2025 at Shenzhen World Exhibition & Convention Center (Bao'an), China. We have organized visit of the Delegates to Yizumi Precision Machinery Headquarters Foshan, on 17th April 2025. The details of Tibro Packages will be mailed to you shortly.

We are also trying to organize visit to Plastic Processing Machinery Factory in Germany during K2025. The details will be informed to you.

I recognize the need to increase the Membership of Organization of Plastics Processing of India. I appeal to each and every member to make sincere efforts to enroll new members. OPPI Secretariat will provide necessary help to you in this regard.

With Best Wishes,

Pradeep Rathod
President

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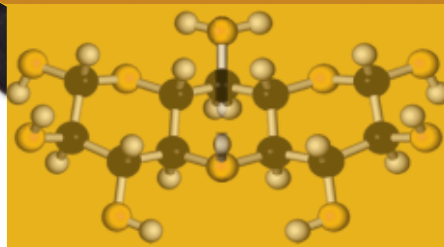
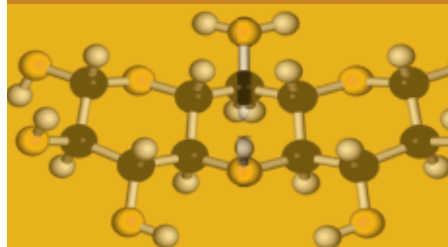
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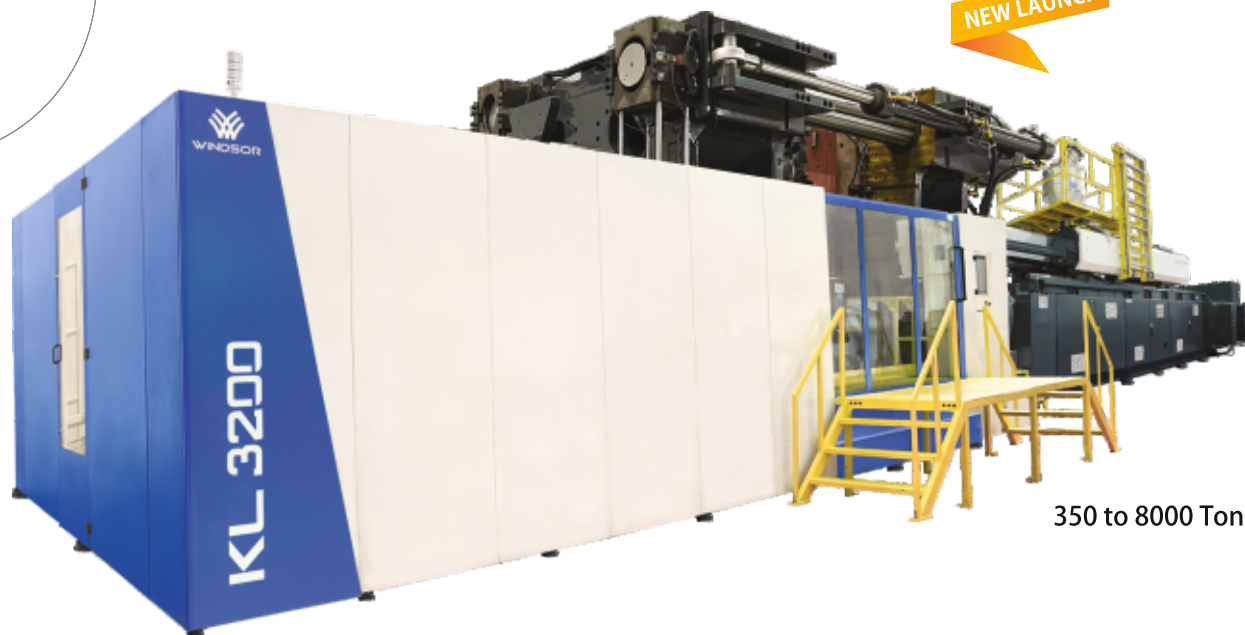
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- **Quality Detection Instrument and Equipment:** Measuring & Detection Equipment, Temperature Controller & Components, Electronic Automatic Instrument, Monitoring Device.
- **Machinery Parts and Accessories**
- **Packaging:** Converting Machinery, 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 (US\$3.25 billion)
- ✓ Export in the first 5 months of FY22 is 29.8% higher compared to the same period of FY21
- ✓ New investments focus on personal protective equipment, medical equipment and toys
- ✓ Government promotes industry-friendly policies to develop skilled manpower, attract foreign investment, ensure technological advancement and the overall development

PRINTING

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

PACKAGING

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

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Arvindar Singh Sahney Appointed Indian Oil CMD

The Ministry of Petroleum and Natural Gas has informed that Shri Arvindar Singh Sahney, Executive Director, Indian Oil Corporation Limited (IOCL), has been appointed as Chairman, IOCL.

Supreme Petrochem Accelerates Growth with Major Expansion Plans

SUPREME Petrochem Limited (SPL), India's largest producer of polystyrene and expandable polystyrene, is poised for substantial growth as it embarks on a significant expansion project at its Amdoshi facility. The company is set to initiate a Mass ABS Project, targeting a total capacity of 140,000 MTPA, which will be executed in two phases of 70,000 MTPA each. The first phase is expected to be completed by March 2025.

The Mass ABS process that SPL is adopting is recognized for its environmentally friendly nature, particularly because it avoids water pollution, unlike traditional emulsion processes. To support this endeavor, SPL has entered into a licensing and engineering agreement with Versalis-Eni Chemicals Group for the first phase, with the total project cost projected at Rs. 850 crores for both phases.

In addition to the Mass ABS Project, SPL is also focusing on increasing its capabilities in Compounds, master batches and expandable Polystyrene (EPS)

at the Amdoshi plant to meet the rising market demand for these products. This expansion reflects the company's strategy to enhance its production capacities in line with customer requirements.

SPL has also made a strategic investment by acquiring 96 acres of land in Munak, Karnal, Haryana. This site will host a new facility dedicated to manufacturing Polystyrene, Expandable Polystyrene and various derivative components such as EPS, 3D panels and PS sheeting lines. The development of this facility will be executed in phases over the next 36 to 48 months, contingent upon obtaining the necessary regulatory approvals. The estimated investment for this project is Rs. 800 crores, which will be funded through the company's internal resources.

Established as a joint venture between Supreme Industries Ltd. and the Rajan Raheja Group, SPL began journey in 1995 with a Polystyrenan plant in Amdoshi that had an initial capacity of 66,000 MTA. Over the years, this facility has evolved into a comprehensive styrenics complex, currently boasting a capacity of 422,000 MTA. SPL's production portfolio includes a advanced materials, such as Polystyrene of Expandable Polystyrene, specialty compounds and Master batches. The company is particularly notable for operating India's first and only plant for Extruded Polystyrene Insulation Foam Board (XPS), which underscores its leadership in promoting sustainable building practices and energy - efficient construction, helping to reduce overall carbon emissions.

Once the first phase of the Mass ABS project and the second phase of the EPS expansion are completed, SPL's overall capacity at the Amdoshi complex is expected to reach 522,000 MTA. Additionally, SPL operates a second EPS manufacturing facility in Manali New Township, near Chennai, which has a capacity of 33,000 MTA.

Demonstrating its commitment to sustainability, SPL has also launched 12.5 MW solar power plant in collaboration with Tata Renewable Energy Ltd., aiming to reduce reliance on traditional energy sources. This initiative not only supports the company's operational goals but also aligns with broader environmental objectives, emphasizing the importance of sustainable practices in the petrochemical industry.

GAIL Inks 10 Year Purchase Pact with UAE's ADNOC Gas

State-run GAIL has signed a 10-year agreement with UAE's ADNOC Gas for the purchase of up to 0.52 million metric tonnes per annum (MMTPA) of liquified natural gas (LNG).

The LNG delivery will start in 2026, GAIL said in a statement. The cargoes will be delivered from ADNOC Gas' Das Island natural gas facility, which has an LNG processing capacity of 6.0 MMTPA.

"India is witnessing a growing demand for LNG to meet its increasing natural gas demand in a diversified sectoral pattern. GAIL plans to significantly increase its term LNG portfolio in the coming years to meet this rising demand," said Sanjay Kumar, director (marketing), GAIL.

India is the fourth-largest importer of LNG in the world. The government has set a goal of increasing the share of natural gas in the country's primary energy mix to 15% by 2030, from the current 6%.

"This agreement ... reflects our ambition to capture future growth opportunities in gas demand," said Rashid Khalfan Al Mazrouei, Senior Vice President (marketing), ADNOC Gas.

(Source: The Economic Times/ 14.11.2024)

Lubrizol, Polyhose to set up Manufacturing Facility in Tamil Nadu to Make Medical Tubing

Lubrizol, a Berkshire Hathaway company, focused on specialty chemicals, has entered into a memorandum of understanding (MoU) with Chennai-based Polyhose to set up a manufacturing facility in Tamil Nadu to make medical tubing used in catheters.

The groundbreaking of the new manufacturing site is expected in 2025, with operations commencing in 2026.

The manufacturing site will increase US-based Lubrizol's local medical tubing volume five-fold, creating easier access to life-saving medical tubing in India and in markets around the world through export. High-quality medical tubing produced through the partnership will be used in neurovascular and cardiovascular medical applications, such as balloon catheters and minimally invasive procedure catheters.

The medical tubing will be produced with Lubrizol's advanced medical-grade thermoplastic polyurethane along with other thermoplastic polymers, which offer biocompatibility and high performance while ensuring patient comfort. The new manufacturing facility will be ISO 13485 compliant, ensuring safe and high-quality medical tubing.

(Source: The Economic Times/ 14.11.2024)

Smart Sensor Bins Introduces to Hospitals for Plastic - Free Waste Management

Kolkata's Charnock Hospital has launched an innovative waste management system with the introduction of Smart ReBins - sensor - fitted bins designed to reduce plastic waste and keep the hospital premises clean. These bins, developed through a collaboration between CII West Bengal Healthcare Taskforce and Magpet Polymers Pvt Ltd, aim to turn hospitals into plastic - free zones while ensuring proper collection and sorting of potentially hazardous clinical waste.

The Smart ReBins come with sensors that monitor how full the bins are and send alerts when they need to be emptied, preventing overflow and littering. Each bin is about six feet tall and can store a large amount of waste. The bins are also geo-tagged and geo-fenced, making them tamper-proof and ensuring they stay in place.

Hospitals that use this initiative, launched by the Ministry of New and Renewable Energy, aims to position India as a global leader in Green Hydrogen technologies by enhancing research in production, storage, and utilization. These bins earn plastic credits for their recycling efforts. The initiative also supports the circular economy by turning recycled PET bottles into high-quality materials, while offering income opportunities to waste-pickers.

Other hospitals in the city are considering the installation of ReBins to help promote sustainability and responsible plastic waste management.

(Source: TOI)

JPFL Films Set to Supercharge Capacitor Business with Rs. 250 Cr Investment by 2025

This expansion with Treofan GmbH supports the Make in India initiative and JPFL's innovation commitment.

JPFL Films Pvt. Ltd. has announced its plan to double its capacitor film production capacity. The company is committing Rs 250 crore by 2025 to meet the rising demand in the capacitor market. This decision comes after achieving full capacity utilization and positive feedback from clients like TDK, Tibcon, Jimcap, Shreem and Magnewin.

JPFL's collaboration with Treofan GmbH, a trusted supplier in the industry, has facilitated the rapid success of its capacitor films. The films are recognized for their high breakdown voltage, a critical feature that has improved through continuous process enhancements.

JPFL employs advanced machinery that allows for customized film surface roughness and multiple metalizing patterns tailored to customer specifications.

Dr. Mahesh N. Gopalamudram, Deputy CEO of JPFL, stressed that this expansion aligns with the government's Make in India initiative, aiming to reduce import dependency.

With state-of-the-art testing facilities and a robust supply chain, JPFL is poised to support various sectors, including electronics, automotive, and energy storage, solidifying its position as an industry leader committed to quality and innovation.

(Source: ManufacturingToday/22.10.2024)

MANALI Petrochemicals Limited Expanding its Projects

MANALI Petrochemicals Limited has made a strategic investment in Polyglycol (PG). MPL is expected to gain a completing one Polyester Polyol (P) plant and that is pushing the second one ahead. Could their focus construction, appliances and elastomers open doors to unexplored markets and further strengthen their foothold? Most definitely! The Greenfield expansion in West India by MPL is considered a bold move to redefine its presence in the petrochemical industry. According to Managing Director R. Chandrasekar, MPL is already executing the projects and the first phase of a PG plant is all set to produce 32,000 metric tons annually. On the other hand, MPL is also focusing on polyester polyol, with one plant completed and another in progress.

Manali Petrochemical Limited is pushing its expansion agenda with a focus on Polyester Polyol (PP), completing one plant with a capacity of 4150 metric tons per annum and continuing with a second project. Thus the vision is clear: the company is driving toward its target construction, appliances and elastomers markets while ensuring supply through captive consumption.

MPL's board has also approved an ambitious expansion plan for Western India, targeting 30,000 tons per annum of polyols. With their investment

of over INR 130 crore and projected 30% internal rate of return (IRR), MPL expects a five-year payback period. Supply for this capacity will come predominantly from their Chennai base, with some reliance on imports.

Alongside these large projects, MPL has also been proactive with smaller and more impactful initiatives. By shifting its energy needs to renewable sources through a hybrid power system and moving from fossil fuels to RLNG (degasified liquefied natural gas), the company optimizes their operational costs while significantly reducing its carbon footprint. They have also secured additional storage capacity for key raw materials like propylene oxide (PO) and polyols while optimizing their plant operations to drive efficiency.

Overall MPL's expansion plans commitment to sustainability reflect their determination to meet rising market demands and solidify their position as an industry leader in petrochemicals.

(Source: Popular Plastics & Packaging)

SUDARSHAN Chemical to Acquire Heubach Group

SUDARSHAN Chemical Industries Limited announces that it has entered into a definitive agreement with the Germany - based Heubach Group, on its acquisition in a combination of an asset and share deal. This strategic acquisition will create a global pigment company, combining SCIL's operations and expertise with Heubach's technological capabilities.

Post-acquisition, the combined company will have a broad pigment portfolio of high-quality products and a strong presence in major markets including Europe and the Americas. It will enhance SCIL's product portfolio, giving it access to customers and a diversified asset footprint across 19 sites globally. The combined company will be led by Mr. Rajesh Rathi and a high performing management team with quality execution skills and technical competency.

(Source: Popular Plastics & Packaging)

Gol Invites Proposals for Establishing Centres of Excellence under Green Hydrogen Mission

This initiative, launched by the Ministry of New and Renewable Energy, aims to position India as a global leader in Green Hydrogen technologies by enhancing research in production, storage, and utilization.



The broader goal of the National Green Hydrogen Mission is to support India's transition to clean energy, significantly reduce carbon emissions, and decrease reliance on fossil fuel imports.

The Government of India has issued a call for proposals to establish Centres of Excellence (CoE) under the Research and Development (R&D) Scheme of the National Green Hydrogen Mission.

Announced by the Ministry of New and Renewable Energy (MNRE), this initiative aims to create world-class Centres of Excellence dedicated to Green Hydrogen innovation.

These centres are intended to drive sustainability and strengthen India's long - term energy independence by advancing research in Green Hydrogen production, storage, and utilization technologies, according to an official statement.

These CoEs will serve as hubs for cutting - edge research, skill - building, and knowledge sharing. They are also designed to encourage collaboration across sectors, involving industry, academia, and government, to accelerate innovation in Green Hydrogen technologies. This includes enhancing

process efficiencies, fostering new product development, and pooling expertise and resources to strengthen India's Green Hydrogen ecosystem.

Previously, on March 15, 2024, MNRE published guidelines for the R&D Scheme as part of the National Green Hydrogen Mission. The Government has allocated Rs. 100 crore for establishing these Centers, inviting public and private institutions, including research organizations and universities, to collaborate and submit proposals in response to this call.

Launched on January 4, 2023, with a budget of ₹19,744 crore through FY 2029-30, the National Green Hydrogen Mission aims to support India's goal of becoming self-reliant in clean energy and contributing to the global shift towards sustainable energy. The mission is expected to significantly decarbonize the economy, lower dependence on fossil fuel imports, and position India as a leader in Green Hydrogen technology and markets.

(Source: BUSINESSLINE/07.11.2024)

UP Cabinet Approves New Bio Plastic Policy

The Uttar Pradesh cabinet has launched a groundbreaking bio plastic policy to encourage investment in biodegradable and compostable plastic manufacturing. Under this policy, companies investing Rs 1,000 crore or more will benefit from a 50% subsidy for seven years and a 100% reimbursement of state GST for 10 years. Additionally, there will be no duties on electricity supply. The total benefits are capped at 2% of the investment over a 10-year period, and each unit is expected to generate over 2,000 jobs. By introducing this policy, UP has become the first state to take such a step, aiming to integrate bio plastics into the startup value chain.

Annual Return Filing Deadline for Plastic Packaging EPR Extended to November 30, 2024 for FY 2023 - 24

In a significant update, the Ministry of Environment, Forest and Climate Change (MoEF&CC) has announced an extension in the timeline for filing

the Annual Return (AR) by registered Producers, Importers and Brand Owners (PIBOs) as well as Plastic Waste Processors (PWPs) for the fiscal year 2023 - 24. According to the Extended Producer Responsibility (EPR) Guidelines notified by MoEF&CC as the IV Amendment to the Plastic Waste Management (PWM) Rules on February 16, 2022, PIBOs and PWPs who were registered during the fiscal year 2022 - 24 on the EPR Plastic Portal are required to file their Annual Returns for FY 2023-24 by September 30, 2024, respectively. However, following the issuance of an Office Memorandum (OM) dated June 18, 2024, by MoEF&CC, it has been officially communicated that the deadline for filing the Annual Return on the EPR portal for plastic packaging for the FY 2023-24 has been NFI extended to **November 30, 2024**, for both PIBOs and PWPs registered during the year FY 2023-24.

(Source: SGS)

Electricity Department to Disconnect Power Supply to 22 Plastic Manufacturing Units

The Pondicherry Pollution Control Committee (PPCC) has directed the Electricity Department to immediately disconnect the power supply of 22 plastic - manufacturing units over failure to register their units under the Extended Producer Responsibility Rules, 2022.

According to N. Ramesh, Member Secretary of PPCC, the Committee had directed all plastic manufacturers to register themselves through the centralized online portal, which is exclusively for Extended Producer Responsibility (EPR) to prevent disconnection of power supply to their units. As per EPR rules (notified by the Ministry of Environment, Forests, and Climate Change), all existing and new manufacturers of plastic covers (industrial packaging) should register their units in the EPR portal of the Central Pollution Control Board (CPCB). Despite reminders, 22 units located in Bahour, Villianur and Nettapakkam communes, Oulgaret municipality and Polagam and Kottucherry in the Union Territory had failed to register in the portal. The PPCC had directed the Electricity Department to immediately disconnect the power supply to these units. Action was initiated against the units under Section 5 of the Environment (Protection) Act, 1986.

(Source: The Hindu)

NAMTECH and ABB Robotics Partners to Establish the School of Robotics

The School of Robotics will open in 2025, advancing robotics education and industry integration in India.



ABB Robotics and New Age Makers' Institute of Technology (NAMTECH) have signed a Memorandum of Understanding (MoU) to establish a School of Robotics. This pioneering collaboration aims to close the education gap in automation, advancing robotics skills and industry integration in India.

“With India's emphasis on education, upskilling, and youth employment, investing in high - quality engineering and technical education is vital for our future,” said Subrata Karmakar, President Robotics & Discrete Automation Division, ABB India. “ABB Robotics' collaboration with NAMTECH is pivotal to equip students with the skills necessary to succeed in the new era of automation. By integrating ABB's expertise in robotics and automation with NAMTECH's innovative educational approach, we will support the continued growth of India's manufacturing sector.”

NAMTECH aims to create a high - quality, world-class engineering workforce proficient in next-generation technologies, with a strong emphasis on Industry 4.0, sustainability, and management principles. NAMTECH is structured around five schools and several competency centres – including the School of Manufacturing Technologies, the School of Manufacturing Design and AI, the School of Sustainability, the School of Robotics, and the School for Social Impact. Each institution is guided by a global academic partner and collaborates with major industry players.

ABB Robotics and the NAMTECH School of Robotics will create an advanced curriculum through international academic collaboration, resulting in hands-on, industry-focused programs. Its goal is to cultivate talent for the wider industrial sector, supported by state-of-the-art infrastructure and global industry leaders like ABB to foster a practical learning environment.

ABB's robotics experts will lead initiatives in knowledge sharing, research, and industry immersion. The Center will have dedicated staff, faculty, and facilities, expanding as the school moves to its new campus.

X

In 2023, India set a new record with the installation of 8,510 industrial robots, marking a 59% increase from the previous year. This upward trend is expected to continue into 2024 and 2025, highlighting India's long-term potential for automation. Globally, India now ranks seventh in annual robot installations. The robotics sector is experiencing a surge in job opportunities, particularly for positions including Robotics Engineers, Robot Design Engineers, Application Engineers, and Smart Factory Designers*.

“The cooperation between NAMTECH and ABB Robotics is a first of its kind. It brings together a pioneering, industry-aligned education institute and an industry leader to innovate and alter the face of the manufacturing sector – not just in India, but at a global level,” said Arun Kumar Pillai, Director General, NAMTECH. “Robotics adoption by Indian companies is in its early stages and there is a shortage of talent in robotics engineering in the country. With India's vision of 'Atmanirbhar Bharat' (“Self-reliant India”) in the manufacturing sector, this collaboration will play a critical role in the growth of the robotics sector as well as help create a globally competitive talent pool.”

This is the latest development in ABB Robotics' commitment to close the gap in robotics and automation education. With expertise bolstered by a global network of industry and academic collaborators, including educators in over 40 countries, ABB acts as a catalyst for transformation, preparing people for the future of work and enhancing business resilience. NAMTECH's talent pool, progressive workforce development strategies, and strong collaborations

with industry, academia, and government, will accelerate the rise of smart manufacturing & robotics, positioning India as a global hub for cutting-edge automation solutions.

(Source: OEM Update/24.10.2024)

Revenue Dept. forms 22 Sub-Committees to Review I-T act

Revenue Secretary Mr. Sanjay Malhotra conveyed this at a meeting taken by union finance minister Smt. Nirmala Sitharaman to take stock of the progress of the review announced in the Budget. Smt. Sitharaman chaired the meeting to assess the progress as the government is looking to introduce the draft bill in the budget session.

Apart from Malhotra, the meeting was attended Central Board of Direct Taxes Chairman Ravi Agarwal, and other senior CBDT officials. The Department has also received 6,500 suggestions from the public, to simplify the IT law.

In her Budget speech on July 23, finance minister had proposed that the I-T law review will be completed in six months in January.

The review aims to make the law simple and taxpayer friendly.

(Source: The Economic Times)

India Poised to Sustain Growth Trajectory, Likely to be World's 3rd-Largest Economy by 2027: FM Nirmala Sitharaman



Finance minister Nirmala Sitharaman

Finance Minister Nirmala Sitharaman said India is poised to continue its growth trajectory and is likely to become the world's third - largest

economy by 2027. India currently is the fifth largest economy in the world with a GDP of around USD 3.9 trillion.

Addressing the Roundtable on 'Investment Opportunities in India' at the New York Stock Exchange, the oldest and the largest stock exchange in the world, the Finance minister said India is poised to continue its sustained growth trajectory and enhance its contribution to global growth significantly. At the current rate, India is likely to be the world's third - largest economy by 2027, Sitharaman said.

As many as 11 Indian companies are listed on the New York Stock Exchange. The Roundtable was attended by various pension funds and other institutional investors and fund managers across the US, forming one of the largest financial systems in the world in terms of total assets under management, the finance ministry said in a post on X.

During the meeting, the Finance Minister shared the contours of various policy reforms and initiatives that are shaping India, with a focus on the Government's priorities for facilitating sustained economic growth for sustained long-term investment opportunities.

Observing that India's emergence as one of the fastest - growing economies in the world which has witnessed a profound positive transformation in the last 10 years, she emphasized on the nation's determination to not just contribute to but also determine the shape and direction of global recovery, while redefining its own place in the global economic order.

As India undergoes this transformation, she exuded confidence that there will be a host of opportunities for growth and returns for investors in India.

Anchoring India's growth in the vision of Atmanirbhar Bharat, she said that it seeks to reinvigorate India's manufacturing abilities and integrate it with the redefining Global Supply Chains.

She further said that India has not only created a strong baseline for infrastructure creation and development with initiatives such as the National Infrastructure Pipeline (NIP) and the National Monetization Pipeline (NMP), but also bolstered the manufacturing sector's competitiveness through Production Linked Incentive (PLI) schemes across sectors.

PM GatiShakti, a programme launched to bring a master-planning approach to infrastructure, stands out as a unique example of using technology for real-time assessment of public policy impact on the ground, she said.

The Government of India has given further momentum to India's growing presence in the global electronics value chains through the USD 10 billion India Semiconductor Mission (ISM) to achieve atmanirbharta in electronics & semiconductors, she said, adding, this initiative gains importance especially in the light of the US Department of State's recent announcement to partner with Government of India.

She referred to India's ground-breaking structural reforms for a stable regulatory framework for investors, such as simplifying the tax structure through the Goods and Services Tax (GST); streamlining the resolution of distressed assets through the Insolvency and Bankruptcy Code (IBC); liberalizing Foreign Direct Investment FDI norms across various sectors; and enhancing the simplicity and transparency of the overall foreign investment policy framework.

These policy reforms and initiatives are built on an entirely new digital economy, spurring innovation and tech entrepreneurship resulting in India becoming the 3rd largest start-up ecosystem globally, with over 100 unicorns engaged in innovations for the public good, she added.

(Source: The Economic Times/21.10.2024)

India will Surpass US and China to Become Leader in Automobile Industry over the Next Ten Years: Gadkari

Union Minister for Road Transport and Highways Shri Nitin Gadkari laid out a vision to transform India into the world's top automobile hub within the next decade, at the Spain - India Business Summit held in Mumbai.



Union Minister Nitin Gadkari

Citing India's competitive advantages in production costs and labor, Shri Gadkari expressed confidence in the country's capacity to become a leading global player.

"The size of our automobile industry is 22 lakh crores, and size of the China's automobile industry is 44 lakh crores and US is 78 lakh crores. Now, our aim is to make India's automobile industry within 10 years number one in the world." said Shri Gadkari.

Shri Gadkari said India's production cost is much less than other countries, but high logistic cost is an issue for India. With the growth of infrastructure, better roads and ports our logistic costs is coming down.

"USA and European countries, it is 12 per cent. And Indian scenario, it going up to 14 to 16 percent. So, this is the first time we have decided to reduce this cost. We have now a lot of express highway, 36 green access control express highways. Our NHI is triple-A rating," Shri Gadkari added.

In discussing India's strides in sustainable technology, Gadkari spoke about innovative water and waste management initiatives.

Gadkari explained, "We have implemented the water sewage, there is a 90 ml dislodge of Mathura converting into clean water and giving that water to Indian oil refinery in Mathura. First time when I

was water resource minister, we planned it for hybrid annuity. 40 per cent from the government and 60 per cent from the investor.”

Gadkari also addressed India's energy independence goals, acknowledging the country's heavy reliance on imported fossil fuels, amounting to Rs. 22 lakh crore annually.

He stated, "It is one of the important economic challenge to our country that we have the import of fossil fuel of 22 lakh crores. We have got electric car, electric buses, electric scooter and electric now auto rickshaw and now electric truck also are ready and electric tractor is ready. So we are making alternative fuel and biofuel.”

He emphasized India's commitment to alternative and biofuels as solutions, noting recent advancements in electric vehicles, including electric cars, buses, scooters, trucks, and tractors.

Gadkari said, "As a success story, already we have global alliance in G20 and lot of new technology have already invented. So we are making ethanol from corn, from sugarcane juice, molasses, B molasses, C molasses and food grain.”

He added, "And that is the reason that by making this alternative and biofuel, I am confident that we will reduce the cost of the fuel and making good express highway, our target is within 2 years, our logistic cost will be 9 per cent, single digit, by which 100 per cent the economic viability, 100 per cent is going to increase. In Indian scenario, there is lot of transparency in our system, the fast track decision making process, and the dream of the Prime Minister is to make India Atmanirbhar Bharat." (ANI)

(Source: ANI/29.10.2024)

PACKEM UMASREE Produces 100% Sustainable FIBC Bags

PACKEM UMASREE has begun production of 100% Sustainable FIBC bags made from recycled PET (rPET), a milestone in our journey towards eco-friendly packaging.

As India's first 100% Bottle-to-Bag manufacturer, PACKEM UMASREE is a proud joint venture between PACKEM (Brazil) and UMASREE (India). They specialize in producing Recycled Clear PET Flakes and 100% Sustainable FIBC/Jumbo Bags made entirely from recycled PET (rPET/PCR), showcasing our commitment to innovation and sustainability.

Key Benefits of rPET FIBC bags:

- 1.Sustainability:** Made from post - consumer PET, reducing virgin material usage and conserving natural resources.
- 2.Lower Carbon Footprint:** rPET production uses less energy and emits fewer carbon emissions than virgin materials.
- 3.UV Resistance:** rPET's natural UV resistance extends the bag's life and protection.
- 4.Superior Durability:**
 - **Abrasion Resistance:** Resists wear during handling and transport.
 - **Temperature Resistance:** Handles a wide range from 20°C to +140°C, outperforming standard PP bags.
- 5.Form Stability:** Keeps its structure during filling, transport and storage.
- 6.Food-Grade Safe:** PET is the only polymer that can be recycled for food-grade use.
- 7.Endlessly Recyclable:** PET can be recycled multiple times without losing strength.

For more information visit: <https://www.packem-umasree.com/>

(Source: Popular Plastics & Packaging)

PLASTIC PRODUCTS AND NEW TECHNOLOGIES



Food Vacuum System Containers use SABIC'S Circular PP with Ocean Bound Plastic Content

- Certified circular SABIC® PP polypropylene from advanced recycled ocean bound plastic (OBP) helps reduce marine litter and accelerate circularity.
- Sustainable material solution from SABIC's TRUCIRCLE™ portfolio meets demanding performance specifications for food contact approved vacuum containers.



SABIC, a global leader in the chemicals industry, reports that B!POD, a business unit of SAES Getters, has selected SABIC's OBP - based polypropylene resin as the material for their containers. In close collaboration, the partners selected SABIC® PP 576P, a high-gloss grade from

the company's TRUCIRCLE™ portfolio of circular resins. The container material has an OBP feedstock content in the range of 50%.

Khaled Al-Jalawi, Global Director of Circular Economy Business at SABIC, states: "We are very pleased about working with SAES Getters to help consumers meet the challenge of improving food preservation with a powerful vacuum system that uses containers molded in OBP-based SABIC PP. The decision to replace standard virgin PP by our OBP material in the containers also marks a significant step towards greater sustainability, as it supports the transformation of the plastics economy towards circularity."

The source of the OBP in SABIC's material is abandoned used plastic collected in regions within 50 km of shorelines and then converted to plastic feedstock by means of advanced recycling. The PP resin produced with this recycle is supplied in natural color to C.E.L. (Costruzioni Elettromeccaniche Legnaghesi), a leading Italian player specializing in the processing of thermoplastic resins. C.E.L. adds special master batches to mold the B!POD containers in different sizes and several distinct custom colors. At the end of their service life, the reusable containers are fully recyclable in existing PP material streams.

Ginevra della Porta, Chief Innovation Officer at SAES Getters & co-founder of B!POD, comments: "This innovation embraces sustainability from the very

concept to end use – with an advanced vacuum technology to minimize food waste, with SABIC's OBP-based material that prevents used plastic from polluting our oceans, and with containers in a range of colors each dedicated to an endangered species, such as orangutan orange or whale grey, it is designed to raise the awareness of consumers.

Moreover, our market research has indicated that reusable rigid containers for food preservation can potentially eliminate the consumption of more than 300 non-recyclable plastic bags per person and year, which corresponds to a per capita release of 30 kg of CO₂ to the atmosphere."

The selected OBP-based SABIC PP 576P resin is a food contact approved grade, free of PFAS and BPA. It offers ease of processing and delivers dimensionally stable parts with low warpage, good impact strength and high gloss as molded. The ocean-bound plastic based solution is fully certified under the International Sustainability & Carbon Certification (ISCC) PLUS chain of custody.

The sustainable B!POD containers molded in OBP based SABIC PP has been fully rolled out across the European Union, in Switzerland and the United Kingdom by mid - 2024, with Asian countries to follow in 2025.

Joint Venture Develops Recyclable Flexible Packaging Film



Packaging Gateway · TOPPAN.

Three Japanese companies have successfully created a new type of flexible packaging film made from horizontally recycled material. The film, produced through a joint pilot project, is designed to reduce waste and promote sustainability in the packaging industry.

TOPPAN Holdings, RM Tohcello and Mitsui Chemicals have announced the development of the recycled film, which is made from BOPP (biaxially oriented polypropylene) flexible packaging film. The process involves collecting printed film waste, removing the ink and repelletising the material before turning it into new film. The recycled film is suitable for mass production and meets the necessary physical properties for packaging applications. They will begin providing samples of the film to potential customers in October 2024.

The development of this new material aligns with the Japanese government's resource circulation strategy for plastics, which aims to increase the recycling and reuse of plastic materials. By creating a recyclable packaging film, the companies are contributing to a more sustainable future.

Mitsui Chemicals played a key role in the project by providing expertise in polypropylene resins and handling the ink removal process.

RM Tohcello contributed its BOPP film manufacturing technology, while TOPPAN provided the film waste and carried out the conversion and marketing.

The companies hope to expand the use of the new recycled film and further develop horizontal recycling technologies for flexible packaging. They believe that this initiative can help to reduce plastic waste and promote a more circular economy. The samples to be provided will be displayed at TOPPAN and Mitsui Chemicals' booths at TOKYO PACK 2024.

"Joint venture develops recyclable flexible packaging film" was originally created and published by Packaging Gateway, a Global Data owned brand.

Berry Launches Fully Recyclable*, High-Performance Alternative to Colored PET Pill Bottles



ClariPPil™ bottles offer enhanced sustainability (reduced carbon footprint and improved recyclability vs. a PET container solution) together with excellent functionality, product protection, and aesthetics.

Leading packaging solutions provider Berry Global has launched a range of clarified polypropylene (PP) bottles for healthcare applications, which offer superior sustainability and enhanced product protection compared to traditional colored PET pill bottles.

Ideal for a wide variety of products including vitamins, nutraceuticals, dietary supplements, beauty supplements and OTC treatments, the new ClariPPil™ bottle has achieved a RecyClass A certification for its recyclability in countries with the appropriate recycling infrastructure in place, when combined with Berry's PP closures.

"We believe our ClariPPil bottle provides an advanced packaging solution that will transform healthcare packaging," said Jessica Rodriguez, Sustainability Project Manager at Berry Global. "As well as its superior sustainability profile, the bottle offers excellent performance and quality."

ClariPPil bottles are available in green, and light and dark amber, enabling them to meet the requirements of different product types. Custom colors can also be produced on demand. Significantly, whereas similar packs in colored PET can pose a challenge to the recycling stream, the colored ClariPPil bottles are all widely recyclable in countries with the appropriate recycling infrastructure in place. Equally important, Berry says that its new manufacturing technology for the bottle delivers a reduction of approximately 71% in carbon dioxide (CO₂) emissions compared to the traditional injection stretch blow molding process for PET bottles**.

Alongside these enhanced sustainability benefits, ClariPPil bottles also deliver up to 84% improved moisture ingress protection compared to PET, to ensure extended product integrity and effectiveness.

The bottle is available in 100, 120 and 150cc sizes and feature a universal 38mm neck for compatibility with a range of standard closures, including child - resistant options. As well as the choice of colors, the design includes a wide decoration area for individualized branding.

"ClariPPil bottles meet the demand for a sustainable packaging solution without compromising functionality, aesthetics, or barrier performance," said Ryan Maszton, Director of Sales, Berry

Global. "Equally important, our high - capacity production facilities mean we can offer companies speed of supply and fast response to help them bring products quickly to market, maximizing opportunities in growing sectors such as vitamins, minerals and supplements."

(Source: BERRY / 15.10.2024)

The TARPAULIFE Project : Polyolefin - Coated Fabrics to Transport Freshwater by Sea

The TARPAULIFE Project aims to find more sustainable recyclable materials to replace the PVC-coated polyester tarpaulins commonly used in lorries and coverings. A production plant for these fabrics will be set up with a capacity of 250,000 m² per year. Two 2,500 m³ floating water bags will be manufactured with the new material to transport freshwater to the North Sea and the Mediterranean.



AIMPLAS

Tarpaulins are large sheets of strong, water-resistant material used for protection from extreme conditions. They're most commonly made from PVC-coated polyester, characterized by its low price and good resistance. However, they're also harder to recycle than other plastics.

The TARPAULIFE Project, which started in May 2024 and will run for two years, wants to prove that manufacturing large - area polyolefin coated fabrics, such as polyethylene and polypropylene, can compete in terms of cost with PVC-coated fabrics while being equally strong, flexible and water-resistant.

This new material will be mainly used to manufacture bags for transporting freshwater by sea, but it can also be applied to products like tarpaulins, commonly used in lorries and coverings. The main result will be a production facility of three-meter-wide polyolefin-coated fabrics with a production capacity of 250,000 m²/year once the project ends.

Solving Water Supply Problems in a Sustainable Way

The technology was developed to carry water from high-production areas relatively close to places affected by drought, seasonal increases in demand and emergencies. It already brought great results like the REFRESH and XXL - REFRESH Projects financed by the European Commission. These successfully tested a floating water bag with a modular design and a zip connection.

Thanks to this new production plant, which will be located at the Milan's Zioplast facility, more than 100 water bags are expected to be produced in the three years after the project ends. Two million cubic meters of water will be stored at three fresh water storage sites. The proposed solution will help avoid the incineration of more than 2,000 tons of PVC and prevent more than 13 tons of CO₂ from being released into the environment.

The project also aims to replicate the results in other sectors, like eco - friendly truck tarps and glacier tarpaulins, to demonstrate the sustainability of the new polyolefin fabric coating solution. This is done by quantifying the environmental and LCA-LCC benefits compared to the use of PVC-coated fabrics for all intended applications.

(Source: Interplas Insights / 28.10.2024)

SEKISUI ALVEO, European Manufacturer of High - Quality Polyolefin Foams, has developed a New Product with Unique Shock - Absorbing Properties.

ALVEOLEN NSA is a polyethylene - based thermoplastic foam that is outstanding for demanding applications including orthopedics, protective elements for sports, vibration protection, child seats, and packaging.

With over 40 years of development experience, SEKISUI ALVEO has created a special formulation of its well-known ALVEOLEN foams to meet the demanding, standardized requirements for body-protection equipment. ALVEOLEN NSA stands out due to its shock-absorbing properties and its viscoelastic behavior. Physical forces acting on the foam are absorbed and dissipated and are not returned or even released after a quick compression phase.

Body Protection and Comfort

The outstanding shock - absorbing properties of ALVEOLEN NSA make the material a first choice for use in personal protective equipment for job-related and leisure activities. Tests conducted by TÜV Rheinland according to EN 1621 confirm that the foam meets the requirements for the use as protector for motorcyclists. Applications as padding for body armor and for protective waistcoats for police or military personnel are also possible. ALVEOLEN NSA can reduce the product weight while providing the same level of protection, which noticeably increases wearer comfort.



Ideal for Orthopedic Applications

Thanks to its material properties like viscoelasticity and Shore a hardness of 35, ALVEOLEN NSA is ideal for demanding orthopedic applications. The foam has efficient shock absorption and can be used as a middle layer in 3 - layer diabetes - adapted insoles. The closed-cell material has been evaluated as per ISO 10993 (Biological Evaluation of Medical Devices) and, like all ALVEOLEN products, can be sterilized and washed. As it is free from heavy metals and other prohibited substances listed by REACH or RoHS as well as being free from latex and sulphur, the material meets the relevant standards in the respective areas of application.

Easy and Efficient Converting

ALVEOLEN NSA can be easily processed using most standard methods like thermoforming, press forming, cutting, water - jet cutting, milling, punching, sawing, plotting, gluing or composite laminating. In contrast to rubber or PU materials, the thermoplastic properties of foam allow it to be molded in several steps to achieve the desired finished geometry. It retains its softness and shock-absorbing properties even after compression molding or thermoforming. ALVEOLEN NSA is the first shock-absorbing foam produced by Sekisui ALVEO that is horizontally foamed, physically cross-linked, and produced in rolls. The roll format saves up to 20% processing waste compared to bun foams.

Technical Benefits and Customer Support

ALVEOLEN NSA has been comprehensively tested at Sekisui ALVEO'S Application Service Laboratory (ASL) in Switzerland. Tests show that the technical performance of the material is at least as good as that of comparable conventional foams across the entire range of parameters. Products with components made from ALVEOLEN NSA retain their shape over their entire service life. ALVEOLEN NSA demonstrates its sustainability through high toughness and long-term elasticity.

The ASL is a technical competence center that offers customers a range of specialized services such as co - engineering, application - specific product development, support with processing techniques, prototyping, application-related testing, and transfer of processing know-how. This is one of many reasons why Sekisui ALVEO is recognized as the preferred supplier of foam solutions for various industries.

(Source: SEKISUI ALVEO)

Avantium and Royal Vezet Collaborate on PEF Based Packaging Trays for Albert Heijn's Salad Bowls

Avantium's PEF (polyethylene furanoate) is a 100% plant-based, fully recyclable polymer and offers a renewable and circular packaging solution for Royal Vezet's salad bowls. Avantium is set to start-up the world's first commercial plant in Delfzijl for 5 kilotons of FDCA (furandicarboxylic acid), the key component of PEF, with commercial production expected to begin in 2025. Following this, PEF production will

be scaled up to plants of 100 kilotons and beyond, enabling large-scale production of FDCA and PEF through technology licensing.

Royal Vezet produces 6 million consumer units per week. The company prides itself on its innovative approach, strong regional ties, and dedication to sustainability and quality. "Partnering with Avantium aligns with our mission to make tasty and healthy food available for everybody, while minimizing our environmental footprint," states Anouk Wissink, CEO of Royal Vezet. "We are eager to demonstrate the potential of PEF - based packaging and its benefits for our products and Albert Heijn's customers."

Albert Heijn will start by introducing the first PEF-based salad bowl trays, and explores further expansion to the packaging of other segments. Marit van Egmond, CEO of Albert Heijn, comments: "We are proud to introduce PEF-based salad bowl trays, furthering our commitment to sustainability. This initiative follows our successful collaboration with Refresco and Avantium on PEF-based bottles for fruit juices. By expanding our use of PEF, we continue to lead the way in offering eco-friendly packaging solutions to our customers."

"We are pleased to partner with Royal Vezet and Albert Heijn on this innovative project. This collaboration is a proof to the power of strategic partnerships in driving sustainable innovation. By combining Avantium's PEF with Royal Vezet's commitment to fresh, high - quality products and Albert Heijn's extensive market reach, we are convinced to make a significant impact on the food packaging industry. Together, we can accelerate the transition to more sustainable packaging solutions, promoting healthy products in eco - friendly packaging that benefit both consumers and the environment," says Tom an Aken, CEO of Avantium.

(Source: avantium/17.10.2024)

Gaia Biomaterials' Compostable Material to be Used in Drinking Straws

Evanesce will produce the first 7.5 million straws in the U.S. with Gaia's Biodolomer.

Sustainable service ware producer Evanescence will soon start production of the first 7.5 million drinking straws in the U.S. made from Biodolomer, a compostable material based on limestone,



developed and manufactured by Sweden's Gaia Biomaterials. "The U.S. market is 500 million straws — per day, and we offer a compostable material that gives the feeling that customers want from a drinking straw. The potential is enormous,"

says Gaia Biomaterials CEO Peter Stenström.

Source: Gaia Biomaterials

Since its founding in 2016, Evanescence has been a leading force in the American transition away from disposable plastic service ware, focusing on compostable alternatives. At the company's Early Branch, South Carolina, production facility, extensive trials have been conducted with the limestone-based Biodolomer. Says Evanescence's CEO Douglas Horne, "There is a strong demand from consumers and brands for affordable, sustainable solutions. Out of the materials we have tested, Biodolomer is the only one that has lived up to our quality expectations, while also being competitively priced premium product."

Biodolomer is certified for industrial composting by both BPI in the U.S. and DinCertco in Europe, and has received FDA authorization for the safe use of food-contact substances. It leaves no micro plastics during the composting process.

(Source: Plastics Technology / 30.10.2024)

Duo UK secures Made Smarter Backing

Duo UK, a manufacturer of packaging products based in Manchester, is using a grant to support technology investment. This means Made Smarter has now reached a major milestone - backing North West companies to invest £25m in new technologies.

330 Businesses have now secured £7.1m matched funding from the government - funded, industry-backed initiative over the last six years, installing technologies as diverse as sensors, robotics, 3D printing and artificial intelligence (AI).

They have put £18m of private sector investment towards 379 technology projects which are forecast to create over 1,700 new jobs - an average of five each,

and upskill 3,200 existing roles - almost 10 per business. The investments in technology and people are set to add £267m to the economy over the next three years.

Duo UK has invested in a cloud-based software solution which captures shop floor data from machinery via sensors and displays it in real time on a web app.

Commenting on the latest milestone and grant awards, Donna Edwards, Director of the Made Smarter Adoption Programme in the North West, said: "These technology projects will have a tremendous impact on individuals, businesses, the sector and society. They will boost efficiency, productivity and growth, creating new jobs and upskilling existing roles, all while shifting the dial on creating a more sustainable approach to manufacturing. I welcome these 23 companies into the Made Smarter family. Alongside the hundreds who have already reaped the rewards of the adoption programme, we have now invested over £25m into the digital transformation of the sector."

As well as grants, Made Smarter offers SME manufacturers access to funded support including digital transformation workshops to create a digital roadmap, impartial and expert technology advice, and leadership and skills training.

(Source: INTERPLAS INSIGHTS / 31.10.2024)

Nylon Particle Foam for Range of Automotive Applications

BASF's Ultramid Expand is distinguished by its high temperature and chemical resistance, and excellent mechanical strength.



A new class of nylon-based particle foam for a range of automotive applications has been introduced by BASF. Based on a combination of nylon 6 grades and developed for structural applications, Ultramid Expand comes with a combination of high-

temperature and thermal-deformation resistance as well as excellent mechanical properties.

This particle foam consists of prefoamed particles with a defined particle size and density, which can be welded into a 3D component without generating foam waste in molding machines. The component is said to have isotropic properties (the same mechanical properties in all directions), and a chemical reaction does not take place in the foam. It boasts excellent chemical resistance (for example, in contact with fuels, oils and lubricants). Also, its closed cell foam structure is said to offer exceptional compressive strength, a requirement for the use in crash-relevant components that are exposed to high mechanical demands.

Ultramid Expand can be processed with standard EPP vapor-molding machines and is compatible with various thermal welding processes. The material can be used in various automotive components, including occupant and battery protection, structural inserts and battery cell holders. The foam is said to be easy to overmold with compatible materials to create hybrid components that are recyclable while providing a monomaterial solution.

(Source: PLASTICS TECHNOLOGY/11.05.2024)

New Colorstream Mineral Red from Merck

LASER marking is the modern way to individually label products. Paint your stories in red with Merck' Colorstream Mineral Red, a vibrant and clear bluish red tone that redefines the meaning of romance and luxury. Discover a new realm of opportunities for printing and plastic applications!

Unbox a World of Endless Possibilities: Designed with circularity in mind, the Unbox a World of Endless Possibilities demo bottles highlight the versatility and brilliance of Merck's pigments for sustainable packaging in plastics and printing. Join us for a sneak peek of these captivating inspirations and learn how brands can leverage endless possible combinations of color and functionality to create eye-catching packaging that truly stands out.

Meanwhile, on July 25th, Merck signed an agreement to enter into a transaction with GNMI, one of largest pearlescent pigment producers globally, listed at the Hong Kong stock exchange. GNMI will acquire and continue to operate the Surface Solutions business as the new owner. GNMI's business and the Surface Solutions business of Merck are a perfect match and

both will benefit from each other and will create a strong value proposition for customers and employees. GNMI has a deep expertise in commodity products-both in natural and synthetic mica and a strong position in Asia and the Chinese market in particular.

With the new owner, the Surface Solutions business will be moving into the center of strategic focus of a key player with a proven track record of industry-leading growth rates and profitability.

Post-closing, joint customers will be able to access a full range of products from high - end premium products to high-volume offerings manufactured with state-of-the-art equipment.

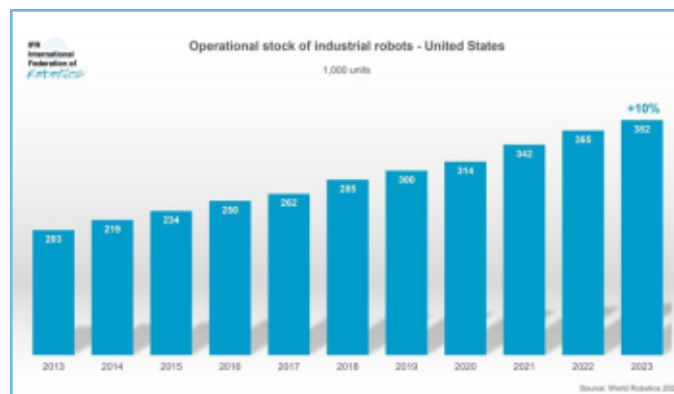
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(Source: Popular Plastics & Packaging)

Record Number of Industrial Robots in use on US Factory Floors

More than 380,000 industrial robots were in action in U.S. factories in 2023, according to the new World Robotics report from the International Federation of Robotics.



Source: International Federation of Robotics

The International Federation of Robotics' (IFR) new World Robotics report registered 381,964 industrial robots in use on U.S. factory floors in 2023 — an

increase of 10% over the prior year. The report stated that annual installations reached 37,587 units in 2023, down 5% but still making it the third best result in U.S. history.

The U.S. accounted for 77% of total installations in North America in 2023, according to IFR, placing it third in the world behind Japan and China. IFR noted that a sizable number of investments have been announced by the automotive industry, which should stimulate demand for robots going forward.

The automotive industry remains the largest U.S. market for industrial robots, accounting for 33% of total installations in 2023. Canadian automotive industry installations grew 95% to a new peak level of 2,500 units installed 2023. In Mexico, automotive demand surged in 2021 and 2022, before declining by 5% to 4,087 units in 2023.

Global Outlook: Robots on the Rise

The new World Robotics report recorded 4,281,585 units operating in factories worldwide — an increase of 10%, as annual installations exceeded half a million units for the third consecutive year. By region, 70% of all newly deployed robots in 2023 were installed in Asia, 17% in Europe and 10% in the Americas. China is by far the world's largest market, with the 276,288 industrial robots installed in 2023 representing 51% of global installations.

Japan remained the second largest industrial robot market with installation of 46,106 units in 2023 (down 9%). South Korea, which is the fourth largest robot market in the world in terms of annual installations — after the U.S., Japan and China — trended sideways in 2023 with installations of 31,444 units down 1% year on year. India remains one of the fastest growing emerging Asian economies, with robot installations up by 59% to 8,510 units in 2023 — a new high.

(Source: Plastics Technology / 12.11.2024)

Klöckner Pentaplast Launches kpNext® MDR1: Sustainable Medical Device Packaging Film

Klöckner Pentaplast (kp), a global leader in sustainable protective packaging, is proud to announce the launch of kpNext® MDR1, a new

medical device packaging film that expands its kpNext® brand beyond pharmaceutical blister films and into the medical device sector. This breakthrough product is designed to meet the growing demand for sustainable packaging options in healthcare packaging.

kpNext® MDR1 delivers the same, best - in - class performance as traditional medical device packaging films, including equivalent clarity, device protection, and ease of processing. As a designed for recyclability film, it also reinforces kp's ongoing commitment to sustainability, while providing an innovative packaging solution tailored specifically for medical devices.

“The introduction of kpNext® MDR1 marks a significant milestone for kp as we expand our kpNext® family of products into the medical device market,” said Cameron Smith, Global Product Line Manager for Medical Device Films at kp. “This new film allows healthcare providers to prioritise sustainability, without compromising on the quality or performance of their packaging materials.”

This expansion into medical device films follows kp's recent launch of SecondLife® MD, another groundbreaking Medical Device film made with 50% certified recycled content*. Together, kpNext® MDR1 and SecondLife® MD offer healthcare providers a comprehensive range of sustainable packaging solutions that address different needs, from recyclability to the incorporation of recycled materials, solidifying kp's role as an innovator in sustainable healthcare packaging.

kpNext® MDR1 film is designed to be compatible with existing packaging lines, eliminating the need for costly retooling, and is designed to be fully recyclable in the RIC 1 stream. Its design reflects kp's mission to innovate products that address the evolving needs of the healthcare industry, particularly as sustainability becomes an increasingly important focus.

Kirstin Hedin, Vice President of Product Line Management & Marketing, added, “kpNext® MDR1 is a testament to kp's leadership in sustainable innovation. We're excited to provide the medical device industry with a film that not only delivers superior performance but also aligns with global sustainability goals.”

(Source: Klöckner Pentaplast)

'Super' Small Color Master Batch Pellets for PVC

Delta Tecnic's new SSP is manufactured using an advanced process distinct from traditional cryopellet production.

What are said to be 'super' small color and additive master batch pellets for polyvinyl chloride (PVC) have been developed by Spain's Delta Tecnic (U.S. office - Boston, Massachusetts, and product supplied through the company's Querétaro, México, manufacturing facility). The newly launched Super Small Pellet (SSP) master batches are said to boast substantial improvements in color homogenization and efficiency in transformation processes.



Source: Delta Tecnic

Traditionally, the market has used standard granules, which, while functional, have certain limitations in color dilution and homogenization in final products for specific applications. Over time, Delta Tecnic has developed different pellet sizes, ranging from micro-pellets to small micro-pellets (SMP).

The company has now taken a further step forward with the SSP — an even smaller pellet designed to optimize dilution. Due to its smaller diameter, the SSP integrates more efficiently, covering the same color surface area with a greater number of small particles rather than fewer larger ones. This is said to significantly enhance the quality of the final product, ensuring visual uniformity without irregularities.

The SSP is manufactured using an advanced process distinct from traditional cryopellet production, which typically involves cryogenic grinding. This new manufacturing method reduces the generation of fine particles, which enhances product quality and improves worker safety by minimizing the risk of inhaling fine particles.

Smaller particles are less likely to be inhaled during handling, reducing the need for workers to wear masks during grinding processes. The SSP's versatility in particle size enables production from small batches of 25 kg to large volumes as needed. This flexibility is particularly advantageous in manufacturing PVC films, compounds and rigid profiles, where achieving optimal dilution is critical.

Moreover, the ability to produce small batches supports customization of colors and properties, enabling Delta Tecnic's customers to swiftly meet market demands and specific application needs. Because it eliminates the need for mills and other energy-intensive equipment, this approach also promotes sustainability by reducing resource consumption and waste generation.

MGG Polymers: PP with Fillers from Large Electrical Appliances

MGG Polymers have started recycling of plastics from large electrical appliances with the recovery of filled polypropylenes. In addition to the existing product family of unfilled polypropylenes (PP), they now also offer PP with various fillers. Of particular note are a polypropylene reinforced with approx. 30% talc and a polypropylene reinforced with approx. 35% chalk. The range is supplemented by a mineral-filled PP with a high glass fiber content. The new product family is also characterized by a high "post-consumer" content of 95% to 100% without the need to add additional fillers.

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PLASTIC RAW MATERIALS



Neste and Braskem Announce Agreement on Supply of Renewable and Recycled Feedstocks for Polymers and Chemicals Production



- Braskem will use more sustainable feedstocks from Neste to produce circular and bio - circular polymer resins and chemicals.
- Output to be sold in South America under Braskem's Wenew brand.

Neste and Braskem, the largest producer of thermoplastic resins in the Americas, have reached an agreement for the supply of renewable and recycled feedstocks for polymers and chemicals production. Braskem products based on these feedstocks are expected to be available on the market starting from the fourth quarter of 2024. These products will be sold mainly in South America and included in Braskem's Wenew product portfolio.

"This is a very important moment for the industry. We're introducing a new solution that will adhere to the industry's high quality standards while ensuring sustainability right from the start of the value chain. This partnership with Neste is a significant milestone in our journey towards a circular economy," stated Fabiana Quiroga, Director of Circular Economy at Braskem in South America.

Braskem will sell polymer resins and chemicals made from Neste's more sustainable feedstock Neste RE™: the recycled feedstock, produced leveraging plastic waste via chemical recycling, and the renewable feedstock produced by processing renewable raw materials such as used cooking oil (UCO).

"We are excited to welcome Braskem as our partner in advancing the transformation of the plastics and chemicals industry towards more sustainable solutions," emphasizes Jeroen Verhoeven, Commercial Director for Polymers and Chemicals at Neste. "We are looking forward to seeing our Neste RE solution in action in South America, reducing the dependence on virgin fossil feedstock in the production of polymers and chemicals."

An ISCC PLUS (International Sustainability and Carbon Certification) certified mass balance approach will be applied to integrate the new feedstocks into Braskem's existing processes. This will give customers further reassurance regarding the uninterrupted chain of custody and the sustainable sourcing of the materials.

An Innovative Solution with Clear Climate Benefits

By combining chemically recycled and renewable solutions, Braskem builds upon two of the most promising solutions to reduce the use of virgin feedstock and to promote sustainability in chemicals and plastics value chains.

Chemical recycling enables the recycling of those types of plastic waste that are otherwise difficult to recycle, for example multi-material or colored plastics. In this sense, Neste's chemically recycled feedstock can contribute to increasing recycling and therefore help reduce the amount of plastic waste entering the environment.

Neste's renewable feedstock, on the other hand, can help reduce greenhouse gas (GHG) emissions when replacing fossil feedstock in the manufacturing of plastics and chemicals. It is produced using renewable raw materials such as waste and residue oils and fats like used cooking oil or residues from vegetable oil processing.

Both feedstocks enable manufacturing of products that are safe and suitable also for sensitive applications, for example food - contact packaging, representing a huge step forward for the market. Particularly for chemical recycling, the Brazilian Health Regulatory Agency (ANVISA) acknowledged that chemical recycling processes, which produce high-purity monomers indistinguishable from the original fossil - based monomers and that comply with applicable regulation for food - contact packaging, can be used without requiring any specific authorization.

Recycled Polycarbonates from COVESTRO Now Available Via ALBIS

With its sustainable engineering plastics, COVESTRO wants to drive the transition to a circular economy. To this end, the company is continuously developing innovative material solutions that have a lower impact on the environment than conventional plastics. ALBIS is now marketing COVESTRO's comprehensive R portfolio, which consists of mechanically recycled post-consumer (PCR) and post-industrial (PIR) polycarbonates and polycarbonate blends. The sales area covers the whole of Europe, North Africa, China and Southeast Asia.



With recycled content of 30 – 90 percent, the plastic solutions offer different properties for use in various industries. Thanks to their excellent flame retardancy, the R-polycarbonates and R-polycarbonate blends are particularly suitable for the electrical and electronics industry as well as for the mobility sector. Examples of applications include housings for household applications and televisions as well as components in e - charging stations and vehicle interiors.

“By expanding our portfolio to include mechanically recycled plastics from COVESTRO, we are developing to our range of sustainable materials – and can thus offer our customers further alternatives to fossil-based solutions,” says Tony Harrison, Senior Director Global Technical Service & Application Development at ALBIS. Mathieu Jung, Global Mobility Industry Manager at COVESTRO, adds: „Our high-quality R series proves that it is possible to use recycled plastics without compromising on quality or aesthetics. We want to support the industry in its transformation to a circular economy and are happy to continue on this path together with ALBIS as a tried and tested partner.“ According to COVESTRO, the recyclates can reduce the carbon footprint by up to 50 percent compared to virgin materials.

In addition to PCR and PIR polycarbonates, COVESTRO's RE portfolio also enables customers to achieve their sustainability goals. The ISCC PLUS-certified materials are based on raw materials from mass-balanced organic waste and residues and can seamlessly replace their fossil counterparts as a drop-in solution without complex and costly approval processes. The RE series is also available from ALBIS.

About ALBIS

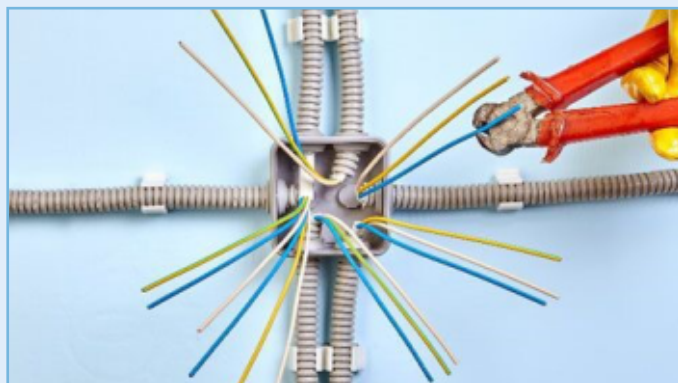
ALBIS is one of the world's leading distributors of standard polymers, engineering plastics, and thermoplastic elastomers. With technical know-how, a strong distribution network and a strong commitment to finding the best solution, ALBIS as an independent distributor offers its customers one of the market - leading and most comprehensive product portfolios in the entire plastics processing industry. With 25 locations worldwide and 500 employees, the Hamburg - based company has a strong presence in Europe, with a growing presence in the EMEA and Asia Pacific regions. For more information, visit albis.com.

About COVESTRO

COVESTRO is one of the world's largest polymer companies. Our business activities are focused on the manufacture of high-tech polymer materials and the development of innovative solutions for products used in many areas of daily life. The main segments served are the automotive, construction, wood processing and furniture, as well as electrical, electronics, and household appliances industries. Other sectors include sports and leisure, telecommunications, health and the chemical industry itself.

(Source: PLAS.TV)

AMPACET Introduces Low Halogen and Halogen - Free Flame Retardant Master Batches



AMPACET, a global master batch leader, has introduced Halolite 527 and Halofree 533, low-halogen and halogen-free flame retardant master batches, to comply with international standards IEC 61249-2-21 and EN 50642 regulating maximum halogen and antimony content.



Good fire resistance is required for electrical equipment used in the Building and Construction sector to help ensure safety in case of fire. The previous generation of flame retardant solutions, based on halogens (bromine and chlorine) and antimony provide excellent flame resistance. However, when burning, these substances generate toxic and corrosive gases and present an environmental risk and a hazard for humans when inhaled.

For new installations in the Building and Construction sector, use of low or halogen-free flame retardant solutions is required to comply with EN 50642 and IEC 61249-2-21 standards.

Designed for use in polypropylene electrical equipment as well as other PP injected or extruded plastics used in Building and Construction, AMPACET Halolite 527, which contains low levels of halogen, and halogen-free Halofree 533 have achieved a UL94 V2 classification and high Glow Wire Flammability Index (GWFI) in compliance with EN 50642 and IEC 61249-2-21 standards.

Halolite 527 and Halofree 533 are available in a natural color and can also be colored by adding separate color master batches; pre-colored versions can be developed upon request.

KRAIBURG TPE Provides Super Soft Compounds for Medical Devices

The demand for ultra-soft TPEs has been increasing across various industrial sectors. The reasons for this are obvious. Whether they are intended for key products such as orthopedic equipment or applications in prosthetics – their particularly soft surface feel, combined with a soft grip, make the compounds particularly suitable for a variety of application segments. KRAIBURG TPE is now meeting these requirements globally.



Due to a substantial increase in the demand for extremely soft thermoplastic elastomers (TPEs), KRAIBURG TPE successfully launched NEXT GENERATION Super Soft TPEs in spring 2021. Since then, the company has been able to appreciate – and satisfy in even greater detail – the complex requirements that customers from a wide range of industrial sectors have for the "super" soft compounds. Most recently, the TPE manufacturer has expanded its range of super soft products by additional hardness degrees. The focus here is on the THERMOLAST® M series, designed for medical devices. This means that the potential applications have become even more diverse, especially for the heavily monitored and regulated medical sector.

Their specific properties make these TPEs particularly suitable for prostheses and orthotic devices. The soft material is characterized by hardness values ranging from 30 to 50 Shore 00 and/or 45 to 70 VLRH. While TPEs in this hardness range tend to oil out and produce sticky surfaces, the extremely soft compounds from KRAIBURG TPE make a convincing impression with their pleasantly dry and velvety feel. Combined with their elastic properties, these TPEs are often used for applications with one-sided compressive loads such as orthopedic damping elements. Tests in accordance with the ISO 10993-10 standard also confirm that permanent contact with the skin surface does not lead to and/or cause allergic reactions.

Super soft compounds are mainly processed using standard injection molding. In developing the extremely soft TPEs, the focus was on achieving a flawless dosing capability and/or flowability of the granules, uncomplicated processing as well as easy ejection. The additional option of using the materials in 3D printing opens up new avenues toward customized therapeutic products.

The properties of these THERMOLAST® M compounds also correspond to those of medical grade plastics in accordance with the VDI 2017 standard and have passed the biocompatibility tests in accordance with ISO 10993-5 (cytotoxicity) and ISO 10993-10 (skin sensitization) as well. The Medical Service Package ensures that THERMOLAST® M compounds are produced on a dedicated production line. KRAIBURG TPE assures formulation and process stability (change control).

In addition, the compounds comply with the ISCC PLUS requirements and thus enable customers to use TPEs with a reduced product carbon footprint (PCF) also in strictly regulated markets such as the medical sector.

High - Productivity PBT and Nylon Compounds Launched

BASF's new HPP portfolio is the result of cost-optimized and energy-efficient production.



Source: BASF

A product portfolio of Ultradur PBT and Ultradur nylons has been introduced by BASF that it says is the result of cost-optimized and energy-efficient production. The new High Productivity Plus (HPP) grades are said to significantly reduce cycle time and energy consumption in the production process. Initial tests with these PBT and nylon molding compounds show a potential reduction in cycle time of around 30%.

Key characteristics of HPP compounds are their excellent flowability and accelerated crystallization. On this basis, it is possible to significantly reduce the required cooling times and hence cycle time, according to BASF, noting that significant cost

savings can be achieved by switching to HPP compounds. BASF offers the following HPP products: Ultramid B3EG6 HPP, Ultradur B4300G2 HPP, Ultradur B4300G3 HPP and Ultradur B4300G4 HPP. If required, HPP technology can also be applied to compounds with other glass-fiber contents.

Novel Method to Make PVC Products More Durable

New method may mean less micro-plastic pollution.



Polyvinyl chloride (PVC) is a widely used material, but its reliance on plasticizers and stabilizers compromises its performance over time. However, researchers have discovered a novel method to enhance PVC's durability and reduce the release of harmful micro plastics. This innovative approach involves securely attaching chemical additives to PVC, offering a long-term solution to prevent deterioration.

Led by Christo Sevov, an associate professor at Ohio State University, this exciting development has the potential to revolutionize the use of PVC in various industries, from toys to medical packaging.

"Instead of mixing in those chemicals, our method involves chemically bonding the plasticizer compound directly to PVC by grafting them onto the backbone of the polymer," said Sevov.

By altering PVC molecules in this innovative way, we can enhance their durability and resistance to chemical changes, resulting in materials with superior properties.

"This is really one of the few examples that we have where there's this much control over changing the properties of PVC," said Sevov. "So this is the

first step in controllably modifying PVC to give it properties you're interested in, whether it's hard, stretchy, or soft."

The team encountered significant challenges in their work with synthetic polymer modifications. The original reactions were designed for small-molecule analogs, not large-molecule analogs like pure PVC. However, through determination and innovation, the researchers optimized their catalyst and overcame the obstacles associated with modifying large molecules.

Beyond its implications for organic chemistry, the team's work also holds great promise for the environment. Their research could play a pivotal role in reducing the release of harmful micro plastics into the environment by controlling the degradation rate of plastics. These tiny plastic particles have been found to contaminate the air, water, and food supply, posing serious risks to both humans and wildlife. Shockingly, the average person may unwittingly consume between 78,000 and 211,000 of these particles every year.

As the world wakes up to the long-term impact of micro plastics, organic chemists are racing to find innovative solutions to phase out these harmful materials from everyday life. According to Sevov, experts are urgently seeking alternatives and strategies to minimize the presence of micro plastics in the environment, understanding the urgency of mitigating their detrimental effects.

"Many chemists are shifting their efforts to studying big molecules and developing new chemistries for upcycling, recycling, and modifying well-known polymers," he said.

Consider the challenges of recycling PVC products. Traditional methods often lead to further degradation due to the high temperatures required, resulting in an inefficient process. However, Sevov's innovative method offers a game-changing solution. With this approach, the material can be reused numerous times, significantly extending its lifespan and reusability.

In the near future, we will have greater control over ensuring consumer safety by effectively addressing PVC leakage. The study emphasizes that this is achievable using their unique method, paving the way for enhanced material safety standards.

"There's no better way to do this on the scale you would need for commercial PVC modification because it is an immense process," said Sevov. "There's still a lot to play around with before we solve the micro plastic situation, though now we've laid the groundwork for how to do it."



Germany: Incoming Orders have still not Bottomed out

The German plastics and rubber machinery industry continues to experience challenging times, with the latest figures for incoming orders and sales also being in line with the recent slump in demand.

Due to the fact that all existing orders have now been processed, the slump in orders is now also directly reflected in sales figures. From January to August, these were 7 percent down on the previous year. "This means that we have to revise our forecast downwards for the current year. The expected lowest point in terms of incoming orders has not yet been reached. We have to be prepared for a 10 to 15 percent drop in sales this year," explains Thorsten Kühmann, Managing Director of the VDMA Plastics and Rubber Machinery Association.

Signs of Slowdown for Italian Plastics Machinery Manufacturers

ISTAT data for Italian foreign trade in machinery, equipment and moulds for plastics and rubber in the first half 2024 shows a progressive drop in trade in both directions compared to the same period in 2023.

According to analyses by the MECS Study Centre of the trade association Amaplast, after positive consolidated year-end results for both imports and exports in 2023, imports were consistently lower in the early months of 2024 with respect to the same period a year earlier, with drops entering into the double digits in the second quarter. This is a symptom of lower propensity to invest within a context of contraction in the economy generally and in the industrial sector specifically. The period closed with a drop of 12 percentage points to a value of 483 million euros, with imports noticeably declining from all three main source countries: Germany, China, and Austria.

UltraMelt Technology from HUSKY

ULTRAMELT Technology: An award - winning hot runner system engineered for the efficient and sustainable molding of bio and sensitive resins. UltraMelt is a recipient of this year's Innovation in bio plastics award.

UltraMelt was developed in response to the growing demand for bio plastics and the inherent challenges they present in the traditional injection molding process. Bio resins, made in whole or in part from renewable biological resources, present unique challenges in injection molding.

UltraMelt - Impact on the Plastics Industry by:

- 1.Enabling Bioresin Usage:** Makes the utilization of sustainable bioresins in injection molding practical and efficient.
- 2.Driving Innovation:** Encourages the development of new, eco - friendly products, widening market opportunities.
- 3.Improving Cost-Efficiency:** Reduces maintenance and adaptation costs, making bioresin products more accessible.
- 4.Aligning with Sustainability Goals:** Supports the global shift towards environmentally responsible materials and manufacturing processes.

Its impact resonates beyond manufacturing, contributing to broader societal goals of sustainability and resource conservation. UltraMelt embodies the essence of innovation, environmental impact, and market significance that the award seeks to recognize and celebrate.

UltraMelt is a hot runner system engineered for the efficient and sustainable molding of bioresins. Recognizing the unique properties of bioresins and the need for specialized equipment. By transforming the way bioresins are handled in injection molding UltraMelt enables the creation of sustainable products without compromising on quality or cost-efficiency.

Stork IMM Launches New High - Speed Injection Machine for R-PET Packaging at Fakuma

NETHERLANDS - BASED Stork IMM (Stork Plastic Machinery B.V.), a leading manufacturer of injection molding machines for the packaging market, showcased its breakthrough injection molding machine specifically designed to convert recycled PET (r-PET) at the recent Fakuma 2024 exhibition.

The new machine was developed in partnership with Brink Moulds & Automation, a leading mold and automation specialist, and Alpla, a leading r-PET supplier, in a major development project to produce an oval 1-L container made of 50% PET and 50% r-PET. This container, developed by

Brink Moulds & Automation, achieves a high level of sustainability and features a complex geometry and a tamper - evident and watertight closure. It is believed to be the first high - quality 1-L r - PET container to be manufactured for high - volume production. At Fakuma, Stork IMM will demonstrate its new high-speed machine, paired with Brink's custom mold, to produce the two-cavity oval 1-L container.

"Stork IMM and Brink have taken an important step in providing a highly sustainable solution for the food packaging market," said Gert Boers, CEO of Stork IMM. "This development reaffirms our commitment to delivering the technology that will support a circular economy."

EU regulations mandate the use of at least 35% post - consumer recycled (PCR) material in plastic packaging. This is a significant challenge for food packaging manufacturers because of the inability to use recycled PP due to EFSA restrictions on permeability issues.

ARBURG Industrial 3D Printing – Applications for Injection Moulders

IN the high - temperature freeformer 750-3X the temperature of the build chamber can be raised to 200.

The focus of the two ARBURG additive exhibits is on applications that are of particular interest to injection moulder. A freeformer 750-3X with a high temperature design will process original plastic granules into functional components in hard - soft combinations. The TiQ 2 filament printer will demonstrate how equipment and robot grippers are 3D printed.

A practical example of how 3D printing and automated injection moulding processes optimally complement each other is the production of plant pots. An electric Allrounder 720 A makes thin - walled pots from recycled material. In order to carefully remove these from the mould, grippers which are precisely adapted to the product. Can be 3D printed quickly and 'on demand' the sturdy black center piece, made of fiber-reinforced plastic of filament, is manufactured using a TiQ printer. It is two to three times lighter, and significantly more cost-effective, than an aluminium component.

The four hard-soft combination white gripping rings were produced by a freeformer using the APF process. The soft gripper part is "inflated" with compressed air, whereby the injection moulded part is secured and carefully handled.

At Fakuma 2024, a Freeformer 750-3X with a high-temperature design produced sophisticated functional components from a wide range of different plastic granulates. Larger functional components or small batches can quickly and flexibly be additively manufactured and customized, using the APF process.

The TiQ 2 3D printer is particularly economical and predestined for successful entry into the world of additive manufacturing. It is possible, for example, to produce resilient suction grippers and mechanical grippers quickly, flexibly and cost - effectively. In addition to the additive manufacturing of end-of-arm tooling (EOAT), the open material system is perfect for the cost - effective 3D printing of operating equipment.

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SIDEL Capitalizes on Over 40 Years' Experience in PET Container Production to Launch Eco - Audit, a Service for Optimizing the Environmental Footprint of its Machines.



At a time when ecological issues have become a daily reality for manufacturers, SIDEL is now helping its clients maximize their environmental performance

thanks to Eco-Audit, a comprehensive approach to improve their PET container production processes. This service will soon apply to other equipment in SIDEL's portfolio.

The service, which can be broken down into several phases, begins with an in - depth audit of the container production process to accurately assess its true environmental impact, then offers expert support to significantly and rapidly reduce the consumption associated with PET containers and blow molding.

A Pressing Need to Reduce Consumption

Against the backdrop of the current ecological crisis, environmental regulations are becoming increasingly stringent for manufacturers. At the same time, consumers are increasingly aware of the carbon footprint of the products they purchase. For manufacturers, this duty to be sustainable, when considered as a means of improvement, represents a genuine competitive factor. Reducing material or energy consumption often translates into a significant drop in operating costs, and actively contributes to the creation of an enhanced brand image.

The carbon footprint of primary packaging is particularly significant. This is particularly true for manufacturers who package their products in PET. Indeed, although this material is convenient for consumers and is recyclable, the production of PET containers nevertheless represents at least 50% of the environmental impact and total cost of ownership of a packaging line, when considering both the preform material and the entire blow-molding process. PET packaging and its production are therefore one of the first production parameters to be addressed when it comes to reducing carbon footprint and production costs.

The Value of Manufacturer Expertise

Determining the factors on which to work to reduce the environmental impact of PET bottle production often requires advanced knowledge of the plastics industry. Mathieu Druon, Eco - Audit Product Manager, explains: "The production process for PET containers is complex. Many factors come into play: the quantity of material and the design of the preform, heating and blowing technologies, and the technical configuration and operation of the machine, from production to maintenance. What's more, these factors vary greatly from one

manufacturer to the next, depending in particular on their economic and strategic choices, their mastery of the blowing process, their knowledge of the latest technological innovations, and the compatibility of these innovations with each machine model”.

This observation led SIDEL to launch its Eco-Audit service. Mathieu Druon sums up: “SIDEL is a pioneer in the development of stretch blow molding technology, and in over 40 years of designing blow-molding machines, we have developed proven expertise in all aspects of PET container production. So it was only natural that SIDEL developed the Eco-Audit to help owners of SIDEL blow - molding machines better control and reduce their machines' consumption”.

A Comprehensive Audit

The service offer developed by SIDEL can be broken down into three phases to suit the exact needs and expectations of each manufacturer.

The first phase, called Eco - Assessment, is a comprehensive, in-depth audit of the production process and associated consumption, from the characteristics of the preform, to the machine's technical configuration and operating parameters. Once this thorough diagnosis is completed, a full report is given to the client, detailing actual consumption, its ecological and economic impact, and all potential avenues for further reductions.

The second phase of the offer, called Eco-Value, aims to implement all the simple adjustments needed to achieve quick savings in materials and energy. All aspects of the process are taken into account: recipe management, machine settings, from oven heating to the use of air in blowing and de-dusting modules, or the detection and correction of potential air leaks.

Finally, the third phase, called Eco-Partner and based on the analysis of the Eco-Assessment and the results of the Eco-Value, consists of fully supporting the client in transforming their production facilities to fundamentally improve the energy performance of their PET container production. This work can take the form of installing custom parts or options to enable the machine to benefit from the latest technological innovations developed by SIDEL. Depending on the case, SIDEL experts can also recommend improvements to the container

(neck, preform or bottle design) in order to reduce the quantity of material and blowing pressure, and assist clients in the subsequent modification of their line. The Eco-Partner then concludes with another complete audit of the line, along with a quantified report on the savings achieved and forecasts for future gains.

Fast, Substantial Gains

Regarding the potential savings from the Eco-Audit of PET blow-molding machines, Mathieu Druon states: “It's hard to quantify because every industrial case is different. That's why our intervention always begins with a detailed audit under real conditions: it enables us to evaluate precisely and factually the savings we can generate for the client. And this is precisely what enables us to deliver the results we announce when we work on our clients' lines to implement our recommendations.

Nevertheless, I can mention the results of two test audits we carried out with clients: in one case, we achieved annual reductions in carbon footprint of 7 tons of CO₂ equivalent for over 80,000 Euro in savings, and in the second case, no less than 157 tons and over 180,000 Euro! And in both cases, the return on investment was barely a few months”.

An Offer Poised for Growth

To make its clients aware of the savings that can be made in PET container production, SIDEL will be distributing an informative brochure in early October, via its social networks and website, outlining solutions for improving the energy performance of their blow-molding machines. And to deploy its Eco - Audit offer worldwide, SIDEL has an international network of experts in packaging and blow molding. They will also be able to rely on SIDEL's Evo-ON Eco, when installed on the line: this digital application, the result of SIDEL'S dual expertise in packaging and digital technology, enables detailed, real-time monitoring of the line's various consumption levels.

As for the other equipment in SIDEL's portfolio, Mathieu Druon explains that “SIDEL intends to broaden the scope of the Eco-Audit to its other equipment in the near future, starting with bottle washers and pasteurizers. Our long-term ambition is to enable our clients to have the most cost-effective production throughout their packaging line”.

Direct Solar Heating for Rotational Molding Enables Feedback Control and Rapid Deployment

Light Manufacturing offers roto molding factory in a box, with no utilities needed. Karl von Kries began his career as a staff engineer at Hardigg Industries, a Massachusetts manufacturer of protective cases. It was a good place to learn roto molding, but von Kries saw one problem. In the summer, as the sun beat down on the roof of the building, the air conditioning struggled to keep the temperature inside comfortable. At the same time, the facility was burning natural gas to heat the ovens it used for rotational molding. There had to be a better way. Years later, von Kries found one.

Heating the molds directly using reflected sunlight seemed an unlikely solution at first. Surely, someone somewhere had tried this and failed. But after a literature search came up empty, von Kries started a new company, Light Manufacturing, to explore the idea, experimenting with molds that had been painted black, a two-axis molding machine and a heliostat, which is a mechanism that automatically moves a mirror to track the sun's path. The initial system did not make good parts, but it showed that the concept was feasible.

Several iterations later, the company is now offering solar rotational molding (SRM) systems that can operate without the utilities or infrastructure needed for a conventional manufacturing operation. Molds are heated directly by a array of heliostats that deflect energy from the sun, using the same principle as concentrated solar power generation plants. Electricity to power the motors, control computers and heliostats comes from photovoltaic panels.

The system can ship in 2 or 3 standard shipping containers, depending on the model, that include the roto molding machines, photovoltaics, heliostats and batteries. The containers themselves double as enclosures for the molding chamber and operator's cabin. The system can be set up on bare ground, in about two weeks, anywhere that gets sufficient sun. According to the company, this includes nearly half of the world's land area. If a location turns out to be suboptimal, the system can be packed up again and moved.



LM's rotational molding systems can be set up in two weeks with no need to connect to utilities. Electricity is provided by photovoltaics mounted on the container roof, while heat is provided by the array of heliostats at right. Source: Light Manufacturing.

The ease of deployment could make SRM the obvious choice for extreme locations with ample sunlight and scarce utilities. And it could be used that way, but the low startup cost, advanced controls and sustainability could appeal to a broader market.

Direct Heating Saves Energy and Enables Closed-Loop Controls

Conventional turret or shuttle roto molding machines heat the mold in an oven, requiring air temperatures of 500-600°F to get the mold and the plastic inside up to the required temperatures in a reasonable amount of time. To establish process parameters like cycle time, a shielded and cooled box is built into the arm of the machine, and electronics are placed inside and connected to thermocouples that make measurements of the mold temperature.

Because solar rotational molding reflects radiation from the sun directly onto the outer surface of the mold, most of the heat is directed just where it is needed. "What's crazy is that you can actually stand in the chamber while 100,000 watts of heat are being pumped into that mold, two feet away and the air is maybe 120(°F)," von Kries says. "That means we can have advanced electronics and robotic components right there in the chamber, and they're fine."

Light Manufacturing has taken full advantage of this, implementing feedback control with real-time temperature monitoring. The temperature data is looped back to the control systems, adjusting processing parameters on the fly and ending the

cycle exactly when the plastic has cured. A part run in the morning, or on a day with more clouds, may require a longer cycle or more mirrors focused on the mold.



A solar rotational molding system with a sample rain catchment tank. Source: Light Manufacturing.

The design of the part may need more heat on one side, if the wall thickness needs to vary. No problem. The system can adjust the speed of the motors to leave that side of the mold in the target area for more time. “The recipe for the part, and the target temperatures, are built into the brain of the system,” von Kries explains. At the appropriate time, the system goes into cooling mode automatically, the fans are activated and when cooling is complete a tone alerts the operator that they can begin demolding and refilling.

Sound Economics Complement Environmental Sustainability

Since 2016, Light Manufacturing has been making roto molded components for Technomad, an outdoor audio systems manufacturer also founded by von Kries. It has also been supplying parts to other customers on a contract basis.

Light Manufacturing has three models of various capacities, with the largest capable of molding an 8,000-liter tank. According to von Kries, the system is now “ready for prime time” and the company is exploring partnerships with manufacturers who would purchase or license the technology.

The economics of such a system should be attractive. Energy costs for roto molding can be 15-30% of operational expenses, positioning Light Manufacturing's technology for significant potential savings. Energy cost could even be effectively negative in jurisdictions that tax carbon emissions or

otherwise incentivize low carbon manufacturing. The option to skip the normal infrastructure would also tilt the economics in solar's favor in some situations.

“It's been an exciting journey to go from expecting it to fail to build this advanced machine. We're excited to see where it's going to go next,” von Kries says.

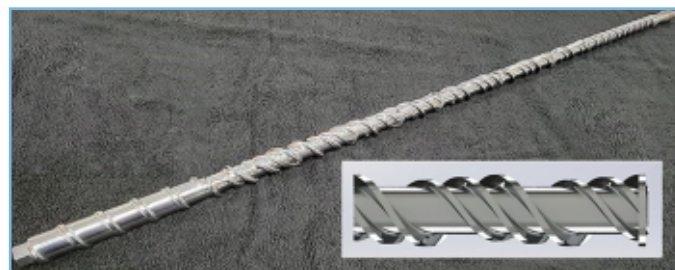
(Source: Plastics Technology/ Updated on 6.11.2024)

New Screw Boosts Mixing, Enhances Polymer Properties

Device mixes at the 'molecular level,' inventor says, to boost mechanicals and in some cases make pre-drying redundant.

Undaunted by commonly held beliefs that “there is nothing more that can be done to improve single-screw extrusion,” and forever the tinkerer, Keith Luker has for the last two decades been working on the next iteration of his SFEM Elongational Mixer. What the founder and president of Randcastle Extrusion has perhaps stumbled onto is a novel device that is not only a more effective mixer but, in some cases, improves material physical properties and makes pre-drying unnecessary.

Luker has dubbed it the Molecular Homogenizer (MH). It's a new device that he says could have broad appeal across the material supply chain — beginning with resin manufacturers. It's so named, he maintains, because it mixes material at the “molecular level.” He elaborates, “The mixing is so fine that the properties of polymers change.” “Physical properties of polymers (virgin polymers processed through the screw) improve. In hygroscopic polymers, water-vapor absorption is postponed. Undried hygroscopic polymers show no bubbles. Rheological properties show incredible improvement.”



Randcastle's Molecular Homogenizer is a 36:1 L/D screw with seven mixing sections. According to the inventor, it has been shown to enhance mixing

and also improve material properties in some cases. Inset shows single mixing element. Source: Randcastle Extrusion

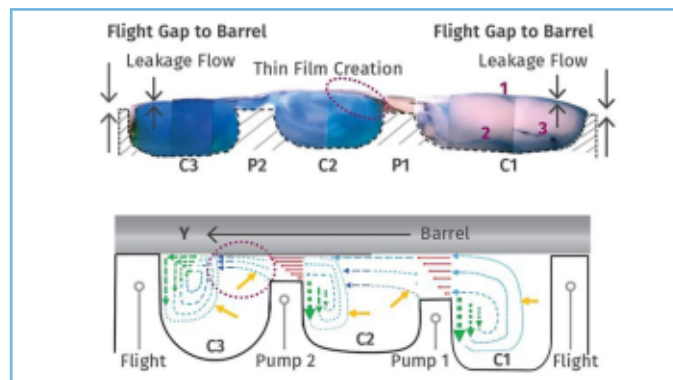
Luker has presented papers on this mixing device in 2022 and 2023 at Plastics Technology's Extrusion Conference, and more recently this past June at the SPE Extrusion Division Screw Design TopCon. Luker is the first to admit that more work, testing and research needs to be done to adequately explain why the design is performing as it is. That said, he has patents pending in five countries and Europe, and had the MH tested on a wide range of materials, including PLA, PMMA, PET, PET with 25% reclaim, PEEK, PVA, PVA with 3% reactive agent, PLA, SAN color concentrate, PC, nylon and coffee chaff in LDPE. The mixer is also being used by at least one extrusion processor in a production environment.

The tested screw had at least 1007 (100 trillion) mixing actions along the XYZ dimensions. "Such an increase resulted in mixing to the small molecule level (such as 3 atom water vapor)," he says. "Because the sequence is orderly, the mixer imposes organization to the messy, tangled mixture produced by a polymer reactor. We believe this mixing changes the alignment of long polymer chains; distributes small molecules (monomer, water vapor), additives, particulate, actives, etc. This results in the improvements we see at the macroscopic level. The mixing may enhance, indirectly, diffusion."

Mixing Forces

Luker notes that many conventional mixers rely on shear with compression forces to push material through narrow gaps. Compression forces, he contends, are negative and counter mixing. That is, when compression is combined with shear or elongation, mixing performance is significantly impaired.

Pullout (left) of MH predecessor SFEM Mixer (C=Channel; P=Pump). C1 shows 2.5 striations, C2 more than 25; C3 more than 250. This results in a 100-fold improvement in mixing. Right depicts new MH. Orange arrows show extensive free surfaces. Red shows 1-dimensional shear in two places. Black oval indicates 3D trilongation in three places. Red oval reveals 2D elongation in two places.



Luker elaborates: "When compression is applied equally and opposite in all three dimensions, it is called pressure. When we apply compression or pressure to a cube, sphere or bubble, mixing does not occur. The force is applied in all three dimensions inwardly. If the cube or sphere were made of loosely held particles, then compression or pressure will push these particles together causing agglomeration. When pressure is applied to the bubble, it shrinks, becoming denser and this too is agglomeration. Agglomeration is the opposite of mixing and is caused by compression and pressure. Think of pressure as an antimixing force.

On the other hand, reorienting or interrupting shear makes "order of magnitude improvements" possible, he adds. Further, when a mixing flow is oriented in one direction and then another, "The orientation imparted by the first section is destroyed, and each 'stage' of the device behaves as a separate unit."

In 2005, Luker developed the SFEM mixer that created significant elongational mixing. Dow Chemical presented a paper at ANTEC 2011 which showed mixing results that were eight times better than their twin with immiscible polymer blends. This new mixer uses first principal arrangements of interrupted shear, interrupted elongation and a mixing flow called inversive mixing.

"Until this arrangement, it was not understood that compression was so detrimental to extrusion mixing," Luker says. "Stated another way, if there were no compression mixed in with shear and elongation, they would mix vastly better. Fundamentally, this is why the MH produces such surprising results."

The design arrangement, Luker maintains, “creates exponentially improved mixing such that surprising results start to become mundane.” For example, processing through the unvented Molecular Homogenizer has been shown to:

- **Improve Physical Properties:** Increase tensile-at-yield greater than the virgin polymer.
- **Increase Viscosity:** Restore undried hygroscopic regrind to the viscosity of the unprocessed virgin polymer.
- **Slow Water Absorption:** Processing slowed water absorption from the typical 4 to 6 hours when exposed to atmosphere to over 72 hours
- **Sequester Water Vapor:** Moisture analyzer measurements showed the moisture content of an unprocessed material entering the Molecular Homogenizer at 0.328%; it then reported that the Molecular Homogenizer processed polymer had 0.171% moisture.

How It Works

Randcastle Molecular Homogenizer has a 36:1 L/D and features seven mixing sections. According to Luker, this design promotes a powerful dispersive mixing force called trilonation, where all the flow is stretched in three dimensions. Each of the mixing elements of the device creates a repetitive mixing sequence twice: 3D trilonation, 2D elongation and 1D shear. Each mixer is known to improve the mixing by more than 100 times, Luker says.

He says that unlike a twin-screw extruder, the entire flow moves through this sequence. Each time it does, the 100-fold improvement is created, a bit like a static mixer multiplication except this is dynamic. He says this creates more than 100 trillion mixing events in the screw. At the end of each mixing element, the flow is inverted where the inside becomes the outside. This reorientation enables the friction-warmed material at the screw to move to the barrel where cooling takes place before the start of the next mixing element. In degassing applications, it moves the trapped bubbles to the extensive surface for rupture and venting.

Test Results

Undried hygroscopic polymers are known to produce visible bubbles in unvented extruders. Luker reports that in his lab the new mixing screw processed PMMA, PET, PET with 25% amorphous reclaim, PEEK, PVA, PVA with 3% reactive agent, PLA, SAN color concentrate (black and white), PC and coffee chaff in LDPE. None of these materials were pre-dried and none showed any evidence of bubbles (water). More specifically:

- **PET With 25% Reclaim:** Undried PET is very well known to absorb water vapor and form bubbles. Undried PET reclaim is amorphous and known to absorb even more water. No bubbles were seen.
- **Reactive Extrusion of PVA:** Undried PVA produces a bubbled extrudate. A reactive chemical was added to dry PVA and created a bubbled extrudate in a conventional screw — implying that the bubbles were not water vapor. Yet, in an undried PVA with 3% reactive agent, no bubbles were seen in the Molecular Homogenizer extrudate.
- **Coffee Chaff:** Coffee chaff is the thin papery skin that comes off the coffee bean. When heated with LDPE, the chaff breaks down, releasing gases such as carbon dioxide (CO₂), water vapor (H₂O), carbon monoxide (CO), and various volatile organic compounds (VOCs). The Molecular Homogenizer produced no bubbles in the extrudate.
- **Black and White SAN Color Concentrate:** SAN is hygroscopic. Both carbon black and TiO₂ are hydrophilic and also absorb water vapor. The undried materials were both pelletized. No bubbles were visible in the strand cut pellets. The pellets were then processed in a conventional screw on a film line.
- **Nylon:** Nylon is a very hygroscopic polymer absorbing moisture in the 2%-9% range. It is expensive to dry polymers. In the Randcastle lab, Luker processed a nylon blend into film on a conventional screw for a week. Drying was necessary. Conditions were well established.

He then swapped out the screw with the Molecular Homogenizer and processed the same nylon but didn't dry it first. Bubbles were still created. He then opened a single atmospheric vent, exposing the

extensive free surfaces, and the film on the right was produced. He notes the output rate was the same (rpm was increased and extruder starved); the temperatures were kept the same as the dried material; no die adjustments were necessary to produce the same tolerance film — implying the viscosity was the same; and pressure was the same as the dried material — implying the viscosity was the same.



Here, undried nylon was processed on the MH. Bubbles were created.

- Undried PVA With More Than 3% Reactive Agent: PVA with 3% reactive agent was one of the materials where the strand did not show bubbles. However, the experiment also mixed

6, 9 and 12% reactive agent. At 6%, bubbles were created. A single atmospheric vent was opened. No bubbles were seen. The experiment proceeded and no bubbles were seen at 9 or 12%.

Luker reports the Molecular Homogenizer has been shown to slow the rate of moisture absorption, which he notes is particularly useful for regrind where it takes more than a couple of hours to grind and reprocess the material. For example, PMMA regrind will absorb moisture in 4 to 6 hours, creating problems (bubbles, lower viscosity, property degradation and roughened surfaces), he points out.

He recalls that the screw was used to process dried PMMA through a water trough and strand pelletizer on a rainy, summer Friday afternoon in New Jersey. The bag of pelletized material was left exposed to the atmosphere over the weekend, and it continued to rain. On Monday afternoon, the pellets were extruded (undried) in a conventional screw. There were no bubbles. This, Luker says, demonstrates that the time for processing regrind can be substantially extended for product improvement.



After a single atmospheric vent was opened, exposing the extensive free surfaces, nylon film was produced with no bubbles at the same rate.

In yet another test, a Molecular Homogenizer and a general-purpose control

screw were used to process virgin dried PETG. The pellets were then molded in a family mold and compared at the Pennsylvania College of Technology. Concerning properties of test samples, says Luker:

- Elongation at Yield: The Molecular Homogenizer was 17.9% better than the general-purpose screw and improved this property 6.7% vs. the virgin material.
- Izod Impact Strength: The new mixing screw was 22.4% better than the general-purpose screw. The Molecular Homogenizer screw was 18% worse than the virgin pellets.

Who Would Benefit?

Luker states many applications that would benefit from the use of this new mixing screw technology. He notes, "Start with polymer producers. The MH has demonstrated postreactor improvement in physical properties and rheology — despite an additional processing history. Since the reactor operation already includes a pelletizing processing history, we expect the same or better results from a Molecular Homogenizer placed at the end of a polymer reactor for pelletizing. This will create polymer with better properties and lessened or no need for drying."

For compounders and those involved in direct extrusion (bypassing the pelletizing step), Luker says the MH serves as a stable, high-pressure pump that eliminates the need for a gear pump. In reclaim operations, meantime, he asserts that the lower water absorption rates demonstrated translate into increased time for processing without the need for drying. Viscosity improvements with reclaim also mean more consistent die flow, he adds. Higher quality and improved viscosity often lead to increased output, Luker notes.

Other applications that Luker believes to be well suited for the Molecular Homogenizer include: processing of PP, PFA and rigid PVC powder, which he says have been shown to run at higher rates with the new screw; research and development, as greater mixing performance could pave the way for new material combinations; and users of twin-screw extruders, where the screw can be used as an add-on.

(Source: Plastics Technology / Updated on 20.11.2024)

Important Factors and Approaches to Estimating Residence Time in Injection Molding

Residence time can have a dramatic impact on part quality and production efficiency but determining its value can be tricky. Use these methods and formulas to accurately measure residence time and enable it to inform everything from scheduling jobs to optimizing a process.

Residence time can be impacted by increasing or decreasing the amount of material the machine processes per hour or if the injection unit specifications have changed, which is common when moving molds among machines. The residence time is defined as the time a resin pellet is physically in the barrel and exposed to shearing or heating via conduction. Changing any time-related machine parameter — cooling time, packing time, holding time, mold open/close times, mold protection time, part ejection time and the addition or removal of a robot — will change the residence time.

This information is crucial, as it will be used to schedule molds for specific machines, determine the optimal placement for thermally sensitive materials to minimize residence time, or assist a custom molder in purchasing a new machine and specifying the appropriate barrel size for a variety of materials and part weights.

As a plastics engineer, I often find that some of the simplest questions in our field can be the most challenging to answer. One such question is determining how many shots of plastic are present in the barrel and calculating the corresponding residence time. A commonly accepted target for residence time in the industry is between 2 to 5 minutes. However, this rule of thumb may not be applicable when working with high - temperature engineering thermoplastics, such as PEEK or thermally sensitive materials like PBT or PVC. Additionally, when PP and PE are applied in packaging applications, deviations from this guideline may also occur.

Throughout my career, I have observed that residence times for packaging applications utilizing RS machines can at times fall below 1.5 minutes. This duration is typically inadequate for effectively

elevating semi-crystalline plastics to their optimal processing temperatures. In certain instances, increasing the barrel temperatures by 100°F to 200°F has been employed to enhance heat transfer through conduction, compensating for insufficient shear generated by the screw configuration. Although solutions such as implementing barrier screws; utilizing screws with higher L/D ratios and increased compression ratios; or acquiring machines specifically engineered for packaging applications may address these challenges, they often present impracticalities regarding cost and machine capacity constraints.

I have also seen residence times as high as 15 minutes for thermally sensitive materials running in semiautomatic mode. In this case, no matter how much we attempted to lower the actual plastic temperature, we had to intermittently purge the barrel to remove degraded material.

The most straight forward method to assess residence time for an existing running application is to note the maximum machine shot size, actual shot size and cycle time, and with those figures calculate the residence time using the following equation:

EQUATION 1

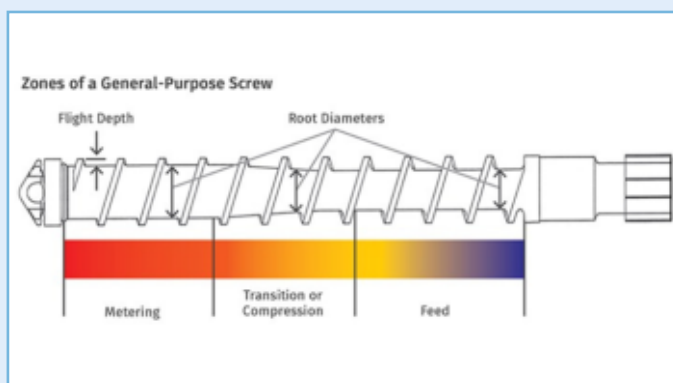
$$\text{Residence Time} = \frac{\text{Maximum Machine Shot Size}}{\text{Actual Shot Size}} \times \frac{\text{Cycle Time}}{60}$$

In determining your actual shot size, the cushion and amount of post decompression should be removed to determine the actual amount of plastic displaced. For example, on a machine that has a maximum shot size of 12 inches with 1.5 inches of plastic being displaced that's running in a 15-second cycle time, the residence time would be 2 minutes.

EXAMPLE 1

$$\text{Residence Time} = \frac{12 \text{ inches}}{1.5 \text{ inches}} \times \frac{15 \text{ seconds}}{60} = 2 \text{ minutes}$$

However, if we consider that true residence time is defined as the time a pellet is physically in the barrel, the above calculation omits the amount of plastic that is being conveyed down the length of the screw within the metering, compression and feed zones as illustrated in Figure 1.



When determining residence time, molders should consider the different zones of a general-purpose screw. Source: Orbital Consulting

Determining this involves pulling back the hopper or shot loader and noting when pellets are last seen between the screw flights in the feed zone and then allowing the machine to continue to cycle. (Important: DO NOT look down the feed throat but rather use a mirror and apply full PPE to avoid being burned by any hot plastic that could be discharged from the feed throat).

For example, you count five complete shots in automatic mode over a 30-second cycle with a 2-inch shot of actual displaced plastic, but on the sixth shot, the screw only recovered to a calculated 1.5 inches of actual displaced plastic, you can then calculate: $1.5 \div 2.0 = 0.75$ inch, or three-quarters of a shot. In this case, you would add three-quarters of a shot to the fifth shot, resulting in a total of 5.75 shots. The residence time can then be calculated by multiplying the total number of shots with the cycle time: $5.75 \text{ shots} \times 30 \text{ seconds}$ equals a residence time of 172.5 seconds (or 2.9 minutes).

Another method would be to add a colored pellet of the same material or a pellet from a batch of color concentrate into the machine and note the moment pellets are last seen between the screw flights in the feed zone by moving the hopper or shot loader back over the feed throat and noting when parts are first molded with color. Of course, if you are running black material, this could be an issue.

John Bozzelli discussed this method in an article titled, "A Simpler Way to Calculate Shot Size vs. Barrel Capacity," first published in February 2017 and updated in June 2022. He puts forward other limiting factors, such as using the

above method for an existing application in production and actually calculating the residence time for a machine purchase.

Bozzelli also points out a common error in calculating the barrel capacity — confusing melt density with specific gravity. The barrel is commonly specified in ounces or grams of general-purpose PS or at times PE. A common misconception is that parts can be produced with any material at the specified barrel capacity. We must convert the barrel size to accurately reflect the material that we are molding, whether it be more or less dense than GPPS, by using melt density versus specific gravity. This will result in the following equation:

EQUATION 2

$$\text{New Barrel Capacity} = \frac{\text{Barrel Capacity (GPPS)} \times \text{Melt Density of New Material}}{\text{Melt Density of GPPS}}$$

For example, we are interested in running PC with an L/D ratio of 22:1 and a 60-ounce barrel, where the melt density of GPPS is 0.97 g/cm³ and 1.02 g/cm³ for PC. This would yield a barrel capacity of approximately 63.1 ounces of PC.

EXAMPLE 2

$$\text{New Barrel Capacity} = \frac{60 \times 1.02}{0.97} = 63.1 \text{ ounces of PC}$$

Conversely, if a less dense material is molded — such as PP with a melt density of 0.75 g/cm³ — this yields a barrel capable of processing approximately 46.4 ounces of PP.

EXAMPLE 3

$$\text{New Barrel Capacity} = \frac{60 \times 0.75}{0.97} = 46.4 \text{ ounces of PP}$$

Because PP is less dense than GPPS, if a scheduler or someone providing quotes assumes that 60 ounces of PP can be processed, they'll find the actual amount is only 46.4 ounces. This misconception leads to an inaccurate calculation of the barrel's utilization percentage, which can affect the expected residence time. In some cases, this can result in the maximum machine shot size being inadequate to fill and pack the machine and mold combination, which results in short shots or the need for the molder to utilize intrusion to compensate.

As mentioned earlier, to achieve a more accurate residence time, it's also important to account for the material being plasticized in the screws feed, compression and metering zones. A method I've been using comes from a guide published by Spirex, titled "Plasticating Essentials." Originally authored by Paul and Illene Colby in 1979, the guide has been updated with additional information in versions released in 1985, 1992 and 2000.

Within this guide, they propose a barrel factor based on the work of Bernie A. Olmstead and Martin E. Davis in which a factor of 1.4 is used to calculate the residence time if the machine injection stroke is four diameters or more. If the machine screw stroke is three diameters, the multiplication factor is 2.0. This assumes the screw has a 20:1 L/D ratio with general purpose compression factors and flight depths.

Thus, Equation 1 is modified with a barrel factor of either 1.4 or 2.0 to yield Equation 3.

EQUATION 3

$$\text{Residence Time} = \frac{\text{Maximum Machine Shot Size}}{\text{Actual Shot Size}} \times \frac{\text{Cycle Time}}{60} \times (1.4 \text{ or } 2.0)$$

Barrel Factors Based on Bore Diameter

Bore Diameter	Barrel Factor
30 mm & less	1.80
31-49 mm	1.65
50-69 mm	1.45
70-79 mm	1.30
80-90 mm	1.25
90-104 mm	1.20
105-109 mm	1.15
110 mm & greater	1.10

Barrel factors based on bore diameters. Source: Practical Injection Molding, Olmstead and Davis

As with Example 1, in calculating the residence time, we would either have 2 minutes x 1.4 or 2 minutes x 2.0 to yield a residence time of either 2.8 or 4.0 minutes, depending

on the machine injection stroke and its screw diameter.

I have used a barrel factor of 1.4 throughout the bulk of my career with good results. What I did not consider is the source of these barrel factors. In reviewing Olmstead's and Davis' data in their book, "Practical Injection Molding," they developed a barrel factor based on the bore diameter of the barrel which is cited below in Table 1.

In order to use this data, we must first calculate what is called Screw Inventory (SI) which considers a L/D ratio other than 20:1 and utilize a

barrel factor from Figure 2. The equations are as follows for Screw Inventory and Residence Time:

EQUATION 4

$$\text{Screw Inventory} = \frac{\text{Machine Barrel Capacity (GPPS)} \times \text{Melt Density of New Material} \times \text{Barrel Factor} \times \text{L/D Ratio}}{\text{Melt Density of GPPS} \times 20}$$

Where:

EQUATION 5

$$\text{Residence Time} = \frac{\text{Screw Inventory (oz)}}{\text{Actual Shot Size (oz)}} \times \frac{\text{Cycle Time}}{60}$$

Thus, for a machine with a 60-ounce barrel, bore diameter of 75 mm (1.30 factor from Figure 2), L/D ratio of 22:1 running 23 ounces of PC, at a cycle time of 30 seconds our screw inventory and residence time is as follows:

$$\text{Screw Inventory} = \frac{60 \times 1.02 \times 1.3 \times 22}{0.97 \times 20} = 90.2 \text{ oz of PC}$$

$$\text{Residence Time} = \frac{90.2 \text{ (oz)}}{23 \text{ (oz)}} \times \frac{30}{60} = 1.96 \text{ minutes}$$

Comparing the screw inventory of 90.2 ounces versus the previous calculated screw inventory of 63.1 ounces of PC (see example 2), the barrel capacity is increased by 27.1 ounces of PC. An increase of nearly 43%, this will clearly affect the residence time for this example.

If one chooses to calculate the residence time based on the maximum machine shot size or to include the amount of plastic that is between the screw flights, multiple residence times can be calculated. In my humble opinion, Equations 4 & 5 put forward by Olmstead and Davis provide an alternate calculation considering a different L/D ratio along with the bore diameter of the barrel.

Additionally, using specific gravity to convert barrel capacities for different materials is often a mistaken approach that assumes the injection unit is rated in grams or ounces of GPPS and that rating applies to all materials molded on a machine.

(Source: Plastics Technology / 11.11.2024)

CIRCULAR ECONOMY/ BIO-PLASTICS/ RECYCLING



Green Methods and the 'Five R' Strategy

Simon Farnfield, event director at Advanced Engineering, explains how the industry is adopting the 'five R' strategy (rethink, reduce, remake, recycle and recover) for a more sustainable future and the latest methods.



Advanced Engineering

As environmental concerns grow, companies are setting ambitious sustainability goals to reduce their environmental footprint. Academia is also trying to integrate climate - related conversations into educational programs.

'Rethink, reduce, remake, recycle and recover' is the five R strategy. Emphasis is on sustainability in manufacturing by 'rethinking' product use and 'reducing' material and energy consumption during design. It also promotes 'remaking' products for

easy repair and refurbishment, prioritizes 'recycling' by selecting recyclable materials and focuses on 'recovering' energy from products at the end of their life cycle.

The Role of AI

Advancements in AI enhance robots' decision-making abilities, opening up new opportunities for companies to improve the sustainability of their operations. For instance, FPD Recycling, an Irish technology start-up, has developed a solution to address the growing issue of electronic waste, particularly from flat panel displays (FPDs) like TVs, monitors and laptops.

Every year, around 50 million tons of e-waste are discarded globally, including valuable materials such as gold, silver and copper. Recovering them is vital to reduce the need to mine new resources. However, e-waste often contains toxic chemicals like mercury and lead, making safe recovery challenging.

To tackle this, FPD Recycling has introduced the UK's first fully automated robotic system designed for processing and recycling complex and potentially hazardous e-waste. Two ABB robots are used to process up to 120 screens per hour when operating at full capacity in an AI-driven compact system that fits into a 40-foot container. This is made up of two machines that can work independently or together to handle different types of devices.

The recycling process involves three stages. First, each device is weighed and identified. Next, a robot arm scans the screen, determines the appropriate processing method and removes the liquid crystal display (LCD) screen. This ensures that valuable materials are extracted and hazardous substances are safely handled, leaving a clean waste stream for further processing.

An advantage of this system is its ability to gather detailed data on every device processed, including weight, size, manufacturer and model. This is crucial for compliance with the EU's WEEE (Waste Electrical and Electronic Equipment) regulation, which requires manufacturers to pay producer responsibility fees.

Revolutionizing Plastic Recycling

Traditionally, many plastics deemed non-recyclable were destined for landfills, incineration or environmental leakage. However, Mura Technology's multi-million-pound facility in Teesside, North East England, shows that these plastics can be effectively recycled.

The facility is the first Hydrothermal Plastic Recycling System (HydroPRS), which converts waste plastics into virgin-grade recycled hydrocarbons. This aims to create a circular economy for plastics while reducing carbon emissions associated with traditional plastic waste management methods.

The HydroPRS process involves several steps. First, plastics are shredded and contaminants like metals and glass are removed for standard recycling. The remaining plastics are pressurized and heated before being sent to HydroPRS reactor, where they are mixed with supercritical steam. This process breaks down the plastics into their component molecules, enabling their reuse in new plastic production.

A key advantage of the HydroPRS technology is its use of water as a solvent under high pressure and temperature to convert solid plastics back into liquid oils and hydrocarbons, the original materials used to make them. This allows for the indefinite recycling of plastics without quality degradation, creating a sustainable loop for plastic materials. Mura's plant is projected to produce 20,000 tons of recycled hydrocarbons annually, with plans for expansion.

(Source: Interplas Insights/28.10.2024)

New EREMA Polyolefin Plant Outputs More than 4 Tons per Hour

Premiere at EREMA: the new INTAREMA® 2325 sees the world's leading manufacturer of plastics recycling systems grow its post-consumer series to enter a new dimension in recycling. The INTAREMA® 2325 T-VEplus® RegrindPro® with laser filter is the largest system ever built to recycle polyolefin regrind and marks a milestone in the very latest recycling technology.



Ansfelden, 16 October 2024 - As the demand for recycled plastics increases, so does the need for larger recycling machines. This is an industry where EREMA can draw on a wealth of proven experience. In the PET sector, the machine manufacturer has already implemented several

projects with large-scale systems of this magnitude featuring their VACUREMA® technology. Now the company is following that up in polyolefin recycling. The new size of INTAREMA® is EREMA's response to market demand. "New legislation and the voluntary commitment of major product brands mean that in the future, our customers will need to process an increasing volume of plastic waste to make high quality recycled pellets without any compromises," says Markus Huber-Lindinger, Managing Director at EREMA. "The INTAREMA® 2325 is our answer to this need."

More Recycled Pellets Per Hour

The INTAREMA® generation of machines is EREMA's flexible series for handling a wide variety of feed materials. Available in 13 sizes for film and 9 sizes for regrind applications, the INTAREMA® range covers a broad spectrum. The new 2325 model with a preconditioning unit (PCU) diameter of 2.30 meters and an extruder screw with a diameter of 250 millimeters enables the production of high volumes of high-quality recycled pellets using a single machine. "With a throughput of over 4,000 kilograms per hour for PO regrind, the INTAREMA® 2325 sets new standards in terms of performance and efficiency," emphasizes Huber-Lindinger. The system also impresses with its compact footprint in contrast to its high throughput capacity.

Consistent processes combined with a high level of automation

The plant is packed with innovative technology. The proven key principle of the TVEplus® Counter Current® system lies in melt filtration upstream of extruder degassing. This makes it possible to produce recycled pellets of impressively high quality, meaning that the proportion of recycled plastics used in the final product can be significantly higher than with lower-quality recycled pellets. "Our extensive trials with around 500 tons of material have shown that the INTAREMA® 2325 impresses with high-quality recycled pellets at high throughput rates, all within a very stable process," says Sophie Pachner, R&D Manager for Process Engineering at EREMA.

Like all INTAREMA® systems, this one is also equipped with patented Counter Current® technology. The plastic material moves through the preconditioning unit in the opposite direction to the extruder screw, ensuring a consistently high output over a wide temperature range. This system, combined with a high degree of automation thanks to the intelligent Smart Start® user interface and energy - saving ecoSAVE® technology, makes the INTAREMA® series particularly user-friendly and efficient.

Largest Laser Filter Ever

"We are convinced that the INTAREMA® 2325 is capable of achieving very high throughputs even with challenging process parameters," says Huber-Lindinger. "This machine is further proof of our company's outstanding engineering capabilities and our willingness and expertise to solve major challenges in plastics recycling."

Many of the specially built, large-scale components were installed and matched together for the first time during this project, such as 690-volt motors and the largest laser filter system ever built by EREMA. The 2/406 Quattro Laser Filter has a total filter area of 7,800 square centimetres and contributes to the high stability of the plant thanks to its robust design and precision filtration. The control panel array is also something new. At 12 meters long, the electrical container is imposing, but it is compact relative to the size of the machine. The well - thought - out configuration makes prior installation, transport and maintenance work particularly straightforward.

Machine Available at Short Notice

EREMA offers machines for all applications, from small through to XXL sizes. From small systems for production waste with a throughput of around 100 kilograms per hour to large-scale PET systems with an output of 6,000 kilograms per hour, the company's product range covers the whole spectrum. "The INTAREMA® 2325 fits perfectly into our wide product portfolio and enables us to respond even more specifically to the needs of our customers," says Huber-Lindinger.

The INTAREMA® 2325 is available immediately and can currently be purchased through EREMA's Fast Track scheme, which offers selected machines with particularly short delivery times. More information is available online at <https://www.erema.com/en/fast-track-machines>.

World's First Biodegradable Plastic Produced from CO2 Emissions in Finland



Fortum Recycling & Waste, a leading waste management and circular solutions company from Finland, has succeeded in producing biodegradable plastic from carbon dioxide (CO2) emissions from waste incineration at its plant in Riihimäki, Finland. This breakthrough, based on carbon capture and utilization (CCU), is a significant step towards reducing and utilizing industrial carbon dioxide emissions.

According to Tony Rehn, Head of the Carbon2x program, the production of CO2-based plastic provides a new, sustainable raw material for the plastics industry.

"I am very proud that our team is the first in the world to successfully produce biodegradable plastic entirely from carbon dioxide emissions. This breakthrough is a significant step towards more sustainable plastic production. This kind of development work helps to reduce dependence on fossil-based raw materials and can create new circular economy-based business," Rehn explains.

Similar carbon capture development projects are underway in several industrial sectors in Finland and globally, but the majority of them focus on the production of synthetic fuels and carbon capture and storage (CCS).

"Captured carbon dioxide should be utilized as a new raw material instead of storing it underground or releasing it into the atmosphere when using fuel. Utilizing captured CO₂ is a much more sustainable option in terms of tackling resource scarcity in the future. Whereas carbon capture and storage is a linear solution that does not address the growing material shortage, carbon capture and utilization promotes circular economy," says Rehn.

Fortum Recycling & Waste's Carbon2x program piloted carbon capture and utilization in 2022. The program aims to capture carbon dioxide emissions from the incineration of non-recyclable waste and use them to produce sustainable products, such as biodegradable plastic.

Plastic is a Superior Material Due to its Versatility

Every year, Europe generates nearly 100 million tons of non-recyclable waste that is incinerated and utilized in energy production. According to Rehn, the wider implementation of the Carbon2x program's innovation would mean that up to 90% of the CO₂ emissions released into the atmosphere from waste incineration could be captured and bound into products.

Lightweight, durable, and easily modifiable, plastic today is an indispensable material in, for example, food packaging and consumer product manufacturing. According to Rehn, new sustainable solutions are needed for plastic production to complement recycled and bio-based plastics. Biodegradable, CO₂-based plastic offers a significant alternative to the market because it has the same qualitative properties as traditional, fossil-based virgin plastics.

"We want to promote the circulation of materials comprehensively. We believe that a whole new category of sustainable plastics is emerging from products such as ours, even though the mechanical recycling of plastics is still needed," Rehn clarifies.

Biodegradable, CO₂-based plastic can be recycled just like many other plastics, closing the carbon cycle. An additional advantage of biodegradable

plastic is that even if it would end up in nature by accident, it decomposes and does not leave harmful micro plastics in the environment.

According to Rehn, the Carbon2x program's innovation is hoped to provide solutions not only for material production for food and cosmetics packaging, but also for other sectors such as toys and home electronics.

Rehn estimates that at this rate of development, the industrial production of biodegradable plastic made from waste incineration's CO₂ emissions could start as early as the end of the decade. The new "plastics born from CO₂" brand will be introduced to the European market in November 2024.

EXXON Faces Lawsuit for Misleading Public about Plastic Recycling

Many people believe that plastics can be easily recycled, but the truth is much different. Unlike aluminum, which can be recycled endlessly, plastics are difficult to recycle. Most plastics are made from different types of materials and chemicals, making it nearly impossible to recycle them effectively. Despite this, companies like ExxonMobil have promoted the idea that plastics can be recycled, allowing them to continue producing harmful, single-use plastics.

Recently, California Attorney General Rob Bonta filed a lawsuit against ExxonMobil, accusing the company of misleading the public about the recyclability of plastics. This lawsuit marks a significant moment in the battle against plastic pollution. For decades, companies like Exxon have focused on spreading the false belief that plastic recycling is the solution to the pollution crisis. In reality, less than 6% of plastics are recycled in the U. S. and most plastic waste ends up in landfills or polluting the environment.

Exxon and other oil companies have been pushing "advanced recycling" techniques, which promise to break down plastics into fuel or new materials. However, these methods are costly, inefficient, and pollute the environment. This lawsuit seeks to hold Exxon accountable and force the company to stop spreading misinformation about recycling while addressing the damage caused by their products.

(Source: SCIAM)

Waste Water Bacteria can break down Plastic for Food, Yielding New Possibilities for Cleaning up Plastic Waste

Northwestern University researchers have uncovered how *Comamonas* bacteria break down plastic waste in urban rivers and wastewater. The bacteria first shred plastic into nano-plastics, then secrete a special enzyme that further degrades the plastic, allowing them to consume it as a carbon source. This breakthrough could lead to bacteria-based solutions to tackle persistent plastic pollution that contaminates drinking water and endangers wildlife.

"We've demonstrated for the first time that a wastewater bacterium can fragment and consume plastic as a carbon source," said study lead Ludmilla Aristilde. Published in *Environmental Science & Technology*, this discovery paves the way for potential environmental clean-up applications.

(Source: Physorg)

INNOVIA Announces Extended Range of Floatable Polyolefin Shrink Sleeves that Support PET Recycling

Innovia Films, a leading material science pioneer that manufactures polyolefin film materials for labels and packaging, has announced the extension of its product range for floatable polyolefin shrink films.

"We are proud to share our extended range of floatable shrink sleeves that work in established PET, HDPE and PP waste streams," explains Lucija Kralj, Business Unit Director Labels EMEA.

"We can now offer our customers several options – from a thinner downgauged version to a high shrink version and just like the clear film range, we now offer a white version which is ideal for light-sensitive products like dairy, food supplements, nutritional products and cosmetics" she continues. These films are sustainable alternatives for existing materials that are detrimental to recycling.

To support more mechanical recycling of post-consumer packaging, design for recycling will be essential. There are still a lot of sleeve labels in

the market that cause problems in PET recycling and are flagged by organisations like RecyClass or the Association of Plastic Recyclers that have created a comprehensive Design Guideline.

"RayoFloat™ sleeve films are made from low density materials that are an ideal alternative. Automatically separate from the PET flakes in the sink/float process step at recyclers and float to the top of the washing tank – while the heavier PET flakes sink to the bottom. This is an ideal density separation that leads to very clean PET flakes that can be recycled back into new bottles – closing the loop," explains Marika Knorr, Head of Sustainability and Communications at Innovia Films.

Thin Version – for Material Efficiency

The standard RayoFloat™ sleeve is 50 micron, but Innovia can also offer a thinner 45 micron version. This downgauged sleeve material is ideal for many bottle and container shapes and comes with the benefits of efficient material usage and a lower carbon footprint.

High Shrink Version – for more versatile bottles shapes

In the recent years, brand owners have gravitated towards more complex bottle shapes. This calls for a sleeve that has a high shrink rate so it can contour to the bottle seamlessly.

RayoFloat™ WAPO (White APO) – Protection For Products that are Light-Sensitive

The new film is a low-density white film made from polyolefin that maintains floatability when printed. The opaque film contributes to the light blocking properties of the shrink sleeves that later can be applied to containers for light sensitive products. "Currently white PET bottles are used which are rarely recycled back into food grade applications because they contain colorants- so the bottles leave the packaging loop or are downcycled," explains Lucija. "Shifting from an opaque bottle to a clear PET bottle with a RayoFloat™ white shrink sleeve film will provide product protection and increases the amount of clear PET that can be reclaimed for bottle-to-bottle recycling. It is our goal to support this with a functional product decoration."

(Source: FINAT/18.10.2024)

TOMRA: Acquisition of Leading Digital Waste Management Solution Provider C-Trace

TOMRA has acquired 80% of the shares in c-trace GmbH, a German leader in digital waste management solutions.

c-trace, founded in 2005, offers advanced solutions that combine software and hardware modules to digitize and improve the process for waste management operations. As municipalities and industries increasingly seek to reduce inefficiencies and comply with stricter environmental regulations, demand for these solutions is rising. Through its innovative solutions and strong customer base, c-trace has a leading position in Germany, the largest market in Europe. Its strong focus on new AI driven capabilities has generated market interest and is opening new market opportunities in the segment.



"We are very enthusiastic about joining forces with c-trace. This allows TOMRA to broaden our offering in the waste management and recycling space and adds new digitalization capabilities across the recycling value chain. Combining TOMRA's solutions and customer base with c-trace, we can drive innovation and unlock new markets opportunities. Over the next years, our priority will be to expand c-trace's international presence by utilizing TOMRA's global footprint. Ultimately, our common ambition is to increase collection and recycling rates – turning more waste into valuable resources – by shaping tomorrow's recycling infrastructure," says Tove Andersen, President and CEO of TOMRA.

TOMRA's acquisition of c-trace aligns with the strategy outlined during the 2024 Capital Markets Day where the company said they would seek to develop adjacent business building, also through M&A. The addition of c-trace will support TOMRA's

goal of driving additional profitable growth and diversifying its revenue streams while broadening its market impact.

c-trace is attractive to TOMRA for three main reasons. Firstly, the market c-trace operates in – digital waste management solutions – demonstrates strong growth and profitability. Secondly, this adjacent market fits TOMRA's positioning and is an area where TOMRA can create additional value. Finally, c-trace is an ideal entry point into this market due to its leading position.

Employing around 120 people, c-trace generates 80% of its sales in Germany and has shown annual growth of more than 15% over the last years. The company's revenues in the last twelve months amounted to EUR 21million with 23% EBIT margin (adjusted).

"We look forward to joining the TOMRA family and see this as the optimal home for the next phase in the growth journey of c-trace. Together with TOMRA we can unlock further value through collaborating on innovation, but also through leveraging TOMRA's international footprint and customer base to reach new customers in new geographies," the founders of c-trace, Helmut Ziegler, Torsten Olschewsky, and Michael Eikermann, say in a joint statement.

TOMRA will initially acquire 80% of the shares in c-trace, with an option for the remaining 20%, which are held by the founders, after 2 years. The acquisition is expected to be immediately accretive and generate strong capital returns to TOMRA – supporting the targets set out at TOMRA's Capital Markets Day.

(Source: TOMRA/20.10.2024)

Farrel Pomini, Lummus Team on Pyrolysis Technology

Mixer's novel capabilities are said to be the key to success of partnership developing pyrolysis technology.

FARREL POMINI is partnering with Lummus Technology to develop a state - of - the - art plastic pyrolysis process.

The partnership is based on FARREL POMINI's Continuous Mixing Technology (photo), the Farrel Continuous Mixer (FCM), which the companies say has been playing an essential role in a pyrolysis process for plastics developed by Lummus.

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Cross section image of pail container showing filling done with recycled material



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