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The Official Journal of the Organization of Plastics Processors of India

Volume No. 13

• Issue No. 06

• Mumbai

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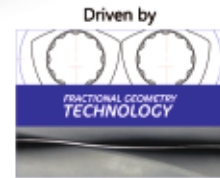
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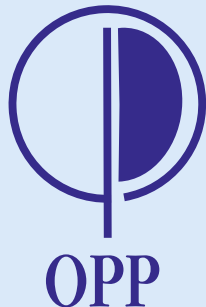
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FROM THE PRESIDENT'S DESK

Mr. Pradeep Rathod



CONTENTS

From the President's Desk	3
News From India.....	21
Plastic Products and New Technologies.....	48
Plastic Raw Materials.....	36
Plastic Machinery.....	51
Circular Economy/ Bio-plastics/ Recycling	57

Dear Members,

Greetings from Organization of Plastics Processors of India!

At the outset I wish you all and your families a very Happy, Prosperous, Peaceful and Healthy New Year - 2025.

It is imperative for the Indian Plastic Processing Industry to expand and establish processing units overseas.

OPPI had done a study of Gulf Countries and have come to a conclusion that it will be advisable to establish Plastic Processing Factories in Qatar for the following reasons:-

- Industrial electricity charges are set at Dhs. 0.13 per kWh (INR 2.29 per kWh).
- Economic Partnership between Africa and the Gulf States poised for significant growth.
- Plot sizes range from 2,000 sqm to 15,000 sqm, depending on availability and project approval. Manateq has various plot sizes. It all depends on the investor requirement. Manateq will try to match to the closest size possible.
- In Qatar, Manateq Logistic Park Service Hub provides land for establishing production units and helps with various permissions.
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- The nearest port is Hamad Port the largest one operating port in the State of Qatar. The port is connected with world class road network and easily accessible.
- Water charges are QR 5.40 per cubic meter (CBM).
- In Qatar the following industrial zones are functioning. These are suitable for plastic processing facilities: – Salwa Industrial Zone (managed by the Ministry of Commerce and Municipality) and Qatar Free Zone Authority (QFZA).
- It is possible to set up plastic processing facilities independently in Qatar, provided the necessary commercial license is obtained. However, securing this license may take time, as it requires special approvals. Interested parties are advised to directly consult the Ministry of Commerce and Industry, Qatar Free Zone Authority (QFZA), Qatar Development Bank (QDB), GORD and QAPCO to explore options and requirements.
- Specific terms and conditions for partnering with Qatar Industrial Manufacturing Company (QIMC) in a joint venture depend on their evaluation of the business proposal. Indian investors may need to present a comprehensive business plan to gauge QIMC's interest and secure favorable terms. A JV with QIMC can facilitate smoother processes for securing bank loans, government approvals, visas and land allocation in Qatar.
- A corporate tax of 10% is levied on net profits, as specified in the Articles of Association.

We are proposing to take a Delegation to Qatar from 9th to 12th March 2025. OPPI Secretariat will mail the details to you shortly.

I appeal to OPPI members to join the Delegation to Qatar for their own betterment.

With Best Wishes,

Pradeep Rathod
President

Printed, Published and Edited by:

DEEPAK LAWALE on behalf of **ORGANIZATION OF PLASTICS PROCESSORS OF INDIA**, Printed at **DESIGN WORLD CREATIONS**, Unit No. 204, A-Wing, Suashish IT Park, Off. Dattapada Rd, Borivali East, Mumbai - 400 066 and Published from ORGANIZATION OF PLASTICS PROCESSORS OF INDIA, 404/405, Golden Chambers, New Link Road, Andheri (West), Mumbai 400 053.

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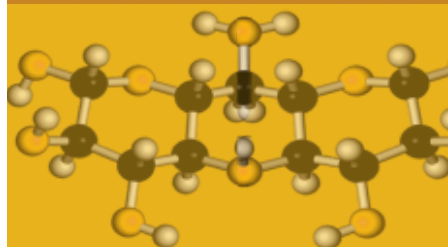
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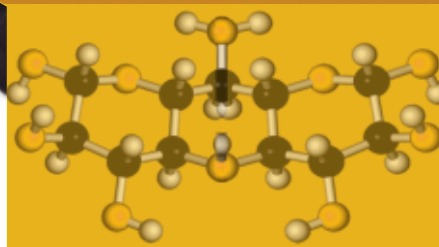
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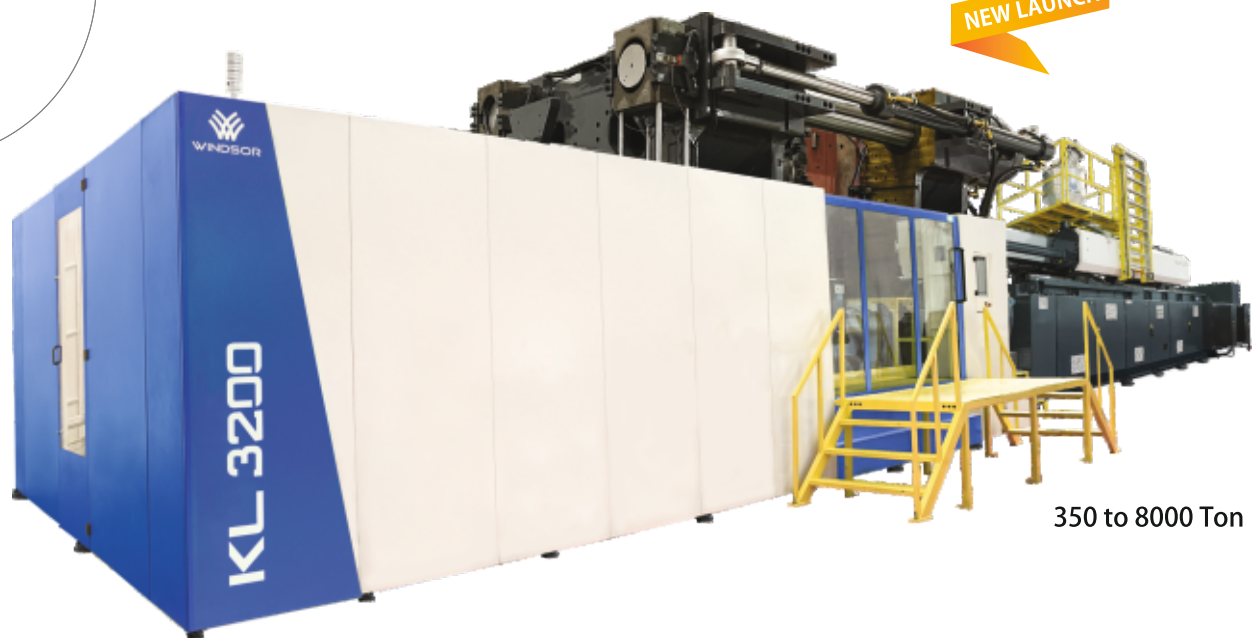
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- **Quality Detection Instrument and Equipment:** Measuring & Detection Equipment, Temperature Controller & Components, Electronic Automatic Instrument, Monitoring Device.
- **Machinery Parts and Accessories**
- **Packaging:** Converting Machinery, 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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Coming up next is CHINAPLAS 2025 - The 37th International Exhibition on Plastics and Rubber Industries - to be held at Shenzhen World Exhibition and Convention Center (Bao'an), PR China from 15th to 18th April 2025.

The delegates will be taken for a visit to YIZUMI plant at Foshan, China.

Organization of Plastic Processors of India has tied up with Tibro Tours Pvt. Ltd. for CHINAPLAS 2025 packages. All Companies booking Tibro Packages CHINAPLAS 2025 through Organization of Plastic Processors of India will be eligible for discount.

Please find attached herewith Tibro's Standard Launched packages based on hotel options. Kindly write to us to secure your travel arrangements on confirmed basis.

Deepak Lawale, Secretary General,
Organization of Plastics Processors of India

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OPPI DIRECTORY 2023 IN PEN DRIVE

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

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

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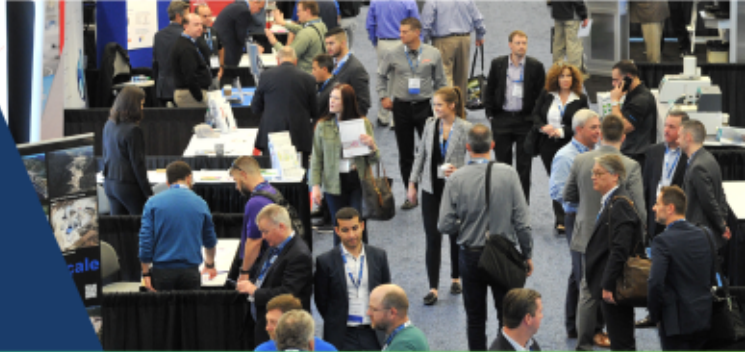
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CPCB Tightens Rules to Combat Plastic Waste Violations



In response to rising complaints regarding violations of the Plastic Waste Management (PWM) Rules, 2016, the Central Pollution Control Board (CPCB) has issued stringent orders to State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) to enforce immediate action against offenders. These violations, which include the use of plastic carry bags below the mandated thickness and unauthorized single-use plastic products, have raised concerns about compliance with national plastic waste regulations.

To prevent unauthorized use, CPCB has called for enhanced surveillance and issued a reminder that government-issued tender documents must align with PWM specifications to avoid regulatory breaches. SPCBs have also been instructed to issue public

notices and coordinate with local authorities to communicate the new directives through print and electronic media, raising awareness among manufacturers and private entities alike.

The renewed focus on surveillance and compliance, along with the enforcement of strict labelling and certification standards, is aimed at improving the effectiveness of PWM regulations, which play a critical role in reducing plastic waste pollution across the country.

Plastic packaging is classified into four categories based on its composition and usage. Category-I includes rigid plastic packaging, while Category-II covers flexible plastic packaging, which can be single or multilayered, consisting of different types of plastic. Category-III is defined as multilayer plastic packaging, comprising at least one plastic layer combined with another non-plastic material. Finally, Category - IV includes plastic sheets used for packaging, as well as carry bags made from compostable plastics. These classifications help streamline waste management and recycling processes under PWM regulations.

According to CPCB's annual report on the implementation of PWM Rules, 2016, India's plastic waste generation has seen a significant rise over the past five years. In 2016-17, plastic waste stood at 15,68,714 tons per annum (TPA), dropping to 660,787 TPA in 2017-18. However, it surged in the

following years, reaching 33,60,043 TPA in 2018-19, 34,69,780 TPA in 2019-20, and climbing further to 41,26,997 TPA in 2020-21.

To strengthen enforcement, CPCB has also outlined multiple provisions that must be strictly adhered to. Notable among these is the requirement that plastic carry bags made from virgin or recycled plastic be no less than 120 micrometers thick as of December 2022. Additionally, non-woven plastic carry bags must meet a minimum density of 60 grams per square meter (GSM), and certain plastic products, including plastic flags, cutlery, and stirrers, are banned outright as single-use items.

According to CPCB, exemptions for thickness do apply to compostable and biodegradable plastics. However, manufacturing and distribution of these products are subject to CPCB certification standards.

Manufacturers must ensure that compostable plastic items bear the official "Compostable Certified" label, along with QR codes displaying critical certification details such as the manufacturer's name, address, and certification number.

The directive also highlights the need for SPCBs to regularly monitor compliance, especially for compostable plastic items, to ensure these are produced solely by certified manufacturers.

(Source: Business Standard / 28.10.2024)

India to Revise GDP Base Year from 2011-12 to 2022-23

The Government of India is set to update the base year for calculating Gross Domestic Product (GDP) from 2011-12 to 2022-23, aiming to provide a more accurate representation of the country's economic structure. This update is the first in over a decade, with the last revision being done in 2011-12.

This information was given by the Minister of State (Independent Charge) of the Ministry of Statistics and Programme Implementation, Minister of State (Independent Charge) of the Ministry of Planning and Minister of State in the Ministry of Culture, Rao Inderjit Singh in a written reply in the Rajya Sabha today.



To oversee the transition, a 26-member Advisory Committee on National Accounts Statistics (ACNAS), chaired by Biswanath Goldar, has been tasked with identifying new data sources and refining the methodology for compiling National Accounts Statistics. This committee includes representatives from the Central and State Governments, Reserve Bank of India, academia and researchers.

Need for Base Year Revision

Regular updates to the GDP base year are crucial to accurately reflect structural changes in the economy, including shifts in consumption patterns, sectoral contributions and the inclusion of emerging sectors. By aligning with the economic realities of 2022-23, the revised series will offer a more precise framework for policymaking and analysis.

The government has also taken several measures to enhance the statistical system, including:

- **Standardizing Data Structures:** Ensuring uniform quality reporting across the National Statistical System.
- **Leveraging Administrative Data:** Promoting better accuracy and comprehensiveness in statistical compilations.
- **Economic Census:** MoSPI has initiated processes to launch a new economic census to provide granular data on economic activities.

New Monthly Labour Force Estimates

Starting January 2025, MoSPI will release monthly estimates of the Periodic Labour Force Survey (PLFS), providing more frequent insights into employment trends across the country.

Speaking at an event last week, Saurabh Garg emphasized the importance of data-driven decision-making and robust data governance through uniform guidelines. However, he highlighted challenges, such as reluctance among some affluent neighborhoods to participate in government surveys, which could affect data collection efforts.

(Source: The Economic Times / 02.12.2024)

Sustainable Packaging Solutions from Borouge

'Design for Recycling' is key to ensuring a sustainable approach for the flexible packaging industry. Borouge offers an extensive product portfolio that caters to increasing market demand for innovative designs that promote easy recycling for a circular economy.

Produced using Borealis proprietary Borstar technology, Borouge has developed a range of polypropylene (PP) solutions, including RD265CF and HD915CF that can provide fully recyclable mono-material alternatives to non-recyclable options with different polymers in use.

For metallized cast film applications, the right film structure ensures enhanced stiffness, efficient processing and high packaging speed. It also provides excellent metal adhesion, maintaining a good barrier and preventing leakage, enabling food safety and highest freshness to consumers.

- RD265CF: A random copolymer PP that offers outstanding metal adhesion performance.
- HD915CF: A high-crystalline homopolymer based on PP based on Borstar® Nucleation Technology, providing superior stiffness for film structures.

Borouge's sustainable packaging solutions are designed to align with the value chain's sustainability goals without compromising on packaging quality and performance.

(Source: Recycling Compendium)

India's Automobile Industry Set to become Global Leader in 5 Years: Nitin Gadkari

Union Minister Nitin Gadkari is confident that India's automobile industry will become the world's largest in five years. At the Amazon Smbhav Summit, he highlighted the sector's growth from Rs. 7 lakh crore to Rs. 22 lakh crore under his leadership.



India's automobile industry poised to lead globally within 5 years: Nitin Gadkari. (Image source: PTI)

Union Minister for Road Transport and Highways Nitin Gadkari expressed confidence about India's automobile industry becoming the number one globally in the next five years.

Speaking at the Amazon Smbhav Summit on Tuesday, Gadkari highlighted the industry's impressive growth, noting it has surged from Rs. 7 lakh crore to Rs. 22 lakh crore since he assumed office.

"Currently, the USA leads with a market size of Rs 78 lakh crore, followed by China at Rs. 47 lakh crore. India, now at Rs. 22 lakh crore, has significant potential," Gadkari stated, adding, "I am confident that within 5 years, India will be the number one automobile market in the world."

The minister pointed to the presence of leading global automobile brands in India as a clear sign of the country's growing stature in the industry. He also outlined his ministry's ambitious plans to enhance India's logistics infrastructure, aiming to cut logistics costs to 9 per cent within the next two years.

“Logistics costs in India currently stand at 16 per cent, while in China it is 8 per cent, and in the USA and Europe, it is around 12 per cent. The government has set a target to reduce logistics costs, and within 2 years, we aim to bring it down to 9 per cent,” Gadkari said.

Gadkari also highlighted several infrastructure projects that will drastically reduce travel times between major cities. For instance, the journey from Delhi to Dehradun, which currently takes about nine hours, will be reduced to just two hours by January 2025. Similarly, travel times between Delhi and Mumbai, as well as Chennai and Bengaluru, are expected to see significant reductions in the near future.

In his speech, the minister emphasized the importance of adopting alternative fuels and biofuels in the country's transportation sector. He explained that using bio-ethanol in vehicles could not only reduce fuel costs but also help lower pollution levels.

Gadkari also unveiled plans to convert organic waste into hydrogen fuel and other valuable resources using advanced recycling technologies. Highlighting the substantial municipal waste generated in Delhi, he said, "Currently, only 80 lakh tons of waste are utilized. Our vision is to convert organic waste into hydrogen. By segregating waste, we can extract petrol, plastic, metals, and glass, which can all be recycled. Additionally, we have technology that can convert waste into green hydrogen."

Gadkari's remarks underline the government's commitment to transforming India's transportation and logistics sectors, positioning the country as a global leader in both the automobile industry and sustainable energy initiatives.

(Source: Financial Express / 10.12.2024)

India's Paste PVC Consumption Increased by 19% in the First Half of FY 2024

India's paste polyvinyl chloride (PVC) consumption rose by 19 percent in the first half of the current financial year (April - September 2024), driven by a substantial increase in demand for manufacturing and processing applications. The

surge in demand for paste PVC also reflects overall economic growth, as India continues to maintain its position as the world's fastest-growing economy.

Speaking to analysts after announcing the July-September 2024 quarterly financial results, Ramkumar Shankar, Managing Director of Chemplast Sanmar Ltd (CSL), said: “The apparent consumption of paste PVC in India increased by 19 percent to 92,000 tons during April-September 2024, compared to 77,000 tons in the corresponding period of the previous year. The volume of paste PVC registered a 6 percent year-on-year growth. It is pertinent to note that when comparing H1 performance on a year-on-year basis, the company has performed much better than in the previous year.”

In June, the Government of India imposed a provisional anti-dumping duty (ADD) on imports of paste PVC from five to six countries. The impact of this ADD was immediately evident, with imports from these countries declining substantially. Imports from China and other nations affected by the ADD dropped significantly after June. However, end users did not face any material shortages, as increased imports from alternative sources adequately met demand.

Rising Imports from European Union

Unfortunately, the European Union moved into that gap, and exported paste PVC to India at very low prices. As a country, imports at cheaper rates is okay because the market will need the material. However, that material needs to be imported at fair prices. Unfortunately, the prices at which the European Union has been exporting Paste PVC into India post June 2024 has been at very low levels. This has negated the impact of the antidumping duties that were imposed on the other countries.

“We have taken up this matter with authorities, and we are hopeful that we would get a good hearing on that. This is not likely to repeat in Suspension PVC. While there could be an increase from the countries that are not covered, the European Union is not as significant a player in Suspension PVC as it is in paste PVC. Their export to India over the last few years has been less than 1 percent so far of the total arrivals. And even if that increases to some extent, we do not believe that, that would be significant,” Shankar said.

CSL is the largest producer of specialty paste PVC resin with its cumulative production capacity standing at 41,000 tons per annum at Cuddalore. The company has been manufacturing paste PVC at the Mettur facility since 1968. It added 41,000 tons per annum one - step process capacity at Cuddalore in January-March 2024 quarter. Primary raw materials for manufacturing paste PVC include ethylene dichloride (EDC), ethylene, chlorine and vinyl chloride monomer (VCM). Chemplast Sanmar has in-house capacity to manufacture a significant portion of EDC and all of VCM requirements for the backward integrated capacity of 66,000 tons per annum. This provides flexibility in operations and reduces dependence on external suppliers.

Ester Industries Advances Sustainable Packaging with Gneuss Recycling Technology in India

Ester Industries is planning to install Gneuss OMNI 200 system to boost sustainable BOPET film production, aligning with India's 2025 recycling goals and regulatory requirements.



Fig.1: OMNI 200 Recycling System with 3C Rotary Feeder, MRS extruder, water ring pump vacuum system, twin RSFgenius screen changers and pelletizing line.

India has set a goal to reduce plastic waste and promote a circular economy. Comprehensive waste collection systems and recycling infrastructure will be in place by 2025 to increase the amount of recycled material in packaging. The Indian government is strengthening its Extended Producer Responsibility (ERP) regulations, with a particular focus on mandatory recycling quotas. Companies must ensure that a certain percentage of their packaging is made from recycled material. The

quotas vary depending on the type of material and packaging and include both post-industrial and post-consumer waste. The recycling quotas are intended to increase the demand for recycled raw materials and strengthen the market for recyclates.

Ester Industries is a leading global manufacturer of polyester (PET) film, specializing in value-added and specialty products. Established in 1985, the company operates state-of-the-art manufacturing facilities in Khatima, Uttarakhand, and Hyderabad Telangana India, and is known for producing high quality BOPET film. Ester serves a global market with exports to over 85 countries and offers an extensive product portfolio.

Ester Industries is committed to sustainability, as demonstrated by its development of postconsumer recycled (PCR) PET film. The company continues to expand its operations with significant investments such as a new production facility in Telangana, India, to increase flexible packaging production capacity.

To further enhance its technological capabilities, Ester Industries has chosen to install a Gneuss OMNI 200 recycling system at its new Hyderabad facility, enabling efficient processing of bottle flakes into food-grade pellets for use in BOPET film production. Gneuss, known for its advanced recycling technologies, is supplying this state-of-the-art system that processes 2,000 kg/h of bottle flakes collected from India and the surrounding regions. These bottle flakes are directly converted into food grade pellets without the need for pre-drying or crystallization. The pellets produced by the OMNI 200 Recycling System will be used in Ester's BOPET film production lines.

The OMNI Recycling System consists of a 3C Rotary Feeder, which ensures constant feeding of the extruder for maximum process stability, even with fluctuating bulk densities. It also includes an MRS extruder, which is based on conventional single-screw technology but incorporates a multi-screw devolatilization section. This design enables highly efficient and gentle decontamination of the polymer melt, ensuring that the material meets the stringent standards for direct food contact applications. The OMNI Recycling System for Ester Industries uses an MRS 200 extruder that degasses the melt at an absolute pressure of 25 mbar, allowing the use of a robust water ring pump vacuum system.

A unique feature of this OMNI 200 recycling system in Ester's new production hall is the dual filtration process, which allows fine filtration down to 16-20 μm . This quality is essential for the efficient processing into BOPET film. It is made possible by two RSFgenius filtration systems that provide maximum filtration quality with minimal material loss. These fully automatic filtration systems operate with integrated back flushing systems, providing self-cleaning without process interruptions or pressure fluctuations. This OMNI 200 recycling system is without pre drying which significantly reduces the amount of time the material is exposed to heat, allowing for gentler processing. Another key factor is the advanced filtration technology, which enables fine filtration with exceptionally long screen life, even when processing post-consumer materials. In addition, the system offers both economic and environmental benefits, including significant energy savings and minimal material loss, making it a highly efficient and sustainable solution. The new OMNI recycling line is expected to be operational by mid to late 2025.

Rishikesh Municipal Corporation Launches Plastic Banks to Combat Waste and Empower Women

Rishikesh Municipal Corporation has set an example for other urban local bodies (ULBs) by effectively managing plastic waste. The Municipal Corporation is not only successfully collecting plastic waste but is also reusing it in many ways through recycling.



Being a major center for rafting and camping in addition to being a pilgrimage city, Rishikesh remains crowded with pilgrims and tourists throughout the year. Due to this, managing plastic waste here is a challenging task. On the initiative of Municipal Commissioner Shailendra Singh Negi, Rishikesh

Municipal Corporation first established plastic banks at ISBT, Triveni Ghat, and Virbhadra. After collecting the old plastic bottles, these have been used by the Municipal Corporation to make boxes for these plastic banks, where people themselves put empty bottles or other plastic waste. About 400 kg of plastic has been recycled from these plastic banks so far. Seeing the success of this experiment, the Municipal Corporation is now going to set up plastic banks at Natraj Chowk, Transit Camp, and the Railway Station as well.

Rishikesh Municipal Corporation has also prepared a 'Waste to Wonder' park from plastic waste on the premises, in which children's swings and decorative items have been made from old tyres, damaged street lights, bicycles, and scooters. Along with this, the Corporation is also preparing benches, tree cards, and plastic bank boxes from recycled plastic. Despite door-to-door garbage collection in Rishikesh Municipal Corporation, earlier the user charge could be collected only for three lakhs rupees per month, but now the Municipal Corporation has given the work of collecting user charges to women self-help groups (Triveni Sena). As a result, the Municipal Corporation's collection has crossed Rs 13 lakh. Out of this, the Municipal Corporation gives a 25 per cent dividend to women groups, providing direct employment to about 250 women.

(Source: Garhwal Post/02.12.2024)

Haldia Petrochemicals Ltd. (HPL) and Lummus Technology Sign License Amendment to Enhance Phenol Plant Capacity

Haldia Petrochemicals Ltd. (HPL), a major player in India's petrochemical industry, has signed a license amendment with Lummus Technology to expand its phenol production capacity for the upcoming Phenol and Acetone Plant in Haldia, West Bengal. The agreement, signed by Mr. Navanit Narayan, Whole-time Director & CEO, HPL, and Dr. Romain Lemoine, Chief Business Officer of Polymers and Petrochemicals, Lummus Technology, marks a key step forward in enhancing HPL's phenol production capabilities from 300 KTPA (kilotons per annum) to 345 KTPA.

This capacity expansion aligns with HPL's ambitious growth strategy and reflects the company's commitment to supporting India's chemicals industry.

In line with its substantial greenfield investment of over INR 4,500 crore in Haldia, HPL is not only focusing on phenol but also on cumene and acetone production to meet rising domestic demand and foster downstream chemical sector growth. The facility also includes India's first on-purpose propylene plant using olefins conversion technology (OCT), which Lummus will supply as well. HPL aims to complete the project by Q1 2026.

Mr. Navanit Narayan, WTD & CEO, Haldia Petrochemicals Limited, remarked on the signing, stating, "Our collaboration with Lummus Technology has enabled us to enhance production capabilities and address India's expanding demand for phenol and acetone. The capacity upgrade to 345 KTPA reinforces our commitment to delivering high-quality products to support the country's chemical and allied industries."

The signing ceremony also highlighted Lummus Technology's role in supporting HPL's strategic initiatives. "This partnership demonstrates our shared dedication to innovation and progress in the petrochemical sector," said Dr. Romain Lemoine, Chief Business Officer of Polymers and Petrochemicals, Lummus Technology. "We are proud to support HPL in scaling up its operations and meeting market needs."

This expansion is a significant milestone for HPL, as it strengthens the company's position as a key contributor to India's industrial growth and advances its role in the production of vital chemical intermediates.

(Source: PR Newswire/14.11.2024)

DGFT wants the Exporters to Submit the Data for the Year 2023-24 by the March 31, 2025

The Director General of Foreign Trade (DGFT) has prescribed an annual return to be furnished by exporters who have claimed duty credits of more than Rs. 1 crore in a financial year under the Remission of Duties and Taxes on Export Products (RODTEP) Scheme. The exporters are surprised by the kind of details and declaration called for in the Annual RODTEP Return (ARR) required to be furnished before the March 31 of the next year.

The RODTEP Scheme, introduced in 2021, intends to rebate duties/taxes/levies, at the Central, State and local level, borne on the exported product, including prior stage cumulative indirect taxes on goods and services used in the production of the exported product and in respect of distribution of exported product, that are not refunded through any other scheme. Under the scheme, exporters get duty credits at a notified percentage rate of FOB value of exports that can be utilized for payment of basic customs duties on imported goods. The rates are based on the recommendations of the RODTEP Committee that examined extensive data from various exporters on transportation and other costs that included un-rebated taxes/duties/levies.

The exporters are puzzled because the ARR calls for export product-wise data regarding the Value Added Tax (VAT) and Excise Duty (ED) paid on inbound transportation by rail / road of raw materials, components etc. for manufacture of export product and outbound transportation by road/rail of export product from factory to the gateway port. This kind of information is impossible to get because the transporter gives an invoice only for the freight amount for carrying cargo from one place to the other. The buyer of the transportation service has no access to the data on how much fuel was consumed or how much VAT or ED was paid on it. In any case, no exporter maintains such data export product wise. Even the transporter will not be able to give data on how much VAT or ED was paid on carrying the cargo of a particular party from one place to another. Similarly, the estimate of embedded Central Goods and Services Tax (CGST) and State Goods and Services Tax (SGST) can only be a matter of conjecture and not hard data based on any documentation.

The DGFT wants the exporters to submit the data for the year 2023-24 by the March 31, 2025. Not furnishing the ARR will lead to denial of RODTEP benefits. Delay of three months in furnishing the ARR can be condoned upon payment of composition fee of Rs. 10,000. Any further delay will entail a composition fee of Rs. 20,000. The exporters are peeved that the ARR calls for a declaration that the amount of remission availed under the RODTEP scheme is not more than the duties/taxes/levies actually incurred during the same period. The ARR filings will be shared with the RODTEP committee for revision of RODTEP rates and based on its assessment, the exporter may be asked to surrender any excess claims.

TRINSEO Announces Agreement to Sell Polycarbonate Technology License and Stade, Germany Polycarbonate Assets to Deepak Chem Tech Limited

TRINSEO (NYSE: TSE) (TRINSEO or “the Company”), a specialty materials solutions provider, announced that it has entered into agreements to supply a polycarbonate technology license as well as all proprietary polycarbonate production equipment in Stade, Germany to a wholly owned subsidiary of Deepak Nitrite Limited for use in India. Deepak Nitrite headquartered in Vadodara, Gujarat, India, is a multi-division and multi-product chemical intermediates company.

“While TRINSEO recently announced its decision to exit virgin polycarbonate production, our polycarbonate technology is highly valued and the manufacturing equipment in Stade, Germany, can be utilized in India by Deepak,” said Frank Bozich, President and Chief Executive Officer of TRINSEO. “These are the initial steps of a strategic, collaborative partnership with Deepak, as we explore additional opportunities to leverage our technology portfolio and expand in higher-growth areas such as India.”

The total value of the combined agreements is \$52.5 million. The Company expects to receive approximately \$9 million by the end of 2024 and an additional approximately \$21 million in the first half of 2025, subject to key milestones. With this disposition of the manufacturing assets in Stade, Germany, the Company has decided to exit the site.

(Source: TRINSEO/13.11.2024)

Up to 75 pc of GST Revenue Comes from 18 pc Slab: MoS Finance

Synopsis

Around 70-75 percent of GST revenues in 2023-24 came from the 18 percent slab. Only 5-6 percent was from the 12 percent slab. The highest 28 percent slab contributed 13-15 percent. The 5 percent slab accounted for 6-8 percent. The GST Council is considering rate rationalization to boost GST revenues.



About 70-75 per cent of GST revenues collected in 2023-24 fiscal year came from the 18 per cent slab, while just 5-6 per cent came from the 12 per cent bracket, Parliament was informed on Monday. Only 6-8 per cent of the FY24 goods and services tax (GST) revenues were from the 5 per cent slab, while the highest tax slab of 28 per cent contributed 13-15 per cent to the revenues in the last fiscal year.

Minister of State for Finance Pankaj Chaudhary shared the details of the proportion of GST collected (excluding compensation cess and other payments) under various tax slabs in 2023-24 in the Lok Sabha.

The GST Council has constituted a six-member Group of Ministers (GoM), under Bihar Deputy Chief Minister Samrat Chaudhary, to suggest rationalization of GST rates as well as merger of slabs to increase GST revenues.

Currently, GST is a four-tier tax structure with slabs at 5, 12, 18, and 28 per cent.

Under GST, essential items are either exempted or taxed at the lowest slab, while luxury and demerit items attract the highest slab. Luxury and sin goods attract less on top of the highest 28 per cent slab.

The average GST rate has fallen below the revenue neutral rate of 15.3 per cent, prompting the need to start discussions on GST rate rationalization.

The committee headed by former chief economic advisor Arvind Subramanian on possible tax rates under GST was of the view that the Revenue Neutral Rate (RNR) should be between 15 and 15.5 per cent.

Based on current data of GST returns as available with Goods and Service Tax Network, the average GST rate for 2023-24 was 11.64 per cent, Finance Minister Nirmala Sitharaman said in reply to a separate question in the Lok Sabha.

To a question on whether there exists bitterness and friction between the Centre and the states on the GST arising out of the share to states, Sitharaman said, "There is no bitterness between Centre and states on GST. GST shares to states are settled on a regular basis as provided under the GST law."

(Source: The Economic Times / 02.12.2024)

DPIIT and Moglix Partnered up to Accelerate Manufacturing Innovation in India



The partnership aims to build a sustainable, innovation-driven manufacturing economy, empower entrepreneurs, and increase India's manufacturing contribution to GDP.

The Department for Promotion of Industry and Internal Trade (DPIIT) has signed a Memorandum of Understanding (MoU) with Moglix, Asia's leading B2B e-commerce platform, to launch a manufacturing incubation initiative. This collaboration marks a significant milestone in India's manufacturing journey, supporting the vision of a Viksit Bharat. The initiative aims to equip growth phase startups with tools, resources, and opportunities to accelerate their progress and drive innovation in the manufacturing sector.

The program will support over 25 growth phase startups in industries such as chemicals, automotive, infrastructure, and green energy. These startups will participate in a 12-month program offering access to Moglix's extensive mentor network, supply chain infrastructure, and financial support via Credlix, its NBFC arm. DPIIT will enhance the program's reach through the Startup India ecosystem, facilitating adoption, resource-sharing, and nationwide outreach.

Sanjiv Singh, Joint Secretary of DPIIT, remarked, "Startups are catalysts for India's economic and technological progress. This MoU with Moglix underscores our commitment to fostering innovation, nurturing entrepreneurship, and building a resilient manufacturing ecosystem aligned with India's vision of self-reliance."

Rahul Garg, Founder and CEO of Moglix, added, "This collaboration is a transformative step for India's manufacturing sector. By combining Moglix's technological expertise with DPIIT's strategic guidance, we aim to build a sustainable, innovation-driven manufacturing economy that empowers entrepreneurs and aligns with India's vision of becoming a global manufacturing hub."

Aligned with the vision of Atmanirbhar Bharat, this initiative will provide startups with collaborations, investment opportunities, and resources to create globally competitive products. It also aims to increase India's manufacturing contribution to GDP and help startups expand into international markets.

This partnership will strengthen supply chain for Moglix while addressing the challenges faced by growth-stage manufacturing startups. It aligns with India's national goals of boosting the manufacturing sector's GDP contribution and positioning the country as a global industrial leader.

(Source: OEM Update / 04.12.2024)

Polymer Update Founder Dr. Sajjid Mitha Honoured among Forbes India DGEMS 2024

Mumbai, India – November 20, 2024: Dr. Sajjid Mitha, the visionary founder of Polymerupdate, has been recognized in the prestigious Forbes India DGEMS 2024 Select 200 Entrepreneurs. This acknowledgment celebrates his outstanding leadership, innovation, and impact in transforming the polymers and petrochemicals industry on a global scale.

Forbes India I D Globalist Entrepreneur Mobility Summit (DGEMS) is a one of a kind global summit recognizing entrepreneurial excellence. The DGEMS forum creates a unique platform for companies with globally scalable offerings to connect and collaborate. The Summit aims to facilitate a borderless ecosystem

for the newly-minded entrepreneurs through sessions with global thought leaders and interactive activity facilitating a global network.

The Forbes India DGEMS Select 200 Entrepreneurs honours trailblazers who have demonstrated extraordinary vision, perseverance, and influence in their respective domains. Dr. Mitha's inclusion is a testament to his relentless pursuit of excellence and his commitment to redefining market intelligence in the polymers and petrochemicals sector.

This recognition highlights Dr. Mitha's unwavering commitment to Environmental, Social, and Corporate Governance (ESG). Over nearly three decades, Dr. Mitha has spearheaded numerous innovative initiatives, transforming Polymerupdate into a globally renowned institution while collaborating closely with policymakers. His focused advocacy for a 'circular economy' in the plastics value chain has garnered significant attention and support from leading corporations worldwide.

Speaking about the recognition, Dr. Sajjid Mitha said, "Being featured among Forbes India DGEMS 2024 Select 200 Entrepreneurs is both a privilege and a responsibility. This honour reflects the dedication of my team at Polymerupdate and our shared mission to revolutionize the way businesses access and utilize market intelligence in the polymers and petrochemicals industry."

Under Dr. Mitha's leadership, Polymerupdate has evolved from a pioneering idea into a globally trusted platform, offering real-time price data, market insights, and industry analysis to stakeholders in over 70 countries. His innovative approach and strategic foresight have not only elevated Polymerupdate's stature but also significantly contributed to greater transparency and efficiency within the industry.

The recognition from Forbes India further underscores Dr. Mitha's contributions as a leader and innovator, inspiring the next generation of entrepreneurs to push boundaries and drive meaningful change.

Govt Developing Industrial Corridor Projects to Compete with World's Top Manufacturing and Investment Destinations

Synopsis

The government is advancing industrial corridor projects under the National Industrial Corridor Development Programme (NICDP) to boost India's competitiveness in global manufacturing and investment. Key developments include Maharashtra's Shendra-Bidkin and Dighi Port Industrial Areas, and the Amritsar - Kolkata Industrial Corridor.



The government is developing industrial corridor projects as part of the National Industrial Corridor Development Programme (NICDP) for the development of greenfield industrial areas, regions, and nodes in order to compete with the world's top manufacturing and investment destinations, stated Minister of State (MoS) in the Ministry of Commerce and Industry Jitin Prasada.

These projects are part of the National Industrial Corridor Development Programme (NICDP), as per the written reply provided by the minister in Lok Sabha on Tuesday.

The minister added that under NICDP in the state of Maharashtra, Shendra-Bidkin Industrial Area (SBIA) and Dighi Port Industrial Area (DPIA) are being undertaken for development.

Under NICDP, the Amritsar Kolkata Industrial Corridor (AKIC) has been conceptualised on the backbone of the EDFC (Eastern Dedicated Freight Corridor). Two projects, namely IMC Agra and IMC Prayagraj, proposed by the State Government, have been considered and approved by the government of India in August 2024, the Ministry of Commerce and Industry quoted the minister in a release.

(Source: The Economic Times/ 10.12.2024)

PLASTIC PRODUCTS AND NEW TECHNOLOGIES



Bio-Based Engineering Plastic DURABIO used on Front Grille of SUZUKI's New Fronx Compact SUV

DURABIO™, A Bio-based Engineering Plastic From The Mitsubishi Chemical Group ("the MCG Group"), Has Been Adopted For Use In The Front Grille Of The New Fronx Compact Suv From Suzuki Motor Corporation ("suzuki") Launched on October 16.



Suzuki Fronx with DURABIO™ Image courtesy of Suzuki Motor Corporation

DURABIO™ is a bioengineering plastic made from isosorbide, a renewable plant-derived raw material that reduces the consumption of petroleum, a depletable resource, and contributes to the reduction

of greenhouse gases because the plants used as raw materials absorb CO2 during their growth. Offering excellent impact resistance, scratch resistance, and colorability, this material is being developed for use across a wide range of fields, including automotive interior and exterior parts, optical and electronic device components, and everyday sundries.

DURABIO™ has been widely used for front grilles on Suzuki's domestic and overseas models such as Swift, Spacia Custom and Vitara since S-Cross was launched in Europe at the end of 2021. The recently released Fronx has earned a strong reputation for its impact resistance, weather resistance and other outstanding features, which include a glossy, sophisticated design achieved simply by adding a colorant that eliminates the painting process previously required and reduces the amount of volatile organic compounds (VOCs) generated during manufacturing.

The MCG Group will continue providing high value-added products and helping bring about sustainable societies through more extensive utilization of DURABIO™.

(Source: MITSUBISHI CHEMICAL GROUP / 05.12.2024)

PLACON Launches New Tamper-Resistant Injection Molded Cup and Lid



PLACON is pleased to announce the release of a new tamper-resistant injection molded cup and lid: The TRP16 cup and TRPLID. The TRP16 is a tamper-resistant, 16 oz. injection molded cup that's perfect for custom food processors, and the convenience store and grocery markets. The cups are ideal for soups, dips, sauces, cut fruit and vegetables and much more. The TRP16 comes in case packs of 250 and 500.

The new TRPLID is the companion lid for the TRP16 base and is an ideal for all kinds of tamper-resistant applications. The TRPLID comes in case packs of 1000.

About PLACON

For 55 years, PLACON has been a leading designer and manufacturer of custom and stock plastic packaging for the food, medical, and retail markets. PLACON has manufacturing operations in Madison, WI; Elkhart, IN; Plymouth, MN; and West Springfield, MA, and currently ranked in Plastics News 2020 Thermoformers Ranking Top 20. PLACON delivers packaging breakthroughs that inspire better engagement between people and products with industry leading innovation and award-winning packaging designs. For more information, visit www.placon.com.

(Source: PLACON/02.12.2024)

Light, Safe and Sustainable

Wild & Coco is all about coconut for health. It provides its powers through yogurts, coconut water and the so-called "Cocofirs". Pureed pulp, coconut

water and fermentation make them as thick and energy rich as kefir. They are just as popular as a snack between meals as they are for refining muesli. With Cocofirs, the Prague-based start-up Wild & Coco offers a lactose-free and vegan alternative with organic coconuts from sustainable cultivation. The coconut all-rounders are now also available as "Cocoguard Shot" in a compressed shot, either pure or with a hint of mango or cocoa – and packaged safely, lightly and sustainably in a 100 percent rPET bottle from ALPLA.



The Cocoguard Shot fits 120 milliliters of coconut drink in a plastic bottle. Six of these make up one pack. With the bottle made from recycled PET material, Wild & Coco minimizes energy and CO2 consumption during packaging, replaces glass and aluminium with lightweight and shatterproof material and thus creates a convenient and transportable solution for everyday use. Like the bottle, the tethered cap is also made of plastic. Marek Grueber, Sales Manager at ALPLA in Bystrice, talks about the successful replace project.

What Makes the Small Bottle Stand Out?

Clearly the recycled material. The customer target was a smaller bottle made of 100 percent rPET. Switching from glass to plastic and halving the volume from 250 millilitres (glass) to 120 millilitres (PET) also reduced the weight from 145 grams to 13.5 grams. We obtain most of the material from our own plants at ALPLArecycling.

How Long Did it Take from the Idea to the Market Launch?

The project took about a year – including product development at Wild & Coco, label design, packaging testing and the acquisition of a new filling line.

How Much Co2 Does The Pure Plastic Packaging Solution Save Compared To The Glass-metal Cap Combination?

The carbon footprint is significantly lower – and not just because of the smaller packaging. We save around 80 percent of emissions per bottle. The 120-milliliter bottle made of 100 per cent rPET with a plastic cap emits 44 grams of CO₂ equivalent (CO₂e). For the glass bottle twice the size with a metal cap, it is 215 grams.

What Challenges Did Alpla And Wild & Coco Overcome From Development To Series Production?

We had to find a bottle with a suitable shape, size and neck finish for the viscous consistency of the Cocofir filling. For the start, we opted for a standard version – a customised design could follow in the future. and, of course, we supported Wild & Coco with our expertise during the changeover to PET filling technology.

Are Further Formats Planned For Larger Packaging?

The smaller packaging solution was developed precisely for the market requirements. Wild & Coco's product portfolio offers further options for the future, such as for glass bottles in larger formats.

Light - Blocking Additive for PET Dairy Packaging

Avient's Lactra LX additive enables blocking of 100% visible light in monolayer PET.

A light-blocking additive developed and launched by Avient is said to enable blocking of 100% of visible light in monolayer PET dairy packaging. ColorMatrix Lactra LX Light Blocking Additive is suitable for ultrahigh - temperature liquid dairy containers, which have longer shelf life requirements and are often stored under ambient conditions. In addition to preserving the quality of dairy products and helping to extend shelf life, this solid masterbatch additive also delivers a bright white color.

Lactra LX UV additive is also said to offer the advantage of versatility in container designs and shapes, enabling product differentiation over other rigid packaging solutions (such as multilayer HDPE containers) and enhancing consumer convenience with easy-to-pour options. It also provides the opportunity for light weighting, reducing overall cost without sacrificing performance.



Source: Avient

Indorama Collaborates in Launch of World's First Bio-PET Bottles

Japan's Suntory Group will introduce the new bottles for selected products in Japan.

A collaboration of seven companies, led by PET resin manufacturer Indorama Ventures, has resulted in the launch of what is said to be the world's first bio-PET bottles. Japan's Suntory Group is producing the bottles for selected products.

Initially, the launch will entail approximately 45 million bottles for beverages made from this new bio-PET, with further introduction for Suntory products to be considered in the future.

This supply chain collaboration includes:

- Mitsubishi Corp. which manages the entire supply chain
- Neste, which produces the bio-naphtha from used cooking oil in ISCC + certified plant
- Mitsui Chemicals, which produces the intermediate materials for bio-paraxylene using bio-naphtha in ISCC + plant
- ENEOS Corp., which produces bio-paraxylene from intermediate material in ISCC+ plant using mass balance approach
- Indorama, which uses the bio-paraxylene to create PTA (terephthalic acid) and then reacts it with MEG (monoethylene glycol) to produce bio-PET in ISCC + plants

- Iwatani Corp., manages operation from production to delivery of PET resin
- Suntory Group, which produces the PET bottles from the bio-PET

By combining the expertise and resources of industry leaders across the value chain, this initiative underscores the power of collaboration in addressing global sustainability challenges. This launch represents a major step forward in reducing the environmental footprint of PET production. The mass balance approach applied throughout the production process ensures that the bio-based materials are transparently and effectively integrated into the PET bottles.

Injection Molded Enclosures Plug into Potential Electric Vehicle Battery Applications

In partnership with material suppliers, Engel is proving out injection molded thermoplastic-based concepts for electric vehicle battery housings, utilizing production tools and dedicated machines at its large press factory in St. Valentin, Austria.

In addition to exhibiting at the Battery show this October in Michigan, Engel held an open house in Austria with stakeholders in November to show its progress toward replacing steel and aluminum in the emerging application of electrical vehicle (EV) battery enclosures.

Michael Fischer, Engel's business development manager for electrical mobility and smart panels, cites LMC Automotive's (now GlobalData Plc's) market forecasts to highlight the coming acceleration for the market. The powertrain composition ratio for global light vehicle sales report from GlobalData forecasts that the market share of internal combustion engines (ICE) will drop from 65.6% in 2024 to 22.3% by 2036, with battery electric vehicles (BEV) share rising from 12.6% to 52.9% over that same time period. When you mix in plug-in hybrid electric vehicles (PHEV) and full-hybrid electric vehicles (FHEV), the potential is even greater. "What do all these — BEV, PHEV, FHEV — vehicles have in common?" Fischer asks, "They need to store electrical energy for the motors."

As a proof of concept, Engel, in collaboration with material supplier SABIC and sustainable product development firm Forward Engineering, developed an OEM-specific, high-voltage battery enclosure (HVBE) based on one already in production for Volkswagen's ID.4 electric sport utility vehicle. "The goal is to deliver an innovative, cost-effective, and flexible scale solution for future EV battery enclosures," Fischer says.



The tray features ribs and 37 metal inserts, and five standard fasteners molded into a single component. Source: SABIC

This concept HVBE consists of a three-piece structure, including an injection molded cover and tray affixed to a structural steel underbody panel. The top cover is composed of three primary elements in a sandwich design in which a 1.9-mm thick layer of flame-retardant Stamax PP material is molded between two 0.3-mm organo sheets inserted onto the A and B halves of the tool, which was built by Christian Karl Siebenwurst GmbH & Co. KG (Dietfurt, Germany).

Run on an Engel Duo 5500 combi M at the company's tech center in St. Valentin, the cell utilizes an easix 6-axis robot with a dual-sided end-of-arm-tool (EOAT) to pick up two 50% glass - filled polypropylene (PP) organo sheets and place them on either side of the tool, with the Siebenwurst mold holding the sheets in place and maintaining space between, which is then filled by a 7.5-kg (16.5-lb) shot of UL-verified flame-retardant Stamax PP from SABIC.

Around the outer edge of the finished part, there's only the molded Stamax, while the rest of the 9-kg (20-lb) component features the sandwich structure. In the field, the top cover is tasked with containing any potential thermal runaway of the battery, preventing any potential fire originating in the cells from spreading through the vehicle. Specifically, the material must withstand the UL 2596 thermal runaway test. SABIC has proven out that a 4-mm thick sheet of flame-retardant Stamax 30YH570 can pass the test, which combines pressure, ablative force, heat and fire, with temperatures up to 420°C and internal pressures of 250,000 kPa (36,000 psi).

Trials with the mold and process began in August, and Engel outfitted the Duo 5500 combi M with a third injection unit for flexibility in future trials. For this process, the machine utilizes a 190-mm (7.5") diameter screw with an L/D ratio of 25.



Battery enclosure tray and cover on display at mold maker Siebenwurst displaying the scale of the parts. Source: SABIC

This cover goes over the injection molded tray, which features ribs and molded-in fasteners for mounting connections and load transfer to the car's underbody panel or body in white. Fischer says the basic concept for the tray was to integrate as much as possible into a single molded component. To that end, the design features 37 metal inserts and five standard fasteners that are insert over molded into the final part. Automation is used to load the inserts and fasteners into another Siebenwurst tool. Testing on the tray, which has a design that features molded-in cooling circuits for the battery, has been running since April 2024, utilizing an Engel duo 4000 press.

While steel and aluminum currently dominate the sector, Fischer does point out some thermoplastic encroachment in the space. Specifically, Lucid Motors' Lucid Air BEV features a one-shot insert-molded module housing, featuring insert molding of a contactor plate and applying a 20% glass-filled Lexan 3412ECR polycarbonate (PC) from SABIC. This component is molded by Plastikon Industries. Fischer and Engel maintain that thermoplastic enclosures, particularly when multiple components and features are integrated via molding in one shot, provide an attractive cost position for OEMs and their suppliers. In addition, if the carbon footprint of aluminum and thermoplastics are weighed in these parts, PA has 2.1 kg of CO₂ equivalent for a kilogram of material, while cast aluminum comes in at 6.8 kg of Co₂.

What's Required

The opportunity is big both in the potential quantity of parts, but also in the individual size of these components, with Fischer saying future enclosures will measure 8 by 5 feet — a challenge to mold with the simplest materials. “We're talking about shot weights that are going up to 75 kg with different, heavily filled materials,” Fischer says. These include PP and polyamides (PA), filled with glass fibers in ranges from 30 to 50%. Parts going up to 3 square meters in size, would require clamp forces up to 11,000 tons.



Siebenwurst built the molds for the battery tray (pictured) and cover. Source: Siebenwurst

In addition to its validation and research work with SABIC and Forward Engineering, Engel is also collaborating with Envalior on battery housing concepts, targeting PA structures, as well as fully or partially integrated organo sheets or UD tapes, metal inserts for connections and integrated ribs for impact resistance.

In addition to outstanding mechanical properties, many of these materials and components will need to offer electromagnetic shielding (EMS) and flame-retardant (FR) capabilities. For the trays the hold the battery cells, long-glass fiber PP with FR V0 rating would be the base materials, with UD tapes, rods and organo sheets applied as needed. The module housing and control box would use glass-filled PC and short-glass-fiber-filled PA and PP. Here too, the components need FR V0 rating and EMS. For the cover and the tray, post mold behavior, including potential warpage, must be considered. Fischer says in addition to helping meet the FR requirements, the organo sheets also alleviate potential warpage.

Plasticizing Concepts and Process Requirements

Fischer says a standard 3-zone screw for materials reinforced with short glass fibers can be applied, while for long glass fiber materials (like SABIC's Stamax), screws with geometries especially designed for maintaining fiber length should be used. He adds

that two injection units for these parts can provide more flexibility and, given the shot volumes that need to be prepared, keep screw diameters in more conventional ranges.

As another means of maintaining longer fibers, Fischer says a two-stage process — where glass fibers are added into the melt in a second screw after a primary screw has prepared the materials — is an option. Engel's own internal tests of such a 2-stage process showed significant increases in fiber length compared to single-stage plasticization, with fiber lengths measured after the nozzle. Fischer notes that this two-stage concept also opens the door for the introduction or regrind and recycled material into these parts. In terms of injection pressure, forces equal to or greater than approximately 22,000 psi are need with a metering stroke of 1.5 to 2D, or one-and-a-half-to-two-times the screw diameter. Use of a sequentially valve-gated hot runner system, with cascading injection across multiple gates, is also suggested.

“Based on testing, Engel remains open material wise,” Fischer says. “I personally believe it must be cost-effective and fulfill all the needs from the OEM. We're preparing for all relevant materials. Different materials will have different properties, and these will be reflected in the design.”

Press Requirements by Battery Housing Size

	Small	Medium	Large
Battery Housing Size	16 ft ²	1-32 ft ²	>21 ft ²
Est. Required Clamp Force	<3,600	3,600-6,100	>6,100
Est. Shot Weight Range	13-62 lb	26-106 lb	35-154 lb
Cycle Time (PAGF & PPGF)	100-160	110-170	120-180

Source: Engel

Source: Engel

(Source: Plastics Technology / 04.12.2024)

Reduction of Defects

Having trouble with inconsistent film builds or defects when powder coating? Products finishing columnist Rodger Talbert offers some advice for troubleshooting your process.

Q: We have been running our powder coating line for a little over a year now. Results are mixed as some days things run well and other days we struggle with excess rejects and rework. Light coating and heavy coating are the most common cause, but we also get a lot of orange peel and small areas with a lot of texture. Our application process is all manual with two operators. We have three standard colors but will do a number of smaller runs and specials. Do you have any general advice for things we should look at for improvement in our yields?

A: Since I have never seen your operation, I cannot comment on specific issues that are causing the inconsistent film build and appearance issues you describe. A review of basic operating control should help you find some issues and make gradual improvements. Typically, no one thing is the root cause of the kind of defects you describe. Establish and maintain a consistent Standard Operating Procedure for the best results.

It starts with material control. Your supplier(s) work hard to give you uniform and reliable product but occasionally, the grind size or some other factor causes inconsistency that can create application issues. Also, when powder is shipped it is often on a truck with no atmospheric control so exposure to heat and humidity may cause agglomerations inside the container. If you do not already, start storing your powder in an air-conditioned environment to keep it dry. When you put a container into production you should sift it or screen it to remove or break apart any clumps of powder. Allow the material to fluidize for 10 minutes or so before spraying so that you know it is in good condition for fluidization and flow.

Ensure you are using clean contacts on your racks and hooks to maintain earth ground at all times. A lack of ground will make it very hard to control the film thickness, leading to light and heavy coating. Keep the racking in good working order by removing powder build-up, keeping hooks and clips in good repair and hanging everything consistently.

Next, look at your gun set-up. Ensure the wear parts in the delivery path are clean and not too worn. Blockage or wear in the pick-up tube, hose, air cap or any connector can cause gun surging and spits and

also may cause the operator to use too much pressure to get the powder to flow at a sufficient rate for coverage. Do a pre-check of the system before a shift.

Voltage can run near the top of the range as long as the micro-amps are controlled. If the micro-amps run too high, it can cause back-ionization, pin-holes or other appearance issues and make it hard to control film thickness. Most guns have controls that limit amperage and factory presets for recoats and Faraday areas. Use them to keep the amperage controlled.

Operator training and technique are also critical. Ensure the operators have enough time and training to practice good technique and consistent patterns. The manual guns should typically be held around 6" from the surface. If the part has inside recesses, they should be covered first. If the easy-to-coat surfaces are covered first, it can increase the resistance in the inside corners (Faraday areas) and make them hard to cover.

Some practice or trials on parts that give you the most trouble could be very valuable. Run a few practice parts and analyze the outcome to look for problem areas.

I would also recommend that you enclose your application booth and surrounding area with an insulated room and add atmospheric control for temperature and humidity. That level of process control can be a big help with the kinds of issues you describe. If the temperature is kept between 60°F and 80°F and the humidity is kept between 40% and 60%, it is much easier to establish standard settings for the application equipment.

(Source: Plastics Technology / 03.12.2024)

Covestro Unveils CERTEVO®: An Innovative Polymeric Substrate to Revolutionize Security Printing

- Launch of official brand CERTEVO® for security printing industry
- Applied in high-secure and durable official documents, certificates, and applications demanding for advanced anti-counterfeiting measures

- Combining advanced security features design with recyclability
- Covestro showcases its advanced polymer substrates at TRUSTECH 2024 in Paris

Covestro is excited to introduce CERTEVO®, an innovative polymeric printing substrate. It is designed for advanced security printing applications like high-secure and durable official documents, certificates, and applications demanding for advanced anti-counterfeiting measures. The launch of CERTEVO® marks a significant advancement in document security, sustainability, and printing technology, combining performance and environmental responsibility.

“The introduction of CERTEVO® marks a pivotal advancement in security printing as an innovative, recyclable polymeric substrate that combines excellent printability, durability, and sustainability,” stated Daniel Hentschel, Global Segment Manager ID & Security Printing at Covestro.

Covestro's CERTEVO® revolutionizes security printing with several key features: It supports excellent printability via intaglio and offset processes, enabling embossing structures—surpassing traditional paper and enhancing security elements. Its hotmelt nature eliminates the need for coatings and primers, ensuring superior ink adhesion that simplifies printing and boosts durability. Additionally, advanced laser engravability allows precise micro-engravings, making counterfeiting efforts more challenging.

As a single-polymer composition, CERTEVO® is recyclable, meeting the demand for sustainable security printing materials. Its high tear resistance and ink adhesion extend the lifecycle of printed items while conserving resources. CERTEVO® thereby addresses environmental concerns and meets evolving sustainability requirements in document production.

Furthermore, its durable composition lowers long-term costs by minimizing replacements, making it an ideal choice for governments and the public sector that prioritize security and environmental responsibility.

Lubrizol Collaborates on Revolutionary 3D Printed Shoes Made by Lore Cycle



CLEVELAND, Ohio — Lubrizol announces its collaboration with Lore Cycle, a manufacturer of custom cycling shoes, to provide a solution for its recently launched 3D-printed shoe.

Leveraging the latest advancements in additive manufacturing technology, Lubrizol and its Avid 3D printing brand collaborated with Lore Cycle to find a solution for a better-fitting rider's shoe.

The innovative 3D printing technology used by Lubrizol enables the creation of custom-fit shoe components that offer unparalleled comfort, support, and style. By combining advanced materials and precise manufacturing techniques, these shoes are designed to provide a personalized fit that conforms perfectly to everyone's unique foot shape. The product is personalized, as it is designed around a 3D scan of a customer's foot.

Specifically, Lubrizol TPU is used in the shoe upper custom made using 3DP providing a lightweight and long-lasting structure. The use of advanced materials allows for this without compromising durability. The endless possibilities in additive manufacturing for personalized printed parts allow an advanced cycling shoe design.

"By harnessing the power of Lubrizol solutions, Lore Cycle is revolutionizing how shoes are manufactured and worn. We are thrilled to see how our technology has contributed to the creation of Lore's 3D printed shoes, which combine cutting-edge technology with Lubrizol's material & application science," said Gert-Jan Nijhuis, general manager, Lubrizol 3D Printing." This 3D printing technology disrupts traditional manufacturing processes, enables on shoring, and offers consumers a new level of comfort and personalization."

"The Lore Two is a ground breaking leap forward into the future of footwear: each pair is precisely 3D printed based on a digital scan of your foot. Unlike conventional shoes that are built off generic lasts, the Lore Two takes into account the individual's unique biomechanics; the shape of the carbon shell accurately cups your sole, relieves fat pad pressure, and features a perfected custom toe box that lets your foot spread out under load", said Stephan Drake, CEO, Lore Cycle.

OCSiAI Opens First Large - Scale Graphene Nanotube Plant

The new facility in Serbia will serve Europe, North America and Asia to drive advances in plastics and rubbers.

Luxembourg-based OCSiAI (U. S. office in Columbus, Ohio), a global leader in graphene nanotube technology, has opened its first large-scale production facility in Serbia. The nearly 108,000-square-foot facility will produce 132,217 lbs of OCSiAI's Tuball nanotubes the first year, with plans to double production by launching a second synthesis unit within the next year, according to OCSiAI Group CEO Konstantin Notman.

Included in the facility are a graphene nanotube synthesis unit, dispersion and concentrate production lines, a research hub, and quality control laboratories. Over the past five years, sales of nanotube concentrates have tripled, driven by rising demand. To support this growth, the facility includes a production line with a capacity of up to 440,925 lb/yr. of easy-to-apply nanotube concentrates, which is enough to enhance up to over 44 million/lbs of plastic or up to 8.7 million lbs of rubber. This will mark a significant step forward in integrating nanomaterials into various industries. More than 1,500 companies worldwide, including leading plastic and rubber manufacturers, already use graphene nanotubes in their production lines.

To meet growing demand, OCSiAI operates a global network of 10 licensed production partners and 25 distributors in more than 50 countries. OCSiAI's strategic plans are focused on further production expansion across the globe, including the construction of a production facility in Luxembourg as the next step.

AIMPLAS, COVINIL and EROSKI have launched the BOTTLE4FLEX Project to Develop 100% Recyclable Flexible Skinpack Packaging Using rPET



The European Union's Circular Economy Strategy stipulates that all plastic packaging in the European Union must be 100% recyclable by 2030, which has resulted in the introduction of new regulations in Spain. One current challenge is the restriction on the use of recycled materials in food packaging to guarantee food safety. For example, in Spain, only recycled polyethylene terephthalate (rPET) has been authorized for post-consumer recycled content for food packaging. In addition, flexible PET packaging cannot be recycled using conventional mechanical technologies because of its multilayer composition.

AIMPLAS, COVINIL and EROSKI have launched the BOTTLE4FLEX Project to develop 100% recyclable flexible skinpack packaging using rPET. Skinpack creates an invisible “second skin” around the product that allows consumers to examine its quality, thus improving the shopping experience with 3D presentation and easy opening. This type of packaging is attractive to consumers due to the premium product appearance and to producers and distributors for its cost-effectiveness and flexibility. However, despite its popularity and efficiency in terms of space and transport, this multilayer packaging faces serious difficulties for recycling.

Through innovations in chemical recycling and polymerization technologies, the project consortium aims to overcome the challenges of recycling multilayer PET flexible packaging and promote sustainability and the efficient use of recycled materials in the food industry. The research project is funded by the Ministry of Science, Innovation and Universities and the European Union through Next Generation funds within the framework of the Recovery, Transformation and Resilience Plan.

In order to comply with the EU's Circular Economy Strategy, it is crucial to carry out research and develop single-material film based on rPET. This material is widely used in trays and is currently the only one recycled in Spain, primarily for rigid packaging due to high demand that exceeds supply. This makes it necessary to develop new recycling and circularity systems for packaging waste to ensure the film's high flexibility, barrier properties and heat-sealing capacity.

The BOTTLE4FLEX Project therefore focuses on promoting solvolysis processes for recycling and to modify the properties of PET through partial depolymerization. It also seeks to make use of innovative technologies such as reactive extrusion, as well as monomers and additives to increase the flexibility of recycled PET. The goal is to develop efficient, sustainable methods that promote the circularity of plastics and lead to new circular production models.

Project CPP2021 - 008773 funded by MICIU/AEI/10.13039/ 501100011033 and by the European Union NextGenerationEU/PRTR

Bulk, Solid and Melt Density: How to Calculate These Values and Why They Matter — Part 1 of 2

How much resin is contained within a bucket, gaylord or hopper? That depends on the bulk density — a figure you need to learn how to calculate due to its impact on everything from storage and conveying to drying and molding.

Knowledge of three types of densities related to plastic material is required in injection molding. These types are: bulk density, solid density and melt density. This two-part article will discuss each of these and provide an easy way to calculate these densities. As a basic definition, density is quantified as how closely the molecules of the material are packed together. The closer they are, the higher the density, or, in other words, there are more molecules in a given volume. The measuring unit is weight per volume, which is discussed below.

Bulk Density: Resin is usually supplied in pellet form from the material supplier. These pellets can have different shapes, ranging from spherical beads to somewhat flattened beads to simply cut extrudates

forming small cylinders. The bigger the pellets are, the more empty space there will be between them. The size therefore causes a difference in the total weight of the plastic in a given volume. For example, consider the same grade of ABS supplied in smaller size and larger size pellets as shown in Figure 1.

Source: FimmTech

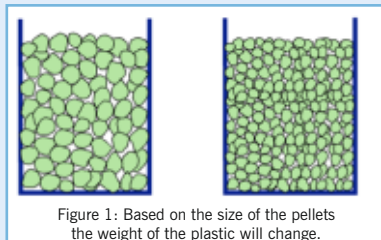


Figure 1: Based on the size of the pellets the weight of the plastic will change.

The weight of the total plastic with the smaller pellets will be more than the one with the bigger pellets. Please note that this is true with pellets sizes used in injection molding,

extrusion, blow molding and similar processes but should not be used for any materials supplied in any other form.

Bulk density is defined as the amount of raw material present in a given volume and is most commonly measured in pounds per cubic feet (lb/cu ft) or kilograms per liter (kg/l). The reason for these units will become clear after an explanation of why bulk density is needed. Bulk density is also given in grams per cubic centimeter (g/cc), but that can often be confusing and also not very accurate when used in calculations — think about the number of digits required after decimal place. The method of calculating the bulk density is very simple.

- Take a container, such as a bucket, and calculate its inner volume.
- Weigh the container.
- Fill the container with plastic pellets and weigh the container again.
- Calculate the weight of the plastic pellets by subtracting the empty container weight from the full container weight.
- Divide the weight of the pellets by the container volume to get the bulk density value, so that:
Bulk density = Weight of the plastic / Volume of the container.

As an example in Figure 2, a bucket with a diameter of 11.5 inches was filled with acrylic pellets to a height of 12.5 inches. Using the formula:

$$V = 0.785 \times D^2 \times H$$

where D is the inner diameter of the bucket and H is the inner height of the bucket, the volume of the filled bucket is 1297.7 cubic inches or 0.75 cubic feet. After the weight of the bucket was subtracted from the weight of the bucket full of plastic, the weight of the pellets was calculated to be 27.27 lbs. Based on the calculation above, the bulk density of these pellets is 36.4 lb/cu ft.

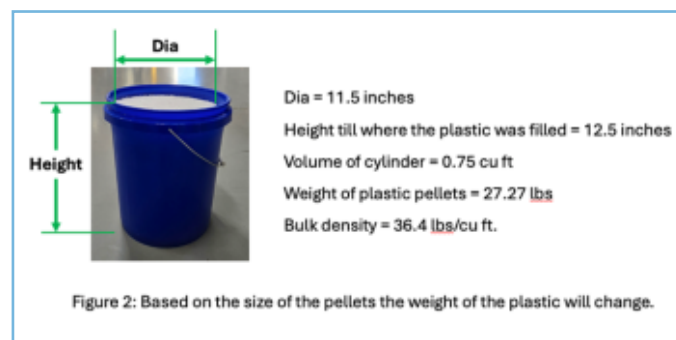


Figure 2: Based on the size of the pellets the weight of the plastic will change.

Source: FimmTech

The size and shape of the pellets play a major role in bulk density. There is no correlation between the bulk density and solid density of the material. (We will be discussing solid density in the next part of this two-part series.) The value of the bulk density is an important number to consider when sizing hoppers, dryer hoppers and storage silos. Every hygroscopic resin has a minimum and maximum recommended drying time. Based on the required throughput per hour, a calculation will be needed to have a minimum and maximum size (volume) of the dryer. Here the bulk density should be used for the calculation. Dryer manufacturers will size their equipment based on bulk densities.

Gaylords are of standard sizes and a material manufacturer needs to know how many gaylords will need to get shipped to a customer to deliver a certain amount of material. If the customer orders 1000 pounds, then the lower the bulk density means the higher the number of gaylords that will be required, with the reverse true as well. Transportation costs could get impacted, as will the storage space required in the warehouse.

Pellet sizes are very important for the conveying of the resin not only through the lines from the dryers to the machine feed throat but also for feeding into the machine and on to the feed zone of the screw. Consider micro molding machines where screw diameters can be as small as 15 mm. The pellets must

fall into the feed section via gravity and then get conveyed further. A larger pellet size may not fall all the way into the feed section causing blockages and / or inconsistency in molding. In the second part of this series, we will discuss solid density and melt densities.

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(Source: Plastics Technology / 13.12.2024)

Using a Melt Flow Indexer to Test Your Pressure Transducer

The MFI tester enables collection of meaningful pressure data in transducers in a relatively short time, providing realistic measures of the response time of a pressure transducer. This information is critical in the interpretation of pressure data measured in an extrusion process.

The measurement of pressure is the most critical measurement in extrusion. The pressure in the extrusion die determines the output of the extruder and pressure variation causes output variation. A pressure - time trend plot enables quantitative determination of the stability of the extrusion process. Pressure feedback control enables more stable extrusion. In addition, pressure measurement is critical to safety in extrusion. Extreme pressures can occur in the extrusion process that can lead to serious accidents. For that reason, operating an extruder without pressure measurement is extremely unsafe. Extruders should be equipped with automatic shutoff. This feature will shut off an extruder automatically when the pressure reaches a critical value.

For these reasons, it is important to make sure that your pressure transducer is working properly and capable of measuring process variation correctly.

The extrusion process is susceptible to short-term pressure variation. Short-term here refers to pressure variations that occur within one second. In fact, these short-term pressure variations occur in every extrusion process. To capture these variations, the pressure transducer has to have a fast dynamic response.

This article describes a simple test method for pressure transducers that uses a melt flow indexer (MFI) modified to enable testing of pressure transducers.

The MFI is a commonly used test apparatus to determine the flow behavior of a molten plastic. It is basically a ram extruder where plastic is extruded by placing a weight on top of a plunger (see Figure 1).

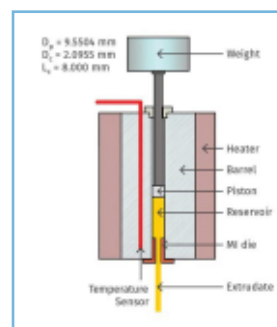


FIG 1 – Melt flow indexer. Source (all images): C. Rauwendaal

The MFI has a heated barrel. Plastic pellets are placed inside the barrel and heated until the plastic is molten and at the required

test temperature. At that point, a weight is placed on top of the plunger. This weight pushes the molten plastic out of the melt index die as a single strand with a diameter of about 1-2 mm.

The MFI value is the amount of plastic extruded in 10 minutes. The amount is expressed in grams. A melt flow index of 3 indicates that 3 grams of plastic is extruded in 10 minutes. A high MFI value (for example, 10 g/10 min.) indicates a low-viscosity plastic and a low value (for example, 0.5 g/10 min.) indicates a high-viscosity plastic. The term "fractional melt" plastic is used for plastics with an MFI value less than 1.0 — these are high-viscosity plastics.

Melt Flow Indexer Modified to Test Pressure Transducers

In this study, an MFI was modified to enable testing of pressure transducers. The MFI die was removed and replaced with an adaptor with a port for a pressure transducer. The MFI was filled with a high-viscosity silicon oil with a viscosity of about 500 Pa.s. This viscosity is close to that of a typical extrusion-grade plastic. The consistency of this oil is similar to that of silly putty.

The pressure transducer is placed in the adaptor and a weight is placed on top of the plunger. The weight determines the pressure exerted on the pressure transducer. Figure 2 shows a photo of the actual MFI discharge end. The MFI was purchased on Amazon for less than \$2,000. The brand name of the MFI was not clear. The instructions suggested that the MFI was made in China.



FIG 2 – Discharge end of a modified MFI.

A few issues were encountered in the testing of pressure transducers. It was found that large weights (5 kg and heavier) caused leakage because the clearance between the piston and the cylinder was too large. This was fixed by making a custom piston with a large outside diameter to prevent leakage. It was also found that the temperature sensor was not functioning in the MFI. In addition, the temperature sensor did not fit properly in the sensor well in the cylinder. As a result, the MFI could not be heated. This was fixed by installing a new RTD temperature sensor and drilling the hole of the sensor well to a diameter that ensured a good fit of the temperature sensor.

The pressure measurements were collected by an Incióna data acquisition system. Figure 3 shows a photo of the Incióna data collection system. Incióna is a specialized engineering and manufacturing services firm based in California.

The black box at the bottom is the actual data collection system. The box on top is the power supply. The measurement data is sent to the cloud. The data is collected and displayed using Grafana. This is a multiplatform, open-source analytics and interactive visualization web application. The data was downloaded as a csv file for more detailed analysis in Excel.



FIG 3 - Incióna data collection system.

The pressure on the transducer is determined by the total plunger weight and

the piston diameter. With the total plunger mass (M_p in kg) and the piston diameter (D_p in meter), the pressure (P in Pascal) is determined from the following expression: $P = 12.5 M_p / D_p^2$

Five weights were available for the pressure transducer testing, 0.875 kg, 0.960 kg, 1.200 kg, 1.640 kg, and 5.000 kg. By adding a second weight on top of the first weight, the weight increased from 0.875 to 1.835, to 3.035, to 4.675, to a maximum of 9.675 kg.

The pressure transducer that was tested was a combination pressure/temperature sensor made by Terwin, model 2076JNN10MSP268 with a range of 0-20 bar (0-3,000 psi).

This is a “fill-free” transducer, meaning there is no fill liquid; therefore, no concern about Mercury inside the transducer. In this transducer, there is a mechanical connection between the first and second diaphragm with a cylindrical rod. This transducer was selected because of the fast response time reported by the supplier. The response time specified by the supplier was less than 2 milliseconds.

Test Procedure 1

The pressure transducer was tested by placing increasingly larger weights on the plunger. Each pressure was maintained for 1 minute. When the maximum weight (9,675 grams) was reached, the pressure was maintained for 5 minutes. Then the weight was removed one by one, again maintaining each pressure for 1 minute. Thus, the pressures were ascending in the first 300 seconds, kept constant for the next 300 seconds and descending for the last 300 seconds.

Analysis of Test Data of Test Procedure 1

The measured pressure versus time graph is shown in Figure 4. Pressure is plotted along the vertical axis in psi, time is plotted along the horizontal axis in seconds. The pressures increase in five steps over a period of 300 seconds. Each pressure is maintained for 1 minute. The maximum pressure is reached after 300 seconds. This pressure is maintained for 300 seconds and then weights are taken off with again each pressure maintained for 1 minute.

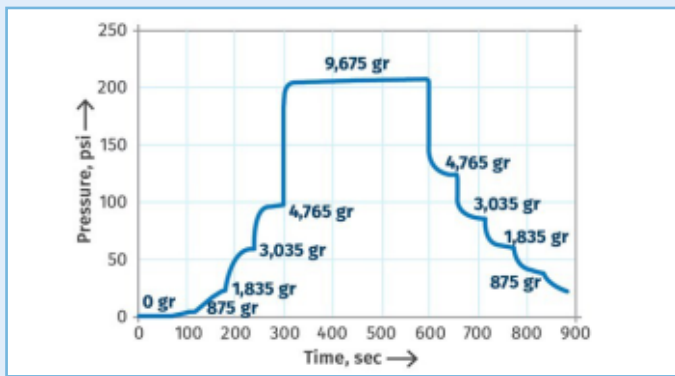


FIG 4 – Pressure vs. time in test procedure 1.

Figure 4 shows that when the 875-gram weight is added, the pressure increases slowly over the 1-minute period and does not reach a steady value within 1 minute. A similar pattern occurs when the second 960-gram weight is added. When the third 1,200-gram weight is added, the pressure gets close to reaching a steady value after 1 minute. When the fourth 1,640-gram weight is added, the pressure almost reaches a steady value after 1 minute.

When the fifth 5,000-gram weight is added, the pressure reaches a steady value in about 30 seconds. This pressure is maintained for 300 seconds. This data shows that a steady pressure value is reached in less than 1 minute only when the 5,000-gram weight is added. For all other weights, it takes longer than 1 minute for the pressure to reach steady value.

These results indicate that for pressures below 100 psi the response time for the transducer is longer than 1 minute. The response time for pressures increasing to 200 psi the response time is reduced to about half a minute. Interestingly, the response time specified by the supplier was less than 0.002 seconds. This means that the measured response time is about 4 to 6 orders of magnitude greater than the specified values — a disturbing discrepancy!

The pressure-time curves for the descending pressure more or less follow the curves for ascending pressure with regard to the time it takes to reach steady values. In descending pressure, the steady values deviate from those obtained with ascending pressure. For instance, with a weight of 4,675 grams the steady pressure in ascending mode is about 100 psi and 130 in descending mode. That indicates considerable hysteresis in the pressure measurement.

Test Procedure 2

In the second test procedure, the pressure transducer was tested by starting with the largest weight (5,000 grams) and then placing increasingly smaller weights on the plunger. Each pressure was maintained for 1 minute. When the maximum weight (9,675 grams) was reached, the pressure was maintained for 5 minutes. Then the weights were removed one by one, again maintaining each pressure for 1 minute. The two test procedures are shown in Figure 5 as a bar chart.

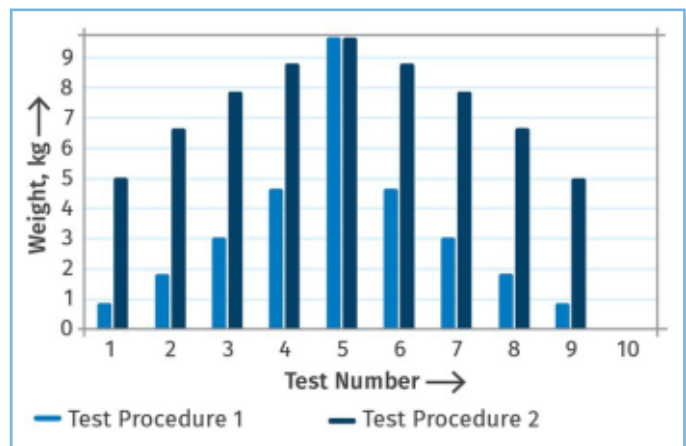


FIG 5 – Test procedures 1 and 2 showing weight vs. test number.

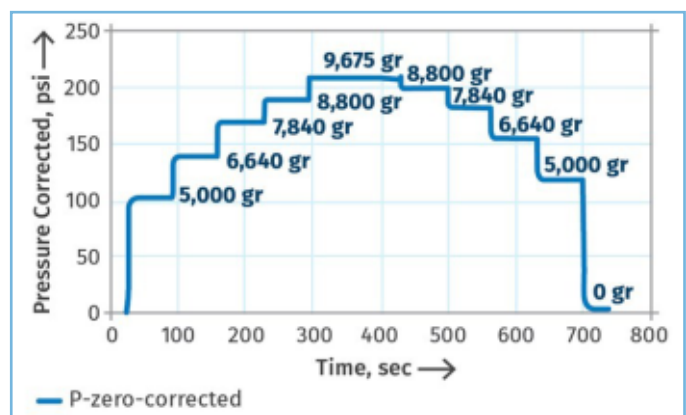


FIG 6 - Pressure vs. time in test procedure 2.

Figure 6 shows pressure versus time test procedure 2, revealing a different pressure-time pattern for procedure 2 compared to procedure 1. With an increase in weight from 0 to 5,000 grams, the pressure levels off in about 20 seconds. With an increase in weight from 8,800 to 9,675 grams, the pressure levels off in about 5-10 seconds. With procedure 1, the response times ranged from 30 seconds to more than 1 minute. With procedure 2, the response times ranged from 5-20 seconds.

Clearly, the measured response times depend strongly on the sequence of weights added or removed from the plunger. It should be noted, however, that even with the lower response times measured with procedure 2, the measured values are still orders of magnitude higher than the specified values. Figure 7 shows pressure vs. time for the first 120 seconds of procedure 2.

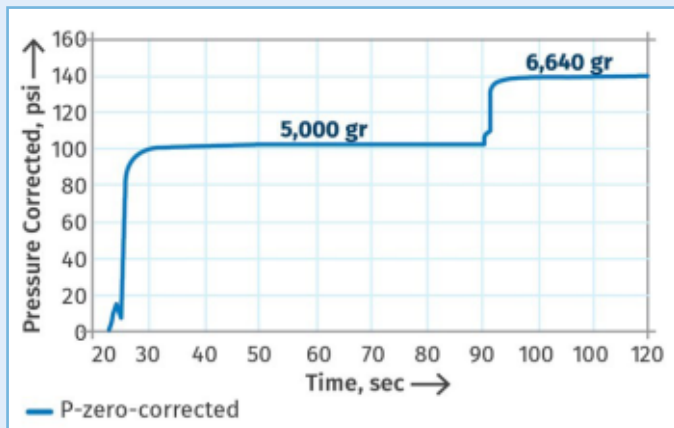


FIG 7 - Pressure vs. time for the first 120 seconds.

When the 5,000-gram weight is added it takes about 2 seconds to add the weight as shown by the peak between 23 and 25 seconds. The pressure increases rapidly between 25 and 26 seconds and then levels off over the next 10 seconds. If we define the response time as the time for the sensor reading to reach 99.3% of the total step change, the response time is about 10 seconds.

The response time specified by the supplier of the pressure transducer is 0.002 seconds. This is three to four orders of magnitude faster than the measured response time using the melt flow indexer.

Future Work

The MFI tester is limited in the pressures that can be generated in the cylinder. The maximum pressure is about 200-250 psi (1.4-1.7 MPa). Higher pressures can be created using the lever principle.

Figure 8 shows how the force on the plunger can be magnified by placing a weight a distance L_1 from a pivot point with the plunger a distance L_2 from the pivot point. This arrangement enables the force to be magnified by a factor L_1/L_2 . A realistic value of L_1/L_2 is 5.

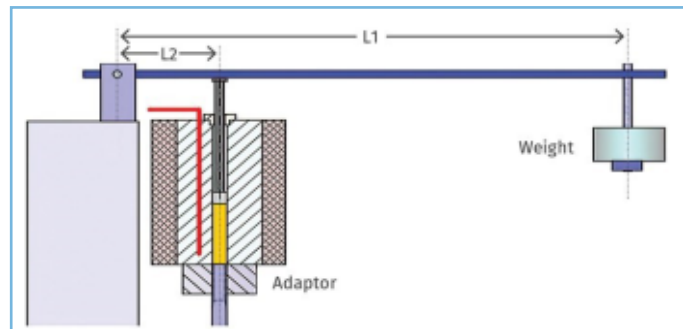


FIG 8. Force magnifier.

The slow response time of the pressure transducer tested makes it difficult to analyze short-term pressure variations in the extrusion process. In this context, short-term variations are fluctuations that occur within one second. These short-term variations occur in every extrusion process. It is critical to have a measurement system that enables detection of these short-term variations. For that reason, it is important to obtain good data on the response time of pressure transducers used in the extrusion process. Pressure transducers with response times greater than 1 second are not suitable for determining short-term pressure variations in the extrusion process.

The melt flow indexer provides a convenient method to test pressure transducers. MFI testers are widely available and they are inexpensive. The MFI tester enables collection of meaningful pressure data in a relatively short time. It provides realistic measures of the response time of a pressure transducer. This information is critical in the interpretation of pressure data measured in an extrusion process.

ABOUT THE AUTHOR: Dr. Chris Rauwendaal is a well-known author, lecturer, researcher, entrepreneur and consultant in the field of extrusion. He holds numerous patents and has written more than 200 articles and 7 books related to extrusion, mixing, injection molding and statistical process control. A fellow of the Society of Plastics Engineers (SPE), he is the developer of the CRD, VIP and ASM mixing technologies that utilize strong elongational flow to improve mixing in extrusion and molding. Rauwendaal also developed the HHT (high-heat-transfer) extruder screw designed to improve cooling in foam tandem and other extrusion operations. In 1990, he founded and is still president of Rauwendaal Extrusion Engineering. Rauwendaal

was inducted into the Plastics Hall of Fame in 2024. Contact: 530-269-1082; chris@rauwendaal.com; rauwendaal.com.

(Source: Plastics Technology / 02.12.2024)

Industrial Resin Recycling Diversifies by Looking beyond Automotive

Recycler equips for new business in medical, housewares and carpeting.

Just about an hour's drive northwest of the Motor City itself, Industrial Resin Recycling (IRR) was built on the auto industry. It's still a major part of the business, and truckloads of molded parts roll in every week from Tier 1 automotive suppliers (suppliers that work directly with OEMs), but today IRR is equipped to handle a much wider range of products from a variety of sources.

IRR has been in business for over 35 years, reprocessing automotive materials and adding extrusion capabilities in the mid-1990s. At that time, IRR began using impact modifiers to alter the mechanical properties and create a higher performing recycled compound. The company has two facilities in Michigan, positioning it near automotive component manufacturers that are its biggest suppliers/customers. About 30% of IRR's business is part of tolling arrangements, the rest is sold into other applications.



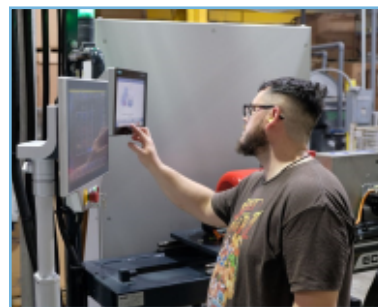
Bob (left) and Trevor Houston (foreground) with a benchtop press in the IRR laboratory. Source: Matt Stonecash

Adaptable Logistical Infrastructure for an Industry in Flux

IRR has a fleet of seven trucks and a large collection of trailers, enabling the company to pick up recyclable materials on call and even leave trailers at suppliers' facilities to be filled. Howell, Michigan, serves as the company's headquarters and size reduction facility, where scrap material is collected, disassembled, shredded, ground and washed. The grounds measure 5 acres, giving IRR the flexibility to store large quantities of scrap material for processing. This enables the recycling operation to build up inventory when available, and work through it when supply is scarce, such as during the supply chain disruptions during the COVID-19 pandemic.

At its Fowlerville facility, just 10 miles away, recycled materials are further processed to make new pellets. The newest addition there is an MAS conical twin-screw extrusion system with automatic self-cleaning melt filter. This system is run at 4,800 pounds per hour and could run higher on cleaner materials, but running with imperfect material is where its capabilities shine.

According to Bob Houston, founder and owner at IRR, the system has saved a lot of time and labor previously associated with stopping the line to clean screens. The MAS system detects pressure changes that indicate the screen is becoming occluded. Automatically, a scraper passes over the screen removing the contamination. Because some plastic is removed along with the debris, the resulting patty can be processed again to extract additional valuable polypropylene. John Sodini, general manager at IRR, says the extrusion system has increased output by around 80%.



Operator configures MAS extruder settings. Source: Matt Stonecash

MAS extruder with magnetic separator system and melt filter. At left are collected patties of scrap from the melt filter, which will be reprocessed to extract usable polypropylene. Source: Matt Stonecash



IRR is currently refurbishing its 8-inch Davis Standard extruder, which will be mostly dedicated to recycling polystyrene. This activity will bring the screw/barrel gap back to optimum and will also include a controls upgrade. One of the areas IRR is expanding into is clothes hanger recycling, which is a mixture of PP and PS. Throughput on the polystyrene line, when placed back in service, is expected to be 3,500 lbs per hour.

Recycling automotive products remains a very important business for IRR. According to Trevor Houston, vice president of sales at IRR, the company processes a minimum of 80,000 lbs of fuel tanks every week. The HDPE, EVOH-lined tanks occasionally end up misshapen in the blow molding process. The tanks are pressurized and the pressure decay monitored. If they fail the leak test, they become scrap. After being recycled at IRR, these postindustrial gas tanks can become material used in plastic decking, drainage pipes and agricultural products.



These gas tanks, composed mainly of HDPE, will be recycled for sale into a variety of applications. Source: Matt Stonecash

Expanding Beyond Automotive

In recent years, the company has been growing and diversifying its capabilities, looking beyond the automotive industries both for growth and to ameliorate the impact of events in one industry. “Over the last two years, we’ve been able to increase our capacity by 50%,” Trevor Houston says. “We’re getting into different things now, such as hangers, trying to expand out of automotive.” Some examples include polypropylene trim parts, postindustrial syringes, vials, pill bottles and even hospital gowns.

An illustration of variability of the automotive industry is the recent pullback in electric vehicle (EV) programs. For example, Ford recently announced it is pausing production of the F150 Lightning EV pickup truck, to bring production in-line with lower demand than expected. The pause and reduced production is in turn expected to impact Ford’s suppliers, the molding operations that also supply scrap to IRR.

“In addition to the fact that we’ve increased our capacity, we’re trying to augment where there’s a fluctuation in the segments — and all of them fluctuate for the most part,” Sodini says.



In this dispenser pump application, the polypropylene pump is ground up with the metal spring still inside. The metal pieces are removed by subsequent processes. Source: Matt Stonecash

IRR is also expanding into materials such as commercial carpeting and household goods. IRR’s Piedmont, Alabama, facility is key to this move.

There, IRR is starting up a new line purchased from NGR for processing carpeting and other materials. The line features a large water-cooled shredding system, feeder and extruder. Piedmont is about 90 miles from Dalton, Georgia, the "Carpet Capital of the World." The company is developing a technique for removing the hard filler materials from carpet backing.

Delivering Consistent Quality

Bob Houston attributes the company's longevity in a challenging market to the consistent quality of its materials and services. With the new recycling equipment online, the company estimates capacity at around 50 million pounds per year, and rejection rate is less than 4% across the company.

"We test every box coming off the line; we make mold plaques to make sure there is no contaminant. Then we do a blend, and we test the blend as well," Trevor Houston says. "So each box from the time it comes in the door to the time it leaves, is tested three times." Lab capabilities include melt index, moisture analysis, FTIR, molding and extrusion of test samples, as well as mechanical properties testing.

One of the biggest challenges has come from contamination of incoming material. Contamination can take the form of the wrong type of plastic, or it can be something more serious - such as bolts and other hardware that can wreak havoc on size reduction equipment. IRR must work in cooperation with suppliers to make sure these materials don't get slipped into the feedstock by a careless worker. "The culture has changed at molding plants," Bob Houston says. "It used to be, 'Well you're the recycler; you're supposed to catch it,' and now they want to use it as a profit center, as a recovery point — which is sometimes shared with the employees now."

Since 2008, the ISO 9000 standard has provided the framework for the quality systems at IRR. Each year, the company is audited both internally and externally to keep the certification up to date. "It truly has made us a better company," Bob Houston says. "If someone asks for some documentation, it's accessible. We have the weight of every box."



John Sodini (left) and Trevor Houston (right) with a VAZ 1300 Vecoplan shredder, being used to process postindustrial medical syringes. Source: Matt Stonecash.

IRR is currently expecting to imminently receive Green Circle Certification, a third-party program that certifies sustainable business operations and products. The company is also working toward A2LA certification for its laboratory. IRR offers reprocessed and compounded PP, reprocessed engineering resins and postconsumer content PP and PS. All products are made with recycled plastic, with no blending of virgin resin.

The plastics market is a moving and unpredictable target, but IRR is preparing to adapt to future conditions as they arise. "We've seen a shift, and we have capacity now to augment our market with health care and other consumers. When — I'm going to say when — auto picks up again, we will be ready to increase our output," Sodini says.

(Source: Plastics Technology)

Greiner Packaging Presents Mix & Match Meal Box

Why the Mix & Match meal box is so compelling

The meal boxes are robust, stackable, and made of high-quality polypropylene (PP). PP is known for its durability, sustainability and ease of cleaning.

- **The advantages of mix & match system at a glance:**
- **Variety of sizes according to Gastronorm standards**
- **Variety of colors**
- **For all types of food:**

The boxes can be sealed repeatedly – ideal for salads and soups, but also perfect for burgers and wraps. Sealing with foil can be done as often as needed without any loss in quality, even with frequent use. Additionally, the box can be equipped with ventilation holes to ensure optimal freshness for crispy dishes.



Freudenberg's Material Innovation for more Battery Safety

Freudenberg Sealing Technologies is making significant strides in enhancing the safety of modern lithium-ion batteries. This commitment was honoured with Dr Ruth Bieringer, Vice President Material Technology at Freudenberg Sealing Technologies, receiving the Meyer-Galow Prize for Industrial Chemistry 2024. This awards two innovations: the development of high-temperature-resistant plastics and leading-edge flame protection barriers.

Bieringer, who has a doctorate in chemistry and oversees material development at the technology company, accepted the €10,000 award. Representatives of Freudenberg Sealing Technologies, the German Chemical Society (GDCh), the society's founder Professor Dr. Erhard Meyer-Galow and others paid tribute to Dr. Bieringer's creativity and innovative talent.

Convincing patented know-how

The foundation highlighted the development of a new, patented class of plastic materials that was successfully developed by Dr Ruth Bieringer and her

team: Quantix ULTRA. Quantix ULTRA materials stand out with for their exceptional heat and flame resistance. These plastics will not melt or catch fire even at temperatures of up to 1,200 degrees Celsius. Processing the material in injection molding is both versatile and economical, enabling the production of complex components. Its lower density compared to metallic materials is an added benefit that makes it even more attractive for modern vehicles, considering their need for lightweight construction.

The second innovation honoured by the foundation are the flame protection barriers, which the expert developed with her team. These flame protection barriers prevent the spread of flames, gases and particles to other cells and electricity-conducting parts. The team's achievement involved increasing the heat resistance of silicone rubber by combining it with special fibers and fillers so that even these electrically insulating materials can withstand a temperature of 1,200 degrees Celsius for at least ten minutes. With injection molding or extrusion, the materials can be processed into mats, profiles or complex 3D geometries.

The commercialisation of both material families is in full swing. The company is also testing potential further developments for applications beyond electromobility.

SABIC Opens Multi-Million-Dollar ULTEM™ Resin Manufacturing Facility in Singapore to Meet Growing Demand in Asia-Pacific

The facility caters to high-tech end-user industries, such as Aerospace, Healthcare, 5G, Artificial Intelligence (AI) and Electric Vehicles (EV).

SABIC, a global diversified chemicals company, today announced the official launch of its new US\$170 (S\$220) million ULTEM™ resin manufacturing facility in Singapore, marking the company's first advanced specialty chemical manufacturing facility in the region producing the high-performance thermoplastic, ULTEM™ resin. The new facility is a strategic move to support SABIC's goal of increasing global ULTEM™ specialty resin production by more than 50%, responding to the growing demand from high-tech and manufacturing industries in the Asia-Pacific region, including Japan and China.

The facility opening was officiated by Ms. Low Yen Ling, Senior Minister of State for the Ministry of Trade and Industry (MTI) and Ministry of Culture, Community and Youth (MCCY), Eng. Khalid H. Al-Dabbagh, Chairman of the Board of Directors of SABIC, Eng. Abdulrahman Al-Fageeh, SABIC Chief Executive Officer and Mr. Omar Al-Harhi, Deputy Head of Mission, Embassy of the Kingdom of Saudi Arabia in Singapore.

Supported by the Singapore Economic Development Board (EDB), the new Singapore facility reinforces SABIC's commitment to localize a reliable supply of high performance materials that support complex and demanding supply chain requirements.

Ms. Low Yen Ling, Senior Minister of State for the Ministry of Trade and Industry (MTI) and Ministry of Culture, Community and Youth (MCCY) said, "The opening of SABIC's new facility underscores Singapore's role as a gateway to Asia and a leading hub for the chemicals industry."

Eng. Abdulrahman Al-Fageeh, CEO, SABIC said, "We're excited to leverage SABIC's advanced manufacturing capabilities to produce one of the world's most advanced plastics in Singapore. The

ULTEM resin facility reflects our long-term commitment to the region's high-tech economies and advanced manufacturing sectors, supporting the growth of advanced applications. Singapore's widely networked trade agreements also provides us with competitive access to markets in the region."

SABIC'S ROLE IN SINGAPORE

SABIC has empowered its workforce by enabling global knowledge transfer and up skilling local talent to effectively manage the production of one of the most technologically advanced plastics in the world. This holistic approach to the expansion integrates human capital development and leverages global expertise to establish an Asian hub built on a foundation of regional talent.

SABIC's advanced materials have become integral to Singapore's leadership in sustainable, high-tech manufacturing, extending to the automotive, healthcare, and telecommunications sectors through application of high-performance ULTEM™ resin.

With strong support from the Singapore government, the new facility benefits from the nation's strategic position as a regional hub and its extensive free trade agreements network, enabling SABIC to efficiently serve the region.

INEOS Introduces Revolutionary ABS Extrusion Grade: LUSTRAN® 532

INEOS Styrolution, a global leader in styrenics, has unveiled its latest ABS grade, Lustran® 532. Engineered for easy processing, medium gloss, and a stable color base ideal for self-colouring, this new grade is tailored specifically for furniture edge band applications. It enhances the company's portfolio of medium gloss extrusion ABS grades, offering a versatile solution for the furniture industry.

Lustran® 532 is manufactured at INEOS Styrolution's state-of-the-art facility in Wingles, France, which has been specializing in ABS production since 2021. Renowned for its expertise in mass ABS manufacturing,

the Wingles site supplies high-quality extrusion materials across the EMEA region. With its reliable performance and superior processability, the new grade is perfectly suited for demanding extrusion applications.



“We are excited to introduce Lustran® 532 as part of our growing ABS portfolio. This grade offers an ideal combination of medium impact resistance and superior aesthetics for applications like furniture edge bands,” said Loic Poullin, Business Development Manager ABS, EMEA. “Produced at our Wingles site, it ensures a reliable, high-quality solution for customers in the extrusion market.” Loic added further.

INEOS Styrolution's ABS extrusion solutions cover a broad spectrum, addressing various demands from low to high gloss, medium to high impact resistance, and thermo formability. These grades serve multiple applications such as sheets, edge bands, pipes and profiles.

DOW Strengthens Footwear Innovation Portfolio with Low-Carbon Material Choices

Innovative technology pioneered by DOW supports the footwear industry on its sustainability journey, bringing lower carbon material choices to consumers.

DOW (NYSE: DOW) has announced the launch of a portfolio of low-carbon material solutions which can help the footwear industry develop more sustainable products which offer the same high-performance results.

The upgraded portfolio consists of bio-circular* materials attributed under a mass balance approach, reversible cross-linking resins, post-consumer recycled resins and polyolefin elastomers for artificial leather in various footwear materials and applications.

Giving used plastics a second life

One such example is its collaboration with Porto Indonesia Sejahtera, an Indonesian consumer brand specializing in recovery footwear. As the first in Asia to use DOW's postconsumer recycled polyethylene resins in footwear, Porto Indonesia Sejahtera has incorporated REVOLoop™ resins in their premium sandal range and flip flops, as part of their vision to drive circular footwear solutions.

DOW's REVOLoop™ post-consumer recycled resins for use in footwear soles capture the value of plastic waste and enable a reduced carbon footprint through less use of virgin plastics.

Porto Indonesia Sejahtera President Cipto Liusman said, “We pride ourselves on the quality of our recovery footwear and DOW's recycled plastics resins enables us to produce shoes that deliver the comfort that customers expect from us, but with enhanced sustainability. We look forward to more collaboration with DOW in future, to drive sustainable footwear solutions.”



Porto Indonesia Sejahtera's sandals containing REVOLoop™ PCR resins

“This expanded portfolio of circular footwear solutions is a significant step in enabling brands and manufacturers to offer sustainable options to consumers,” said Bambang Candra, Asia Pacific commercial vice president for DOW's Packaging and Specialty Plastics business. “By supporting the footwear industry with low-carbon and circular solutions that enhance product sustainability while maintaining high performance, we reduce reliance on fossil feedstocks and give plastic waste a new life.”



Starlinger Acquires Woven Packaging Division from Windmüller & Hölscher



In Weissenbach, Lower Austria, Starlinger manufactures machinery for the production of woven plastic packaging which it has been exporting worldwide for more than 50 years. © Starlinger

Sacks made of plastic tape fabric for packaging dry bulk goods such as cement provide a lightweight, resistant and sustainable alternative to paper and film sacks. © Starlinger

Starlinger & Co Gesellschaft m.b.H. takes over the woven packaging division from German machinery producer Windmüller & Hölscher (W&H), based in Lengerich / Germany, as well as its Viennese subsidiary company "W&H Machinery GmbH" which specialises in woven packaging.

With this acquisition, Starlinger further strengthens its position as world - leading supplier of machinery for woven plastic packaging. The

integration of the related technologies holds significant potential for synergy effects in engineering, service, and sales.



"The acquisition of W&H's woven packaging division means that we can extend our portfolio and offer even more individual solutions to producers of sustainable woven plastic packaging," said Angelika Huemer, CEO and Managing Partner of Starlinger. "We expect synergy effects and advantages for our customers not only with regard to technology, but also through our well - developed worldwide sales and service network."

"The decision to part with our woven sack division allows us to focus our resources on growth in the paper and film packaging market," explained Dr. Falco Paepenmüller, CEO of W&H Group. "Woven packaging products, on the other hand, fit perfectly into the existing portfolio and infrastructure of Starlinger. When we chose the

buyer, it was especially important for us that our customers in the woven packaging market continue to receive excellent and reliable service and support," he added.

The products of W&H's woven packaging portfolio will be marketed by Starlinger in future. The rest of W&H's product portfolio remains unaffected by this. With regard to service and spare parts, Starlinger takes over the worldwide support of the customers.

The financial details of the transaction are subject to contractual confidentiality.

Extrusion Plastometer is Modular, Easy to Clean

Improved accessibility and optimized surfaces enable the instrument to be cleaned quickly, expediting testing times.

The Mflow Extrusion Plastometer from ZwickRoell is a modular instrument that cuts the time it takes to perform tests. The new instrument measures both the melt mass flow rate (MFR) and the melt volume flow rate (MVR), while guaranteeing reliable and reproducible test results — both crucial for the quality assurance of plastic products.

In its basic configuration, the Mflow performs tests according to method A for MFR and method B for MVR. Its modular design allows it to be modified to the specific needs of the plastics industry, with expandable features such as a cleaning function and a pneumatic weight - lifting unit with pegging function which eliminates the need to move weights manually. These enhancements provide greater adaptability and ensure the melt flow tester remains future proof for evolving laboratory demands.

A key innovation of the Mflow is the reduction in cleaning time of up to 30% between tests. This is achieved due to improved accessibility and optimized surfaces, enabling successive tests to be carried out faster.



Source: ZwickRoell

The Mflow's design prioritizes ergonomics, providing an optimized working position, simplifying the process of filling the specimen material, and reducing physical strain on the operator.

The integrated touch display and LED status indicators support intuitive operation, whether used with or without a PC. With the new Mflow, ZwickRoell is setting new standards in plastics testing. The combination of time efficiency, ergonomic design and flexible modularity makes the Mflow an indispensable tool in modern testing labs in the plastics industry and significantly contributes to increased productivity.

Compact Solution for Two - Component Molding

Zahoransky's new internal mold handling technology foregoes the time, space and money required for core - back, rotary table or index plate technologies for 2K molding.

Zahoransky Automation and Molds GmbH has introduced what it calls internal mold handling as an alternative for core - back, rotary table or index plate technologies normally applied for multicomponent injection molding. The company says internal mold handling enables high output in a smaller space by automatically reducing the cavity pitch distance before the second material is injected. Commercially proven, an internal mold handling tool is already used in the production of applicator caps for continuous glucose measurement devices.

This application features a special applicator so that patients can attach the device to themselves with minimal effort. Used for the correct application of the devices and for storage, the applicator is sealed with a screw cap molded using two-component

injection molding with a polypropylene (PP) shell and a thermoplastic elastomer (TPE) seal. The cap's screw thread means the parts cannot just be ejected from the mold but must be unscrewed.

Zahoransky said core - back or turntable methods were ruled out by the customer from the outset, noting that use of a standard index plate would have been possible but not ideal in terms of footprint and machine efficiency, as space is limited in the production hall.

To meet the challenge, Zahoransky paired its Z.Warp offering for fully automatic 2K molding, with the new internal tool handling. That system features a gripper arm, sitting on a mold-integrated handling unit, which removes the initial PP part and places it in the mold for TPE over molding. Importantly, before the half-finished part is inserted and the second material is over molded, the cavity pitch distance is reduced, so that at changeover, the distances between the cavities are automatically reduced or adapted to the optimum requirements. The finished caps are then removed by a six-axis robot in parallel with the injection molding process, enabling the cycle time to be significantly optimized.

Zahoransky says that in addition to technical advantages, such as minimizing mold open, this technology enables significant space and cost savings because the mold itself requires less space due to the internal handling and the required injection molding machine can also be significantly smaller.

A Zahoransky spokesperson told Plastics Technology that internal mold handling enables the tool to only open 200 mm or roughly 8 inches. Because a rotary table or index plate mold must open completely and the handling system must move between the two mold halves with the end-of-arm tool (EOAT), that setup would have required an opening stroke of approximately 400 mm or 16 inches.

The spokesperson says a 225 - ton all - electric injection molding machine with 22 inches of tiebar spacing is used in production. If an index plate had been used, a press with tiebar spacing of 28 inches and 360 tons of clamp force would have been required. That shorter opening stroke plus the elimination of rotation time and removal with a closed mold enabled Zahoransky to take three seconds off the final cycle time.

The reduction of the pitch or cavity spacing enables Zahoransky to make the mold more compact and fit more cavities into the same area. The spokesperson notes this would not be possible with a conventional index plate, because the gauge must remain identical. In the case of the internal mold handling tool, the gauge is condensed by approximately 40 mm or 1.5 inches.



Zahoransky internal mold handling enabled the creation of a smaller production cell for the two - component cap. Source: Zahoransky

(Source: Plastics Technology / 01.12.2024)

How to Configure Your Twin - Screw Barrel Layout

In twin - screw compounding, most engineers recognize the benefits of being able to configure screw elements. Here's what you need to know about sequencing barrel sections.

The design of the twin-screw extruder provides an advantage over other plastic processes. Full flexibility gives the process engineer the ability to configure the extruder to optimize the process and produce the best properties attainable. Most engineers recognize the benefits of being able to configure screws. The barrel sections can also be moved around to provide the optimum arrangement for the process at hand.

Processes such as single - screw extrusion and injection molding generally have fixed screw and barrel configurations. Once the process is designed, it is essentially fixed. Any changes require metal to be cut, resulting in potentially high costs for simple changes. For example, adding a vent to a single-screw extruder requires that the barrel be modified and a new screw fabricated. Each of these actions can be quite costly.

A twin - screw extruder, by contrast, is fully configurable. It can be viewed as a series of unit operations that can be arranged as needed to optimize the process. Segmented barrels and screws provide a flexibility not seen in other polymer processes. The proper sequencing of the barrel sections along with the corresponding screw elements can allow a broad range of process specialization.

Viewing the twin-screw extruder as a series of unit operations, the process engineer has the opportunity to address:

- Solids conveying;
- Melting of polymers;
- Customizable mixing of additives into the melt;
- Liquid injection;
- Downstream addition of additives;
- Venting (atmospheric and vacuum);
- Pumping;
- Heat Transfer;
- Chemical reaction, in the case of reactive extrusion.

Here, we will discuss the configuration of the barrel and how each barrel section can be used for various operations. In later articles, we will look at the screw configuration and the effectiveness of each element type on the various unit operations listed above.

Barrel Configuration

Most of us do not consider reconfiguring the barrel of an extruder as a practical option.

However, the location of certain functionality can have a profound effect on the capability of the twin - screw extruder and effectiveness of the compounding operation. Fortunately, the twin-screw extruder offers many cost-effective options. Most manufacturers provide segmented twin - screw barrels consisting of individual sections that are four, five or six diameters long. Each barrel section is independently heated and cooled to provide precise barrel - temperature control.

Beginning with a bare machine consisting of only a motor, gearbox and frame, we can build the process section of the extruder as needed based on the compounds being made. For small - scale laboratory and pilot-plant lines, the barrel sections can be rearranged as necessary to optimize the process during development. Obviously, frequent changes would not be advisable for a large-scale twin-screw extruder due to the impracticality of moving around large, heavy barrel sections. In the same way, the screw is rarely changed on a large production line, while the screw configuration of a lab machine may be changed every day.

The barrel layout can be arranged to optimize the process based on the compounding requirements. Typically, once a layout is chosen it is not changed. The process engineer should keep in mind that changing the barrel layout is possible and can be considered if the unit operations needed are not in the preferred order. But, while possible, rearranging the barrel is not common.

Open Barrel Sections

A few barrel section designs provide the configurability that is unique to the twin - screw extruder. We will look at each of these barrel types in general and in more depth as we pair each barrel section with the appropriate screw configuration for the unit operation specific to that section of the extruder.

Every barrel section has a figure 8 pathway through which the screw shafts pass. An open barrel is a barrel that has an opening to allow for feeding or venting of volatiles. The same open barrel design can be used for both feeding and venting and can be placed at any location along the overall barrel.

Feeding: Obviously, material must be introduced into the extruder to start the process. The feed barrel is an open barrel section designed such that an opening exists at the top of the barrel through which material is fed.

The most common location for the feed barrel is in the Barrel 1 position — i.e., the first barrel in the process section. Pellets and free - flowing granules are metered with a feeder so that they drop into the extruder through the feed barrel directly on to the screws.

Powders with a low bulk density often present a challenge in that air is typically entrained with the falling powder. The escaping air blocks the flow of the light powder, reducing the ability of the powder to feed at the desired rate.

One option for feeding powders is to have two open barrel sections in the first two barrel positions of the extruder. In this setup, powders are fed to Barrel 2, allowing the entrained air to vent out of Barrel 1. This configuration is known as a back - vent arrangement. The back vent provides a pathway for the air to exit the extruder without backing up the feed chute. As the air is removed, the powder can feed more efficiently.

Once the polymer and additives are fed to the extruder, these solids are conveyed to the melting zone where the polymer is melted and mixed with the additives. Additives can also be fed downstream of the melting zone using a side feeder.

The barrel section used for this operation is called a side-feed barrel. In addition to the figure 8 for the extruder screws, a second figure 8 opening in the side of the barrel allows the side stuffer to be connected directly to the extruder so that the additives are stuffed into the molten polymer. A standard open barrel is typically positioned just upstream of the side feeder as a vent to allow any entrained air to escape.

A more compact version of the side-feed barrel with an open vent is known as a back-vent combi-barrel (see Fig. 1). This has both a figure 8 to match a twin-screw feeder and a small vent opening on the top of the barrel section towards the upstream end of the barrel section for air to escape.

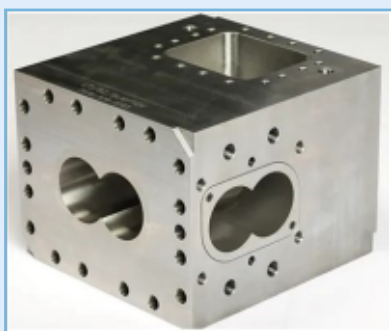


FIG 1 This combination barrel has a backward oriented atmospheric opening and side-feed port and offers a replaceable, highly abrasion - resistant CPM-10V powder-metallurgy steel liner in

the main process channel and a replaceable wear - resistant side feed port. Barrels can be supplied with and without internal water cooling channels. (Photo: Composite Technologies Inc.)

Venting: The open barrel section can also be used for venting; volatile vapors that are generated during compounding must be vented before the polymer is forced through the die.

The most obvious location for a vent is toward the discharge end of the extruder. This vent is often connected to a vacuum pump to ensure all volatiles entrained in the polymer melt are removed prior to discharge through the die. Vapors or gasses remaining in the melt will result in poor pellet quality, including foaming and reduced bulk density, which may affect how well the pellets can be packaged.

My preference for an extruder that is at least 10 barrel sections long ($L/D \geq 40$) is to place this vent two barrel sections upstream of the die. Quite often, if the extruder head pressure rises too high, molten polymer could back up in the vent. During a compounding run, the head pressure can vary, especially with a tight screen. If the viscosity of the polymer melt is low, the polymer will back up and flow out of the vent. Locating the vent two barrel sections before the discharge essentially eliminates this possibility, resulting in more stable operation.

Additional vents, both atmospheric and vacuum, can be added along the length of the extruder if high levels of volatiles are present, if a diluent is being injected to remove an undesired volatile, or if a large amount of liquid/vapor byproduct is being generated as the result of a reaction.

Closed Barrel Sections

The most common barrel section design is, of course, the closed barrel section (Fig. 2). This barrel section fully encases the polymer melt on all four sides of the extruder with only a figure 8 opening through the center for the screws.

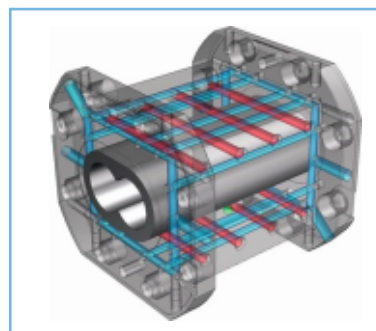


FIG 2 Closed barrel section showing heating (red) and cooling. (Photo: Leistritz)

Once the polymer and any other additives are fed completely into the extruder, the material is conveyed through the extruder, the polymer is melted, and all of the additives and

polymers are mixed. Closed barrel sections provide temperature control on all sides of the extruder, whereas open barrels have fewer heaters and cooling channels.

Assembling the Extruder Barrel

Normally, the extruder will be assembled by the manufacturer with a barrel layout that matches the process configuration that is required. In most compounding systems, the extruder will have an open barrel in Barrel 1. This feeding section is followed by several closed barrels for conveying the solids, melting the polymers, and mixing the molten polymer and additives together. A combi-barrel may be located at Barrel 4 or 5 to allow side feeding of additives, followed by a few more closed barrels for continued mixing. The vacuum vent is located near the end of the extruder, followed by the last closed barrel before the die an example of an assembled barrel can be seen in Fig. 3.

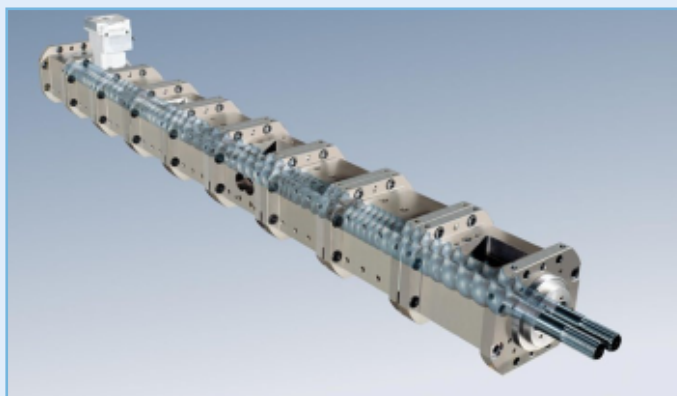


FIG 3 Assembled process section of twin-screw compounding extruder. (Photo: Leistritz)

The length of the extruder is typically expressed as the ratio of the length to the nominal screw diameter (L/D). In this way, scale-up becomes much easier in that a small extruder with a L/D of 40:1 can be scaled up to a much larger-diameter extruder also with a 40:1 L/D length.

In the coming months we will explore each of the unit operations discussed earlier, considering both the science and the art of configuring the twin-screw extruder for compounding and reactive extrusion.

About the Author:

Kenneth W. Russell has more than 35 years' experience working with polymer processing and resin companies. He has expertise in polyolefin polymerization, polymer

compounding, reactive extrusion, and film and sheet extrusion. In 2014 he started Optimized Compounds LLC, providing consulting services in reactive extrusion, polymer compounding, new product development, process optimization and scale - up with clients worldwide. In 2021, he joined GEM Plastics, a manufacturer of HDPE sheet, providing process engineering, technician training and materials expertise.

Contact: kwrcompounding@gmail.com.

(Source: Plastics Technology / 26.11.2024)

Aerodry's CHD Series Crystallizers for Efficient PET Recycling



CHD series crystallizers are designed for efficient PET recycling, providing continuous crystallization of amorphous PET. This advanced technology quickly turns PET into a stable crystalline form, ensuring a smooth and fast recycling process. A key feature of the CHD series is its ability to speed up startup times, reducing downtime and boosting productivity.

By preventing issues like lumping that can disrupt material flow, the crystallizers help maintain consistent quality throughout the recycling process. Additionally, the continuous crystallization process reduces energy consumption, making the system cost - effective. The CHD Series is ideal for PET recyclers who utilize large volumes of recycled PET material and to optimize their operations and achieve better results with less energy Aerodry's innovation leads the way in sustainable PET recycling, offering a reliable solution to meet the growing demand for recycled materials.

CIRCULAR ECONOMY/ BIO-PLASTICS/ RECYCLING



ALPLA Opens State-of-the-Art Recycling Plant in South Africa

Production plant to supply up to 35,000 tons of recycled PET material per year from 2025.

ALPLA is entering the South African PET recycling market. Approximately one and a half years after the start of construction, the packaging and recycling specialist is opening a state-of-the-art plant in Ballito. The company has invested 60 million euros in the new plant in the province of KwaZulu-Natal. From 2025, the ALPLA recycling division will produce up to 35,000 tons of recycled PET (rPET) per year. The high-quality material will then be processed into safe, affordable and sustainable plastic packaging at ALPLA's production plant in Lanseria.

From 2025, ALPLA will produce up to 35,000 tons of mechanically recycled rPET flakes and food-safe rPET pellets annually in South Africa. The international packaging and recycling specialist has just opened the state-of-the-art plant, which is located on a 90,000-square-metre site in the coastal town of Ballito, after a construction period of around 18 months. With an investment of 60 million euros, ALPLA is setting the course for further growth in South Africa and providing an economic boost to the densely populated province of KwaZulu-Natal and the iLembe district.

At the opening ceremony on 31 October, ALPLA Chairman Günther Lehner, together with Dietmar Marin, Managing Director of ALPLA recycling, and Plant Manager Gerhard Meyringer, welcomed around 180 guests from the worlds of business and politics including representatives from the South African Ministries of Trade, Industry and Competition and Forestry, Fisheries and the Environment, representatives from the province of KwaZulu-Natal, the eThekweni Metropolitan Municipality and the iLembe District Municipality, as well as Austria's Ambassador Romana Königsbrun.

'South Africa is a strategically important market for us and one in which we want to continue to grow. Together with our customers and partners, our aim is to provide safe, affordable and sustainable packaging solutions to our customers and to continue improving standards of living. With our investments in Ballito and before that in Lanseria, we have laid the foundation for a successful future,' says ALPLA CEO Philipp Lehner. 'ALPLA's involvement does not only accelerate the industrialisation of iLembe District Municipality, but ensures investing in projects that support UN Sustainable Development Goals, attracting other companies along the value chain and creating several thousand jobs in the collection infrastructure,' says Sihle Ngcamu, CEO of Trade & Investment KwaZulu-Natal.

Setting the Course for the Future

The Ballito recycling plant will have an initial output capacity of 35,000 tonnes of rPET flakes, of which 16,000 tonnes will be processed into rPET pellets. A state-of-the-art extrusion line has been installed for this purpose. Once all processes have been qualified and the flakes and pellets have been approved by the customer, ALPLA will start production in early 2025. 'Our plant will increase the supply of rPET in the national market. The country's beverage industry will benefit in two ways: it will receive high-quality material and it will be able to meet the legal requirements,' explains Dietmar Marin, Managing Director of ALPLA recycling.

Under South Africa's Extended Producer Responsibility (EPR) regulation, which came into force in 2021, PET drinks bottles have had to contain 10 per cent recycled material since 2022. The legislation requires this to double to 20 percent by 2026. 'With our expertise and experience in recycling and processing, we are a reliable partner for sustainable solutions. At the same time, we are promoting the circular economy in South Africa and reducing waste through close cooperation with regional collection programmes,' says Plant Manager Gerhard Meyringer. The recycling plant is already designed to increase the proportion of pellets and can accommodate a second extrusion line for this purpose. An additional 30,000 square metres of space is available at the site for further expansion. ALPLA will process the high-quality recycled material into PET preforms for the production of drinks bottles at the Lanseria plant, which opened in 2022.

About the ALPLA Group: ALPLA is one of the world's leading companies in the manufacture and recycling of plastic packaging. Around 23,300 employees worldwide produce custom-made packaging systems, bottles, caps and moulded parts at 196 sites across 47 countries. The high-quality packaging is used in a wide range of areas, including for food and drinks, cosmetics and care products, household cleaning products, detergents and cleaning agents, pharmaceutical products, engine oils and lubricants. 3/3 ALPLA operates recycling plants for PET and HDPE in Austria, Germany, Poland, Mexico, Italy, Spain, Romania, Thailand and South Africa. Other projects are being realized elsewhere around the world. www.alpla.com.

AMUT's Winning Strategy for Recycling Lightweight PET Bottles

2024 marked a significant transitional moment for Coca-Cola as it moves towards its sustainability goal of reducing PET usage by 2025. According to a statement from the company, this transition will cut the annual use of virgin PET by an equivalent of nearly 800 million bottles by 2025 compared to 2024. This project represents a major step towards reducing environmental impact while maintaining bottle durability and functionality.

Coca-Cola's new initiative will reduce the weight of its sparkling beverage bottles from 21 g to 18.5 g in the United States and Canada. Coca-Cola has redesigned its PET bottles, minimizing the weight of its beverage portfolio with a slimmer design that retains the same overall height and diameter.

In the developing plastics industry, these lighter bottles present new challenges for recycling facilities, as they are more prone to damage during the mechanical recycling process.

AMUT's technology is ready to handle this updated packaging, meeting customer needs effectively. Specifically, equipment such as its patented De-Labeller and wet shredder has been designed and tested, achieving over 95% efficiency in label removal on lightweight bottles. The redesigned grinder is intended to process a high volume of bottles while minimizing fine particle generation.



The Envicco project in Thailand is a highlight, over the past three years this project saw AMUT's equipment process approximately 45,000-50,000 lightweight bottles. This case study is particularly important due to its high percentages of both PVC and non-PVC shrink sleeve labels, managed through a double de-labeller configuration.

In the first stage, AMUT's De-Labeler performs a dry cleaning action that removes most shrink-sleeve labels. The second unit, a wet De-Labeler, operates as a cold pre-wash, helping to remove contaminants without damaging the bottles or losing bottlenecks during processing.

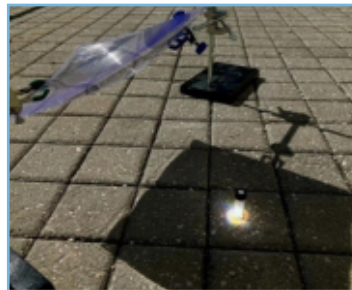
AMUT's fully automated system is designed to meet the most demanding bottle-to-bottle applications, ensuring the removal of all label types, preserving bottlenecks and bodies, and maintaining low operational costs.

Using Sunlight to Recycle Black Plastics

Not all plastics are equal — some types and colors are easier to recycle than others. For instance, black foam and black coffee lids, which are often made of polystyrene, usually end up in landfills because color additives lead to ineffective sorting. Now, researchers report in ACS Central Science the ability to leverage one additive in black plastics, with the help of sunlight or white LEDs, to convert black and colored polystyrene waste into reusable starting materials.

“Simple, visible light irradiation holds the potential to transform the chemical recycling of plastics, using the additives already found in many commercial products,” say the paper's authors, Sewon Oh, Hanning Jiang and Erin Stache.

An emerging strategy for plastic recycling involves using light to help break down plastic into chemically useful materials that can be recycled into new products. This process requires a helper compound to convert light into the heat needed to break apart polymer bonds. However, finding the right helper that won't create more waste and is easily incorporated into recycled materials remains a challenge for researchers. Seeking to create a circular economy for plastic recycling, Stache and a team of researchers took advantage of something already found in black polystyrene waste — an additive known as carbon black.



Inside this reaction vial, spot lit by concentrated sunlight, a piece of black polystyrene from a foam tray breaks down into a recyclable material. - Hanning Jiang

The researchers tested a method to recycle lab-made black polystyrene: They ground a mixture of polystyrene and carbon black to a fine powder, placed the powder in a sealed glass vial and then set the vial under high-intensity white LEDs for 30 minutes. The carbon black converted the LED light into heat. The heat then broke apart the polystyrene's molecular structure, creating a mixture of shorter one-, two- and three-styrene units. And these three components cleanly separated within the reaction apparatus. In experiments, the team recycled the leftover carbon black and styrene monomer into polystyrene, demonstrating the circularity of the new method.

Applying the technique to post-consumer black plastic from food containers and coffee cup lids, the researchers cut the waste into small pieces and found that up to 53% of the polystyrene converted to styrene monomer. Waste samples contaminated with canola oil, soy sauce and orange juice broke down slightly less efficiently. When the researchers switched the light source from LEDs to focused sunlight outdoors, they observed a higher reaction efficiency (80%). Additionally, a multicolored mixture of black, yellow, red and colorless polystyrene waste converted to styrene in sunlit conditions at a higher rate (67%) compared to white LEDs (45%). The researchers attribute the higher efficiencies to the greater light intensity achieved by focused sunlight. By demonstrating sunlight's ability to break down colored polystyrene waste, the researchers say that their method could create a closed-loop recycling process for this type of plastic.

(Source: ACS Chemistry for Life / 25.11.2024)

ExxonMobil, Cyclyx Increasing Texas Recycling Capacity

The addition of 350 million pounds of annual processing capacity comes as feedstock - preparation company Cyclyx, a joint venture involving ExxonMobil and LyondellBasell, announces FID on a second U. S. plant in Texas. | JHVEPhoto/Shutterstock

Energy giant ExxonMobil is expanding its U.S. chemical recycling footprint, with 350 million additional pounds of capacity expected to start up in Texas in 2026.

The new ExxonMobil capacity is in addition to a 150 - million - pound unit that started up in December 2022 and a second unit announced in May at the massive Baytown site in Texas, expected to start up in 2025. The most recently announced capacity will bring the company's total U.S. plastic processing capacity to 500 million pounds per year by 2026, over a total of six units. The Baytown and Beaumont sites will each house 175 million pounds of the new capacity, with two new plants each.

As of last month, the Baytown site, the company's only currently operational chemical recycling plant, had processed more than 70 million pounds of plastic scrap, according to a press release.

In addition to the new Texas capacity, the company is developing chemical recycling projects elsewhere in North America, as well as in Europe and Asia, toward its goal of building 1 billion pounds of annual recycling capacity globally by 2027. ExxonMobil had previously indicated that in addition to Beaumont, it was considering siting more recycling capacity in Baton Rouge, Louisiana; Joliet, Illinois; and locations in Belgium, the Netherlands, Singapore and Canada.

ExxonMobil uses pyrolysis to break down hard-to-recycle plastics into their molecular building blocks, which can be used as feedstock for making virgin-quality polymers. The ExxonMobil spokesperson said “advanced recycling transforms plastic waste into raw materials that can be used to make many valuable products – from fuels to lubricants to high-performance chemicals and plastics.”

Chemical recycling, which is also called advanced recycling, remains controversial in the recycling industry. In September, a draft policy from the National Recycling Coalition included language

stating that non-mechanical processes that convert plastics at the end of life into chemical fuels or fuel feedstocks do not meet the organization's definition of recycling. NRC comprises multiple state and local recycling organizations.

In addition to packaging giant Amcor, which signed a PCR offtake agreement with ExxonMobil in 2022 and recently announced it would acquire Berry Global, ExxonMobil has chemical recycling customers in more than 15 countries across such sectors as food-contact packaging and pet food, according to the press release.

Cyclyx Announces Second Processing Facility

Feedstock for the existing ExxonMobil plant includes material sourced from Cyclyx, a joint venture between ExxonMobil, Agilyx and LyondellBasell. Cyclyx collects post-use plastics – including post-consumer, post-industrial and post-commercial – with its 10to90 community takeback program in Houston, and it's building a feedstock preparation plant with expected startup in 2025.

On Nov. 26, Cyclyx announced it had made final investment decision on its second circularity center, to be located at an existing distribution center near Fort Worth, Texas, and expected to start up in the second half of 2026. Each of the two centers will process about 300 million pounds of scrap plastic feedstock each year, according to a press release.

The nation's largest hauler, WM, also is building a new 144,000-ton-per-year materials recovery facility near Fort Worth, expected to open by the end of 2025.

Cyclyx supplies chemical recycling companies such as ExxonMobil and LyondellBasell, as well as mechanical recycling companies, with the plastic scrap.

The center will “help enable the aggregation and recycling of post - consumer, commercial and industrial plastic waste,” said Cyclyx CEO Joe Vaillancourt in the press release.

The three joint venture partners are investing a combined \$135 million to fund construction and operations for the second center.

In its November investor update, Agilyx said it was raising funding for the second center. Agilyx also said the first Cyclyx plant was fully funded and construction was under way, with startup planned for October 2025.

The recently announced projects are among numerous recycling - related projects Texas has attracted with its expansive existing infrastructure, a robust energy industry and powerful business incentives. Financial support from the state and the U.S. Department of Energy also spurred Tennessee-based chemical company Eastman to proceed with its second methanolysis plant, to be located in Longview.

In addition, LyondellBasell is shutting down its Houston refinery in 2025 and is considering options for the site that include a chemical recycling plant.

Company, industry under scrutiny

Litigation has increasingly become the preferred tool to hold brand owners and huge corporations accountable for plastic pollution, as evidenced by lawsuits targeting Pepsico and the publication of a guide to pursuing legal avenues.

In September the California attorney general sued ExxonMobil, alleging that the company misled the public with its chemical recycling claims and polluted the state.

In an unusually fiery response to the lawsuit, ExxonMobil said in an emailed statement that "for decades, California officials have known their recycling system isn't effective. They failed to act, and now they seek to blame others.

"Instead of suing us, they could have worked with us to fix the problem and keep plastic out of landfills," the company stated.

(Source: Plastics Recycling Update / 27.11.2024)

EPA Releases National Strategy to Prevent Plastic Pollution

The EPA has released the National Strategy to Prevent Plastic Pollution, a six - part strategy to eliminate the release of plastic waste by 2040.

In November 2024, the U. S. Environmental Protection Agency ("EPA") released its National Strategy to Prevent Plastic Pollution, a comprehensive plan with the goal of eliminating the release of plastic waste into the environment by 2040. The strategy is the third pillar of the

EPA's "Building a Circular Economy for All" initiative and follows national strategies on recycling and reducing food loss and waste.



The strategy targets the entire plastics lifecycle and encourages innovators to create systems for a circular economy where materials are returned to supply chains for recycling and reuse. A draft of this strategy was published in April 2023 and received nearly 92,000 comments.

Six Key Objectives

The EPA identified six key objectives and particular actions that businesses, industry, nonprofits and government can take. The objectives are:

- Reduce pollution from plastic production;
- Innovate materials and product design;
- Decrease waste generation;
- Improve waste management;
- Improve capture and removal of plastic pollution; and
- Minimize plastic pollution in waterways and the ocean.

For each objective, the EPA identified actions that governments, businesses, industry, academia, and nonprofits can take. Actions include:

- Reducing the production and consumption of single-use plastic products and expanding capacity for reuse and refill products.
- Enhancing the market for sustainability by certifying and recognizing plastic products that meet stricter environmental standards.
- Developing a national challenge program or Genius Prize to encourage inventors to design materials, products, and systems for a circular economy.
- Developing and updating sustainability standards, ecolabels and design guidelines to increase circularity of materials.

- Enhancing water management systems to capture and remove plastics from storm water and wastewater.

EPA anticipates implementation of the strategy to be an iterative process requiring collaboration across academia, industry, nonprofit organizations and government. The EPA is already implementing actions from the strategy including:

- Allocating \$160 million through the Solid Waste Infrastructure for Recycling grant program to support solid waste infrastructure.
- Developing and finalizing reports on plastic pollution as directed by the Save Our Seas 2.0 Act.
- Creating the Trash Free Waters Program to prevent trash from entering the environment, remove trash from waterways and disseminate research findings.
- Finalizing rules in 2024 to reduce emissions of toxic air pollutants including ethylene oxide and chloroprene, which will reduce harmful air pollution in communities near plastic production facilities.

The EPA intends to pursue regulatory action when needed as well as engage with various stakeholders to implement the strategy. It also plans to address additional issues, including textiles, in its "Building a Circular Economy for all" initiative. Consistent with the strategy, some proposed grants pursuant to the Infrastructure Act and the Inflation Reduction Act seek to increase plastics recycling capabilities. It remains to be seen how those grants specifically, and the plastics strategy more generally, will be impacted by the incoming administration.

(Source: Jones Day / 26.11.2024)

Advancing Plastic Circularity Innovative Additives & Expert Solutions from MILLIKEN

Milliken's additives, along with global team of scientists, can help to develop an innovative solution for unique challenges and help advance plastic circularity. The right additive combined with the right science expertise can help with reducing

energy usage, enhancing recycling capability, using less plastic in a product and enabling the use of more recycled plastic.

(Source: Recycling Compendium)

Reifenhauser Commits to Advanced Sustainability in Plastics & Packaging with R-Cycle

R-Cycle Revolutionizes packaging data management across the value chain. With a global, open standard, it ensures that all stakeholders - from materials to recycling can access essential data. This fosters sustainability by closing the loop and enabling a circular economy and Reifenhauser India Marketing Pvt. Ltd. embraces this commitment.

Why R-Cycle?

- **Material Verification:** Provides a clear, traceable record of materials.
- **Enhanced Recyclability:** Enhances efficient waste sorting and recovery.
- **Effortless Reporting:** Simplifies compliance with regulatory standards.
- **Comprehensive Life Cycle Assessment (LCA):** Measures environmental impact throughout the product's journey.

R-Cycle leads the transition to a circular economy, enabling companies to innovate sustainably while fulfilling regulatory requirements. Together, let's create a greener, more responsible future!

(Source: Recycling Compendium)

Enhancing PCR Content Packaging with Advanced Resin Stabilization Technology from Baerlocher

The waste management cycle transforms discarded materials into valuable resources, beginning with waste collection, washing and sorting as per polymer type. These polymers are then processed into shredded flakes and passed through a heat cycle to form pellets, which are reused in various applications effectively closing the loop on sustainability.

Baerlocher contributes to this cycle with innovative solutions like Baeropol T - Blends, a family of synergistic polymer stabilizers designed to tackle the challenges of processing post-consumer (PCR) and post-industrial (PIR) recycled materials. These recycling additives enhance melt stability, colour retention and yellowing resistance, allowing recyclers to convert feedstock into high - quality recyclate. This technology enables recyclers and brand owners to incorporate more PCR content into packaging without compromising productivity or performance, supporting global sustainability goals.

As a global leader in additives for PP, PE PVC and other thermoplastics, Baerlocher continues to drive sustainability through industry collaboration, helping to advance the circular economy.

(Source: Recycling Compendium)

From Waste to Want: Dodhia Group's Revolutionary Recycling Journey

In a bold move towards a sustainable future, Dodhia Group is pioneering a reverse journey from waste to want. With an ambitious goal to recycle 100% of plastic bottles, the company harnesses groundbreaking technologies to manufacture high-quality recycled polyethylene terephthalate (rPET), polypropylene (rPP) and polyethylene (rPE) products.

Setting New Standards in Recycling

Dodhia Group's cutting-edge facilities produce rPET products that meet stringent standards comparable to those of virgin products. Their rPET chips have earned prestigious approvals from both the US FDA and the European Food Safety Authority (EFSA), ensuring suitability for food contact applications.

(Source: Recycling Compendium)

QMRE Unveils the UK's first Plastic Waste - 2 - Oil System

QM Recycled Energy (QMRE) welcome the UK's first VÍXLA plastic waste-2-oil system into its Kent facility. This 16.4-tonne, containerised unit from Eagle Technology of Norway is the first compact, containerised, decentralised, plastic waste-2-oil system seen in the UK.



The partnership with Eagle has been cemented by QMRE sharing the results of their three years of operating experience with their test and development pyrolysis system. The results were fed into Eagle's production processes and led to creating what is a thermolysis-driven plastic waste-2-oil system.

The delivery of the first VÍXLA system from Eagle Technology represents a significant milestone, and the first step towards achieving an annual processing capacity of 6,600 tonnes (operating four VIXLAS) of plastic waste at our site in Hoo. The oil produced from the VÍXLA will be sold to Petrochem companies who will use it to make new and renewable plastic instead of using feedstocks from fossil origins.

A typical QMRE VÍXLA system will convert 1kg of plastic waste into 1 litre of QUEL (pyro-oil) - 85% of the total, 12% non-condensable gas used to heat the process and 3% carbon ash which can be used in construction products. The system operates for 330 days of the year. When fully operational with 100 sites each with four VIXLAS, 550 - 600,000 tonnes of plastic waste will be recycled per annum, which is 10-12% of the 2021 plastic waste figures. (Source: ORA - Original Recycling Association, 2022).

Commenting on the introduction of the UK's first containerised, modular plastic waste-2-oil system, QMRE's CEO Tim StClair-Pearce said, "This is a truly momentous day. For six years QMRE has been laying the groundwork to produce a system that could deal effectively with the problem of plastic waste pollution. Our collaboration with Eagle and other parties has resulted in the VÍXLA which will now be rolled out to create a nationwide network of plastic waste-2-oil systems, which, with further processing, will turn the oil back into new and renewable plastic. So, what was once an environmental problem can now become an asset which reduces the need for virgin plastics from fossil origins."

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



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