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# PLASTISCOPE

The Official Journal of the Organization of Plastics Processors of India

Volume No. 13

• Issue No. 11

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• May 2025

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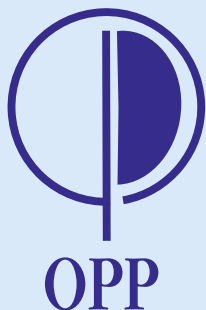
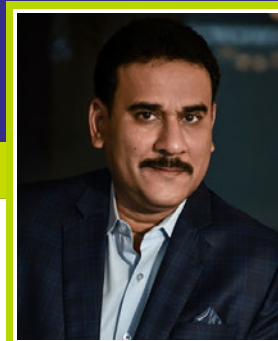
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# FROM THE PRESIDENT'S DESK

Mr. Pradeep Rathod



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Dear Members,

Greetings from Organization of Plastics Processors of India!

The International Monetary Fund (IMF), in its World Economic Outlook (WEO) report released in April had said India is expected to be the fourth largest economy in the world with GDP of \$4.19 trillion in 2025, ahead of Japan.

According to Niti Aayog, in order to achieve the goal of a Viksit Bharat by 2047, an overall framework for strategic interventions and reforms based on six key building blocks, with a total of 26 themes covered across all the building blocks have been identified. The six key building blocks include - Macro-Economic Goals and Strategy; Empowered Citizens; A Thriving and Sustainable Economy; Technology and Innovation Leadership.

Total plastic exports from India touched \$12.5 billion in 2024-25 against \$11.5 billion in 2023-24, recording a growth of 8.70 per cent.

Plastic films and sheets saw a growth of 15.9 per cent, increasing from \$1,750 million to \$2,028 million; while woven sacks, woven fabrics and tarpaulin grew by 16 per cent to reach \$1,571 million, up from \$1,355 million.

Floor coverings, leather cloth and laminates recorded an increase of 9.9 per cent, totaling \$762 million compared to \$693 million in the previous fiscal. India's plastics export markets include the US, China, the UAE and Brazil.

**Global plastic trade is worth \$1300 billion, but India's exports are only \$12.5 billion, just 1.1% of the global share.**

It is observed that 21 countries are importing more than 70% of plastics products on HSN Code basis across the world.

I appeal to all OPPI members to concentrate on exports.

K 2025 is scheduled from 8th – 15th October 2025 in Düsseldorf, Germany. The hot topics of K 2025 are – Circular Economy and Digitalisation.

Organization of Plastic Processors of India has tied up with Tibro Tours for K 2025 packages.

All Companies booking Tibro Packages for K 2025 through Organization of Plastic Processors of India will be eligible for special discount.

With Best Wishes,

**Pradeep Rathod**  
President, OPPI

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**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.

Editor: **DEEPAK LAWALE**



Organization Of  
Plastics Processors Of India

## ADVERTISEMENT IN OPPI DIRECTORY- 2026

With the fast changing business environment and the growing competitive world, it becomes important for all those connected with the Plastics Industry to increase the visibility of their activities.

Organization of Plastics Processors of India will be publishing Membership Directory 2026. The directory will be distributed to all OPPI members, Plastic Associations in India, Major Chambers of Commerce and Industry/Industry Associations in India and abroad, Trade Promotion Organizations, Financial Institutions and Diplomatic Missions.



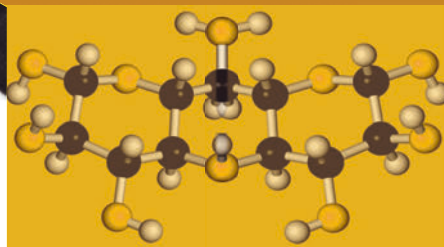
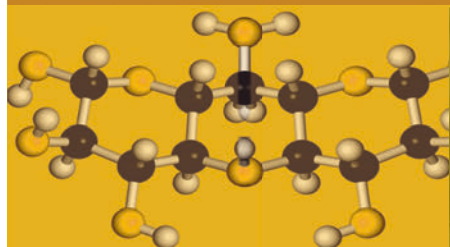
### Unique features associated with OPPI Directory 2026:-

- ✓ OPPI Directory distributed in all International exhibitions promoted by OPPI. Advertisers get noticed by the importers in various countries.
- ✓ Advertisement in OPPI Directory gives wide publicity to products and services of advertising company.
- ✓ MNCs setting shop in India refer to OPPI Directory for outsourcing their requirement of plastic products from India.
- ✓ Multi-national Retail Chains refer to OPPI Directory for outsourcing their requirements of plastics based goods; flexible packaging material etc.
- ✓ Foreign Plastics Processing Machinery Manufacturers, polymer producers etc. consider OPPI Directory as a reliable aid to reach their target customers in India.

### Please Contact

Secretary General, ORGANIZATION OF PLASTICS PROCESSORS OF INDIA  
404/405, Golden Chambers, New Link Road, Andheri (West), Mumbai - 400053. INDIA  
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Email address: info.ind@yizumi.com

Website: www.yizumi.com



A world without plastic is entirely possible.  
Only, a little inconvenient.



The truth is, replacing this truly versatile material is easier said than done. Be it stainless steel, glass, natural fiber cloth, ceramics or even tree-free paper, what most people do not realise is that the carbon footprint of materials other than plastic is way higher, especially when taken at scale. What we should concentrate on instead is its judicious use through the principle of **reduce, reuse and recycle**.

To know more, follow [fnpindia.com](https://fnpindia.com)



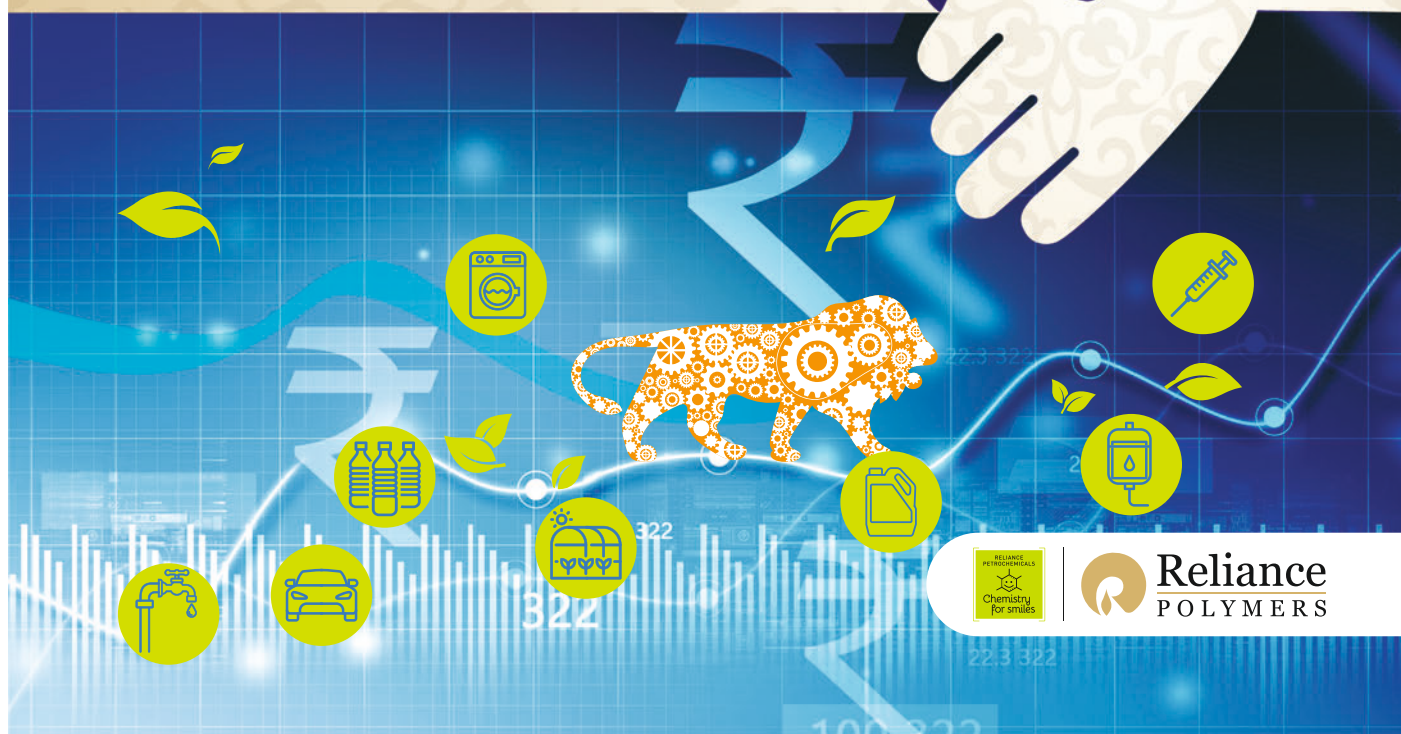
**Fight Pollution Not Plastics** - A Reliance initiative, supporting Indian Centre for Plastics in the Environment (ICPE) to eradicate plastic pollution and creating awareness about responsible use of plastics.

# Collective Collaboration. Shared Success.

As the industry leader, **Reliance Polymers** recognises the importance of self-reliance. We foster collaboration and empower our downstream value chains for co-existence and optimal growth. By supporting growth and nurturing long-term relationships we champion sustainable growth and an **Atmanirbhar India**.



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## HanoiPlas

The 13<sup>th</sup> Hanoi Int'l  
Plastics and Rubber  
Industry Exhibition  
4<sup>th</sup> to 7<sup>th</sup> JUNE 2025

Hanoi International Center for  
Exhibition (I.C.E) Hanoi, Vietnam

### EXHIBIT PROFILE

Plastic & Rubber Machinery, Chemical & Raw Materials, Machinery Auxiliary Industry, Heat & Control Equipment, Mould, Hydraulic & Pneumatic, Recycling, Dosing equipment, Mixers, Silo systems, Software

### POST SHOW REPORT 2024

Exhibitors  
220

Exhibitors  
From  
13 Countries

Visitors  
7,832

Space  
9000 sqm

### PARTICIPATION FEES

#### Standard Booth:

USD 310 / sqm (Min. 9 sqm) = USD2790

Standard Equipped : Wall Partitions, Carpet, Company Fascia, 3 Folding Chairs, Three 50W Long Arm LED Light, 1 Reception Table, 1 Round table, 1 Dustbin, 1 Single Phase 5 amp/220v Plug.

#### Raw Space:

USD 280 / sqm (Min. 18 sqm)

**Corner fee: 10% surcharge 5% VAT will be applicable on invoice**

Form is attached. Kindly email the scanned copy of duly filled Space Application Form to [secretarygeneral@oppindia.org](mailto:secretarygeneral@oppindia.org)

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



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## Cambodia's Economic Outlook for 2025 Shows Strong Growth!

We warmly welcome all relevant companies to participate in this year's Cambodia International Machinery Fair!

With over 220 companies will attend the show, this is a golden opportunity to explore and develop your presence in Cambodia's growing market.

Don't miss your chance to be part of this exciting event!

### MARKET NEWS!

#### Gross Domestic Product (GDP) Growth:

The Cambodian government anticipates a growth rate of 6.3% for 2025, driven by expansions in key sectors:

- Industrial Sector: Projected to grow by 8.6%.
- Service Sector: Expected to increase by 5.6%.
- Agricultural Sector: Forecasted to rise by 1.1%.

#### Manufacturing Sector Expansion

In 2024, the number of manufacturing enterprises in Cambodia reached 2,316 as of November, marking a 10% increase from the previous year. This expansion reflects the sector's robust development and the establishment of new manufacturing facilities.

#### Rising Machinery Imports

##### Government Initiatives and Economic Outlook.

The Cambodian government has implemented policies aimed at diversifying the industrial sector and promoting investment in manufacturing. These efforts are expected to further boost the demand for machinery and equipment. The Asian Development Bank projects Cambodia's economic growth at 5.8% for 2024 and 6.0% for 2025, indicating a favorable environment for continued industrial expansion.

### Prices

#### Bare Space

**USD 210 / sqm ( Min 36 sqm = USD 7,560 )**

Standard Package: Carpeting, 3 folding chairs, 1 round table,  
1 information desk, 1 waste basket, wall partitions, fascia name, 2 spotlight,  
1 fluorescent light, one 5-AMP power point

#### Shell Scheme

**USD 240 / sqm ( Min 9 sqm = USD 2,160 )**

• Corner fee 10% surcharge

• 5% VAT excluded

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**Organization Of  
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**CIMIF**

The 9<sup>th</sup> Cambodia Int'l  
**Machinery**  
Industry Fair

**6 – 9 August 2025**

Diamond Island Convention &  
Exhibition Center  
Phnom Penh, Cambodia



Exhibition Venue	Diamond Island Convention and Exhibition Center (Tonle Bassac Commune, Chamkarmorn Dist., Diamond Island City, Phnom Penh, Cambodia)
Exhibition Date and Time	August 6 (Wed.) – 9 (Sat.), 2025 Show Times: 09:00 – 17:00 (Last day will close at 15:00)
Organizer	Yorkers Trade and Marketing Service Co., Ltd.
Co-organizer	Cambodia Chamber of Commerce
Official Supporter	General Directorate of Trade Promotion, Ministry of Commerce (TPD) Korea Packaging Association (KOPA) Ministry of Industry, Science, Technology and Innovation (MISTI)
Show Management	Chan Chao International Co., Ltd.

### The Largest Specialized Machinery Exhibition at Cambodia

After a long break, CIMIF is back again! Before COVID-19, we attracted 8,000 to 10,000 professional visitors yearly. In 2025, CIMIF will once more provide a great opportunity for exhibitors to reach a large portion of the international machinery industry in Cambodia.

### High Potential Market

Due to many countries having lifted pandemic regulations and the global economy recovering, Cambodia's GDP growth is expected to pick up again. It is predicted increase by 6.3 percent in 2025. The Kingdom is considered as one of the most open and dollarized economies among ASEAN members, and provides numerous benefits to foreign investors.

### Officially Supported by the Cambodian Government

CIMIF is co-organized with the Cambodia Chamber of Commerce.

### Why Exhibit in CIMIF?

- > CIMIF – The Only International Machinery Industrial Fair in Cambodia.
- > CIMIF – The Best Platform to Reach Potential Buyers.
- > CIMIF – Your Gateway to ASEAN Market.

### Shell Scheme:



Includes: 1 Carpet Floor, 1 3-Sided System Panel, 1 Set of Fascia Panels, 1 Reception Desk, 1 Round Table, 3 Chairs, 1 Fluorescent Light, 2 Spotlights (100W), 1 Waste Basket, 1 5A/220V Single Phase Socket Plug

### Space Only

Includes: Name of Exhibitor in Catalogue



### Exhibitor Benefits

#### 1 Exhibitors Profile

Exhibitors at IPF are entitled to numerous event and promotional opportunities. The organizer would like exhibitors to have the maximum branding exposure at the show, so please take advantage of any and all benefits.

#### 2 Online Product lists

Five Products Information for visitors' reference will be uploaded to website for free. Additional product lists will be charged upon request.

#### 3 Exhibitor Press Release

One Exhibitor Press Release will be uploaded to website for free. Additional Press Release will be charged upon request.

#### 4 Invitation Card

The Organizer offers free invitation cards for exhibitors to invite their suppliers or clients. The Organizer reserves the right to the quantity of invitation cards.

#### 5 Visa Invitation Letters

The Organizer issues invitation letter to exhibitors for applying visa upon request.

### Remarks:

- Each Shell Scheme Booth, will be provided with 220V/5A electricity free of charge. Additional power supply and drainage will be at exhibitor's expense.
- The raw space booth is without partition, carpet, or any display facility. Booth facilities are available on a rental basis from the official contractor.

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## VIETNAMPRINTPACK 2025

The 23<sup>rd</sup> Vietnam Int'l Printing & Packaging Industry Exhibition

10-13 September 2025

Saigon Exhibition & Conference Center (SECC)

Ho Chi Minh City, Vietnam



We have the pleasure of  
inviting you to participate  
in VietnamPrintPack 2025  
scheduled from 10-13  
September 2025 at Saigon  
Exhibition & Conference  
Center (SECC),  
Ho Chi Minh City,  
Vietnam

### 2024 VIETNAM EXPO AT GLANCE

Exhibitors  
362

Gross Space  
(sqm)  
19,850

Booths  
900

Visitors  
20,660

#### ●●● PARTICIPATION FEES:

- ✓ Shell Scheme (Minimum 9 sqm): USD 320
- ✓ Including Needle Punch Carpet: Wall Partitions, Carpet, Company Fascia, 3
- ✓ Folding Chairs, 3 Spotlights, 1 Reception Table, 1 Round table, 1 Dustbin, 1 Single Phase 5 amp/ 220v Plug.
- ✓ Raw Space Only (Minimum 36 sqm): USD 300/sqm

Please fill up the contract form attached herewith and Email scanned copy of filled Application form to  
[secretarygeneral@oppindia.org](mailto:secretarygeneral@oppindia.org)

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



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Organization Of  
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We have the pleasure of inviting you to participate in VietnamPlas 2025 scheduled from 17<sup>th</sup> – 20<sup>th</sup> Sept., 2025 at Saigon Exhibition & Convention Center (SECC), Ho Chi Minh City, Vietnam

## VietnamPlas 2025

The 23<sup>rd</sup> Vietnam International  
Plastics & Rubber Industry  
Exhibition  
17<sup>th</sup> – 20<sup>th</sup> Sept., 2025  
Saigon Exhibition &  
Convention Center (SECC)  
Ho Chi Minh City, Vietnam

### SHOW REPORT 2024

GROSS SPACE  
**23,000 SQM**

EXHIBITORS  
**700**

BOOTHS  
**1,100**

COUNTRIES & REGIONS  
**20**

VISITORS  
**20,390**

EXHIBITOR SATISFACTION  
**88%**

VISITOR SATISFACTION  
**86%**

### PARTICIPATION FEES:

- Standard Booth: USD 340 / sqm (Min. 9 sqm)
- Includes : Wall Partitions, Carpet, Company Fascia, 3 Folding Chairs, 3 Spotlights, 1 Reception Table, 1 Round table, 1 Dustbin, 1 No. of 5Amp/220V single phase power socket (max. 600W)
- Raw Space: USD 310 / sqm (Min. 18 sqm)
- \*Corner Fee: 10% surcharge based on Total amount.
- \*The prices above exclude VAT at 5%.

Please fill up the contract form attached herewith and Email scanned copy of filled Application form to [secretarygeneral@oppindia.org](mailto:secretarygeneral@oppindia.org)

### ORGANIZATION OF PLASTICS PROCESSORS OF INDIA

Deepak Lawale, Secretary General,



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The World's No. 1 Trade Fair  
for Plastics and Rubber  
**8-15 October 2025**  
Düsseldorf, Germany

## K 2025 – INTERNATIONAL TRADE FAIR ON PLASTICS AND RUBBER – IS TO BE HELD IN MESSE DÜSSELDORF GMBH, GERMANY FROM 8<sup>TH</sup> – 15<sup>TH</sup> OCTOBER 2025.

In K 2025 it will once again be the most prestigious event on the industry's calendar and the starting point for decisions that shape future products, processes and solutions.

**SPECIAL  
DISCOUNT  
FOR BOOKINGS  
THROUGH  
OPPI**



### HOT TOPICS OF K 2025

Circular  
Economy

Digitalisation

Coding  
about  
people

Organization of Plastic Processors of India has tied up with Tibro Tours Pvt. Ltd. for K 2025 packages.

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# Visit to the Mahindra Automotive Plant at Chakan on Friday 9th May 2025

On 9th May 2025 group of OPPI members visited Mahindra Automotive Vehicles Plant at Chakan.

Initially Presentation on Mahindra & Mahindra was given to the group.

Mahindra & Mahindra has 9 Plants across India.

Mahindra & Mahindra Chakan plant is spread over 650 acres.



At Chakan Plant 5 lakh vehicles are being rolled out per annum- Scorpio, Bolero, XUV and other utility models. Electrical vehicles unit at Chakan has a production capacity of 1 lakh vehicles per annum. 1700 electrical vehicles are produced per day at the Chakan Plant.

EV Plant is 95% Robo operated while other Plants are 50-60% Robo operated.

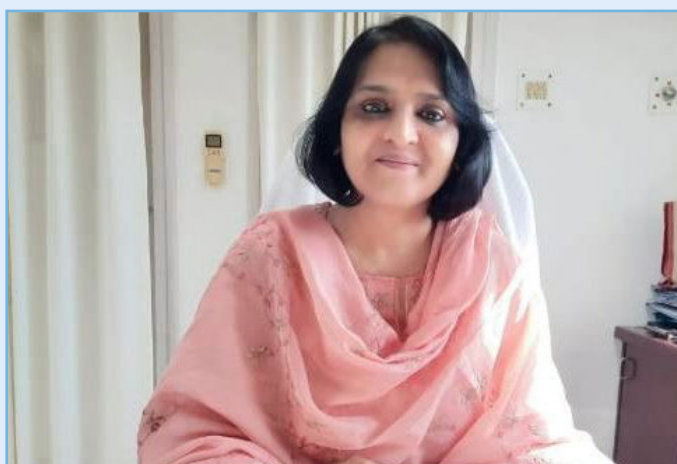
Chakan Plant has solar facility as well as rain water harvesting.

Mahindra is implementing technology driven systems- AI camera to monitor movement of workers to achieve maximum output, avoiding errors and tracing of any defects. Technical systems for auto assigning of work station to worker while punching at the main gate to avoid time delay in work allotment every day.

The Body shop Technology is from Korea. Robots are from Japan.

Mahindra has R&D centre at Chennai for product development and to connect Chennai centre for any new development of Plastic Raw Materials.





**Mrs. Nivedita Shukla Verma**

## **Govt Aims Completion of Infrastructure in Nine Plastic Parks by End of 2025**

The government is aiming completion of physical infrastructure at all nine plastic parks by end of 2025, according to Chemicals and Petrochemicals Secretary Mrs. Nivedita Shukla Verma.

The government has so far approved a total of 10 plastic parks under a central scheme that provides funding up to 50 per cent of the project cost, capped at Rs.40 crore per park.

Currently, there is a stay order on one park in Tamil Nadu by National Green Tribunal.

"The parks are in different stages of development. We are pushing for the completion of the physical infrastructure. By the end of this year, we want to complete the infrastructure in all nine parks," Chemicals and Petrochemicals Secretary Mrs. Nivedita Shukla Verma told PTI.

While physical infrastructure is advancing in many parks, operationalisation remains slow. Out of nine parks, 3-4 parks are partially operational that include Tamot (Madhya Pradesh), Paradeep (Odisha) and Tinsukia (Assam), she said.

While the intention is try to complete the parks at the earliest, the secretary said it has taken a "little longer for the plastic parks because of issues related to land acquisition and coordination with the state governments."

However since last one - and - a - half year, the government is pushing state governments to complete the physical infrastructure in the parks. "So a lot of progress has taken place in the last few years," she added.

The parks are designed to attract both domestic and foreign investment, enhance production and exports of plastic products and create a robust ecosystem for plastic processing.

The Plastic Parks Scheme was launched in 2013, with approvals for parks in Tamot and Paradeep granted on October 9, 2013.



The scheme has since expanded, with additional parks having been approved in subsequent years.

(Source: PTI-THE WEEK/ 18.04.2025)

## Recycled Plastic in Food Packaging – is the Industry Ready Yet?



(Source: IPP Group)

Amid the uncertainty and confusion over government regulations that set specific targets for the use of recycled plastic in various forms of packaging including multilayered as well as rigid plastics and PET bottles from 1 April 2025, as part of the EPR norms, the Food Safety and Standards Authority of India (FSSAI) has allowed the use of rPET in packaging, storing, carrying or dispensing of food products.

The 28 March 2025 amendment, which modifies the Food Safety and Standards (Packaging) Regulations, 2018, however, says recycled PET can be used only when the standards and guidelines are notified by the food regulator. "All rPET packaging must comply with relevant national standards or regulations," the FSSAI notification says.

"In the Food Safety and Standards (Packaging) Regulations, 2018, in regulation 4, in sub-regulation (4), for clause (e), the following clause shall be substituted, namely (e) Products made of recycled polyethylene terephthalate (PET) may be used for packaging, storing, carrying or dispensing of food products as and when standards and guidelines are notified by the food authority and such packaging materials shall comply with national standards or regulations as applicable to such materials," the FSSAI notification signed by G Kamala Vardhana Rao, chief executive officer, says.

In a recent stakeholder consultation on sustainable packaging for food in Mumbai, the Union Minister of State for Health and Family Welfare Shri Prataprao Ganpatrao Jadhav announced that the guidelines which were yet to be released for the use of rPET in packaging have been prepared by FSSAI after extensive consultations and in line with the best global practices.

The FSSAI move assumes significance in the wake of the mandatory use of 30% recycled plastic for Category I packaging, defined as rigid plastic, which includes PET bottles, primarily used by beverage manufacturers, from 1 April 2025. Category II, which includes flexible mono-layered plastics, has to use 10% recycled plastic, while Category III, multi-layered plastics, has a 5% target for FY 2025-26.

All categories have a specific annual increase in targets. Category I has a 60% target by FY 2028-29 and category II has 20%. Category III has a 10% target to meet by FY 2028-29. The norms apply to all PIBOS (producers, importers and brand owners) who manufacture, import or use plastic packaging materials.

Beverage and FMCG players, however, feel that the targets are impractical because of recycling infrastructure limitations, material shortage and potential cost increase. The industry has requested the government to give the industry more time to meet targets or allow some relaxations in the norms.

## Cosmo Films Bags SIES SOP Star Awards 2025



Cosmo Films has been honoured with the prestigious SIES SOP Star Awards 2025, further cementing its position as an innovative packaging solutions provider.

The 8th Edition of the SIES SOP Star Awards witnessed an impressive participation of over 200 entries, with Cosmo Films securing recognition in two critical



categories under packaging materials and components. The company's two products that merited the awards are metallised BOPP for high-speed packaging and next generation UHB-HR MO high-heat resistance BOPP film for replacing metPET mono carton packaging application.

## India's Plastic Exports Touch \$12.5 Billion in 2024 - 25, Up 8.7% Yoy

Growth in shipments driven by performances across several key product categories, says PLEXCONCIL.



Total plastic exports from India touched \$12.5 billion in 2024 - 25 against \$11.5 billion in 2023 - 24, recording a growth of 8.70 per cent.

A media statement by the Plastics Export Promotion Council (PLEXCONCIL) said the growth in India's plastics exports was driven by strong performances across several key product categories.

Plastic films and sheets saw a growth of 15.9 per cent, increasing from \$1,750 million to \$2,028 million; while woven sacks, woven fabrics and tarpaulin grew by 16 per cent to reach \$1,571 million, up from \$1,355 million.

Floor coverings, leathercloth and laminates recorded an increase of 9.9 per cent, totalling \$762 million compared to \$693 million in the previous fiscal. India's plastics export markets include the US, China, the UAE and Brazil.

(Source: businessline/29.04.2025)

## Plastics for Change Wins Bharat Startup Challenge 2025, Secures INR 10 Cr Investment



Plastics for Change, a social enterprise revolutionizing plastic recycling through ethical sourcing and Fair Trade practices, has won the Bharat Startup Grand Challenge 2025. The recognition includes a Rs. 10 crore (USD 1.169 million) investment from Stride Ventures, in partnership with the Department for Promotion of Industry and Internal Trade (DPIIT) and Startup India.

Selected from over 120 startups across 22 states, Plastics for Change was recognized for its tech-enabled supply chain that connects informal waste collectors to global brands, bringing transparency, traceability, and dignity into the recycled plastics industry.

"This recognition affirms the value of our traceable and ethical sourcing platform," said Srinidhi Kashyap, Chief Operating Officer. "We help brands integrate recycled plastic into their supply chains with full transparency and social impact while supporting the people who make recycling possible."

Shifrah Jacobs, Co-Founder and Chief Impact Officer, added, "Waste collectors are the backbone of the circular economy. This support allows us to scale with purpose, bringing more dignity, opportunity, and fairness into the supply chain."

Founded in 2016, Plastics for Change transforms discarded plastic into high-quality, Fair-Trade Verified recycled materials. The responsible sourcing platform connects informal waste collectors with global brands

like L'Oreal, The Body Shop, and many more, enabling them to replace virgin plastic with ethically sourced recycled plastic. This initiative is all about improving the livelihoods of the ultra - poor and preventing plastic from entering the ocean.

With this funding, the organization will expand to more cities, strengthen its infrastructure, and enhance its traceability technology, empowering more brands to meet EPR and ESG goals through responsible sourcing.

This win is a milestone that reflects the potential of India's startup ecosystem to deliver solutions that are both sustainable and inclusive.

### Balrampur Chini Mills to Set Up PLA Bio Polymer Unit in Uttar Pradesh

Balrampur Chini Mills has announced to set up a Polylactic Acid (PLA) biopolymer manufacturing unit at Kumbhi, Uttar Pradesh with an investment of Rs. 2,850 crore.

This plant will be India's first industrial - scale biopolymer facility and will set a new global benchmark in sustainable manufacturing. It will be powered entirely by 100% renewable energy throughout the production process and will be the first location where sugarcane is transformed into PLA in a single, integrated site, showcasing a truly closed-loop sustainability model.

With an annual production capacity of 80,000 tonnes, the plant will produce 100% industrially compostable and bio-based PLA (Poly Lactic Acid), a versatile material ideal for replacing banned single-use plastic (SUP) items such as straws, disposable cutlery, food trays, bottles, curd cups and carry bags.

### Steer World offers PEX Plastic Recycling Machine

India-based firm says its extruder has been designed to shred and process crosslinked polyethylene for recycling.

Electrical wire and cable is among the applications in which crosslinked polyethylene (PEX) plastic is used.

India-based Steer World is offering what it calls a first - of - its - kind method to recycle crosslinked polyethylene (PEX) plastic using its custom Omega Twin-Screw Extrusion Technology.

PEX is used in corrosion-resistant piping applications and as wire and cable coating and insulation. Steer World says the material's "exceptional durability" also makes it extremely difficult to recycle using conventional methods. Thus, most discarded PEX ends up in landfills.

The Omega Twin-Screw Extruder uses Steer World's patented fractional geometry technology (FGT). That process uses a combination of mechanical shearing and controlled heat to break PEX crosslinks while preserving its base structure, turning it into a marketable material called de-PEX (decrosslinked PEX).

"This is not just an innovation in recycling, it's a shift in how we look at thermoset waste," Prakash Hadimani of Steer World says. "With the Omega series of machines, we've made it possible to recover and reuse a material that was once considered unrecoverable. That's a win for the industry and a big step forward for sustainability."

Steer World says the modular design of its Omega machine allows precise control of temperature zones, screw speed and configuration—"factors essential to ensuring consistent and scalable decrosslinking."

According to the firm, the resulting product can be further processed into new products or blended with virgin polymers for a range of industrial applications.

The new extruder opens new doors for manufacturers seeking sustainable alternatives for discarded materials, Steer World says and can help reduce reliance on virgin plastic, enabling circularity in the PEX sector.

### PepsiCo Cuts 2025 Profit Forecast amid Trade Tensions and Cost Pressures

PepsiCo cut its annual profit forecast and warned of higher production costs and more volatility from President Donald Trump's on - again off - again trade tariffs.



Laguarta also called out consumer conditions in many markets to remain subdued and have an uncertain outlook. | File Image

Shares fell 2.4 per cent in premarket trading after the Frito-Lay maker also posted its first quarterly profit miss in at least five years.

PepsiCo now expects fiscal 2025 core earnings per share to decline 3 per cent, compared with its previous forecast of a low-single-digit increase. The company reported earnings per share of \$8.16 last year.

"As we look ahead, we expect more volatility and uncertainty, particularly related to global trade developments, which we expect will increase our supply chain costs," said CEO Ramon Laguarta said in a statement.

The company plans mitigation actions to address the higher supply chain costs where possible, he said, without going into the details. PepsiCo and other consumer goods companies are already navigating higher prices for their products following hikes undertaken to offset rising costs initially tied to supply - chain disruptions during the COVID-19 pandemic.

On an adjusted basis, the company earned \$1.48 per share in the first quarter, missing estimates of \$1.49, according to data compiled by LSEG.

US packaged food companies with sprawling international operations are bracing for a hit to earnings from Trump's sweeping tariffs on trading partners as many of them import everything from raw materials to finished goods.

PepsiCo has two food plants in Mexico and two concentrate plants in Ireland. The 25 per cent US tariffs on steel and aluminum, which came into force in March, could also weigh on the company's margins.

Organic volumes declined 2 per cent in the first quarter, the company said, as promotions on snacks and sodas take longer to boost demand.

Laguarta also called out consumer conditions in many markets to remain subdued and have an uncertain outlook.

The soda and snacks giant's revenue fell 1.8 per cent to \$17.92 billion. Analysts on average had estimated \$17.77 billion.

## UFlex Secures USFDA Approval for Recycled PE in Food Packaging

**Announces Rs. 317 crore investment in new recycling plant.**

UFlex Ltd., has achieved a significant milestone by becoming the first Indian company to receive approval from the United States Food and Drug Administration (USFDA) for its recycling process.

This approval allows UFlex to use recycled polyethylene (rPE) in food packaging, marking a major step in reducing plastic waste and supporting global brands in meeting their sustainability goals.

UFlex's recycling process is categorized as super-clean recycling, with the ability to de-ink post-consumer recycled (PCR) materials by more than 95%, making it one of the most advanced processes worldwide. This certification adheres to international standards and contributes to the global shift toward a circular economy, reinforcing UFlex's commitment to sustainability and innovation.

To further strengthen its recycling infrastructure, UFlex is investing Rs. 317 crores in advanced recycling technologies. This includes the establishment of two new recycling plants at its Noida facility in India, with a combined annual capacity to process 39,600 metric tons of plastic waste. These plants will significantly boost the production of rPET and rPE materials for use in food packaging, aligning with India's growing emphasis on sustainability and its evolving legislative framework.



## UFlex's High - Speed Packaging Innovations at Snack & BakeTec 2025

At Snack & BakeTec 2025 Mumbai, Uflex' engineering business division garnered attention with its latest high-speed packaging solutions, aimed at addressing the demand for flexible, sustainable and performance driven machinery across the FMCG and food industries.

In an interaction with Packaging South Asia, Sumeet Arora, Senior Vice President, Sales and Marketing (Engineering Business), UFlex, outlined the company's long - standing contribution to India's flexible packaging ecosystem as well as its latest technological highlights.

"UFlex started with packaging machinery and it continues to be an important part of the business," Arora said. "Over the past four decades, we have expanded across the entire packaging value chain-films, laminates, printing, inks, dyes, cylinders and machinery creating a vertically integrated presence."

Uflex showcased two key products - a high - speed vertical form-fill-seal (VFFS) machine capable of delivering up to 160 pouches per minute and a pick-fill - seal machine for pre-made bags, including stand-up, zipper and centre-seal pouches.

"These are among the fastest machines at this trade fair. To achieve two-and-a-half pouches per second is a remarkable feat-it requires creating, filling and sealing within a blink," Arora noted. "We constantly challenge ourselves to raise the bar."

## SRF Acquires Kanpur Plastipack's CPP Film Business

SRF, a leader in specialty chemicals and packaging films, has entered into a definitive agreement to acquire Kanpur Plastipack's (KPL) cast polypropylene (CPP) film business for INR 49.25 crore. The acquisition includes KPL's Windmüller & Hölscher CPP film plant and machinery, marking SRF's latest expansion in the flexible packaging segment.

In a regulatory filing, KPL stated that its Board of Directors, in a meeting held on 11 March 2025, approved the sale of the CPP division's plant and

machinery, located at Gajner Road, Village Shyampur Fatehpur Roshnai, Kanpur Dehat, citing the non-viability of manufacturing operations.



KPL, a key player in the Flexible Intermediate Bulk Container (FIBC) and CPP segments, had established its CPP film line with a production capacity of 7,200 tonnes per annum. The facility specializes in manufacturing high-barrier, seven-layer transparent CPP films and other value-added variants.

Following the acquisition, SRF will integrate the assets into its existing packaging films portfolio, which includes BOPP and BOPET films. This move strengthens SRF's leadership in the flexible packaging space, enhancing its ability to serve key industries such as consumer goods, pharmaceuticals, and automotive.

Singhi Advisors acted as the exclusive strategic and financial advisor to KPL for the transaction. This marks Singhi Advisors' eighth deal in the packaging industry and its second transaction with SRF, having previously advised the company on the strategic sale of its engineering plastics business to DSM.

The transaction is expected to be completed in the coming months, with SRF relocating and installing the acquired machinery at its advanced manufacturing facility in Indore.

## Kdc/one and Clarion Group to Launch Beauty Packaging JV in India

The partners will build a new domestic manufacturing facility in Gujarat over the next year.

Knowlton Development Corporation (kdc/one), a provider of custom formulation, packaging design, and manufacturing services, has partnered with Clarion Group, a contract manufacturer, to establish a new joint venture (JV) in India.



Image: Packaging Gateway

This collaboration, named kdc/one Clarion Beauty, will focus on providing advanced solutions for beauty packaging production and formulation development.

The venture will address the region's packaging needs for colour cosmetics, skincare, and personal care, combining Clarion's expertise in the local market with kdc/one's global innovation and formulation capabilities.

Kdc/one beauty and personal care global president Sandra Wisniewski said: "We are delighted to join forces with Clarion Group and combine our individual and collective strengths to enable brand owners to grow their global business in the fast - developing Indian marketplace.

"We look forward to bringing the bespoke packaging design, quality and development credentials of both kdc/one and HCT, and benefitting from Clarion's significant track record in India, highly strategic personal care manufacturing footprint and deeply experienced local management team."

As part of the JV, the partners will build a new manufacturing facility in the Indian state of Gujarat over the next year.

This facility will be dedicated to the production of injection-moulded and metallised beauty packaging to meet the growing demands of the domestic market.

Clarion Group chair K. N. Lakshmanan said: "Our two companies not only have complementary manufacturing, formulation and packaging strengths in the beauty and personal care products sector, but

we also share a commitment to providing the highest level of innovation, quality, service, agility and regulatory compliance.

"We are excited by the huge potential of this joint venture and believe that together, we will be the partner of choice for brand owners, and I believe the dream for brand owners, whether they are already operating in the Indian market or looking to enter the region, we aim to help bring their vision to life."

## Plastic Credit Market to Grow 70% with New Recycling Rule, Hit \$1.7 Billion by 2030

India's plastic credit market could grow to \$1.67 billion by 2030 from \$982 million now, bolstered by the mandate under the extended producer responsibility (EPR) for plastic producers, importers and brand owners to use recycled content in their plastic packaging, say industry experts. They also flagged challenges in the procurement of plastic for recycling and issues with the price discovery mechanism in the credit market.

Organizations can buy and sell plastic credit, a tradable unit representing the collection and recycling of plastic waste. The mandate to use recycled content in plastic packaging came into effect on April 1st this year.

"The trajectory of the plastic credit market will mirror the rapid growth in plastic recycling services," said Saunak Saha, Partner, Climate Change and Sustainability Services at EY India. "As per the Plastic Credit Market Forecast of 2024, the Indian Plastic Recycling Services Market is projected to be valued at approximately \$1.67 billion by 2030, growing at a CAGR of 14.5%," he said.

As part of plastic waste management rules under the EPR, recycled content should comprise 5-30% of the total plastic packaging of a plastic producer, importer or brand owner in the first year, depending on the plastic category. This portion of recycled content they must use will increase to 10%-60% by FY29. "It's a big positive; the mandate has expanded the market for recyclers, incentivizing industry to thrive," said Rashi Agrawal, Chief Business Officer at Banyan Nation, a plastics recycling company.

(Source: The Economic Times / 10.05.2025)

## MAAG India: Service and Availability for the Indian Market

The globally active MAAG Group, headquartered in Oberglatt, Switzerland, will continue to position itself as a strong regional player in the Indian market: The Vadodara subsidiary specializes in localized machine and service offering.

With a growing number of customers in the polymer, chemical and petrochemical industries, India has developed into an important market for MAAG. Present through regional partners since 1980, the company has been underlining the strategic importance of the Indian market with its own branch in Vadodara in western India since 2016. It currently employs more than a dozen local specialists.

### Localized product and service offering

As a provider of customer - specific systems and integrated solutions for the polymer industry, MAAG India focuses on localized products such as strand pelletizers. Customers in India thus benefit from machines that are precisely tailored to their regional requirements and at the same time meet the highest quality standards from German production.

This localized portfolio is complemented by a comprehensive on-site service: Native-speaking technicians from the MAAG team provide maintenance and consulting services throughout the country to ensure reliable and long-term use of the machines.

### The world's largest service network in the polymer industry

MAAG also operates its own grinding center in India for cutting rotors on pelletizing systems. The site is therefore part of the world's largest service network in the polymer industry, which includes a total of eight grinding centers across the globe. MAAG passes on its manufacturing expertise to local specialists. Equipped with state of the art machinery, MAAG India specialists are able to provide a quick, reliable and professional grinding service for cutting rotors, including those from other manufacturers. The precision of the regrinding on the entire tooth profile ensures long - lasting granulation results and optimized cutting rotor lifetime.



(Source: Plastech)

### Hub for international companies

Vadodara, located about 400 km from Mumbai, has become an attractive hub for international companies in recent years and a first choice location for MAAG India. The city has a population of around 2.1 million and is centrally located in the state of Gujarat. A location which enables MAAG to be close to its customers as many companies from the polymer and compounding industry are also established nearby.

## Avery Dennison opens its First India - Based RFID Production Facility

Avery Dennison Corporation (NYSE:AVY), a global materials science and digital identification solutions company, has announced the opening of its first radio - frequency identification (RFID) inlays and labels production site in India. Located in Pune, the plant's opening marks a pivotal step in the company's long-term commitment to supporting RFID technology growth in South Asia under the "Make in India" initiative. The official opening date is 23 April 2025.

The Pune facility establishes Avery Dennison as the first ARC - certified RFID inlay company to manufacture RFID inlays and labels in India. True to its legacy as a leader and innovator, Avery Dennison has introduced AD Cobra, a radio - frequency identification (RFID) inlay designed exclusively for the Indian market. The inlay is tailored to meet the unique environmental and operational challenges faced by Indian businesses, empowering brands to deploy smart product solutions with higher confidence and seamless integration.

"With the opening of our RFID inlay and label manufacturing facility in Pune, Avery Dennison is taking a significant step toward strengthening its



presence in India.” said Saurabh Agarwal, Vice President and General Manager, South Asia, Avery Dennison. “Local production will help us respond more efficiently to market needs, reduce lead times and better support our customers across industries. This aligns with our ongoing efforts to contribute meaningfully to the Indian ecosystem.”

“India represents one of the fastest growing markets for RFID adoption, and this facility underscores our commitment to being closer to our customers. By localizing production and innovation, we’re not just enhancing our responsiveness and speed-to-market — we’re also partnering more deeply with Indian brands to unlock the full potential of smart supply chain solutions tailored to their unique needs,” said Kelvin Tan, director, APAC, Intelligent Labels, sales and business development, Avery Dennison.

Avery Dennison has an extensive RFID technology portfolio that spans the UHF, HF and NFC frequency bands, and is widely used in the apparel, pharmaceuticals, fast moving consumer goods (FMCG), logistics and retail industries. RFID applications across these sectors are proven to minimize errors, reduce stock discrepancies and enhance real-time visibility throughout the supply chain. Moreover, RFID technology plays a critical role in product authentication and anti-counterfeiting, which are essential in maintaining brand trust and compliance in highly regulated industries. By supporting faster restocking, improving product availability and streamlining checkout experiences, RFID optimizes operational efficiency, elevates customer satisfaction and positively impacts brand loyalty.

### Kaustubh Chitale Named Baerlocher India's Managing Director

Baerlocher India announces a key leadership transition. Effective April 7, 2025, **Mr. Kaustubh Chitale** assumes the role of **Managing Director**, taking the baton from Mr. Jayen Modi, who retires after an impactful 14-year tenure.

This milestone signifies more than a change in leadership, it marks the evolution of Baerlocher India, shaped by a legacy of growth and innovation. Under Mr. Modi's stewardship, the company

strengthened its position in the PVC additives industry by consistently delivering quality and promoting sustainable solutions.



**Mr. Arne Schulle, Group CEO**, expressed his gratitude:

“Jayen's unwavering commitment and foresight have been vital to Baerlocher India's success story. Under his leadership, Baerlocher India has grown tremendously. For instance, our production capacity increased from 14,000 MT to 100,000 MT with the full operationalization of our Dewas 2 site. Additionally, the development of the Baerlocher Research & Innovation Centre, where innovation thrives, is among many other milestones achieved. He has built a strong, competitive team and positioned us as a market leader in India. We're pleased he will continue supporting us as a Baerlocher Global Consultant.”

He added, “We warmly welcome Kaustubh, a Chemical Engineer with over 29 years of experience across industries. His deep knowledge of specialty chemicals and equipment will lead us confidently into the future.”

### Duty Remission Scheme Restored to Aid Exporters

**Applicable from June 1, 2025 for products manufactured in AA units, SEZs, EOUs**

In a boost to exports, the government on Monday 26th May 2025 announced that it has restored the Remission of Duties and Taxes on Exported Products (RoDTEP) Scheme benefits for units operating under Advance Authorization (AA), Export-Oriented Units (EOUs) and units operating in Special Economic Zones (SEZs) with effect from June 1, 2025.

# PLASTIC PRODUCTS AND NEW TECHNOLOGIES



## Ideal for Bananas – the SB3 Pallet Box from Craemer

How and where do bananas turn yellow? They only ripen after being picked, during storage. The perforated SB3 pallet box from Craemer is the ideal solution for the ripening process of this popular tropical fruit. This is demonstrated on a plantation in Central America. The plastic container meets all the requirements for storage: it is stackable, hygienic, easy to clean and dry. The one-piece moulding and heavy-duty construction also make the container extremely robust.

The SB3 pallet box in industry standard size is made of high-quality, food-safe polyethylene and is 100 percent recyclable. This container has a height of 790 millimetres, a capacity of 610 litres and a payload of 700 kilograms. The box is also temperature-resistant from -30 to +40 degrees Celsius, briefly up to +90 degrees. The SB3 is optionally available in a closed or perforated version, with three runners or nine feet. Depending on the version, it weighs 38.5 or 43.5 kilograms. This means that the pallet box can be used in a wide range of applications in different climate zones.

### Perforated version for fruit storage

The perforated version of the SB3 box is particularly suitable for fruit, such as grapes, bananas and avocados. The chamfered vents ensure good air

circulation, protecting the delicate fruit skins from damage and preventing mould growth. The SB3 box has proved particularly useful in an agricultural facility in Central America, where Craemer pallet boxes are used to ripen green bananas. After 90 hours of storage in SB3 boxes, the unripe tropical fruits have a rich yellow colour and are free of bruises and mould when reaching the shops or processing plants. The management is “very pleased” with the results.



The perforated version of the SB3 pallet box has proved its worth in an agricultural facility in Central America for ripening green plantains. Photo: Craemer Group

(Source: Craemer / 14.04.2025)



## Amcor Builds Cutting - edge Coating Facility, Enhancing Healthcare Packaging Access in Asia Pacific



Image Source: amcor

New facility enhances supply chain security, reduces lead times and supports customers' growth.

First in Asia equipped with advanced air knife coating technology.

First in Asia to produce both top and bottom substrates for medical device packaging.

Amcor (NYSE: AMCR, ASX:AMC), a global leader in developing and producing responsible packaging solutions, announced that it has completed construction of its advanced coating facility for healthcare packaging in Selangor, Malaysia. This state-of-the-art facility is the first in Asia to leverage cutting-edge air knife coating technology, strengthening the supply of high-quality, sterile packaging for healthcare customers across the region.

The new facility expands Amcor's existing healthcare packaging plant in Selangor, creating an integrated campus that makes Amcor the first in Asia to produce both top and bottom substrates for medical device packaging. This development delivers critical benefits to customers, including enhanced supply chain resilience and reduced lead times.

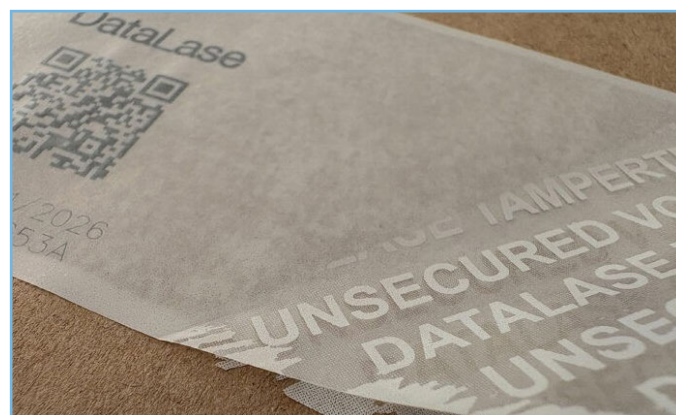
Equipped with advanced technologies such as water-based coating systems, online inspection systems and air knife technology, the facility sets new standards for precision and efficiency. The air knife technology, in particular, uses high-speed air streams to ensure uniform coating application, enhancing product consistency and reducing material waste.

"Amcor's investment in this new facility reflects our unwavering commitment to support our customers across the Asia Pacific region," said Chris Kenneally, president of Amcor Flexibles Asia Pacific. "By introducing advanced coating technology and boosting local production capacity, we are better positioned to meet the growing regional demand for sterile, reliable packaging and to offer our customers greater flexibility and security."

"Producing our industry - leading global product platform locally brings us closer to our customers, enhancing supply security and flexibility," said Virginie Maes, vice president of global healthcare, Amcor. "By investing in advanced coating technologies and expanding our regional capabilities, we are not only addressing the growing demand for high-performance healthcare packaging but also reinforcing our promise to deliver a consistent and innovative value proposition to our customers worldwide."

This new facility is part of Amcor's broader commitment to expanding its healthcare capabilities in the Asia Pacific region. Recent initiatives include the acquisition of healthcare packaging company MDK in China, the establishment of a grid lacquer paper unit in India and the construction of a co-extrusion blown film and printing plant in Singapore.

## DataLase and TamperTech Partnership Delivers Smart Tamper-evident Tape for Modern Supply Chains



DataLase, the global leader in Photonic Printing solutions and TamperTech, a market leader in the design and manufacture of tamper-evident packaging and security solutions, have joined forces to introduce a groundbreaking innovation in tamper-evident tape technology. The development marks the first time



DataLase's photonic printing technology has been incorporated into tamper tape, combining security, authentication and tracking into a single, seamless solution.

By integrating DataLase's pigment chemistry as a coating on paper or film within the tape, the new product eliminates the need for additional paper and plastic labels, conventional sealing tapes and traditional wet printing processes that rely on inks, solvents and other materials. The result is a more sustainable, energy-efficient and high-performance alternative that enhances both product security and supply chain efficiency.

This innovation significantly advances tamper tape technology by offering a multifunctional solution that decorates, informs, protects and secures packaged goods in one simple application. It provides a clear pathway for reducing waste, improving logistics and lowering transportation costs while also contributing to sustainability efforts. The ability to integrate customizable track-and-trace functionality into tamper - evident tape is a key differentiator, allowing businesses to enhance security with digital verification capabilities. This solution addresses concerns related to counterfeiting and stolen goods by providing instant, non - contact and verifiable tamper detection that integrates seamlessly into existing logistics and security infrastructures.

While traditional tamper - evident tapes clearly indicate physical interference, they don't offer the added assurance of digital verification. As regulatory requirements and consumer expectations for product security continue to grow, this innovation bridges the gap by combining reliable physical protection with intelligent tracking technology, creating a more advanced and seamless solution.

This innovation has broad market potential, offering enhanced security, authenticity and compliance across multiple industries. In pharmaceuticals and healthcare, it strengthens counterfeit prevention and regulatory adherence. Logistics and supply chain providers benefit from improved transit security, while e-commerce and retail, particularly for high-value goods, gain consumer trust through visible, tamper - proof packaging. Electronics manufacturers can combat warranty fraud and counterfeiting, government and defence sectors can secure classified materials and the food and beverage industry can ensure compliance and contamination protection.

Interest is already growing, with pharmaceutical companies, logistics providers and high - tech manufacturers exploring its benefits. Cold chain logistics operators see its potential for maintaining package integrity, while regulatory bodies and customs authorities are assessing its role in compliance and border security.

## Plastic Supercapacitors Could Help Solve the Energy Crisis



Illustration of a PEDOT film on a graphene sheet that can be used in supercapacitors to store large amounts of energy. Credit: Maher El-Kady

A new method produces PEDOT nanofibers with enhanced electrical conductivity and increased surface area for improved charge storage.

UCLA chemists have developed a new textured, fur-like version of PEDOT, a conductive plastic commonly used to protect electronics from static and in devices like solar cells and electrochromic displays. This innovative form significantly increases the material's surface area, allowing it to store nearly ten times more electric charge than standard PEDOT. When used in a supercapacitor, it also withstood almost 100,000 charge cycles. This breakthrough could help supercapacitors play a greater role in energy storage as the world moves toward renewable and sustainable energy sources.

Plastics have shaped our modern world and transformed the way we live. For decades, they were primarily used in electronics for their excellent insulating properties. However, in the 1970s, scientists accidentally discovered that some plastics can also conduct electricity. This breakthrough revolutionized the field and paved the way for new applications in electronics and energy storage.

One of the most widely used electrically conductive plastics today is poly (3,4-ethylenedioxythiophene), commonly known as PEDOT. This material forms a flexible, transparent film that is often applied to surfaces such as photographic films and electronic components to prevent static buildup. PEDOT is also used in touchscreens, organic solar cells, and electrochromic devices, like smart windows that change transparency with the push of a button.

Despite its many applications, PEDOT's use in energy storage has been limited. Commercial forms of PEDOT typically have low electrical conductivity and limited surface area, which restrict their ability to store significant amounts of energy.

UCLA chemists are addressing these challenges with an innovative method to control the morphology of PEDOT to grow nanofibers precisely. These nanofibers exhibit exceptional conductivity and expanded surface area, both of which are crucial for enhancing the energy storage capabilities of PEDOT. This approach, described in a paper published in *Advanced Functional Materials*, demonstrates the potential of PEDOT nanofibers for supercapacitor applications.

### Supercapacitors vs. Batteries

Unlike batteries, which store energy through slow chemical reactions, supercapacitors store and release energy by accumulating electrical charge on their surface. This allows them to charge and discharge extremely quickly, making them ideal for applications requiring rapid bursts of power, such as regenerative braking systems in hybrid and electric vehicles and camera flashes. Better supercapacitors are, therefore, one route to reduced dependence on fossil fuels.

The challenge with supercapacitors, however, is creating materials with enough surface area to hold large amounts of energy. Traditional PEDOT materials fall short in this regard, which limits their performance.

The UCLA chemists produced the new material through a unique vapor-phase growth process to create vertical PEDOT nanofibers. These nanofibers, resembling dense grass growing upward, dramatically increase the material's surface area, allowing it to store more energy. By adding a drop of liquid containing graphene oxide nanoflakes and ferric chloride on a graphite sheet, the researchers exposed

this sample to a vapor of the precursor molecules that eventually formed the PEDOT polymer. Instead of developing into a very thin, flat film, the polymer grew into a thick, fur-like structure, significantly increasing the surface area compared to conventional PEDOT materials.

### Exceptional Energy Storage Capabilities

"The material's unique vertical growth allows us to create PEDOT electrodes that store far more energy than traditional PEDOT," said corresponding author and UCLA materials scientist Maher El-Kady. "Electric charge is stored on the surface of the material, and traditional PEDOT films don't have enough surface area to hold very much charge. We increased the surface area of PEDOT and thereby increased its capacity enough to build a supercapacitor."

The authors used these PEDOT structures to fabricate supercapacitors with excellent charge storage capacity and extraordinary cycling stability, reaching nearly 100,000 cycles. The advance could pave the way for more efficient energy storage systems, directly addressing global challenges in renewable energy and sustainability.

"A polymer is essentially a long chain of molecules built out of shorter blocks called monomers," said El-Kady. "Think of it like a necklace made from individual beads strung together. We heat the liquid form of the monomers inside a chamber. As the vapors rise, they react chemically when they come in contact with the surface of the graphene nanoflakes. This reaction causes the monomers to bond and form vertical nanofibers. These nanofibers have (a) much higher surface area, which means they can store much more energy."

### Record - Breaking Results and Durability

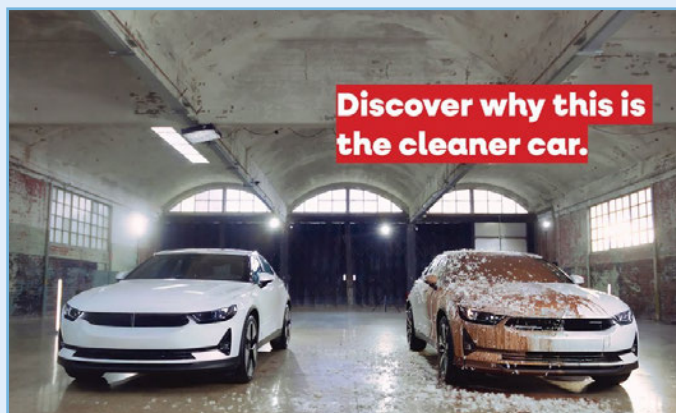
The new PEDOT material has shown impressive results, exceeding expectations in several critical areas. Its conductivity is 100 times higher than that of commercial PEDOT products, making it far more efficient for charge storage. What's even more remarkable is that the electrochemically active surface area of these PEDOT nanofibers is four times greater than that of traditional PEDOT. This increased surface area is crucial because it allows for much more energy to be stored in the same volume of material, significantly boosting the performance of supercapacitors.

Thanks to the new process, which grows a thick layer of nanofibers on the graphene sheet, this material now has one of the highest charge storage capacities for PEDOT reported to date — more than 4600 milliFarads per square centimeter, which is nearly one order of magnitude higher than conventional PEDOT. On top of that, the material is incredibly durable, lasting through more than 70,000 charging cycles, far outlasting traditional materials. These advances open the door for supercapacitors that are not only faster and more efficient but also longer-lasting, which are essential qualities for the renewable energy industry.

“The exceptional performance and durability of our electrodes shows great potential for graphene PEDOT's use in supercapacitors that can help our society meet our energy needs,” said corresponding author Richard Kaner, a UCLA distinguished professor of chemistry and of materials science and engineering, whose research team has been at the forefront of conducting polymer research for over 37 years. As a doctoral student, Kaner contributed to the discovery of electrically conductive plastic by his advisors Alan MacDiarmid and Alan Heeger, who later received a Nobel Prize for their work.

(Source: Sci Tech Daily / 01.04.2025)

### Beaulieu Fibres drives 'The Cleaner Car' with Lower Impact Plastics for Automotive Parts



With plastics making up 12-15% of a car's total weight, reducing their carbon footprint is essential for the future of sustainable mobility. As a leading supplier of advanced polymer fibres, Beaulieu Fibres is addressing this challenge, taking the next step in support of the automotive industry's transition to low-carbon materials.

To help Tier 1 and Tier 2 players, as well as automotive brands make informed material choices, Beaulieu Fibres now provides detailed CO<sub>2</sub> footprint calculations for polypropylene (PP) fibres used in automotive parts such as underbody shields, door panels, and parcel shelves. These cradle-to-gate lifecycle calculations follow the industry standards.

“When PP fibres are made from circular materials—whether bio-circular or recycled—they significantly reduce CO<sub>2</sub> emissions while maintaining the high - performance standards required in automotive applications,” says Gillis Beun, Business Development Manager at Beaulieu Fibres.

### Collaborating for Cleaner Cars

Beaulieu Fibres has been a trusted partner to the automotive industry for decades, supplying highquality raw materials for compression-moulded nonwoven parts. The company actively collaborates across the entire value chain—from Tier 3 suppliers to OEMs — to scale sustainable solutions that drive real impact.

“As raw material providers we have a dedicated Scope 3 program in place to drive sustainability efforts throughout the automotive supply chain,” adds Gillis Beun. “We invite all stakeholders to join us in developing cleaner, lower-carbon mobility solutions.”

For more information on Beaulieu Fibres' sustainable fibre solutions and CO<sub>2</sub> footprint calculations, please visit [www.beaulieufibres.com/thecleanercar](http://www.beaulieufibres.com/thecleanercar) or contact Gillis Beun, Business Development Manager.

(Source: Beaulieu International Group / 22.04.2025)

### BASF and Hagihara Industries Collaborate to Deliver Highly Durable Artificial Grass for Sports Fields

- Hagihara Industries uses innovative Tinuvin® formulations to enhance weather resistance and longevity of synthetic turf
- The turf with exceptional durability has been installed in the J-League football practice field in Okayama Prefecture, Japan
- Tinuvin® is an ideal choice for weather-resistant outdoor applications





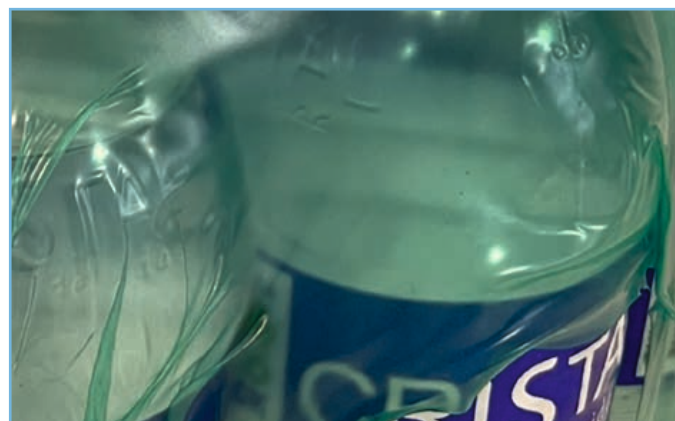
BASF, a global leader in chemical innovation, and Hagihara Industries, Inc., a leading synthetic fiber producer in Japan, have joined forces to develop highly durable polyolefin yarns for artificial turf used in sports arenas, including football stadiums, baseball fields, and tennis courts. After three years of collaborative research and development, the two companies have created an advanced formulation with a series of Tinuvin® grades that significantly enhances the durability of synthetic grass, making it less susceptible to damage from sun exposure and ensuring it retains its vibrant color.

BASF's range of light stabilizers are designed to convert UV rays into harmless thermal energy, serving as an umbrella to shield against the sun's damaging effects. Certain UV rays can attack polymers, compromising their strength and elongation. However, with the use of selected Tinuvin® grades, this radical reaction can be effectively prevented.

Hagihara Industries successfully incorporated the advanced formulation of these additives into their yarn manufacturing process, which resulted in the production of artificial turf that lasts up to 10 years. Fagiano Okayama, a J-League football club located in Okayama Prefecture, manages the company's exceptionally durable artificial turf on its practice field. The turf has been acclaimed for its quality.

As a trusted partner for innovation, BASF continuously pushes the boundaries of what is possible. Beyond synthetic turf, BASF's comprehensive range of light stabilizers offers versatile solutions for demanding outdoor applications, such as construction tarps, heavy-duty waterproof sheets and swimming pool covers. BASF's innovative solutions ensure that its partners in the plastics industry can deliver high-performance, durable and cost-effective products.

## Collation Shrink Films Containing PCR Unveiled by ExxonMobil and Partners



ExxonMobil has helped Plastilene and Reciclene develop collation shrink films with post-consumer recycled content, claiming to reinforce their strength and durability with its polyethylene polymer.

At the start of the process, Plastilene provided instructions and training to local waste collecting associations like Recitoc, which now collect and sort plastic residues to be sent to Reciclene.

"Our customers demand that films containing recycled content perform as well as those featuring virgin resin," said Ricardo Estrada, vice president of Sustainability & Global Procurement at Plastilene. "To accomplish this task, it is important to secure high-quality post-consumer content."

"For waste pickers, recycling has turned into a work opportunity where not only can it help change our life quality but also that of our families," added Recitoc legal representative Marcela Ramos. "One of the materials that has generated a positive impact to waste collectors is the plastic that is picked and sold to Reciclene."

At this point, Reciclene cleans and processes the recycled content, resulting in CICLOLENE PCR standardized resin. ExxonMobil's Exceed Stiff+ m 0238 polyethylene, part of its Signature Polymers polyolefin portfolio, is integrated into the recycled material to form collation film with recycled content.

According to 'extensive' testing at ExxonMobil's Technology Center, the polyethylene helps the final films maintain their mechanical properties, providing high holding force to support the implementation of PCR – all while aligning with local recycling regulations and broader industry standards.

The films have also been tested for tensile properties, haze and shrinkage with the ASTM D882, ASTM D1003 and Plastilene methods, respectively.

ExxonMobil also provided Reciclene with formulation suggestions, including a detailed analysis to characterize six different types of post-consumer recyclate and determine which was the most suitable for the application.

The collaboration sets out to prove that high-quality recycled content is compatible with flexible packaging without impacting its performance. It is believed to reinforce the industry's efforts to optimize resource efficiency, support local extended producer responsibility (EPR) requirements for brand owners and contribute to the Plastilene Group Sustainable Innovation Strategy Commitments.

The announcement comes after ExxonMobil worked with Alico and Kuraray to produce a high-performance shrink barrier bag for protecting fresh meats against oxygen and humidity without relying on PET or PVDC. The pack combines ExxonMobil's Exceed Tough+ m 0512 polymer with orientable EVOH grades from Kuraray's EVAL range to balance mechanical and optical properties in one solution.

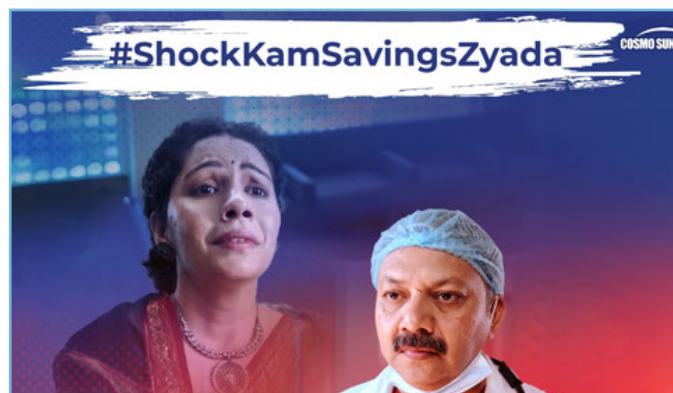
In other news, Borealis has just released a high-performance linear low-density polyethylene grade containing 85% post-consumer recyclate. Tailored for non-food blown film applications across primary, secondary and tertiary packaging, it is said to offer "exceptional" stretchability, low gel content and an "excellent toughness-stiffness balance".

(Source: Packaging Europe / 28.04.2025)

### **#ShockKamSavingsZyada – Cosmo Sunshield's New Brand Film Delivers on Electricity Savings This Summer**

Cosmo Sunshield, the premium window film vertical of Cosmo First Ltd. has unveiled their new brand film – #ShockKamSavingsZyada. With the upcoming summer season, electricity bills are all set to rise, and Cosmo Sunshield's new film provides the hack to overcome this and save some money. During summer, excess heat leads to frequent use of AC and coolers across home and office spaces. Cosmo

Sunshield's window films block the heat leading to reduced temperatures, thus easing the load on AC, and bring down electricity bills.



Source: Screen Print India

With a simple plot, the film centers on a narrative scene in a hospital environment. It starts with a scene depicting a concerned mother and daughter waiting at a hospital. This follows with a consultation between the mother and the doctor, who reveals the father is experiencing shock. Surprised and concerned, the mother seeks clarity behind this shock from the doctor. The film ends with a quirky twist where the doctor reveals an unexpected reason – Reduced electricity bills with application of Cosmo Sunshield window films.

Brand film link:

<https://www.youtube.com/watch?v=E3mJ3URbktE>

Speaking on the new brand film, Pankaj Poddar, Group CEO, Cosmo First said, "During summers, customers often bear the pressure of higher electricity bills. Cosmo Sunshield addresses this challenge directly with our advanced window film technology that demonstrably reduces the amount of heat entering through the glass while still letting light pass through and providing excellent visibility. Our new brand film is simple; one that the masses across the country can relate to. And through Cosmo Sunshield, we look forward to bring live this 'shocking' yet real benefit to our valued customers."

An increase in demand for energy-efficient solutions, such as those for a building's heating and cooling, is driving the window film market in India. Cosmo Sunshield's offering is a step towards catering to this market demand while keeping sustainability at its core.

## Introducing EvoFILL can compact from Sidel: More Quality, Less Space



Sidel presents EvoFILL Can Compact - a high-performance, versatile filling solution designed for premium beverage producers including beer and carbonated soft drinks.

The launch of EvoFILL Can Compact addresses the growing demand for flexibility, efficiency, and adaptability in the beer and carbonated soft drink sectors especially, within the low-to-medium speed production market (up to 40,000 cans per hour).

Global beverage production volumes are expected to rise, with the alcoholic beverage market reaching 492.1 billion units by 2028 [1], and non-alcoholic beverage packaging volumes projected to hit 1.3 trillion units by the same year [2].

Metal packaging remains a key material in both markets, with increasing consumer preference for smaller, portable cans that offer convenience and recyclability. As SKU proliferation continues to shape the industry, it's clear the need for filling systems capable of managing diverse product lines has become more critical.

“EvoFILL Can Compact extends the range of the well-known EvoFILL Can, offering a highly compact and efficient solution that meets the demands of low volume premium beverages market,” comments Tommaso Tegoni, Product Manager – Filling at Sidel. “Its ability to accommodate frequent changeovers with minimal downtime, coupled with advanced automation and modular design, ensures reliable, top-tier performance across both carbonated and non - carbonated beverages — including hot fill products—while maintaining speed and precision.”

This innovative system is designed to meet the growing need for high - quality, flexible filling solutions in the expanding beverage market.

### A compact, 'plug and play' design

The system features a 'plug and play' design, ensuring easy installation, operation, and handling. Its compact design combines the seamer and process unit into a single, space-efficient block, minimizing its footprint to overcome space constraints and optimize total cost of ownership (TCO).

### High - precision filling

With a high-precision filling accuracy of  $\pm 1$ ml standard deviation, up to 500ml format, the machine offers exceptional accuracy and minimal product losses (less than 0.1%). It is also highly versatile, supporting both CSD and hot fill applications. The EvoFILL Can Compact offers ambient temperature filling for carbonated soft drinks with limited CO<sub>2</sub> losses (less than or equal to 0.2 Vol).

Similarly, this latest can filling machine achieves an impressive 98.5% monoblock efficiency, ensuring seamless operation with minimal downtime. Designed for reliability and precision, it optimises productivity while maintaining superior quality in beverage canning.

EvoFILL Can Compact utilises electropneumatic technology with magnetic flowmeters for precise and efficient liquid measurement. Electronically controlled pneumatic valves regulate flow, ensuring smooth and consistent filling. This advanced system enhances speed, accuracy, and hygiene while minimising waste and maximising production efficiency.

Coupled with seamers integrated on the filler frame, this advanced can filling system ensures a seamless, efficient production process. The seaming machine is directly attached to the filler, allowing for immediate sealing of the can after its filled. This integration streamlines operations, reduces handling time, and enhances both speed and hygiene, resulting in a faster, more efficient production line delivering high quality beverages.

### Seamless changeovers

Changeovers are quick and easy, taking less than 25 minutes, thanks to an automatic height adjustment of the filling carousel. The integrated enclosure and roof, equipped with HEPA filters, are built into the



frame rather than being free-standing, contributing to increased machine compactness while maintaining high hygiene standards.

For effortless cleaning, automatic dummy caps are available, allowing the machine to be cleaned without human intervention, ensuring maximum product safety.

(Source: Sidel / 29.04.2025)

### Applying Sustainable Solutions to Golf Balls. SK Chemicals Applies Bio - Based Material ECOTRION to Srixon Golf Balls

- Applied ECOTRION to Golf Ball cover reducing carbon emissions by 30%
- Enhancing Golf Ball performance while meeting the value Driven consumer trend.



SK Chemicals (Seongnam-si, South Korea) announced that it has begun applying its biobased material ECOTRION to the 2025 Z-Star series golf balls from SRIXON, a global golf brand under Dunlop Sports Korea.

Dunlop Sports Korea is a global sports company that supplies a wide range of sporting goods to the Korean market, including products for golf, tennis, squash, and badminton. In particular, through globally recognized golf brands such as Srixon, XXIO, and Cleveland Golf, the company has established a strong position as a premium brand in the Korean golf market.

The New Z-Star Series, now featuring Ecotrion, is widely recognized for its reliability and is chosen by top global tour professionals such as Brooks Koepka and Hideki Matsuyama, as well as many players on the KPGA (Korea Professional Golfers' Association) Tour, including Choi Kyung-ju.

The material used in the New Z-Star Series is Ecotrion, a biobased polyol made entirely from 100% bio - derived ingredients. Ecotrion is characterized by excellent elasticity, resilience, and abrasion resistance, making it suitable for use in applications such as urethane and spandex. According to Dunlop's research lab, the contact time at impact for the New Z-Star Series, which uses Ecotrion in the ball cover, increased by up to 18% compared to the company's previous models.

Industry experts see the application of Ecotrion to the New Z-Star Series as achieving enhanced performance and alignment with the growing consumer trend toward value-driven consumption.

According to the company, the application of Ecotrion not only enhances golf ball performance but also aligns with the latest golf and leisure trends that emphasize value-driven consumption, including the environment. Through life cycle assessment (LCA), ECOTRION has been shown to reduce greenhouse gas emissions by 30% compared to conventional petrochemical-based polyol production processes.

SK Chemicals plans to actively expand into the sports and leisure market by leveraging ECOTRION's strengths – its excellent materiality and lower carbon emissions compared to petroleum-based alternatives.

A representative from Dunlop stated, “With global interest in sustainability on the rise, the golf industry is also making various efforts to reduce carbon emissions and improve environmental impact. The adoption of Ecotrion in the New Z-Star Series is part of our commitment to contributing to a circular society through the use of sustainable raw materials.”

Kim Eung-soo, Head of the Green Materials Business Division at SK chemicals, stated, “Biobased materials are one of the most powerful alternatives to petrochemical materials. By collaborating with various brands leveraging Ecotrion, we aim to build an ecosystem that delivers both high functionality and sustainability.”

### Exceptional Protection in a Sustainably Advantaged Coating

The PPG ENVIROLUXE™ powder coatings portfolio combines durability and sustainability for a versatile solution that meets diverse application needs. This

new suite of coatings is designed to combine performance and aesthetics with sustainability benefits, making them a preferred choice for businesses looking to enhance their products while supporting their sustainability goals.

PPG ENVIROLUXE Plus powder coatings are designed to meet a variety of application needs while providing substantial sustainability benefits. The coatings achieve up to a 30% reduction in carbon footprint compared to standard durable powders. This reduction is made possible by the elimination of polytetrafluoroethylene (PTFE) fluoropolymer and the use of post-industrial recycled plastic (rPET).

### ENVIROLUXE™ powder coatings

Available in a broad selection of standard and custom colors, including metallic options, these coatings allow for aesthetic flexibility without sacrificing performance.

- Per- and polyfluoroalkyl substances not intentionally added
- Specifically made without per- and polyfluoroalkyl substances



### Benefits

- Options formulated with post-industrial recycled plastics (rPET), without PFAS, or both
- Reclaimable and reusable overspray helps reduce material loss
- Low volatile organic compounds (VOCs) compared to traditional liquid coatings
- Maximize coating application with minimal waste

### Typical uses

- Interior office furniture, lighting fixtures
- Interior racking, signs, point of sale displays
- Exterior signage, racking
- Outdoor fencing and furniture
- Heavy-duty equipment and transportation

(Source: PPG)

### Borealis Introduces Renewables - Based Polymer Grade for Footwear Midsoles



- Borealis launches renewables-based ethylene vinyl acetate (EVA) solution developed specifically for footwear midsole applications.
- The new grade is part of Borealis' Borneewables™ portfolio of premium solutions made from renewable feedstocks, delivering virgin-quality performance while reducing reliance on fossil-based materials.
- The innovation is another example of how Borealis enables its customers to shift to circular solutions without compromising quality.

Borealis has introduced a renewables-based ethylene vinyl acetate (EVA) grade designed for footwear midsoles. EVA is a lightweight, foam-like material that provides comfort, cushioning and firmness, making it ideal for midsole applications. Part of the Borneewables™ portfolio, the new grade delivers the quality and durability required by the footwear industry—while enabling a midsole with a 45% lower carbon footprint than one based on traditional fossil-based materials. This innovative midsole

solution is a clear example of how advanced material solutions can enable the shift to a circular economy without compromising quality.

The Bornewables is Borealis' range of premium solutions that deliver the same material performance as fossil-based equivalents, but with significantly lower environmental impact. Feedstock is sourced entirely from waste and residue streams, including vegetable oil production residues, waste oils, and by-products from the timber and food industries. The entire portfolio is ISCC PLUS (International Sustainability & Carbon Certification) certified, ensuring full traceability from point of origin through the entire supply chain.

The first application of the new EVA grade is in a pair of lifestyle shoes by Swiss brand On, whose latest Cloud 6 model features a midsole made with the renewables-based material. The new midsole delivers the same comfort, cushioning, and durability the brand is known for, while significantly lowering the product's carbon footprint.

"We're pleased to support our customers in achieving their sustainability goals with this high-performance, renewable EVA solution," says Chris McArdle, Borealis Vice President Global Marketing. "This is one of the many ways we're reinventing essentials for sustainable living." The launch of the Bornewables EVA grade for shoe midsoles marks another step in Borealis' strategy to support its customers to advance circularity through collaboration and innovation.

## Groundbreaking Innovation for Liquid Sachet Packaging

In recent years, small sachet formats have received a lot of attention in the media for the environmental challenges they present. These small plastic envelopes are widely used to dispense condiments, sauces, personal care creams and many other liquid products. While they are convenient for the consumers, they are often highlighted for the issues that they create at the end of their life.

Estimates\* suggest that approximately 855 billion sachets were used globally in 2018. Most of these packs are produced with complex multi-layered packaging that can withstand the nature of the ingredients and preserve the products during the supply chain for their required shelf life. They are usually

produced from 3-layer structures including layers of polyolefin, aluminium and often polyester, making the packs extremely difficult to recycle as the components of the laminate structure are incompatible for recycling and not easily separated. Their very small size and the fact that they often remain contaminated by foodstuff, further add to the difficulties in recycling.



Compostable film producer Futamura, flexible packaging converter Repaq and machine producer GK Sondermaschinenbau have worked together to produce a compostable solution for this market segment. Today, they are delighted to launch a fully compostable solution based on NatureFlex technology for this application. This can wrap ingredients like ketchup or mustard, cooking sauces or hand cream, and includes a barrier cellulose film layer from Futamura as well as another biofilm to provide hermetic seals. The structures have been certified as compostable, both in industrial and home settings.

The new compostable packaging structures have been proven to make effective sachet solutions when produced on the newly designed GK Sondermaschinenbau machinery. The demonstration packs delivered have confirmed the required shelf life and protection for a range of sauces. The machineability of the new liquid sachet packs has been repeatedly proven, at scale, by the first brands implementing the compostable structure. There was no difference in efficiency when using this structure compared to a conventional one. That has been reported for all GKS machinery, whether small, medium or large.

Joachim Janz, Regional Sales Manager at Futamura stated: 'This home compostable liquids sachet packaging is indeed a really exciting launch. Ultimately, it means a perfect match to the request for offering a full portfolio of demanding food and non - food items to be packed in compostable



packaging choices. Small - portion sachets have always been the tricky ones for recycling, so this success in compostability is good news to be shared.'

(Source: FUTAMURA/07.05.2025)

### Elkhart Plastics, a Myers Industries Company, Introduces Vertical Water Tanks to Help Protect People, Property and Resources

AKRON, Ohio--(BUSINESS WIRE)-- Elkhart Plastics, a Myers Industries Company and recognized leader in rotational molding, introduced its new Vertical Water Storage Tanks—broadening its product portfolio and marking its entry into a new market.



Designed to protect people, livestock, crops and property, these vertical storage tanks support a wide range of commercial and residential water needs. From crop irrigation and livestock care to manufacturing processes and fire suppression, they provide reliable access to water—critical in regions facing water scarcity. The tanks also protect resources by enabling bulk water storage, well water collection and rainwater harvesting.

Elkhart's Vertical Water Storage Tanks have been engineered for durability and cost-efficiency, making them the ideal choice in many operations. Constructed from UV-resistant, FDA-approved high-density polyethylene, the tanks come with a 10-year limited warranty and currently are available in four sizes—1,000-, 1,500-, 2,500 and 3,000-gallon capacities—with more sizes planned.

The tanks also feature key design elements that enhance performance:

- **Multiple connection points** — risers and tie-downs with flat surfaces offer greater flexibility for additional fittings
- **Dual manway lids** — provide more flexibility for secure top-down access
- **Integrated air bleeds** — help maximize fill efficiency and minimize fill time
- **Tough tank top** — large radii and increased wall thickness safeguard against sun exposure

"The launch of our Vertical Water Storage Tank underscores our commitment to innovation, quality, and sustainability," said Cullen Jones, V.P. of Sales for Rotational Molding at Myers Industries. "As water becomes an increasingly precious resource, effective storage and conservation are vital to maintaining ecosystems, supporting human populations, and ensuring a sustainable future. These tanks demonstrate our dedication to delivering economically viable and environmentally responsible solutions to customers."

The Vertical Water Storage Tanks are available for purchase directly from Elkhart or through the company's dealer network.

(Source: Myers Industries/06.05.2025)

### Debut for Opel and for PLEXIGLAS®: The Grandland Electric is the First Series Model with an Illuminated Logo

- Confident revamping of the traditional Opel brand with innovative illuminated brand lettering
- Automotive supplier HELLA Lighting has integrated letters with a 3D effect made of PLEXIGLAS® molding compound into the center section of the multi-part rear light
- Brand PMMA from Röhm offers highest optical quality and excellent formability for illuminated emblems and lettering

The Opel “Blitz” lightning bolt glows white at the front, and brand name in signal red letters at the rear. The new Grandland Electric SUV is Opel's first series model to feature the new exterior design without chrome elements. Instead, the brand insignia are made from PLEXIGLAS® and are illuminated. With this illuminated lettering, parent company Stellantis is taking a definitive step in modernizing and electrifying this traditional German car brand.

Integrated into the slimline rear light strip that extends across the entire width of the vehicle, the OPEL lettering is discernible even from a distance. The lighting specialists at HELLA Lighting produce the multi-part rear light of the Opel Grandland Electric using PLEXIGLAS® molding compounds, the brand polymethyl methacrylate (PMMA) from Röhm. “It's a well-known material for us at HELLA. We know and appreciate the properties,” says Samuel Tomka, head of the Optical Development Department at HELLA Slovakia.

#### **A synergy of innovation, design and processing capabilities**

The three-dimensional lettering is injection-molded in one piece. The letters are approximately 30 millimeters high and long, and 10 millimeters deep. “The challenge is to achieve uniform thickness and avoid cracks and sink marks,” explains Tomka. “PLEXIGLAS® molding compounds have the potential to mitigate these risks to a minimum, so we can produce the lettering with the highest precision and ensure that the aesthetics and functionality meet the highest demands.”

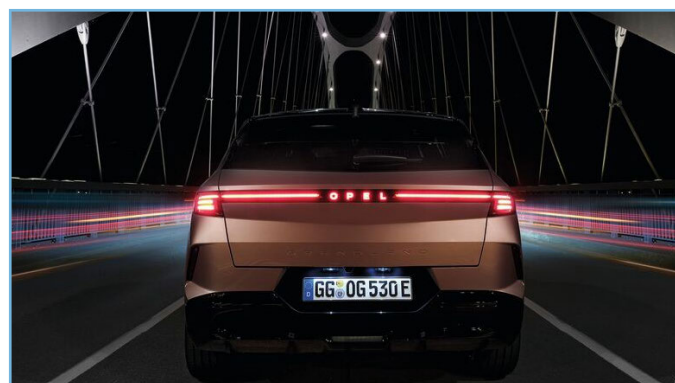
Rafal Czokow, Senior Business Manager in Röhm's Molding Compounds business unit, describes the characteristics of the molding compound used here: “This PLEXIGLAS® product is characterized by maximum optical purity and excellent light-guiding properties, as well as a high heat deflection temperature and mechanical stability, making it a great choice for use in vehicle lighting components. Thanks to its well - balanced melt viscosity, the molding compound is very well suited for injection molding and offers great freedom of design.”

#### **Targeted light extraction at the surface**

Since the lettering is part of the rear light, it has to comply with the international regulations for vehicle lighting. This is why the Opel brand name is also illuminated in signal red, the required color for rear

lights. The optical properties of the brand PMMA enable designers to create spectacular lighting effects: Thanks to a fine surface structure, the red light of the LEDs is emitted only through the front of the otherwise crystal-clear letters. In daylight, the Opel lettering stands out beneath the rear light cover thanks to its elegant 3D effect.

HELLA also produces the transparent cover from PLEXIGLAS® molding compound. This is because, in addition to its excellent transparency, the material also has excellent UV and weather resistance, and does not turn yellow over time. As a result, the signal colors required by the relevant standards are reproduced perfectly, and the Opel brand name is highlighted with sharp and crystal-clear brilliance.



All eyes on the brand – the Grandland Electric SUV is the first series model from Opel to feature an illuminated brand lettering, which HELLA Lighting produces from PLEXIGLAS® molding compound. © Opel

#### **PLEXIGLAS® offers great potential for interior lighting**

In Europe, illuminated emblems and logos on vehicle exteriors have only been allowed since 2023, and they are subject to strict requirements in terms of dimensions and colors. When it comes to vehicle interiors, however, lighting designers have virtually free rein. In his role at HELLA Lighting, Tomka has noticed that ambient lighting is increasingly coming into focus in automotive design, and that both the showcasing of the brand and customizable lighting scenarios are set to play a major role in future. “This opens up exciting new opportunities for us and relieves bonds from creative minds,” says the newly appointed Head of Program Management for Interior Lighting in the International Segment. And the right material is already at hand: With the broad portfolio of light-guiding and light-scattering PLEXIGLAS® molding compounds from Röhm, illuminated visions can become reality.

(Source: Röhm/06.05.2025)





## Borouge Set to Boost Production Capacity to Over 6.6 Million Tonnes



Borouge Plc announced a series of strategic asset expansion projects to accelerate its growth, contributing annually between \$165 million and \$200 million (AED600 million – AED730 million) in EBITDA.

The company has awarded two major contracts aimed at boosting the nameplate capacity of its second ethane cracker (EU2) and the fourth and fifth polyethylene units (PE4 and PE5). Linde Engineering has been awarded a contract for Front-End Engineering Design (FEED) services to upgrade Borouge's second ethane unit (Eu2) with an additional capacity of 230,000 tonnes per annum (tpa).

This strategic project is expected to increase the Eu2 cracker's capacity by 15 per cent, delivering significant financial gains upon completion in Q4 2028. Linde Engineering was selected for its expertise in design and execution, and its role as the licensor of the existing EU2 cracker. The ethane used as feedstock for the EU2 cracker is supplied by ADNOC Gas and ADNOC Refining, ensuring an integrated and reliable supply chain.

Borouge has also awarded Target Engineering Construction Company an engineering, procurement, and construction (EPC) contract for the expansion and refurbishment of its PE4 and PE5 production units, following a competitive bidding process. This enhancement will increase their nameplate capacity from 540,000 to 700,000 tpa each. Leveraging Borealis Borstar Polyethylene technology, the project is scheduled to be ready for start-up in Q1 2027.

Hazeem Sultan Al Suwaidi, CEO of Borouge, said, "By increasing production at our EU2, PE4 and PE5 units, as well as delivering the Borouge 4 mega project, we are strategically positioned for accelerated growth.

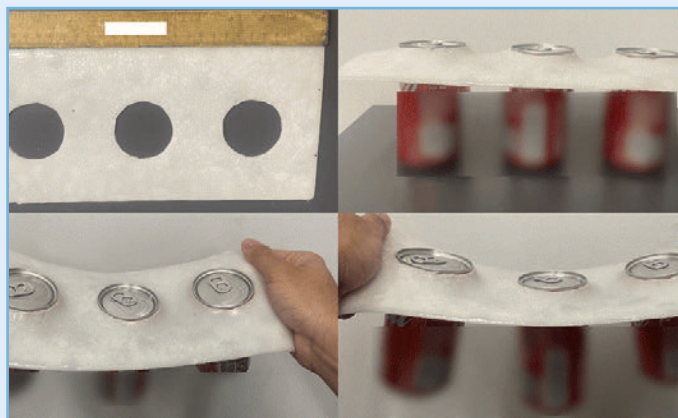
The expansions of our ethylene and polyethylene capabilities will enable Borouge to meet growing market demands, unlock new revenue streams, and further strengthen our global market position. These projects demonstrate our commitment to innovation, operational excellence, and sustainable growth."



Since 2001, Borouge has increased its annual production capacity tenfold, reaching 5 million tpa and positioning itself among the top five polyolefin producers in the Middle East and Asia Pacific. Together with the Borouge 4 mega project, these expansion projects, once fully ramped up, will increase the company's annual total polyolefins production capacity to over 6.6 million tpa by 2028. These projects are driving significant value to the UAE's economy through ADNOC's In-Country Value (ICV) programme, supporting economic and industrial growth. (ANI/WAM).

(Source: The Print / 28.04.2025)

### Seashell Material Transforms Plastics Pollution Fight



The Chung Lab's biocompatible plastic substitute can be used as a replacement for beverage holder rings. Image/Chung Lab.

Marine life may soon face far fewer deadly encounters with beverage rings and plastic bags thanks to an ingenious biomaterial developed by USC researchers. The team created a biodegradable plastic substitute using calcium carbonate—the same mineral that gives seashells their strength—combined with a citric acid polymer already approved for medical implants.

"I started thinking about how, even in our lab, everything is single-use plastic because everything has to be sterile. Nothing can be contaminated. It all just started to feel very overwhelming for me personally," said Eun Ji Chung, who led the research team at USC Viterbi School of Engineering.

The innovative material, called POC-CC, was developed by incorporating different concentrations of calcium carbonate into poly (1, 8-octanediol-co-

citrate), a biodegradable elastomer used in FDA-approved orthopedic devices. When tested in simulated ocean water over six months, samples lost up to 8.5% of their weight, demonstrating their biodegradability while maintaining sufficient strength for practical applications.

Unlike conventional plastics that persist for centuries and break down into harmful microplastics, the POC-CC material proved biocompatible with marine microorganisms. When a common marine algae was exposed to water containing POC-CC degradation products, researchers found no significant impact on cell viability—a crucial factor for any material intended for marine environments.

As proof of concept, the team successfully created a prototype beverage holder ring strong enough to support three soda cans weighing over 190 grams. This demonstrates the material's potential as a practical alternative to conventional plastics in real-world applications.

"Our results show the degradation rate increases with increased POC content, and the addition of CC maintains the pH of ocean water," Chung explained.

With UNESCO reporting that plastic waste constitutes 80% of all marine pollution—with 8-10 million metric tons entering oceans annually—this seashell-inspired innovation represents a promising step toward addressing one of our most pressing environmental challenges. The research team is now developing an improved version designed to degrade even faster, potentially revolutionizing how we package everyday products while protecting ocean ecosystems for generations to come.

### Fuel Independent Science Reporting: Make a Difference Today

If our reporting has informed or inspired you, please consider making a donation. Every contribution, no matter the size, empowers us to continue delivering accurate, engaging, and trustworthy science and medical news. Independent journalism requires time, effort, and resources—your support ensures we can keep uncovering the stories that matter most to you.

(Source: Science Blog / 02.05.2025)



## ENGEL and WINTEC Present New Injection Moulding Machines and Digital Systems at Plastics and Rubber Indonesia 2024

ENGEL's participation in Plastics & Rubber Indonesia 2024 marked another milestone in showcasing cutting-edge injection moulding technologies and digital solutions. The spotlight was on the ENGEL iQ weight control system and WINTEC's new machine lines. These advancements highlight ENGEL's commitment to smarter, sustainable production and its growing presence in Southeast Asia's manufacturing landscape.

ENGEL customers showed strong interest in the digital solution demonstrations such as the ENGEL iQ weight control - an intelligent software that optimizes injection volume and the ENGEL shopfloor monitoring - a digital system that monitors the entire machine park and provides transparency in production.

## B&R Presents AI - Enhanced Fitness Tracking for Machines

B&R presents AI-enhanced fitness tracking for machines Industrial IoT apps for machine health and performance

- AI-powered Industrial IoT apps support real-time optimization and predictive maintenance
- Containerized software enables open integration across edge and cloud environments
- Domain-specific AI analysis of machine data boosts availability, efficiency and equipment lifespan



B&R launches two Industrial IoT apps that enable AI-powered optimization of machine health and performance. Designed for open integration into any platform, IIoT Connector serves as the core enabler of data-driven services, providing flexible access to B&R device data across edge and cloud environments. Building on this data, ACOPOStrak Monitor applies AI-based analysis to support real-time performance optimization and predictive maintenance of B&R's adaptive product transport solutions.



"Many of us use smartwatches and fitness apps to analyze data from our body—our pulse, steps, and breathing—so we can stay healthy and perform better," explains Sridharan Rangarajan, Vice President and Global Product Group Manager for Software at B&R. "What fitness tracking is to the athlete, Industrial IoT solutions are to the machine." What's special about B&R's approach, notes Rangarajan, is how easy it is to turn data from B&R products into measurable improvements in productivity, equipment lifespan, and efficient utilization of materials and energy. "We wanted a solution that really works for our customers, so we've designed our IIoT solutions to fit friction-free into any platform and any system architecture."

**Connecting data to value:** When digital transformation projects struggle to deliver meaningful value, it's rarely due to a lack of data. Most often, it's due to the cost and complexity of accessing data and making sense of it. Or, as B&R IIoT expert Reinhard Achatz explains it: "Machines are already telling us everything we need to know, the key is finding the right way to listen and understand." That's the job of IIoT Connector, the new containerized app that gives users open and configurable access to data from B&R assets across any architecture—edge, cloud, or hybrid—in both new and brownfield installations.

With automatic asset discovery and selective data forwarding, IIoT Connector simplifies what were once complex, costly tasks. Built on open communication standards like OPC UA and MQTT, open edge orchestration frameworks like Margo, and with APIs to allow direct integration in third-party tools, IIoT Connector makes it easy to incorporate B&R device data wherever it is needed. More than simply providing access, IIoT Connector transforms complex, B&R-specific datasets into lightweight, standardized formats that are easy to manage within IT systems — making B&R data readily available for use in cloud environments and enterprise infrastructures. It also streamlines everyday operations with practical visibility into hardware configurations, software versions and available updates.

**AI-enhanced health and performance:** Building on the IIoT Connector, technology-specific software can apply contextualized analysis to help reduce downtime, improve asset utilization and extend equipment life. As the first such app from B&R,

ACOPOStrak Monitor combines B&R's deep domain expertise in track technology with advanced AI algorithms to transform data from B&R track systems into clear insights—helping operators move from reactive maintenance to proactive optimization.

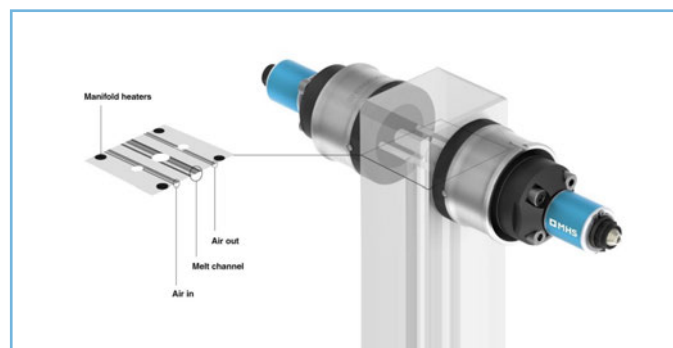
Live status, historical trends, and automatic notifications are presented in intuitive, user-friendly dashboards that can be viewed locally or remotely on HMI panels and mobile devices. "Like the dashboard in your car, ACOPOStrak Monitor tells you what you need to know at a glance—helping your track system run better and last longer," says Achatz.

The dashboards enable faster, more informed decisions throughout the life of the machine. Feedback during assembly and commissioning enables faster time to market. Condition monitoring and advanced diagnostics minimize downtime and extend component life. Like IIoT Connector, B&R's data-driven service apps are containerized and feature APIs to allow easy integration into any ecosystem. Importantly, ACOPOStrak Monitor derives everything it needs to know from existing shuttle data—no additional sensor hardware is needed.

(Source: B&R Automation)

## MHS to Feature New iVG™ 4 Hot Runners at K 2025

The updated design of the internal valve gate nozzles offers space-efficient, high-performance molding.



MHS Mold Hotrunner Solutions Inc., a global leader in hot runner technology, presents the innovative Rheo-Pro® iVG™ 4 hot runner program, designed to revolutionize injection molding efficiency. With a patented internal valve gate design, new fourth generation iVG™ nozzles allow manufacturers to build extremely compact molds, while maximizing



production capacity and profitability. New iVG™ series nozzles will be on display at K2025 in Germany from October 8-15 (Hall 1, Booth C40).

Space inside the mold is a valuable commodity, and Rheo-Pro® iVG™ technology offers a groundbreaking solution by enabling ultra-compact single face molds, back-to-back “short stacks,” and stack molds with an impressive tip-to-tip length of just 285mm and a pitch distance of 63.5mm. This space-efficient design provides tool makers and OEMs with exciting new opportunities to optimize mold layouts for applications such as single face molds, stack molds, rotating cube molds, and multi-material injection molds.

For injection molders, the benefits are substantial. The compact iVG™ hot runner system allows for stack molds that increase production output on smaller machines with lower clamp tonnage, resulting in reduced operating costs and improved energy efficiency. By producing more plastic parts per cycle in a smaller footprint, manufacturers can achieve significant cost savings while maintaining the highest levels of quality and precision.

The new Rheo-Pro® iVG™ 4 is the world's most compact internal valve gate nozzle. It is the only pneumatic valve gate hot runner that operates entirely without elastomeric seals, lubricants, or cylinder cooling. Unlike electric actuators, the iVG™ can operate at extreme temperatures of up to 400°C (750°F). The new nozzle series features an upgraded design, including a smaller valve pin diameter and more powerful internal actuation with a force of 140 psi (10 bar) air pressure, producing 90 lbs (400N) of valve pin closing force at the gate. This allows the iVG™ to process parts and materials that require a higher packing or hold pressure and time, typically required for thick-wall precision parts with semi-crystalline materials.

The new 2.5 mm diameter valve pins increase the flow channel and reduce melt pressure drop and melt shear. More valve pin closing force (by a factor of x2.5) increases the hold pressure up to 11,850 psi (817 bar), allowing for a higher melt density in the mold cavity for added part precision and less shrinkage.

New precision valve pin tip-guidance increases the lifetime of the gate and ensures perfect gate marks on the part surface.

The iVG™ 4's patented design completely rewrites the rules of valve gating technology and creates endless new possibilities, from high-cavitation to single-drop hot runner systems.

MHS remains committed to delivering cutting-edge solutions that empower manufacturers to stay competitive in today's demanding production environment. Discover how Rheo-Pro® iVG™ 4 hot runner systems can elevate your injection molding operations.

Craig Sandey GM of MHS says, “We launched the iVG series over 15 years ago. There is nothing like it on the market that can compete in terms of pure reliability and design flexibility.”

(Source: Plas & Pack / 11.04.2025)

## SACMI CCM64MD - Born to Perform

SACMI presents the CCM64MD, its most productive cap compression press to date. With its 64-cavity configuration, the CCM64MD achieves output rates as high as 2,850 caps per minute (or 171,000 caps per hour), boosting productivity by 50% compared to previous models.



### A winning press - mold combination

The first of a new generation of machines, the CCM64MD combines productivity, energy efficiency and user-friendliness.

Its development was driven by SACMI's cross-sector machine and mold expertise. The solution integrates SACMI Cool+® molds, optimized to bring out the full potential of the machine's performance, and has a cycle time of just 1.35 seconds: unmatched speed that improves on the previous record, also set by SACMI.

In addition to greater productivity, the machine-mold combination translates into consistent quality and reliability, reducing operating costs.

### +50% productivity, same footprint

Offering 50% higher productivity while still occupying the same floorspace, the CCM64MD is designed to keep pace with the ultra-high output capacity of bottling lines: this means a single machine (171,000 caps per hour) can feed up to 2 high-capacity lines (80,000 bottles per hour), providing a timely response to market demand for huge volumes.

### Simple, natively digital management

One of the distinctive features of the CCM64MD is that it delivers unrivalled performance without making management any more complex. The press introduces no new process variables, maintains the same operator interface and shares the same process logic as the previous CCM64M generation.

What has increased, though, is the precision of process control: this further advantage stems from the new SmartPack 2.0 release, a cutting-edge hardware/software kit that proactively monitors all key process parameters such as extrusion, pellet insertion in the cavity, mold control and thermoregulation.

The result: maximized Overall Equipment Effectiveness (OEE), greater line availability and a drastic reduction in the need to intervene on either the machine or the process.

### Up to 15% less consumption

On the consumption front, the CCM64MD sets a new industry standard. Output remaining equal, specific consumption is up to 15% lower compared to the previous generation of machines, settling at 0.43 kWh per kilogram of HDPE processed. Environmental impact has also been softened, with each installed press saving approximately 8 tCO<sub>2</sub>eq per year compared to the previous model under the same operating conditions, thus making a substantial contribution to the industry's sustainability goals.

### Integrated CVS systems for process control

Like all SACMI presses, the CCM64MD incorporates CVS vision systems, developed and produced in-house. These let manufacturers prevent non-conformities by interpreting the huge amounts of data harvested during optical checks.

SACMI CVS improves manufacturing immensely by shifting product quality control towards process quality control.

## Plug - and - Play SCARA Robots Join B&R Codian Lineup

### Machine - centric handling for speed and precision in a compact footprint

- New SCARA models enable easy and compact mounting, including under cleanroom conditions
- Availability as open robot mechanics allows full design flexibility for third-party integration
- Optional integration in machine control allows seamless engineering and tight synchronization

With the new Codian SR, B&R adds SCARA kinematics to its Codian portfolio of open robot mechanics and integrated Machine-Centric Robotics solutions. The new series offers high-speed articulated movement with four degrees of freedom – perfect for tasks like pick-and-place, loading and unloading, assembly and dispensing that demand both speed and repeatability on a compact footprint.

Complementing the existing Codian delta lineup, the new SCARA models extend the range of applications to include high-speed handling with a lateral offset or overhead mounting restrictions. They are particularly easy to install on a small footprint alongside linear and planar product transport systems and handle payloads ranging from 3-65 kilograms with exceptionally high repeatability. The Codian SR lineup includes clean room qualified models that provide compact high - performance handling with undisturbed airflow in sensitive environments like semiconductor or pharmaceutical production.

To ensure maximum flexibility, B&R Codian SR models – like their delta cousins – are available either as open robot mechanics or together with B&R controls and software as an integrated Machine-Centric Robotics (MCR) solution. "Our MCR solutions make robots a plug-and-play part of the machine – physically, logically, and operationally," explains Dario Rovelli, B&R's global product group manager for mechatronics.



# CIRCULAR ECONOMY/ BIO-PLASTICS/ RECYCLING



## Emirates Biotech Appoints Samsung E&A as Contractor for PLA Plant

The plant, which will be built in KEZAD in Abu Dhabi, will start operations in 2028.



Marc Verbruggen, CEO of Emirates Biotech and Hong Namkoong President and CEO of Samsung E&A sign the pre-EPC contract for Falcon PLA Project.

Dubai-based Emirates Biotech announced that it has selected Samsung E&A as the contractor for its upcoming Polylactic Acid (PLA) production plant in KEZAD free zone in Abu Dhabi.

The company said in a press statement that the South Korean company will oversee all engineering, procurement, and construction (EPC) work for the Falcon PLA project, which will produce biodegradable and environmentally friendly plastic alternative.

The pre-EPC contract, covering the initial phase of the collaboration, was signed on 14 April 2025.

The PLA plant, which will use technology from Sulzer, is scheduled to start operations in early 2028, the statement said.

In December 2024, Zawya Projects had reported that the new plant will be developed in two phases, each with an annual capacity of 80,000 tonnes, for a total production of 160,000 tonnes per annum. The project will have an overall investment of approximately \$800 million, split over the two phases.

The report also noted that the plant's output will be sold in the UAE, Saudi Arabia, Oman and Kuwait as well as India, Turkey and Europe.

Emirates Biotech is a joint venture between UAE-based SS Royal Kit Emirates Investment and Hong Kong-based Global Biopolymers Industries (GBI).

## Polykar Leads PolyVie, a Collaborative Recycling Initiative with Saint - Laurent Businesses

Businesses in the Saint-Laurent borough are joining forces to develop new solutions for reusing plastic waste, helping to advance the circular economy. Leading the charge is Polykar, a world - class,



innovative sustainable packaging solutions manufacturing company, which has officially launched PolyVie, an ambitious pilot program aimed at transforming plastic waste from local businesses into reusable resources.

The initiative brings together five leading organizations, including:

- **EssilorLuxottica:** Known for its optical lenses, iconic eyewear brands and vision care products.
- **Majestic International:** Manufacturer of men's innerwear.
- **Moneris Solutions Corporation:** One of Canada's leading providers of commerce solutions.
- **STANPRO:** Canadian leader in the field of lighting, offering innovative and energy-efficient products.

"PolyVie is much more than a recycling program; it's concrete proof of the power of local collaboration. By bringing together Saint-Laurent businesses, we're demonstrating that sustainability starts at home. This initiative transforms plastic waste into opportunity, setting a new standard for how communities can work together to advance the circular economy in tangible ways," said Amir Karim, President and CEO of Polykar.

### Transforming a vision into impact

The program has achieved an impressive 96% recycling rate, diverting thousands of pounds of plastic waste from landfills and repurposing it at Polykar facilities to create new products. By sourcing plastic waste locally from businesses, the initiative encourages a community effort to address environmental challenges. While still in its early stages, the program's success highlights the immense potential of collaborative sustainability efforts.

Moneris was the first partner to join this initiative, recognizing the importance of integrating sustainability into its operations.

STANPRO also played a crucial role, helping to build momentum for the initiative.

### Collaboration at the heart of the initiative

The initiative was born thanks to the support of Excellence industrielle Saint-Laurent and its sustainable development team, which facilitated synergies between Laurentian industries producing plastic waste, who wanted to give it a second life, and Polykar, which offered a solution.

### Join the movement

Polykar invites other organizations to participate in PolyVie and contribute to the transition to a more sustainable future. For more information about Polykar, the PolyVie initiative, or to learn how to get involved, please contact the person below.

(Source: Polykar / 15.04.2025)

### New Plastic Recycling Method Achieves Cost - Parity with Virgin Plastic

Single-use plastic might just be the most insane act of collective self-harm humanity commits every single day.

Each year, the United Nations Environment Programme estimates that we discard a staggering 400 million tonnes of plastic waste—a grotesque leap from just 2.1 million tonnes in 1950. At this rate, we're on course to triple plastic pollution to over a billion tonnes annually by 2060, according to the environmental news site Earth.org. All of this is fueled by relentless production and shoddy waste management.

Our track record is dire. Around 60% of plastic waste is dumped in landfills or the natural environment, according to the British waste management company Business Waste. Only 15% gets recycled; 17% is incinerated; and over 22% is littered directly into ecosystems. Plastic doesn't biodegrade in any meaningful way—it fractures into toxic micro- and nanoplastics that contaminate everything from Arctic snow to deep-sea trenches.

The consequences are grim. Plastic pollution drives biodiversity loss, killing an estimated 100,000 marine mammals, as estimated by the nonprofit Surfers against Sewage, in addition to one million seabirds every year. Microplastics are now found in human organs—livers, kidneys, even placentas—and plastics leach chemicals linked to cancers, developmental disorders, and immune dysfunctions.

Faced with this slow-motion catastrophe, how can we step up to turn the tide? And why hasn't more been done to treat plastic pollution like the human health and ecological crisis it is?

### The Entrepreneurs Fighting the Plastic Pandemic

Samantha Anderson, Co-founder and CEO of DePoly, was plagued by these questions during her PhD when she read about microplastics being discovered inside human bodies. "We noticed no one was offering a complete solution to the problem," she told me in an interview. "The recycling industry, especially the oil sector, had been misleading people for decades about what plastic recycling could actually achieve."

Investigations by NPR and PBS Frontline, among many others, revealed a chilling truth: plastic manufacturers knowingly sold the myth of recycling, all while cashing in on virgin plastic sales. As one former industry insider told NPR, selling recycling sold plastic, even if it wasn't true.

Global giants like Coca-Cola, Nestlé, PepsiCo, and Starbucks have been repeatedly identified by journalists as top plastic polluters. Despite some virtue signaling in the form of flashy green pledges, genuine action has been slow, dubious and patchy.

So Anderson and two fellow PhD students decided they wouldn't wait for the system to fix itself. With backgrounds in chemistry, they set out to engineer a new chemical recycling method. Within six months, they cracked it—and DePoly was born. "We started scaling up from there," Anderson recalls. "What began as a tiny side project is now a company of over 40 people."

### Breaking the Recycling Barrier

What sets DePoly apart is their ability to tackle the types of plastic waste that conventional methods can't touch: dirty, complex, multilayered materials like household waste, textiles, and post-industrial scrap. Traditional mechanical recycling can't handle this mess; DePoly's low-cost, low-energy chemical process can.

Using safe, everyday chemicals—nothing exotic or dangerous—their technology recycles PET, polyester, and more, achieving what the startup

itself estimates is a 65% lower CO<sub>2</sub> footprint compared to producing new plastics from fossil fuels, all while rescuing many tons of plastic from landfill.

And crucially, DePoly's recycled materials aim for cost parity with virgin plastics—a game-changing milestone.

"Packaging is an enormous, cutthroat industry," Claire Hae-Min Gusko, founder of sustainable packaging innovation company onefive, told me in an interview. "Margins are razor-thin."

Big brands answer to shareholders who demand quarterly growth. Already, many major companies are quietly abandoning their sustainability goals: "and shareholders don't seem to mind," she adds. "If anything, they're willing to accept it if it means growth continues. It's a harsh truth about the state of our capitalist markets, but it's a reality. Sustainable packaging has to be affordable; there's no way around it."



### From Lab Bench to Global Impact

With the promise of offering both cost-parity and sustainability, DePoly is ready to compete with virgin plastic and has a scale-up journey that is both methodical and ambitious. They are currently building a pre-commercial plant to serve as a blueprint for full industrial facilities. Their first commercial plant is slated for 2027–2028, targeting markets in Europe, North America and potentially Asia.

Anderson still marvels at the scale of progress. "Seeing something that started as a 400-milligram lab sample now operating in a massive warehouse—it's surreal. It's amazing to see a vision we dreamed about actually come to life," she says. "It's been incredibly rewarding to bring in new team members who fully embraced the challenge and push the process even further than we imagined."

Location choices are strategic, factoring in local waste streams, regulatory landscapes, and economic incentives. And everything is geared toward one goal: mass-market competitiveness.

Chemical recycling is no silver bullet—but it's a huge leap forward. "It's the logical next step after mechanical recycling," explains Hae-Min Gusko. "Chemical recycling can create higher-quality materials, closing the loop for plastics that would otherwise end up as trash."

Still, challenges remain. Infrastructure investment, political will, and public awareness all lag behind. The waste industry already struggles with tight margins and tricky feedstocks; "for chemical recycling to become a significant part of our recycling rates in the next 5-10 years, a huge amount of infrastructure investment and change will have to take place in the waste industry," she adds.

### Fueling the Recycling Revolution

DePoly recently closed a \$23 million funding round led by MassMutuals Ventures, making it one of Europe's top-funded recycling tech startups. The company is fully focused on converting plastic waste into virgin-quality raw materials without fossil fuels.

Yet, for all the innovation that is possible, change won't come overnight. Change is often dependent on governments pushing industry through regulation.

"Industries are trying to improve, but it's slow," says Anderson. "Still, the trends are in our favor. Regulation is tightening. Consumers are demanding better. Companies are actively looking for real solutions."

European regulations, like the Green Deal and the new Packaging and Packaging Waste Regulation, are poised to reshape markets, forcing companies to prioritize recyclability and recycled content. For sectors like hospitality, additional rules under the Single-Use Plastics Directive will drive shifts toward reusable containers and natural polymers.

"The world of packaging is not a mystery: its future is being written by government policies and regulations such as the EU Green Deal," explains Hae-Min Gusko. Looking at the EU alone, a closed-loop technology such as DePoly's fits well with the EU's vision for the future of its waste infrastructure."

"By 2028, we'll know whether these policies have had the expected impact," explains Hae-Min Gusko. "If they have, it'll be a turning point not just for Europe, but globally. Key markets in Asia, like Japan and South Korea, are already following similar regulatory paths."

### The AI Accelerator Changing Global Businesses

One wild card accelerating change? Artificial intelligence.

AI is already transforming industries by boosting efficiency, but packaging and materials development remains a massive challenge due to its complexity and deep-rooted expertise, says Hae-Min Gusko.

Her AI platform aims to change that - using AI to design new packaging solutions and move directly to mass production, skipping the costly, time-consuming testing loops—"It may sound ambitious, but with AI evolving rapidly, we believe it's within reach."

Anderson is optimistic but clear-eyed about the road ahead: "The tipping point will come from making recycling cost-competitive and giving waste real economic value."

"We're close," she says. "We just need that final push."

With the world drowning in plastic and big polluters under mounting pressure, solutions like chemical recycling can't come fast enough. Whether policymakers, investors, and industries move quickly enough to seize the moment will define the future health of our planet.

Time, after all, is running out.

(Source: Forbes/29.04.2025)

### kp Elite® Trays Achieve Groundbreaking TCEP Endorsement, Setting a New European Benchmark for Recyclability!

Klöckner Pentaplast (kp), a global leader in rigid and flexible packaging and specialty film solutions, has achieved Tray Circularity Evaluation Platform (TCEP) endorsement for its flagship kp Elite® range of modified atmosphere packaging (MAP) trays, as the platform cements its position as Europe's leading benchmark for PET tray recyclability assessment.



TCEP, an independent industry association focused on PET thermoforms is a PETCORE initiative, which is rapidly emerging as the definitive authority on Design for Recycling (D4R) in food packaging trays. The platform's stringent evaluation criteria are already helping shape upcoming Packaging and Packaging Waste Regulation (PPWR) legislation.

"We're excited to have gained TCEP endorsement for kp Elite<sup>®</sup>," said Paul Rawlings, Launch Manager at kp Food Packaging.

"TCEP represents the most comprehensive and practical testing protocol available for assessing PET thermoform recyclability. The organisation's technical expertise and rigorous evaluation process makes it the clear choice for validating packaging designs that will truly support a circular economy.

kp Elite<sup>®</sup> is made with up to 100% recycled post-consumer PET (rPET), which is recyclable, and we also systematically include kp Tray2Tray<sup>®</sup> PCR content.

This TCEP endorsement is particularly significant for kp's Tray2Tray<sup>®</sup> initiative, which aims to close the loop on PET tray recycling by recovering post-consumer PET trays and recycling them into new, food-safe packaging. With an estimated one million tonnes of PET trays produced annually in the EU, but only 5% currently recycled back into food-grade trays, TCEP endorsement helps to validate the circularity potential of kp's fresh and innovative approach to closing the tray loop."



Two other innovative solutions from kp have recently received TCEP endorsement as compatible with current European PET recycling streams. kp MonoSeal<sup>®</sup>, a mono PET rigid film with enhanced sealing performance for challenging fresh food applications such as sliced cheese and processed meats, contains up to 80% post-consumer recycled

content. Additionally, kp HotFill<sup>®</sup>, a fully transparent mono PET film designed for hot filling applications up to 90°C with up to 50% recycled content, has also achieved TCEP endorsement.

The TCEP platform brings together technical experts in PET production, design and recycling through its Technical Committee, which is establishing and evolving test procedures while providing confidential assessments of new technologies. This comprehensive approach makes TCEP endorsement particularly valuable for food brands and retailers looking to validate their packaging choices against upcoming PPWR requirements.

(Source: Klöckner Pentaplast Group/ 09.04.2025)

## Global Plastic Recycling Rate 'Stagnant' at 9%: Study



Plastic waste in a landfill in Gorakshep, Sagarmatha Region, Nepal on Oct. 12, 2024. Mailee Osten-Tan / Getty Images

New research has found that the amount of plastic waste being recycled globally has remained "stagnant" at nine percent, with most new plastic continuing to be made from fossil fuels.

The plastic recycling rate in the United States is even lower at just five percent.

"Plastics are one of the most ubiquitous materials [on] our planet, owing to their versatility, durability, and relatively low cost. The global demand for plastics has quadrupled over the past decades and it is projected to double by 2050, resulting in severe impacts on the environment and human health," the authors of the findings wrote.

Researchers from China's Tsinghua University said the recycling rate had hardly changed, while plastic production has grown, resulting in a “pressing global environmental challenge,” reported AFP.

The findings come as the Intergovernmental Negotiating Committee for the global plastic treaty prepares to meet again in August following the failure to reach an agreement during the last round of talks.

The annual production of plastics worldwide has experienced a yearly growth rate of 8.4 percent — from two million metric tons in 1950 to 400 million in 2022, the study found.

“Plastic has become an integral part of our lives. Addressing the global environmental concerns of plastics requires a comprehensive analysis along the whole supply chain,” the authors wrote. “Our findings suggest that plastics are subject to geographical concentration, with feedstocks concentrated in oil-resource rich countries and processing in countries with large manufacturing capacity... Income disparities among countries diminish in the context of plastic waste imports, reshaping the global plastics trade patterns. Uncovering the complex plastic supply chain is crucial for reducing pollution and promoting sustainable plastic management.”

For the study, the research team examined international databases, national statistics and industry reports to put together the first detailed analysis of the world's plastic sector from manufacture to disposal, AFP reported.

The team provided a material flow analysis for plastics linked to global trade in 2022. That year, trade of plastics worldwide was 426.7 million tonnes, with final products accounting for 111 million tonnes.

The researchers found that there had been a major shift in waste disposal, with landfill use decreasing to 40 percent, incineration being used 34 percent of the time and global recycling remaining steady at nine percent.

The authors said that burning plastic was “emerging as the most practiced method for managing plastic waste,” with the world's highest incineration rates found in Japan, the European Union and China.

Plastics not made with recycled products were produced using fossil fuels — mostly from oil and gas — illustrating what “little progress has been made to reduce the reliance of fossil-fuel feedstocks for plastic production,” the authors wrote in the findings.

“The high reliance on fossil - fuel feedstocks for plastics production will further compromise the global efforts to mitigate climate change,” they added.

Food contamination and labels on plastics made some harder to recycle, while the complexity and diversity of additives in plastic materials was another obstacle.

One of the biggest roadblocks to plastic recycling is that making new plastic is often less expensive than recycling it.

“This economic barrier discourages investment in recycling infrastructure and technology, perpetuating the cycle of low recycling rates,” the authors wrote.

They noted “the significant role” of informal recycling, which could impact the overall recycling rate.

“Informal plastic recycling in the African continent and in other developing countries plays a critical role in waste management, offering both benefits and posing significant challenges. Such waste management practices are often characterized by small-scale, unregulated operations and they provide livelihoods for millions of people,” the authors wrote.

They explained that the informal burning of plastic — primarily in poorer countries where there are no alternatives — worsens air quality, spreads plastic in the environment and exposes workers to toxic chemicals.

“Despite their economic and environmental benefits, informal recycling practices often occur under hazardous conditions that expose workers to health risks from toxins and pollutants,” they said.

The findings, “Complexities of the global plastics supply chain revealed in a trade - linked material flow analysis,” were published in the journal *Communications Earth and Environment*.

(Source: EcoWatch/ 14.04.2025)

## Garbage Bag Giant Fined \$8.25m for Falsely Claiming Products were Recycled Sea Plastic

The company behind GLAD garbage bags has been fined \$8.25m for falsely claiming the products were made from recycled ocean plastics.

The Australian Competition and Consumer Commission took Clorox Australia to the federal court over the misleading claims made between June 2021 and July 2023.

Clorox had marketed and supplied the kitchen and garbage bags as being made from 50% recycled plastic waste collected from the ocean or sea.

Instead, the bags were comprised of recycled plastic that had been collected from communities in Indonesia situated up to 50km from the shoreline.

Clorox sold more than 2.2m bags during the offending period, with the price for each item generally higher than its standard range of household kitchen bags.

The company discontinued supply after the consumer watchdog started investigating and the products are no longer supplied in Australia.

Clorox admitted the "50% ocean plastic recycled" claims displayed on the bag packaging were misleading and worked with the ACCC to reach an agreed penalty.

Federal court judge Penelope Neskovic enforced the \$8.25m fine on Monday after finding Clorox had engaged in greenwashing.

"The (misleading claims) deprived consumers of the opportunity to make informed purchasing decisions, free from the false impression conveyed," the judgment read.

"Consumers might have purchased alternative products, including from Clorox's competitors, and may have purchased products that offered substantiated environmental benefits or that were cheaper."

The judge accepted that while the conduct was serious, it was not the most serious case of environmental misrepresentations.

"Clorox genuinely believed the products would contribute to the reduction of plastic waste in the ocean and did not deliberately engage in a strategy to mislead consumers," the judgment read.

Justice Neskovic noted Clorox had discussed recycled plastics with its supplier Oceanworks and considered "ocean-bound" plastics to be a kind of ocean plastics.

But the judge determined the company knew the recycled plastics were not collected or recovered directly from the ocean or sea.

As part of the penalty, Clorox will have to pay \$200,000 of the consumer watchdog's legal costs and publish a corrective note, explaining the offending and apologising to consumers.

A Clorox Australia spokesperson said the company took seriously its obligations to package and market products with accurate claims.

"We respect this outcome and see this as an opportunity to further enhance our practices and reaffirm our commitment to offering products that help reduce environmental impact and meet consumers' evolving needs," the statement read.

(Source: The Guardian/ 15.04.2025)

## Plastics are Greener than They Seem

Even if the world needs to become much better at managing their waste



Michael Phelan, a famous billiards player and supplier, lamented in 1858 that the growing popularity of the game had made the ivory needed for the balls scarce and costly. "If any inventive genius would discover a substitute", he wrote, "He would make a handsome fortune for himself, and



earn our sincerest gratitude." Five years later, Phelan's company offered a reward of US\$10,000 (about US\$250,000 today) for anyone who could do just that. The result, after some tinkering, was celluloid—the world's first major synthetic plastic.

Though he never claimed the prize, John Hyatt, the inventor, was indeed richly rewarded. Ever since, the world has had an almost insatiable hunger for plastics. This is because plastics' structure—made up of repeating molecular units called monomers, which can be combined and arranged in an enormous variety of ways to form polymers—meant that they could be used to replicate the properties of almost any other material. They could also improve on it: becoming lighter, more durable, cheaper or easier to manufacture.

Their impact has been stunning. The ability to ship goods much more efficiently—and perishables more safely—allowed supply chains to stretch across borders, then oceans. In 2000, some 234 million tonnes of plastic were produced. By 2021 annual production had roughly doubled, with the trade in plastics (and goods containing it) estimated to be worth US\$1.2 trillion (S\$1.6 trillion) each year.

Without plastics the modern world would look decidedly different. Plastic packaging is significantly lighter than other materials—the weight of a one-litre plastic bottle is just 5 per cent that of a glass one; a paper bag is nearly six times heavier than a plastic one (and takes three times as much energy to produce). Using cans or glass bottles for soft drinks results in greenhouse-gas emissions two and three times higher respectively than using plastic, even taking recycling into account.

### **Cascade Recycling: the Key to a Circular Economy for Plastics**

Justin Wood, Vice President and Head of Europe, Middle East & Africa of the Alliance to End Plastic Waste, explains why cascade recycling is the best method for creating a circular plastics economy.

Touted for its versatility, durability, convenience, and cost-effectiveness, plastic has now become ubiquitous in contemporary society, used as an essential material in wide-ranging sectors spanning packaging, construction and healthcare among

others. Yet its usage has resulted in 360 million tonnes of plastic waste generated annually, with much of the ensuing waste improperly managed and left unrecycled.



Unmanaged plastic waste poses a significant global environmental challenge, often remaining uncollected, leaking into the environment or being dumped in landfills.

Key to tackling the plastic waste problem is making the fundamental shift from a linear 'take-make-dispose' model to a circular one. Alongside reduction, reuse, and refill strategies, recycling is the engine that will drive the transition to a circular economy, allowing existing materials and products to be kept in circulation and in use to the fullest extent.

Recycling is a process that produces new products or packaging from plastic waste. An optimal recycling system aims to maximise recycling rates, retain the value of materials and reduce carbon footprint. Among the many different technologies that exist today, recycling is often broadly categorised into mechanical or chemical recycling.

However, no single recycling solution is optimal. Instead, a sequence of multiple technologies is what will get us closer to circularity. Termed 'cascade recycling', various technologies and methods are employed – mechanical, chemical, closed-loop, open-loop, downcycling and upcycling – one after another sequentially to retain materials at the highest level of quality and economic and environmental value for as long as possible.

### **Closed-loop recycling**

Currently, the most established form of recycling, mechanical recycling, is the process by which plastic waste is converted into recyclates without

significantly altering the chemical structure of the material. It is by far the most cost-effective, environmentally friendly and accessible form of recycling, reaping significant environmental benefits as compared to other recycling solutions.

For instance, studies show that by avoiding the production of virgin materials, mechanical recycling saves around 1.4 to 2.1 tonnes of carbon dioxide per tonne of plastic recycled. In addition, under ideal conditions, mechanical recycling can process plastics like PET bottles back into new bottles and into high-value textiles in certain situations.

Originally a supply chain concept, a closed loop supply chain aims to reuse or recycle materials in the manufacturing process, thereby reducing or even eliminating waste. Adopting this to a broader context, a closed loop can be taken to mean recycling back to a similar quality as the original material, in which the product is able to be used again in the original or in an equally demanding application.

Despite being the ideal recycling choice, closed-loop recycling has its limitations. The inadequate segregation, collection and sorting of used plastic can impact the availability of high-quality feedstock. This can be attributed to several factors. For one, waste management still poses a significant challenge – to date, 2.7 billion people still do not have their waste collected, with many less-developed countries often having little to no waste segregation at source or post-collection.

At the same time, the presence of different types of plastics, mixed grades of the same plastic, and organic contamination also compromise the quality of the plastic available. All of these hinder the use of closed-loop recycling, thereby contributing to the insufficient supply of quality feedstock. Some plastics also degrade after each round of the recycling loop and after three to ten cycles, are no longer fit for purpose.

### **Open-loop recycling**

Where quality is compromised, the used plastic can be mechanically recycled into a lower quality application – a process known as 'downcycling' – creating products that do not require the highest grades of plastic, such as garden furniture, basic construction materials, and textiles.

Although not as economically and environmentally effective as closed-loop recycling, the open-loop method still offers economic value and a reduction in carbon footprint in comparison to producing new virgin plastic or sending the plastic to landfills or to waste-to-energy facilities. What makes downcycling a practical option is the long life cycle for these applications, where the carbon that is used to manufacture the product is contained rather than released into the atmosphere for a period of time.

However, much like closed-loop recycling, open-loop recycling still faces scalability issues due to the challenge of finding markets that are large enough to take on all the production, even if feedstock was readily available. In addition, mechanical recycling cannot be carried out indefinitely – that is, once the quality of the plastic deteriorates to the point when the quality of the downcycled product is no longer acceptable.

### **Chemical recycling**

From pyrolysis and gasification to depolymerisation, various chemical recycling technologies are being developed, offering solutions to different recycling challenges. By accepting different streams of clean plastic waste, including degraded plastics, chemical recycling technologies can break down or depolymerise a plastic product back to a raw material. The raw material can then be used to replace fossil feedstock, producing plastic of virgin-like quality – which helps in meeting the need for more demanding applications such as for food or medical use.

However, chemical recycling typically entails a higher carbon footprint and operating cost than closed-loop or open-loop recycling. Taken in this context, it can be argued that chemical recycling should only be deployed when mechanical recycling options have been exhausted. Therefore, as part of the recycling technology mix, it is important to determine which chemical recycling solutions are the most appropriate choice for different types of plastic waste, ensuring that its overall environmental footprint is commensurate with the gains in material circularity.

### **Cascade recycling**

While the recycling debate is often framed in terms of mechanical versus chemical methods, it is clear that there is no one optimal solution. Instead, a series

of complementary recycling technologies should work in tandem to ensure further gains in material circularity, allowing the plastic to be recycled over and over to maintain the quality of the recyclate and to keep the material in circulation for the maximum amount of time possible.

Defined as 'something arranged or occurring in a series or in a succession of stages so that each stage derives from or acts upon the product of the preceding', the notion of "cascade recycling" is exactly what a "cascade" is – a series of recycling methods carried out in sequential order. Think of recycling as a cascade of quality and value, where mechanical recycling should be the first option in the cascade. Once all the possibilities for mechanical recycling have been exhausted, then chemical recycling can come in as the final step of the cascade, upcycling the material back to virgin quality.

To illustrate how cascade recycling works, let us look at the journey of a PET beverage bottle. Mechanical recycling is well-established and should be utilised as the first step of the cascade to recycle the bottle back to a new beverage bottle as much as possible.

However, each time you mechanically recycle the bottle, the plastic composition gets increasingly mixed and the quality deteriorates. Once the quality is compromised, the plastic can then be downcycled into other products that do not require food or medical-grade quality, such as bottles for household cleaners, food trays or buckets. Only when all of this is exhausted do we look at chemical recycling methods such as glycolysis or methanolysis to upcycle the material into virgin plastic.

### Circularity in action

Today, less than 10% of the world's plastic waste is recycled. Further investments are still needed to scale recycling capacities in order to create this cascade of closed-loop, open-loop, and chemical recycling. Despite this, solutions to drive this transition already exist and many emerging technologies are being developed at a remarkable pace. With second and third generation technologies, significant improvements will continue to be made – innovative concepts that can increase scale and improve reliability and yields and the use of heat-integrated design and renewable energy sources are but some of the possibilities.

With the right investment and know-how, cascade recycling is capable of enhancing recycling rates, paving the way for a more circular economy for plastics. Just as a journey of a thousand miles begins with a single step, so too does the path to circularity. As in the cascade recycling process – closed-loop recycling first, then open-loop recycling, and finally chemical recycling – each step takes us closer to achieving circularity.

And then we repeat this cycle – over and over again. This is circularity in action.

### Incubator for Plastic - to - Fuel to Open in Teesside

Nexergy Holdings has announced plans to establish a new technology incubator at the Materials Processing Institute (MPI) in Teesside.



Terry Walsh, CEO of the MPI (left) and Jason Turner, managing director of Nexergy. Image credit: Andrew Douglas

Nexergy hopes to draw on the MPI's expertise to advance its thermo-mechanical process to convert plastic waste into a form of light crude oil.

The oil can be refined to be used as an alternative to traditional fossil-based petroleum.

The collaboration marks the start of Nexergy's go-to-market phase and the incubator will offer a controlled environment to scale-up and de-risk the technology.

It will serve as the first of 16 planned production facilities for Nexergy in the UK.

Jason Turner, managing director at Nexergy, said: "The Materials Processing Institute offers technical expertise, cutting-edge facilities and a shared commitment to sustainable innovation.



"Locating there means we will be able to move efficiently from proof - of - concept to commercial readiness, which is a critical step as we prepare for the rollout of our first full-scale production facility."

The MPI plans to play a central role in defining the company's technology and supporting industrial-scale decarbonisation and testing as part of its circular plastics strategy.

Terry Walsh, CEO of the MPI, added: "The MPI supports forward - thinking companies that are developing solutions for industrial sustainability.

"Nexergy's approach aligns well with our own research priorities and with the region's focus on green growth.

"Setting up at our site will mean that they have immediate access to our expertise and facilities to support this programme to develop its sustainable solutions capability."

As work progresses, Nexergy said it will engage with local stakeholders, industry partners and policymakers to ensure the project contributes to regional economic development and supports the UK's wider environmental objectives.

Bob James, the MPI's business development manager, said: "We are delighted to welcome Nexergy to our site and to be working together on innovative opportunities to support materials recycling and re-use.

"This partnership reflects our broader vision to drive forward clean and green technology and industrial decarbonisation across all sectors."

(Source: letsrecycle.com / 14.04.2025)

## Circular Plastics from Cyclic Molecules

Macrocycle is pioneering an approach to PET recycling via cyclic oligomers.

The molecular structure of polyesters enables a wide spectrum of recycling approaches, both mechanical and chemical. Somewhere in the middle ground between solvent-based extraction approaches and advanced recycling technologies that break down molecules all the way back to the monomer level, sits a company called Macrocycle.

Macrocycle, founded by CEO Stewart Peña Feliz and CTO Jan-Georg Rosenboom, is developing a process based on the phenomenon of ring opening polymerization.

The process uses specialized solvents, catalyst systems and thermodynamics to convert polymer molecules into macrocyclic oligomers, selectively extract them and then upgrade them to a linear PET structure.

Macrocycle is looking at both packaging waste and textile waste as feedstock materials, and is processing both at its pilot facility. While mechanical recycling is well established and effective at processing clear bottle flake, other feed streams are more challenging. "We're not going after those clear flakes, we're going after the bad stuff, stuff the mechanical recyclers don't want. And we are going after the emerging supply of textile waste," Rosenboom says.



CTO Jan-Georg Rosenboom and CEO Stewart Peña Feliz compare their upgraded PET to postconsumer waste samples. Source: Macrocycle.

Textile waste is not widely recycled, mostly ending up in a landfill or incinerator in the United States, so the polyester textile waste that is widely available is postindustrial. But that could change. In 2022, Massachusetts enacted a law which makes it illegal to dispose of textiles in trash.

"I think collection of textiles will emerge, and there are folks looking at that waste stream coming online and becoming viable, but they need to figure out how to upgrade the polymer quality and how to remove the impurities that are present," Rosenboom says. Macrocycle is working with its partner Helpsy, a waste collector that brings in textile waste from various brands. Macrocycle analyzes the waste for contaminants before and after recycling to confirm its process removes them.



Macrocycle's processing system with engineer Dr. Andres Granados Focil. Source: Macrocycle sits a company called Macrocycle.

According to Rosenboom, the process is inherently purifying, such that even if a feedstock contains unwanted or nonintentionally added substances (NIAS), these

are removed by the Macrocycle recycling process itself. Testing conducted thus far has found the resulting rPET product to be free of BPA and to have only low levels of acetaldehyde.

Rosenboom's work in ring opening polymerization began as part of his Ph.D. research at ETH Zurich. At that time, the focus was on finding processes for polyethylene furaonate (PEF), a bio-based polyester. Later, this technology formed the foundation for Macrocycle, which Rosenboom formed with Feliz at MIT. "Soon enough I realized this fascinating ring opening-ring closing chain equilibrium chemistry is applicable not only to bioplastic waste but also to existing plastic waste which is already out there," Rosenboom says. Instead of PEF, Macrocycle focuses on recycling processes for PET, going after a polyester already ubiquitous in the market.

In discussions with potential customers, Macrocycle has found that requirements such as viscosity can vary, especially between textile and packaging applications. Macrocycle can produce materials of different chain lengths to meet these needs. "We can tune our process very well, and are excited to offer our tailored solutions to industries," Rosenboom says.

Based on technical and economic analysis, the company expects to see both environmental and economic benefits from skipping the repolymerization steps necessary in competitive technologies which go completely back to monomer. According to Rosenboom, much of the energy demand lies in heating and cooling the solvent systems, whereas depolymerization methods incur significant costs in the purification of monomers. "We believe we can be competitive with fossil-grade PET," Rosenboom says,

"so, the breakthrough is: lower energy demand and lower cost." Even customers that are not otherwise incentivized to use recycled materials may take notice at the prospect of cheap resin.

Macrocycle recently raised \$6.5 million in funding to commercialize its PET recycling technology, which the company will use to expand operations and scale up pilot capacity. With the completion of this round, Macrocycle will be producing larger quantities of material so it can work with customers to develop products such as packaging and textiles. Currently, the company has more requests to test material than it can supply. Before moving to industrial scale, another fundraising round will need to be completed, currently targeted for 2026 or 2027.

## The Stache Lab Discovers Startling Mechanism to Promote Depolymerisation

Researchers have shown that carbon black can depolymerize polystyrene and polyvinyl chloride (PVC), two of the least recycled plastics in the planet's waste stream. The lab's most recent pair of papers showcases the potential. Turns out that the black plastic lid atop your coffee cup has a superpower. And the Stache Lab, which uncovered it, is exploiting that property to recycle at least two major types of plastic.

Their startling mechanism for promoting depolymerization relies on an additive that many plastics already contain: a pigment called carbon black that gives plastic its black color. Through a process called photothermal conversion, intense light is focused on plastic containing the pigment to jumpstart the degradation.

First, in ACS Central Science at the end of last year, there was a proof - of concept for the depolymerization of polystyrene using a common Fresnel lens to focus photonic energy. Then, earlier this month, the lab published their method to upcycle PVC in the Journal of the American Chemical Society (JACS).

In both cases, carbon black serves as the trigger of the breakdown, a quality Assistant Professor of Chemistry Erin Stache discovered recently and that even industrial partners she has spoken with were unaware of. The lab's method has since been tried



out on such post-consumer waste as PVC pipes, black construction pipes, trash bags, credit cards, even those ubiquitous yellow rubber duckies.

(Source: Department of Chemistry / 28.01.2025)

### Sumitomo Chemical to Begin Selling Chemically - Recycled Acrylic Resin Product to Major Electronics and Automotive Companies

Sumitomo Chemical will begin selling its polymer material polymethyl methacrylate (PMMA) made from methyl methacrylate (MMA) monomer produced through chemical recycling. LG Display Co., Ltd. of South Korea and Nissan Motor Co., Ltd. of Japan have decided to use this chemically - recycled material for their products. Sumitomo Chemical will accelerate the implementation of chemical recycling in the MMA supply chain as an industry leader.

In 2022, Sumitomo Chemical constructed a new pilot facility for the chemical recycling of PMMA at its Ehime Works located in Niihama City, Ehime Prefecture, Japan. It has also implemented such initiatives as a joint project with Niihama City to recycle PMMA protective partition panels, which are used for reducing the spread of droplets, in the area, as well as providing its chemically-recycled PMMA as raw material for the acrylic jewelry sold by Star Jewelry Co., Ltd.

In addition, Sumitomo Chemical has received third-party certifications, such as the ISCC PLUS\* certification, and is making efforts to globally implementing practical recycling systems using the mass balance approach.

(Source: Sumitomo Chemical / 06.03.2025)

### PLA Compounds for Automotive and Electronics

TotalEnergies Corbion, a global leader in polylactic acid (PLA) bioplastics and Benvic, a leading expert in compounding, have come together to drive the adoption of sustainable Luminy PLA - based compounds.



This collaboration will expand the use of plant-based solutions in durable applications such as automotive, healthcare and medical, cosmetics packaging, appliances, and electric & electronics.

Through this partnership, Benvic's Plantura portfolio, which incorporates TotalEnergies Corbion's Luminy PLA, offers biobased alternatives with a significant lower carbon footprint. These solutions provide sustainable alternatives to conventional plastics such as ABS, PS and PP compounds.

"We are excited to collaborate with Benvic in extending the usage of sustainable PLA compounds," said Hao Ding, Global Marketing Director at TotalEnergies Corbion. "With our strong network of brand owners and deep understanding of the PLA and the market, we are confident that together we can accelerate adoption in key industries, demonstrating the versatility and benefits of PLA far beyond packaging and food serviceware."

By working together on product optimization and customer engagement, the two companies aim to position PLA compounds as innovative, scalable solutions for durable goods OEMs and brand-owners, particularly in automotive and electronics.

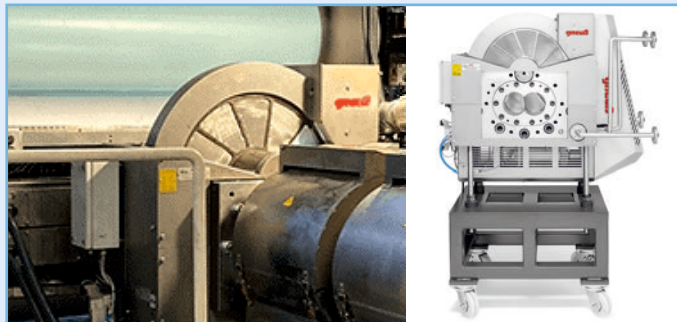
"Benvic has managed a continuous focus in terms of engineering and production capabilities on Plantura because we believe in a biobased future," said Eric GRANGE, marketing director at Benvic. "With the support of TotalEnergies Corbion, we are poised to unlock new opportunities, strengthen our presence in the market, and deliver high-performance sustainable materials to our customers."

(Source: Indian Chemical News / 28.03.2025)

### Major Efficiency Improvements in PVC Recycling at Renolit with the Gneuss SFneos Screen Changer

At its factory in the Barcelona region, Renolit manufactures high quality flexible PVC films. Thanks to its innovative SFneos Filtration System from Gneuss – the latest addition to its range of process-

constant, continuous screen changers, Renolit is now able to reuse a significant percentage of recycled material without any compromises regarding product quality or production efficiency.



The flexible PVC films made by Renolit are coated on to polyester and in spite of separating processes, the scrap still contains a small amount of residual polyester. This is sufficient to cause problems with conventional slide plate screen changers – the frequent changes due to the contamination load result in production interruptions and flow disturbances which, with flexible PVC lead to frequent burn-ups.

The SFneos screen changer supplied to Renolit by Gneuss was extensively customised to exactly match the twin screw extruder, with extremely short and streamlined flow paths, designed with the help of flow simulation software.

The SFneos operates continuously and pressure-stable, even with high and varying contamination loads. Thanks to these unique performance characteristics of the SFneos, Renolit was able to process a high percentage of recycling containing residual polyester without production interruptions and were therefore able to significantly increase the yield and efficiency of their existing extrusion line without compromising their product quality. At the same time, by using waste material (and this material is generally seen as difficult to recycle) Renolit is saving valuable resources. On post-industrial recycling applications, the Filtration Systems from Gneuss can play a decisive role in unlocking potential, making processes more cost-efficient and contributing toward sustainability.

(Source: Gneuss / 28.03.2025)

## The Growing Impact of PCR Laws on Plastic Packaging and Products

Post-consumer recycled (PCR) content laws are gaining popularity at the state-level to reduce plastic's environmental impact. PCR laws require a

variety of plastic products, such as beverage containers, trash bags and personal care product packaging, to contain a minimum percentage of PCR plastic.

By increasing demand for recycled plastic, PCR laws aim to create a strong and stable market for recycled content materials. PCR laws usually include a provision to set aside funds and resources to expand community recycling programs and improve recycling infrastructure. These provisions ensure adequate supply will be available to meet increasing PCR demand.

### Elements of PCR Laws

PCR laws have been passed in several U.S. states including California, Connecticut, Maine and New Jersey. While the future of plastics legislation is still murky at the federal level, PCR laws are being embraced by states and are anticipated to continue at previously announced trajectories throughout 2025. The specifics of active PCR laws are determined on a state-by-state basis, but the existing laws have several common elements:

- Minimum PCR content percentage requirement for covered products
- Annual registration and reporting
- Penalties for noncompliance
- Flexibility to adjust targets based on market conditions

### Minimum PCR Content

Each active PCR law requires all specified products distributed, offered for sale or sold within the state to contain a minimum percentage of PCR content. For this reason, PCR laws impact any company that sells its products within a given state — not just companies based in the state where the law is active.

Packaging is a common area of focus for PCR laws, especially plastic beverage containers, personal care products and household cleaning products. Plastic grocery bags and trash bags are also included by multiple states. These items, known as covered products, must contain a specific percentage of PCR plastic by weight.

Many states will increase the PCR content requirement as time passes. For example, beginning in 2022, California Assembly Bill 793 required plastic beverage containers contain at least 15% PCR content. In 2025, the PCR content requirement has increased to 25%, with a further planned increase to 50% in 2030.

### Annual Registration and Reporting

Brand owners, manufacturers or distributors who sell covered products in states with PCR laws are required to register products with each state's overseeing organization. In Connecticut, that organization is the Department of Energy & Environmental Protection (DEEP).

Producers, including brands and manufacturers that offer for sale sell or distribute plastic beverage containers in or into Connecticut in 2025 will be required to register with DEEP by April 1, 2026. Registration will continue on an annual basis in Connecticut until 2031, after which registration will be renewed every five years.

PCR laws require registered companies to share an annual report including the weight in pounds of virgin plastic and PCR plastic in any given product. This report helps to calculate the percentage of PCR plastic and certify it meets terms set out in the PCR law.

### Penalties for Noncompliance

Producers who do not follow PCR laws may be subject to penalties for noncompliance. In California, producers are charged \$0.20 for each pound of PCR plastic short of the target requirement. These fees are then reinvested in the state's recycling infrastructure, including recycling collection and processing systems.

### Target Flexibility

Due to current market conditions and inconsistent quality of PCR material, many PCR laws include a measure of flexibility for states to adjust PCR content requirements in the future. For example,

California can review current targets this year based on market conditions such as the supply and demand for PCR plastics, recycling collection rates, and material availability. This flexibility ensures producers will not be held to unattainable standards while the PCR market stabilizes.

### Preparing for PCR Laws

PCR laws will continue to drive demand for PCR resin as more states pass PCR content requirements and required percentages increase over time. Beverage containers are the most likely products to be regulated at the moment, but that won't be the case for long. In Washington, PCR content requirements for household cleaning product packaging and personal care product packaging went into effect on January 1, 2025.

As more products are added to PCR laws, producers can prepare to comply by testing sustainable plastic products containing PCR content and beginning to track and anticipate shifts in raw material sourcing. Visit M. Holland's Sustainability market page for more information.

(Source: MHolland / 15.04.2025)

### Recycling of Plastic Waste

India generates 26,000 tonnes of plastic waste every day. This is how we reduce that number. Plastic waste is an issue in India, with only eight per cent of plastic recycled. A new circular economy roadmap aims to fix that.

India recycles a relatively small portion of its generated plastic waste. Estimates vary, but the recycling rate is typically cited as being between 12% and 60%. The informal sector plays a significant role in plastic waste collection and recycling, but the lack of formal infrastructure and regulations poses challenges.



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