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• February 2023

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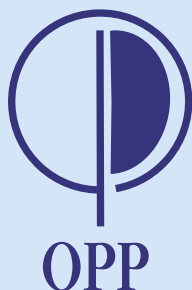
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FROM THE PRESIDENT'S DESK

Mr. Dilip Parekh



Dear Members,

Greetings from Organization of Plastics Processors of India!

I hope that you were at Plastindia 2023 either as an exhibitor or as a visitor and had a fruitful experience.

The Union Budget 2023-2024 was announced on 1st February 2023. The Plastic Processing Fraternity was relieved because there was status-quo with respect to Customs duty on Plastic Polymers.

Customs duty on Naphtha has been raised to 2.5 percent in the Budget from 1 percent earlier. Similarly, Customs duty on both styrene and Vinyl Chloride Monomers has been raised to 2.5 percent from 2 percent earlier.

IPF Bangladesh was held from 22nd to 25th February 2023 at Dhaka after a gap of 4 years. 23 Indian companies participated in IPF Bangladesh 2023. All exhibitors had good response and enquires during IPF Bangladesh.

As informed to you PLEXCONNECT 2023 will be held from 15th to 17th June 2023 at NESCO, MUMBAI. It is a marquee event that aims to connect the Global Plastics supply chain with Indian Plastics Industry, PLEXCONNECT 2023 is the perfect setting for industry members to explore and grow through networking and close interactions with the buyers from across India and the world. **I appeal to all members to participate in PLEXCONNECT 2023 through OPPI.**

With Best Wishes,

Dilip Parekh
President

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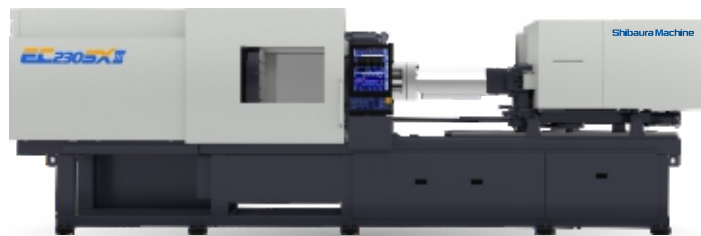
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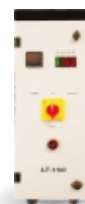
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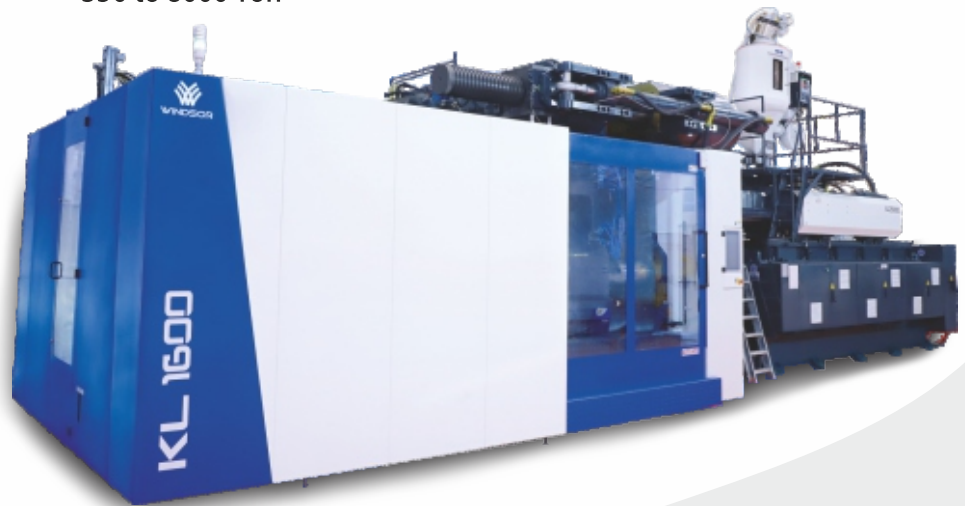
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"PLEXCONNECT 2023 is primarily export focused.

A marquee event that aims to connect the Global Plastics supply chain with Indian Plastics Industry, PLEXCONNECT 2023 is the perfect setting for industry members to explore and grow through networking and close interactions with the buyers from across India and the world.

Spread over 20,000 sq mtr at Mumbai's NESCO Centre, the show will feature 500+ leading exporters/plastics manufactures and allied industries. The show will feature Themed Pavilions, State Pavilions, Plastic Associations, Technology Pavilion and much more. Focus is on promoting Indian exporters.

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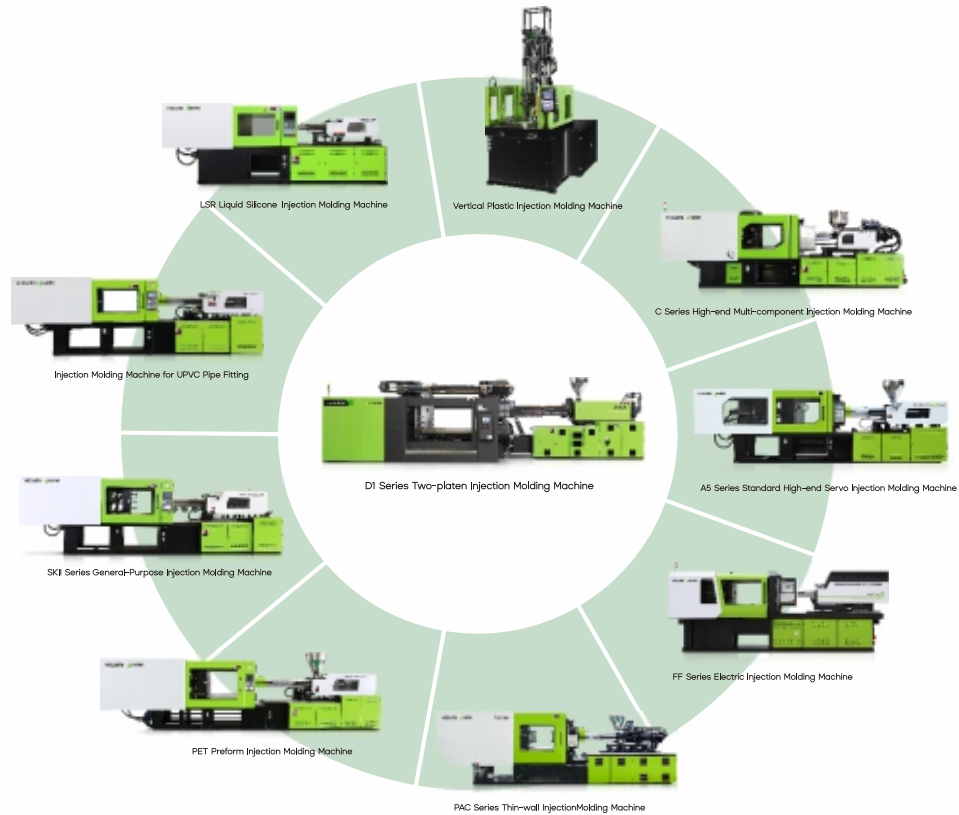
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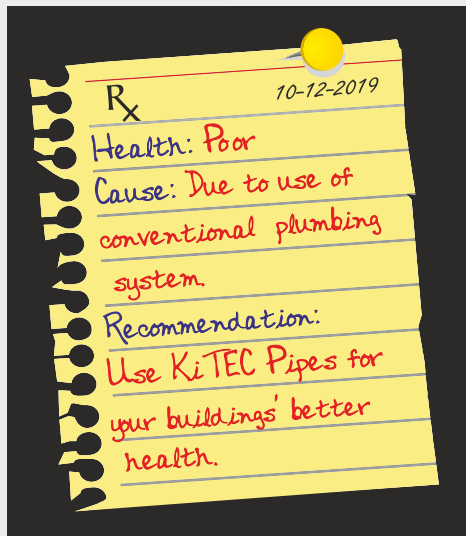
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


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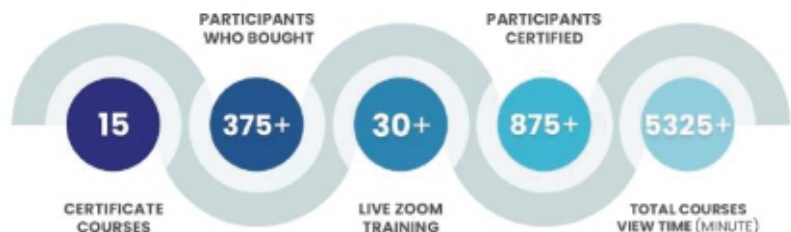
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NEWS FROM INDIA

Nation Can Only be Developed by Facilitating its Wealth Creators: Shri Mansukh Mandaviya

Shri Mansukh Mandaviya, Hon'ble Minister For Health, Family Welfare, Chemicals & Fertilizers said that nation can only be developed by facilitating its wealth creators.

The Minister quoted ancient Indian polymath Chanakya and said, "India's mindset towards its wealth creators is driven by the age-old philosophy from Chanakya who said that 'a Samruddh Rajya requires Rajasva to be given to its Mahajanas' i.e., a nation can only be developed by facilitating its wealth creators."

Following this philosophy, along with welfare programs for the poor, the government is taking significant steps in promoting ease of doing business and supporting its wealth creators. This conclave is one such step where I encourage all the stakeholders to understand India's ethos and invest in our growth story," said Union Minister of Chemicals & Fertilizers, Shri Mansukh Mandaviya at the CEO Conclave at PLASTINDIA 2023.

The conference saw the presence of over 90+ CEOs of the Plastic Industry from both India and abroad. Exhibitors from more than 45 Countries of the world as well as more than 2,00,000 Business Visitors across the world are expected to visit.

Speaking on occasion, Shri Mandaviya stated that "these brainstorming sessions are important for exchanging ideas and best practices. It will bolster the ecosystem of stakeholders involved in the plastic industry."

Informing about India's advantages to the participants, the Minister said that "the country boasts a strong and impartial legislative structure along with favourable manpower and technical expertise." He said that "the present government has led to a perception shift towards our wealth creators and as a consequence, we have over 100 unicorn startups, favourable ecosystem for new businesses and a rising economy."

He further added that "India provides a big market as the consumption power is increasing along with a rising middle class."

Drawing everyone's attention towards India's ethos, Shri Mandaviya said that "India not

only provides robust technical expertise but the values it holds while doing commerce. We well-differentiate between commerce and service towards the nation and we thus, prioritize benefit for all rather than few. This allows us to harmonize the welfare of our citizens along with the development of industries too."

Reiterating the vibrant support by the government, Mandaviya stated that "the present government has a strong decisive approach and a long-term vision under the leadership of our Prime Minister. This long-term vision of government has facilitated policy flexibility and the creation of roadmaps in each sector as India enters the Amrit Kaal."

"Similarly, the plastic industry's roadmap has also been created after wide and crucial consultations with local and international stakeholders and will help in long-term policy support, investment as well as export promotion". "The recent comprehensive budget catering to all sections of society is a result of such crucial consultations and government being perceptive to its people" he further added.

Shri Mandaviya encouraged the investors to invest in India and assured them that strong support

will be provided by the government so that the growth story of India continues. He was hopeful that these meetings and consultations will create opportunities to showcase India's capabilities and will help in facilitating the growth of the Indian Plastic Industry.

Hon'ble Minister also visited the stalls at the exhibition where he interacted with CEOs of firms comprising Innovations and R&D, Processors, Recycling and brand owners. (ANI)

PLASTINDIA 2023



In PLASTINDIA 2023 the stall of Organization of Plastics Processors of India was located in Hall 5, 1st Floor.

OPPI Secretariat had mailed invitations to the Plastics Fraternity to visit the OPPI stall.

This resulted in getting many visitors to the OPPI stall. Many important visitors including Mr. Deepak Mishra, Joint Secretary (Petro Chemicals) visited the OPPI stall.

GAIL (India) follows Reliance: Plans to Replace Naphtha with Ethane Imported From the US

Following in the footsteps of Reliance Industries Ltd (RIL), GAIL India Ltd (GAIL), plans to import ethane from the United States to replace natural gas and naphtha as feedstock for its petrochemical facilities. Moving in this direction, GAIL and the Central Board of Direct Taxes (CBDT) entered into a landmark advance pricing agreement (ArA) for determining the transfer pricing margin payable on its long-term LNG sourcing contract from the USA for five years.

Now, GAIL (India) seeks to import ethane from countries that have surplus availability, in an attempt to diversify the feedstock and save revenue outgo on regular basis. The public sector gas supplier aims to develop export terminal infrastructure through waterborne transportation to India and then transport it further through its own pipeline systems to demand centers. Reports said that GAIL (India) has already invited quotations for a 20-year contract period beginning mid-2026 for which the company is all set to hire very large ethane carriers (VLECs) to import ethane from the United States.

The VLEC, the very large vessel, has the capacity to carry between 80,000 – 99,000 cubic meters of ethane and is intended to pick up cargo from the United States ports of Marcus Hook, Nederland, Morgan's Point, or Beaumont and to deliver it on Dahej, and Hazira in Gujarat or Dabhol in Maharashtra.

Also, GAIL (India) is aiming to build another unit at Usar in Maharashtra in addition to its petrochemical facility at Pata, close to Kanpur. After the government shifted gas supplies from the plant to municipal gas suppliers, GAIL India had to reduce its transport through Pata. This had an effect on its profitability and prompted the company to move towards ethane as a feedstock supplement.

Experience at Reliance Industries

Reliance Industries Ltd (RIL) is reported to have saved around US\$450 million annually by switching to ethane from propane and naphtha used in the manufacturing of ethylene. The company began importing US feedstock in 2017 after announcing ambitions to produce ethane in 2014. According to reports, RIL used six VLECs to transport 1.6 million tonnes of ethane which the company imports every year.

At RIL, ethane decreased the company's use of naphtha by around 5,000 tonnes and also allowed the company to export additional feedstock (naphtha). Annually, RIL uses 2.5 million tonnes of naphtha as feedstock in petrochemical crackers. In fact, ethane production in North America is projected to increase sustainably and significantly due

to the shale gas revolution which eventually produces an abundance of liquefied natural gas (LNG) and liquefied petroleum gas (LPG).

With steam crackers, ethane is largely used as a petrochemical feedstock to make ethylene. Beginning with ethylene, a variety of articles such as packaging films, wire coatings, squeeze bottles, plastics, and synthetic rubber can be products. Reliance abundantly uses ethane at its crackers in Nagothane in Maharashtra, Dahej, and Hazira in Gujarat.

GAIL offers options to bidders

GAIL (India) in a tender said that the company was considering co-transporting LNG and ethane in the same vessel but loaded in different compartments. The company offered bidders the option to specify whether the time-charter vessel is capable of accepting LNG and ethane component loads. The primary and secondary fuel sources may need to be suggested in case of co-transportation. In fact, the 20-year charter hiring contracts can be extended by a further period of five years.

Govt. Offers Two - Year Pandemic Relief to Plastic Micro, Small and Medium Enterprise

In a major relief for the entire Rs 350,000-cr Indian plastic industry, the government has decided to compensate the most of loss incurred by micro, small, and medium enterprises (MSMEs) in this sector during the last

two years of the coronavirus (Covid-19) pandemic. Since the pandemic started in India in March 2020, the government ordered periodic lockdowns which resulted in the stoppage of work at factories, and the distribution and retailing of manufactured goods to consumers, resulting in a massive loss to stakeholders.

According to the government, the Indian plastic industry is an integral part of the economy with over 50,000 units spread across the country, of which 80-90 percent belong to the small and medium enterprises category. Contributing to around Rs 350,000-cr and offering direct and indirect employment to lakhs of trained and untrained manpower, India's plastic industry exports to the tune of around Rs 35,000 - cr annually.

Through an office memorandum issued by the Ministry of Finance told all concerned departments that the government has decided to issue compensation to the loss incurred by MSMEs in the Indian plastic industry. The government has been getting many references from MSMEs regarding difficulties being faced by them in the last two years due to the pandemic. It has already provided certain benefits to the industry including MSMEs in government contracts in the past.

In order to further support MSMEs, it has been decided to provide relief in all contracts for the procurement of goods and services, entered into by any ministry and departments, and also Central Pollution Control Board (CPCB), etc with MSMEs. The government, therefore, has

set the criteria for this grant under which the contractor or supplier should be registered as medium, small, or micro - enterprises with the Ministry of MSME as on March 31, 2022. The original delivery period has been fixed between February 19, 2020, and March 31, 2022.

The office memorandum proposes 95 percent of the performance security forfeited from such firms shall be refunded. Further, 95 percent of bid security (earnest money deposit), if any, forfeited from MSME firms in tenders opened between February 19, 2020, and March 31, 2022, shall be refunded.

According to the memorandum, 95 percent of the liquidated damages (LD) deducted from such firms shall also be refunded. LD so refunded shall not exceed 95 percent of the performance security stipulated in the contract. In case, the firm has been debarred only due to default in consultation with such contracts, such debarment shall also be revoked, by issuing an appropriate order by the procuring entity.

However, in case a firm has been ignored for placement of any contract due to debarment in the interim period (i.e. date of debarment and the date of revocation under this order), no claim shall be entertained, the government clarified. Further, the Ministry of Finance mentioned that no interest shall be paid on such a refunded amount.

Interestingly, the Ministry of Finance is planning to set up a Government e-Marketplace (GeM) for the smooth implementation of this order through which

vendors and other participants can raise their claims and avail of the benefit. Despite obstacles like the pandemic, the government is hopeful that the Indian plastic industry has the potential to achieve worth Rs 10 lakh crore by 2027 and create a huge employment opportunity for one crore people in the next five years.

Plastic Waste Use Must On NH Service Roads

The Government of India has made the use of plastic waste in the making of service roads mandatory.

In its bid to increase the use of plastic waste in road construction, the road transport and highways ministry has made the use of the waste material in hot mix bituminous wearing coat or top layer mandatory on all service and slip roads throughout the National Highway (NH) network in the country.

In a circular issued to all NH owning agencies, the ministry said this “shall be made applicable for all such NH and centrally sponsored road works for which bids are yet to be received”. The current length of the NH network in the country is around 1.41 lakh km. Till now the use of plastic waste in the hot mix bituminous wearing coat and periodic renewal was mandatory only on service roads along NHs within 50 km periphery of urban area having population more than five lakh.

The use of waste plastic in bituminous mix reduces the need for bitumen by around 15% and

it also increases the strength and performance of roads. The roads with plastic have longer life than the normal bituminous roads.

IPF Bangladesh 2023

23 Indian Companies were booked through Organization of Plastics Processors of India to participate in IPF Bangladesh 2023.

Bangladesh ranks 12th in plastic exports. Hon'ble Prime Minister Sheikh Hasina's pro-business doctrine has propelled exports of all kinds. Following this trend, plastic products are also being exported to 57 different countries along with the USA, Canada, the UK and various countries of the EU. It is expected that by 2025, the global market for plastic products will be worth \$721 billion. Even if one percent of this market is occupied by Bangladesh, it is possible to export more than 6000 crore BDT per annum.

Constantia Flexibles Announces Joint Venture in India

Constantia Flexibles, a leading producer of flexible packaging worldwide, signed a joint venture (JV) agreement for its Indian business and operations with Premji Invest and SB Packagings. The combination will help Constantia Flexibles achieve its ambition to grow further and create value in the Indian market.

The JV is pursuing organic as well as inorganic growth in higher value added market segments in India, continuing its strong growth trajectory in the hygiene segment whilst further developing

the more sustainable mono-material EcoLam product range. With the new partners, Constantia Flexibles is able to strengthen its business in the region and various market segments. As SB Packagings is a leading player in the hygiene segment, the new partnership will help extend Constantia Flexibles' portfolio.

The closing of the joint venture agreement is expected to be completed by the end of March, pending regulatory approvals.

KPMG India acted as the exclusive financial advisor to Constantia Flexibles for the transaction.

Constantia Flexibles is the world's third-largest producer of flexible packaging. Based on the guiding principle of 'People, Passion, Packaging', some 8,750 employees manufacture tailor-made packaging solutions at 38 sites in 16 countries. Many international companies and local market leaders from the consumer and pharma industries choose the sustainable and innovative products of Constantia Flexibles. Sustainability is a top priority in product development at Constantia Flexibles: the company was rated Level A by Climate Change Leadership (CDP) in 2021 and Gold by EcoVadis in 2022. www.cflex.com

SB Packagings, founded in 1989 by Mr. O.P Banga & Mr. Amit Banga, is one of the leading flexible packaging companies based out of India.

Premji Invest is the investment arm of Azim Premji's endowment and philanthropic initiatives. It has been active in investing in the Indian markets for over ten years with a large investment corpus. The focus of investments has been to grow medium - sized Indian companies into large companies that can compete globally.

STALLS OF INDIAN EXHIBITORS IN IPF BANGLADESH 2023



ORGANIZATION OF PLASTICS PROCESSORS OF INDIA



ONGC PETRO ADDITIONS LIMITED



MAMATA MACHINERY PVT. LTD.



RAJOO ENGINEERS LIMITED



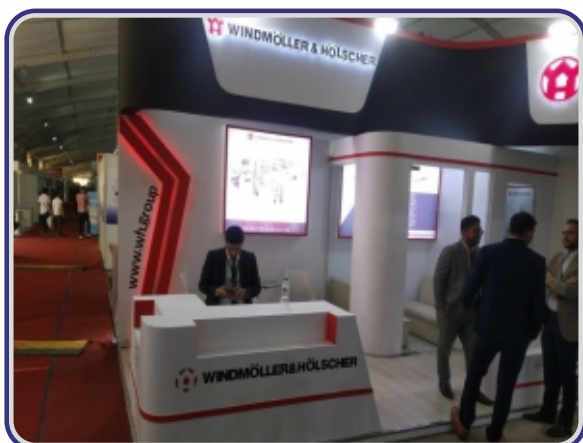
R R PLAST EXTRUSIONS



THE SHAKTI PLASTIC INDUSTRIES



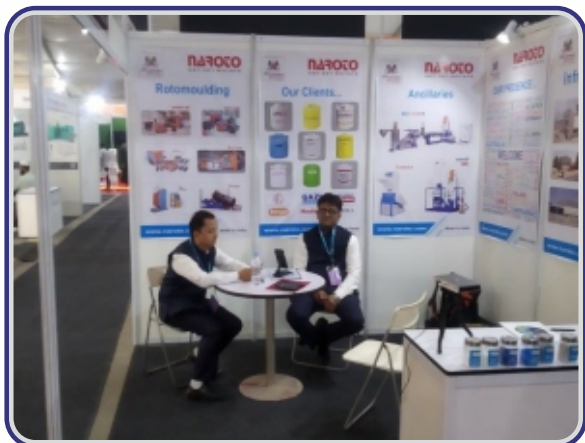
BASIL PROMPT VINYL PVT LTD



**WINDMOLLER & HOLSCHER INDIA
PRIVATE LIMITED**



BRY-AIR (ASIA) PVT. LTD



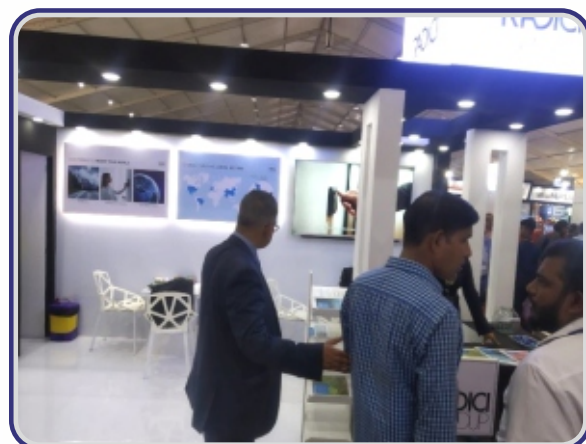
N.A. ROTO MACHINES & MOULDS INDIA



BLEND COLOURS PVT. LTD.



TECHNOLOGY PLASTOMECH PRIVATE LIMITED



RADICI PLASTICS INDIA PRIVATE LIMITED



JAGMOHAN PLA MACH PVT LTD



MERIT POLYMERS



PLASTIC PRODUCTS AND NEW TECHNOLOGIES

Plastic Packaging

Case Study: Sustainable Plastic Packaging with MDO Technology

Italian packaging manufacturer ManuliTech has invested in a 7-layer blown film line with inline machine - direction orientation (MDO) from Hosokawa Alpine, to produce laminating and laminate films with an oxygen barrier in full PE. It's the company's attempt to corner the market for plastic packaging with recyclability credentials.



The new 7-layer blown film line with inline MDO from Hosokawa Alpine installed at ManuliTech near Milan.

With the laminating and laminate films with oxygen barrier in full PE design produced by the 7-layer line with inline MDO from Hosokawa Alpine, ManuliTech offers solutions for recyclable plastic packaging.



ManuliTech, based in Cambiago near Milan, produces multilayer blown films for customers primarily in the food and pharmaceutical industries. The company has undergone a rapid rise to success; in 2018, production capacity was around 12,000 tonnes, and in 2019, it was increased to 15,000 tonnes.

"ManuliTech has achieved a very high level of quality within a very short time," said Nicola Pirani, Alpine's representative in Italy. The first Alpine line was installed at the site in northern Italy in 2020. The quality of the film produced from that line has been a key part of the firm's rapid growth, according to Alpine. This was followed last year by the construction and configuration of the new, flexible 7-layer high-performance line with inline MDO to meet the emerging demand for full-PE films in Italy. "The market for full-PE barrier films is growing in Italy, but it is still difficult for end-customers to get these films in consistently good quality and

sufficient quantity," Pirani said. ManuliTech targeted this gap in the market with its capital investment.

In many cases, in order to achieve the desired product properties in these applications, composites have needed to be produced from different materials that cannot be fully recycled. Full PE packaging with films made from pure polyethylene composites, however, can be fully recycled after their original use and reused without material loss for end products, making for a more sustainable product, and resource efficiency. "We support this circular economy approach and offer our customers suitable solutions for it," said Alessandro Manuli, managing director at ManuliTech. "This is a long-needed development for the sustainability principle and a promising growth market for us," he added.

"More than 100 MDOs made by us are in operation worldwide," said Stefan Sager, operations director in the film extrusion division at Hosokawa Alpine. The technology was first introduced 25 years ago. Working with its customers, Hosokawa Alpine designs each MDO blown film line to fit the desired film

production, tailored to the customer's needs. "That's one secret to our success, the other is the quality of MDO film," said Sager.

Alpine claims that film produced on its equipment is characterised by excellent processability, optimised flatness and no hanging edges. To achieve this, the MDOs are equipped with three features: TRIO technology (Trim Reduction for Inline Orientation) for best flatness and roll cylindricity, flexible stretch gap adjustment to reduce neck-in, and unique vacuum technology for best flatness and excellent process stability.

Hosokawa Alpine MDO technology is based on monoaxial stretching of blown film. In this process, the film is drawn between two rolls which rotate at different speeds. Depending on the application, the film runs over eight to twelve rolls, two of which are stretching rolls. After heating to the optimum temperature, the film is brought to the desired ratio in the stretching phase. The stretching process reduces the film thickness while improving its optical and mechanical properties. These include, for example, barrier properties, transparency or processability. "This technology reduces the need for raw materials in a resource-saving way, while also increasing efficiency," said Sager. The stress created during stretching is reduced in the subsequent annealing phase. Finally, the film cools down and compensates for the thermal shrinkage.

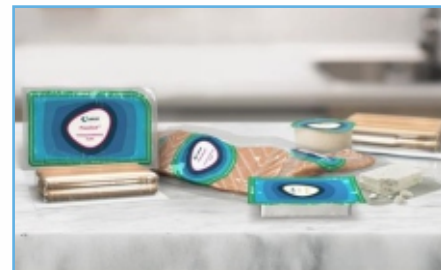
TRIO increases finishing quality

The TRIO system integrated into the line reduces neck-in by up to 50 percent. At the same time, the flatness of the film is optimised, and a uniform thickness profile is produced. "TRIO 2.0" is a further development of the system and is now on the market. It includes single-layer measurement of the stretched film after slitting and before the winding points. "This more precise detection of the film layers enables even better positioning of the thin sections for the stretching process," emphasizes Sager. A smart control algorithm calculates an improved mapping of the influences from the MDO on the entire control loop from the measured values. The optimised recording and calculation of the target values for the thin sections makes the control in the inline MDO process more precise and thus increases the further processing quality.

Trend - setter

ManuliTech uses the new blown film line to produce mono-material films from polyethylene. When an oxygen barrier is needed, ethylene vinyl alcohol plastic (EVOH) is used as a barrier layer. If the EVOH content of a film is less than 5 percent, it does not affect recyclability in the PE waste stream. "Alpine is not only a pioneer in MDO technology, but also a market leader. We are pleased that, together with this competent partner, we have been able to integrate anew, future-oriented component into our product range," said managing director Manuli.

Amcor Releases Recyclable Forming Films for Meat and Dairy That Offer '80% Carbon Footprint Reduction'



Amcor has unveiled its recyclable PrimeSeal and DairySeal Recycle-Ready Thermoforming Films with memory retention technology for meat, fish, and dairy products – which it says can lower carbon footprints by 80% in comparison with existing PA and PE films.

The transparent polyethylene films are made with low EVOH content and are certified as recyclable within PE streams by Cyclos-HTP. They are also heat resistant at temperatures of up to 90°C and are said to result in a tight, wrinkle-free pack when applied to a product.

Available thicknesses range between 85 and 200 microns with custom-engineered forming; the films are also puncture and abrasion resistant in a bid to ensure the products they package – meat and fish, both fresh and processed, as well as hard cheese – are sufficiently protected.

Similar to Amcor's newest innovation is Mondli's mono-material, high-barrier solution to vacuum package Handl Tyrol bacon, with the polypropylene film said to be recyclable in existing mixed polyolefin streams.

MULTIVAC is also pursuing sustainability in thermoforming processes with its SFP Light steam flushing system – aiming to save the energy used in cooling systems and extend the shelf life of perishable products by enabling the immediate vacuum packing of hot food. Additionally, its R3 thermoforming machine is compatible with recyclable packaging films made of mono-materials.

Berry's Upgraded 'Sustane' Film Hoping to give Company Sustainability Boost

Berry Global's flexible films division is launching a next generation version of its proven stretch hood film with a minimum 30% recycled plastic content. The company says that this will help to support businesses in achieving their own sustainability objectives as well as meeting the requirements of current and forthcoming UK and European plastics packaging legislation.

Key Highlights

- New Sustane film contains 30% recycled material
- The product is being manufactured across Europe; Germany, Poland and the UK
- Berry has calculated that the film can reduce emissions by 18%
- Material to be used in building, beverages and glass

Stretch hood film stretches over and around a pallet of finished goods, Berry claims this provides improved load stability and full

waterproofing for the load, with much lower material usage than traditional shrink hooding films.



However, it is the demanding stretch requirements of the film that make the inclusion of any level of recycled material in its manufacture extremely challenging, particularly in terms of impeding the overall stretch capability. Berry's Sustane polymers aims to incorporate recycled plastic with the objective of delivering high levels of technical performance, consistency, traceability and quality.

In particular, the company believes the incorporation of Sustane into the stretch hood film has been achieved while maintaining reliable seal integrity and high tear resistance. It is claimed that this ensures effective product protection throughout the supply chain. The new Stretch Hood Sustane film containing a minimum 30% recycled content is particularly ideal for low to medium stretch applications in markets such as beverages, building and glass.

It is being manufactured in Berry factories in Belgium, Germany, Poland and the UK, offering localised supply and support to businesses and brands of all sizes. Berry has calculated that the recycled content film can deliver a reduction in carbon emissions of around 18% compared to one produced entirely from virgin

material. Importantly it can also be used on existing stretch machinery. The company claims that sustane fits in well to the company's sustainability plans. This strategy seeks to develop solutions that minimise a product's environmental impact, focusing on areas such as enhancing its recyclability and the increasing incorporation of post-consumer recycled resin, along with Berry's own commitment to reduce greenhouse gas emissions by 25% by 2025 versus the company's 2016 baseline.

ProAmpac European Launch of New High-Performance Mono PE Recyclable Film

ProAmpac, a leader in flexible packaging and material science, announces the launch of ProActive Recyclable R-2050, their newest patent-pending addition to the ProActive Recyclable® series of polyethylene-based structures, being introduced to serve the European market. R-2050's unique performance characteristics make it an ideal replacement for conventional multi-material laminates without affecting the high-speed filling line efficiencies.

R-2050 is the newest member of the ProActive Sustainability family and is available in standard and high-barrier versions to maintain or extend the shelf life of food products. Both platforms are widely recyclable in Europe through existing streams, and OPRL compliant in the UK for front-of-store drop-off.

Available in rollstock or premade pouches with optional recyclable reclose features, the R-2050 series is ideal for various

applications, including dry foods, frozen foods, pet treats and fresh produce.

R-2050 utilizes ProAmpac's award - winning high definition (HD) flexographic printed graphics and is available with matte or gloss registration to offer brands a package that pops off the shelf. In addition to the R-2050, ProAmpac offers a range of ProActive Recyclable film and paper - based flexible packaging solutions.

Craemer Makes Hygienic Pallet Boxes Made of PE for Gentle Grape Harvesting

Whether for juice or wine production, the grapes have to be harvested carefully and with finesse because of their sensitive thin skin. The Craemer Group, a pioneer in plastics processing, has food-safe, extremely robust collection containers for hygienic and gentle harvesting. Particularly suitable: the plastic pallet boxes CB3 High and SB3 .

World novelty HB3: The first and only completely closed pallet box with three welded runners from Craemer.

The sensitive fruit must be protected from pressure throughout the entire harvesting process, from



picking and collecting to emptying into pallet boxes and transport to the place of processing. Two

Craemer pallet boxes made of high - quality, industrial - size polyethylene (PE) (1200 x 1000 mm) are ideal for this: the Cb3 High with a particularly large volume and the SB3 with closed or perforated walls, both of which have a stable construction, are manufactured in one piece and are therefore very resistant – and durable. With nine feet (optional) they also hold on uneven and steep ground.

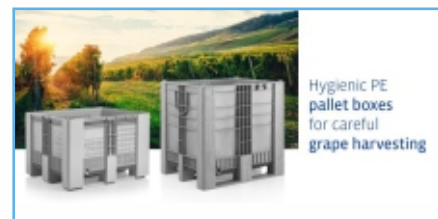
The CB3 High holds around 1000 liters

In the 1140 mm high CB3 High , with a capacity of around 1000 litres, the juice from burst grapes is not lost thanks to the closed walls. A drainage hole is convenient for juice drainage as well as water drainage when cleaning the box, like the SB3. The strong lower deck ribbing ensures high strength of the tank floor. Depending on the version, the CB3 High weighs 46 or 49 kilograms.

The SB3: closed or perforated

The closed version of the Sb3 also catches the juice from burst grapes. The slits of the perforated version, which are rounded on the inside, are particularly gentle on the sensitive inflorescence (for winegrowers). It is 790 millimeters high, has a capacity of 610 liters and a payload of 700 kilograms. Depending on the version, it weighs 39 or 42.5 kilograms.

The two pallet boxes made of PE are odorless and tasteless, resistant to mold and bacteria, do not splinter and are particularly impact and shock resistant. The seamless construction and the smooth inner walls protect the grapes during harvest, transport and storage and allow for easy



emptying, cleaning and drying. The containers are temperature-resistant from -30 to +40 degrees Celsius (briefly up to +90 degrees) and optionally available with an open 1-inch and 2-inch drainage hole. In addition to the CB3 High and SB3, Craemer has a wide range of plastic pallets, storage and transport containers. Also ideal for the grape harvest: the hygiene box HB3 and the ET box.

AUTOMOTIVE

Climate - Friendly and Recyclable: Nalyses Research Project Develops Sustainable Headlamp

Hella is researching in collaboration with industry partners how headlights can be de-signed more climate friendly. To this end, the automotive supplier operating under the FORVIA umbrella brand, has now started the NALYSES research project, in which the BMW Group, Covestro, geba, Miele, the Heinz Nixdorf Institute of the University of Pa-derborn, the Fraunhofer Institute for Mechatronics Design Technology IEM and the Hamm - Lippstadt University of Applied Sciences are involved in addition to Hella. The results of the project are to be incorporated into the development of future generations of headlamps but shall also be considered for other application and product areas. The three-year project is funded by the German Federal Ministry of Education and Research (BMBF).

“The aim of our research project is to design and produce our future products more resource-friendly and with lower emissions. We are therefore looking at options to reduce the Co2 footprint of a headlamp over its entire life cycle,” says Dr Michael Kleinkes, who is responsible for development in the lighting Business Group at Hella. In essence, the example of the headlamp will be used to research how products and raw materials can be reused as long as possible in the sense of a circular economy. The findings contribute significantly to Hella's climate objective to manufacture its products CO2-neutral by 2045 at the latest. “The project is also relevant because the findings go far beyond the headlamp as a product. The approaches are also to be transferred to vehicle components from the electronics sector and to other industries, for example, to the production of household appliances”.

“We therefore start with the selection of sustainable, low-emission materials and look at how recycled or bio-based plastics can be used, for example. In addition, product design also plays a decisive role: a sustainable headlamp should be both repairable and recyclable in order to increase its lifetime, conserve resources and contribute to the circular economy,” says Dr Michael Kleinkes. Individual components should be able to be reprocessed and recycled at the end of the headlamp's life.

In addition to leading the consortium, Hella is supporting the research project NALYSES primarily through its expertise in automotive lighting technology. The BMW Group defines the

overarching system requirements of car manufacturers, while Covestro, geba and Hamm-Lippstadt University of Applied Sciences contribute their expertise in sustainable materials. The Heinz Nixdorf Institute at the University of Pa-derborn and Fraunhofer IEM are developing a digital product twin that can be used to evaluate recyclability and the effects of material selection or design on the carbon footprint in a very short time. Miele is involved in the research project in order to transfer findings to other industries.

Toray Develops High - Speed Thermal Welding Technology for Carbon Fiber Reinforced Plastics that Contributes to High-Rate Production and Weight Savings of Aircraft

Toray Industries, Inc., announced that it has developed a technology that thermally welds carbon fiber reinforced plastics (CFRP) at high speed. This technology will enable high-rate production and weight savings of CFRP airframes. The company will push ahead with demonstrations with a view to commercializing airframes after 2030 while further expanding CFRP applications.

Global aircraft demand should recover through 2025 after stagnating amid the COVID-19 pandemic. Demand for next-generation aircraft with 120 to 240 seats should be heavy from 2030. Thermosetting CFRP is the primary structural material for aircraft main frames because of its long use and high reliability. The downside is that complicated adhesive bonding

and bolt fastening processes of CFRP have become assembly bottlenecks. CFRP production times greatly lag those for aluminum alloy airframes. High-rate production and weight savings that help enhance fuel efficiency to will be important to capture prospectively large demand.

Toray developed a thermal welding technology that swiftly and robustly joins thermosetting CFRP components for aircraft like conventional welding would do.

This simple bonding approach employs Toray's technology to form a thermally weldable layer on the surface of thermosetting CFRP, instantaneously heating part surfaces to bond them. This technology enables high-speed assembly of thermosetting CFRP parts or thermosetting and thermoplastic CFRP parts without the need for adhesive bonding and bolt fastening.

Using this technology to thermosetting CFRP with thermally weldable layers offers the same mechanical properties as CFRP for current aircraft models. Toray demonstrated that the joint strength of thermally welded structures is equivalent to that of co-cured CFRP structures for current aircraft models, ensuring the reliability of bonding technology for practical application studies. The company assembled a demonstrator simulating the elemental structure of an aircraft at high-speed using thermally weldable thermosetting CFRP parts. Thereby, its elemental technology concept was confirmed. Toray's technology should achieve a high-rate production that matches or surpasses that for aluminum alloy airframes.

A CFRP airframe using Toray's technology should reduce carbon dioxide emissions across the life cycle compared with those for an aluminum alloy airframe. Cutting the weight of bolt fasteners should lighten airframes, and further reducing these emissions.

Toray has partnered with Boeing to promote a number of technological development projects in the fields of aircraft manufacturing and materials technology.

Some of Toray's progress through this development effort is based on results obtained from a project, "Development of New Innovative Composite Materials and Forming Technologies," supported by the New Energy and Industrial Technology Development Organization (NEDO).

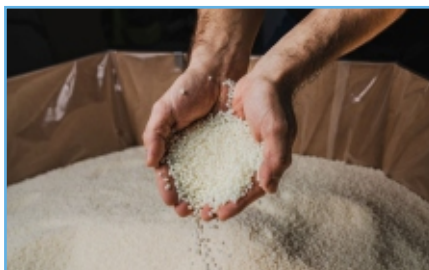
Under the Toray Group Sustainability Vision, the company committed itself to helping resolve environmental, resources, and energy issues through business. In keeping with its corporate philosophy of contributing to social progress by delivering new value, the company will keep creating advanced materials and innovative technologies that contribute to a carbon - neutral economy.



Thermally Welded Assembly of Aircraft Structural Demonstrator Applying This Technology

Manufacturer of Sanitary Fittings & Fixtures Opts for ABS with up to 100% Recycle Content

Ineos Styrolution's new Novadur Eco chosen by Hansgrohe for their chrome plated sanitary fittings.



The new line of ABS resins with up to 100% PCR content highlighted by Ineos Styrolution at K 2022 is now in use by manufacturer of sanitary fittings and fixtures Hansgrohe. The company has opted to use grade Novadur Eco P2MC B50 for their next generation products. As part of their challenge to reduce the company's ecological footprint, this globally leading manufacture of shower heads, hand - held showers and taps/faucets, they decided to look at the materials used for the production of their sanitary fittings.

Hansgrohe opted for the new grade as it would not compromise its high-quality standards and adjustments to production would be minimal. The bio - attributed Novodur grades fulfill these demands

As they offer identical properties as the conventional material – including surface quality, impact strength, high flowability and, in the case of Novodur Eco P2MC B50, suitability for electroplating.

The material is also a plug - in solution not requiring any changes to the production setup.

At the same time, Novodur Eco B50 grades offer product carbon footprint (PCF) savings of up to 71% . Hansgrohe's CEO Frank Semling said, "We are extremely pleased that the transition to the new sustainable Novodur Eco P2MC B50 was very swift and completely hassle-free. We are excited to be the first Ineos Styrolution customer in our industry to change to the new bio - attributed material. We encourage more companies in all industries to make the switch to sustainable materials to jointly improve our CO2 footprint and achieve the goals defined in the Paris Agreement."

ECKART Develops Pigment Solution for Automatic Sorting of Plastics

Automatic plastic sorting systems in recycling plants work with NIR sensors that do not always correctly identify certain colorants such as conventional silver shades. With NIR Silver, ECKART has developed a pigment solution that is tailored to the needs of automatic sorting.

NIR spectroscopy uses the wavelength signature of specific polymers to distinguish between them. NIR Silver optimally reflects these specific wavelengths and thus supports the sorting of plastics.

The pigments are easy to process in all conventional plastics and provide impressive silver metallic effects. Particularly in combination with post consumer resins, NIR

Silver offers the packaging industry an interesting opportunity to further strengthen its efforts with regard to sustainability.

With NIR Silver, ECKART provides the industry with another pigment solution on how to best reduce its environmental footprint – an additional building block in the growing sustainability portfolio of the effect pigment manufacturer.

MHT Mold & Hotrunner Technology and KEBO Partner on Blood Collection Tubes (BCT)

The German and Swiss tool and hot runner makers say the collaboration will extend to the full BCT portfolio, including test tubes, caps, rubber plugs, tube holders, luer adapters, needle hubs and protective caps.

MHT Mold & Hotrunner Technology AG (Hochem-am-Main, Germany) and KEBO AG (Neuhausen, Switzerland) announced a partnership to “develop their businesses and provide complete blood collection tube (BCT) solutions to their customers.”

MHT develops, manufactures and distributes injection molds and hot runners for PET applications, including preforms for beverage packaging and BCTs for the medical packaging industry. On its website, MHT notes its BCTs have a wall thickness of less than 1mm, with a length to wall thickness ratio up to 120. KEBO's expertise lies in medical and packaging molds and hot runner. Applications include

medical, pharmaceutical and laboratory, as well as thin-wall products for the packaging industry.

The companies say this partnership comes in response to the strong market desire for diagnostic and laboratory applications. In terms of the collaboration, the companies note that MHT will bring its expertise for BCT injection molds and PET hot runner systems, while KEBO supplies knowledge of medical injection molds and hot runner solutions.

The partnership was officially signed on Jan. 17, 2023.



MHT and KEBO will combine their expertise on blood collection tubes in a collaboration intended to meet growing market demand

Graphene Nanotubes Prevent Static Electricity Buildup in TPU Hoses.

Thermoplastic polyurethane hoses enhanced with graphene nanotubes demonstrate a combination of electrical conductivity, high flexibility, and good abrasion resistance.

Cost-efficient, durable hoses are already used in the flour - milling, pharmaceutical, and wood processing industries.

Stable, permanent anti - static properties combined with high performance allow hoses to meet strict industrial requirements.

In various industries with special operating conditions, when dry bulk materials are conveyed by compressed air through a nonconductive hose, there is a risk of the accumulation of electrical charge due to friction. This can lead to sparks, resulting in damage to electronic components, or even fire or explosion. To prevent static electricity buildup and arc discharge, conductive material enhanced with metal wire is used as the key component for the manufacture of this type of conveying hose. Use of traditional conductive agents like carbon black requires high concentrations, which results in detrimental effects on the mechanical properties of the final product, including reduced flexibility.

“Replacement of a standard compound with TPU modified with grapheme nanotubes results in stable, homogeneous conductivity of the final hoses, without compromising their



strength or flexibility. By adding only 0.4–0.5 wt% of graphene nanotubes, our client was able to obtain thermoplastic polyurethane with resistance of the order of 10 ohm/sq, allowing the hoses to meet the typical requirements of

industrial norms related to electrostatic risks. Additionally, graphene nanotubes' low working dosages make it possible to maintain the abrasion and chemical resistance, flexibility, and non-marking properties of TPU," said Dr. Christian Maus, development and support leader for thermoplastics, OCSiAl Group.

The nanotube-modified hoses perfectly meet the demands of heavy-duty operating applications, which frequently require a combination of ESD protection and high abrasion resistance and durability. Based on their excellent performance, these industrial TPU hoses can be widely used in pneumatic and aspiration systems for pumping or transporting materials with high abrasive properties, including abrasive powders, sawdust, chopped paper, construction waste, petroleum products, and crushed or granular materials.

Toyoda Gosei and Asics Design Sustainable Sneakers Using Airbag Fabric

Toyoda Gosei Co., Ltd. has teamed up with major sports equipment manufacturer Asics to make a "sustainable sneaker" using airbag fabric remnants from the manufacturing process. Asics Sports Style and other models are available for purchase at Asic's online store and elsewhere.

Airbag fabric and steering wheel leather remnants are difficult to recycle, and Toyoda Gosei has been transforming these materials into bags, pen cases, and other products that it sells under the Re-S eco brand. Asics has also

been seeking ways to incorporate recycled materials in its sneakers and sportswear.

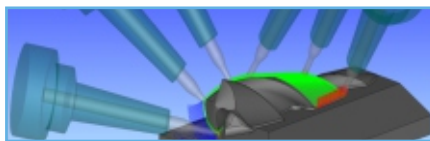
This joint project has been achieved with a shared mindset between the two companies in working to achieve a sustainable society. These sneakers use a highly durable nylon fabric while also featuring excellent design, including embroidered seams. They were planned to appeal especially to younger people with a high environmental awareness.

Toyoda Gosei will continue joint product planning with Asics to utilize material remnants generated in its plants.

How to Generate the Ideal Tool Path for High-Level Accuracy and Finish

When a mold builder can't compromise part accuracy and surface finish, CAM software with specialized programming strategies is essential.

When it comes to CAM programming, the goal is to use the supplied CAM software to output quality tool paths while considering tolerance, runtime, machine and tooling capabilities



and many other variables. Oftentimes, users feel the easiest tool path to create is the best option. Basic CAM software has sufficient toolpath strategies that enable many machined parts to meet a programmer's needs, but this is not always the case. For example, cases that require no

compromise for part accuracy and surface finish call for specialized programming strategies offered by a select few CAM software providers.

Every CAM programmer is familiar with basic toolpath strategies, such as roughing, re-roughing, Z-level finishing, planar (scan) finishing, flat surface and remachining. While a programmer can "make it work" with these tool paths when machining most parts, other software offers strategies — although used less often — that are invaluable in the right circumstances. For example, advanced strategies that use composite curves and surfaces, a surface to "aim" a tool path onto a part or cylindrical surfaces to produce the perfect thread for the molded plastic part.

Where Mold Manufacturing and Plastics Processing Connect

The Moldmaking Pavilion is one of seven pavilions returning to the show that houses exhibitors offering technology and service solutions for your specific moldmaking needs.

Plastics Technology Expo (PTXPO) is a trade show created to connect the entire North American plastics market under one roof, featuring a robust, pavilioned exhibit hall, free education and demonstrations and countless networking opportunities. The feedback from its 2022 debut revealed that the plastics supply chain is eager to reconnect and do business face-to-face once again.

The Mold making Pavilion is one of seven pavilions returning to the show that houses exhibitors

offering technology and service solutions for your specific mold making needs. Here is a snapshot of the products, equipment and processes being promoted in the Mold making Pavilion as well as in booths of longtime mold making industry supporters across the entire show floor.

Because PTXPO brings the North American plastics supply chain together, there is more to this show than moldmaking!

Mold Making Services

- Global manufacturers of small-, mid- and large- size molds
 - Contract machining services and short-run plastic part production capabilities.
 - Integrated precision injection molds, molding, metal products and assembly services.
 - Plastic injection, die-cast and rubber moldmaking services for the automotive, appliances, electronics, packaging and medical industries.
 - Fully interchangeable, high-precision injection molds (multi - cavity, multi - shot, metal injection, silicone, micro molds and aluminum die-casting molds).

Mold Components

- Innovative standard solutions for the moldmaking and molding industries
 - Exclusive mold component innovations to speed mold builds reduce costs and minimize downtime.
 - Precision standardized mold components for injection molding and die casting.

- Off-the-shelf standard mold components.
- Standard mold bases and plates.
- Modular standard mold component system.
- High-precision linear guide elements.
- Ejector pins, core pins, sleeve ejectors, blade ejectors, leader pins, bushings, tapered interlocks, sprue bushing and locating rings.

Hot Runners

- Melt delivery systems, mold configurations and thermal (cooling) systems
 - Complete hot half or manifold-only solutions for engineered resins, high-cavity systems or multiple material applications.
 - Hot runner manifolds.
 - Optimized hot runners.
 - Precision hot runner systems.
 - Compact hot runner systems.
 - Hot runner temperature controllers, monitors and sensors.
 - Standard hot runner and control systems.
 - Valve gate technology.

Mold Material

- Pre-hardened mold steels and tool steels, cold work die steels and vacuum heat treatment.
- Precision aluminum cast plate.
- Self-venting mold steel.

Software

- CAD/CAM/CAE/PDM solutions.
- Integrated CAD/CAM solutions for plastic injection molds and sheet metal stamping dies.
- Complete 3D design to manufacturing CAD / CAM solutions.
- Knowledge - based, automated mold design solutions.
- Moldfilling, packing, cooling, shrinkage, warpage and fiber analysis services.
- CAE simulation services.

PTXPO 2023 brings partners across the plastics supply chain together, which really changes things when you walk the show floor. Here, one exhibitor will recommend another exhibitor to help with an additional need, requirement or challenge the attendee is facing because they are trusted partners or vendors. These natural introductions come with credibility and is something you can't get without being there!

3D Printing

- Additive tooling
- 3D-printed vented core pins and conformal cooling solutions.
- Metal powder-bed fusion 3D printing systems and services.
- Metal 3D printing technology for precision tooling components.

Surface Treatment

- Laser engraving and texturing services.
- Engineered mold coatings and finishes.
- Ultrasonic cleaning units for mold maintenance.
- Mold sprays, greases, lubricants and releases.

Machining and Cutting Tools

- Five-axis machine tool and automation specialists.
- Multifunction machining centers that combine milling, deep-hole and radial drilling, tapping and boring technology.
- Deep - hole drilling system experts.
- Holmaking and finishing cutting tool systems

Training

- Online knowledge and training solutions using 3D process simulation technology.

However, because PTXPO is bringing the North American plastics supply chain together, there is more to this show than moldmaking! After you take time to explore the floor plan of the Moldmaking Pavilion here and online at short.moldmakingtechnology.com/PTXPO23, check out more exciting exhibitors scattered throughout the other six pavilions — Injection and Blow Molding, 3D Printing, Materials, Recycling, Auxiliary Equipment and Extrusion — showcasing products, equipment and services related to packaging, injection and blow molding, bottling and containers, consumer products, recycling and scrap reclaim, extrusion and thermoforming, moldmaking, medical, tooling, 3D printing, materials and sourcing and auxiliary equipment.

Then register using PROMO CODE: **MMT23**.

Sumika Partners with Hexagon, Enabling 60% Plastic Carbon Reduction for New Vehicles by Digitizing Sustainable Compounds for Engineers

Hexagon's Manufacturing Intelligence division and Sumika Polymer Compounds Europe (SPC Europe), a leading manufacturer of thermoplastic compounds, have partnered to digitise the performance of new sustainable automotive-grade polypropylene (PP) compounds, enabling engineers to design components that are more recyclable and offer a lower carbon footprint for future vehicles.

Sumika Polymer Compounds' short glass-fibre polypropylene (GF-PP) THERMOFIL HP and recycled polypropylene (GF-rPP) THERMOFIL CIRCLE materials benefit from sustainable manufacturing and recycling processes and offer carmakers performance equivalent to incumbent engineering plastics, but with an up to 60% lower carbon footprint. A growing proportion of today's PP components are recovered and recycled compared to polyamides (PA), of which up to 70% are utilised in waste - to - energy initiatives or finish up in landfill, but there remains substantial room for improvement. These new Sumika recycled PP compounds are designed for the circular economy, contributing to plastic waste reduction at vehicle end-of-life.

Plastics can contribute up to 20% of the total weight of a car, and their application is escalating with the continuing replacement of metals. The automotive

industry's shift to eMobility has increased the need for light-weighting components to maximise the energy efficiency of vehicles and mitigate the considerable weight of battery packs, but their environmental performance throughout the lifecycle must also be considered by product development teams.

“Limited material behaviour data is a barrier to sustainable eMobility innovations because automotive engineering teams have not been able to put new materials through the rigorous virtual durability and safety tests required for automotive endorsement,” said Guillaume Boisot, head of the Materials Centre of Excellence at Hexagon. “Our unique multiscale material modelling technology accelerates the adoption of SPC Europe's ground-breaking recycled materials by making it possible for product development teams to accurately simulate a component and subject it to established automotive engineering test and validation.”

This vital engineering data is the result of a long-term partnership between the two companies, providing product development teams the ability to evaluate the suitability of GF-PP compounds in new designs to address carbon-neutral targets by replacing traditional engineering plastics.

“Our THERMOFIL short glass - fibre reinforced polypropylene compounds offer equivalent performance to traditional engineering plastics while providing a much lower carbon footprint, which makes them highly suitable to meet design challenges that sustainable eMobility brings,” said Bruno Pendélio, marketing manager for

SPC Europe. “Combining our efforts with Hexagon allows us to support the race towards carbon neutrality by further lightweighting our customers' automotive components, reducing physical material testing and prototyping.”

Hexagon conducted a detailed and rigorous testing and physical validation programme with SPC Europe to produce highly accurate multi-scale behavioural models of its THERMOFIL® HP grades and THERMOFIL CIRCLE™ portfolio of recycled PP grades. Each material grade has a model that simulates the materials' mechanical and environmental performance throughout a component's lifecycle. The encrypted proprietary material models can be accessed by SPC Europe customers through Hexagon's Digimat software. Digimat is interoperable with popular computer - aided engineering (CAE) software tools, such as MSC Nastran, Marc, and third - party software, empowering engineers to perform accurate analyses using established digital engineering workflows.

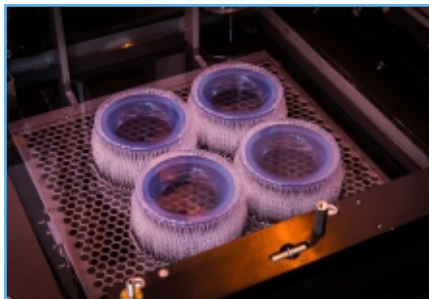
Manufacturability Analysis for 3D Printing Designs

Protolabs has added a design for additive manufacturability (DfAM) analysis for 3D-printed parts to its online quoting platform, allowing users to optimize designs prior to printing.

Protolabs (Minneapolis, Minn.) has launched instant design for additive manufacturability (DfAM) analysis on 3D-printed parts

through its online quoting platform, automating design feedback. Protolabs said DfAM analysis is available globally on parts uploaded to its design portal for any of its plastic and metal 3D printing services. With this technology, customers' 3D CAD files are put through a digital twin of the selected manufacturing process, identifying key DfAM issues before a part goes to the printer. When users receive their quotes, the analysis highlights potential manufacturability issues for things like thin walls, small gaps or prints that exceed maximum available build size.

Protolabs also announced that it has broadened its additive material and finishing options. Users can choose 3D-printed silicone in multiple levels of shore - A hardness. In addition, vapor smoothing was launched for select materials, providing enhanced finishes that eliminate rough surfaces and leave a glossy, aesthetic appearance on 3D-printed parts. The company already offered automated manufacturability analysis on injection molded and machined parts.



Protolabs says its design for additive manufacturability (DfAM) tool analyzes a 3D print design for any potential issues that could impact its fabrication.

Colorants for HDPE Allow for PET Gloss Levels

Ampacet's Waterscapes collection for any multi - layer HDPE packaging captures the ephemeral beauty of water



A collection of colorants designed for all markets using multi-layer HDPE packaging has been developed by Ampacet. The Waterscapes Collection evokes the growing scarcity of clean water and other natural resources, issues that will continue to dominate news and political conversation throughout the coming decade. In leveraging these colors, the most ephemeral qualities of water are harnessed by using a mixture of matte and gloss surfaces on a single object, mimicking the glassy - to - foam transition courses of waves, ripples, waterfalls and melting ice. This new-to-market effect allows PET gloss levels to be achieved in HDPE.

The Waterscapes Collection includes verdant Hydrosphere Green, refreshingly cool Green Harbor and algae - driven Sea - Guard. On the blue side, Ampacet achieves serenity with Glacier Blue and appeal to a deep tranquility with Coastal Blue and Waterways.



PLASTIC RAW MATERIALS

Ampacet Introduces ELTech™ Masterbatches for Electrical & Electronics Equipment Market



Ampacet, a global masterbatch leader, has launched the ELTech™ product range, specifically formulated to respond to the stringent requirements of the E&E market.

Modern society lifestyles rely on electricity and telecommunication, whether at home, at work, during transport as well as for leisure activities. The Electrical & Electronic Equipment (E&E) segment covers a broad array of applications, including power and telecommunication cables, connectors, electrical boxes, casings, ducts, conduits, plugs, sockets and switches.

“ELTech solutions, part of our diversification strategy, will further enrich Ampacet's wide portfolio of masterbatches and open

opportunities for new markets,” says François Thibeau, Ampacet Strategic Business Manager E&E.

“Ampacet ELTech masterbatches are designed for coloring wire and cable jacketing and connectors, as well as other E&E applications, following the RAL color standards. The ELTech product range is based on various carrier resins such as PE, EVA, PBT and Universal Carrier (UN),” he added.

The ELTech product range also includes masterbatches combining color with functional additives.

For proper functionality and operability of E&E applications, Ampacet offers advanced additive masterbatches, including laser marking, metal deactivators, UV stabilizers, flame retardants, antimicrobial, scratch resistance, slip and release, odor absorbers, process stabilizers and processing aids.

Borouge's Polypropylene (PP) Solutions Find Wide Applications

At Borouge, innovative and differentiated polyolefin solutions are created to better serve global communities. For over 20 years,

the company has been contributing to the development of sustainable pipe networks in India by making them safer, durable and more efficient.

Borouge's polypropylene (PP) solutions are commonly used in plumbing and heating systems, silent drainage pipes and industrial applications that involve corrosive chemicals at high temperatures. Within its grade portfolio, the Borstar® polypropylene random copolymer (PP-R) material is a well-established solution for domestic plumbing and industrial piping systems. It offers distinctive advantages such as:

- Over 50 years of service life.
- Excellent impact performance and pressure resistance at sub-zero and high temperatures.
- Strong welded joints that create uniform, leak-free connections.
- Does not corrode nor contain toxic substances, hence imparts no taste or odour to water.
- Uniform material shrinkage with any color pigments used.
- Reduced injection moulding cycle times.

All of Borouge's quality solutions are not only tailored according to the clients' requirements, but they also meet all international standards. Borouge's experience, technical expertise and a forward-looking attitude make them the right partner for the infrastructure market.



Highly - Efficient TiO2 with Lower Carbon Footprint

Chemours' Ti-Pure TS 1510 boasts superior processing performance and efficiency in plastics applications.



A highly - efficient rutile TiO2 pigment designed to enhance processing performance in plastics applications, including polyolefin masterbatch has been introduced by Chemours Thermal & Specialized Solutions, and Advanced Performance Materials. Ti-Pure TS-1510 is the latest pigment launch within the company Ti-Pure Sustainability (TS) series, a new product family showcasing its commitment to advancing societal, customer, and business segment sustainability goals. The enhanced processing performance

of Ti-Pure TS-1510 reportedly unlocks up to 6% lower net carbon footprint from the advanced pigment manufacturing process through masterbatch production when compared to traditional TiO2 pigments while improving profits.

The new grade was developed to address customer challenges and improve their production rate and processing. Chemours innovated a novel technology to produce this pigment with enhanced material bulk density to address these issues while improving profits and the processability of masterbatch. Ti-Pure TS-1510 is said to provide masterbatch suppliers the following benefits:

- Up to 12.5% processing energy reduction for plastic processing, which provides cost savings through efficiencies in processing, enabling less energy use
- Improved line productivity enables up to a 30% increase in compounding; this allows for asset flexibility for increased production and sales or capital avoidance
- Smaller package size due to higher bulk density means a 50% reduction in package height, reducing storage space and warehouse cost
- Superior pigment properties provide easier and more complete unloading with faster feed rates
- Increased flowability drives efficiencies in energy and labor
- Enhanced handling through low dusting leads to cleaner production areas, minimized pigment loss, and reduces dust collection system maintenance

- Packaging designed for ease of recycling and reduced material usage

The new level of processing efficiency enabled by Ti-Pure TS-1510 reportedly will help Chemours' direct and downstream customers reduce their environmental footprints individually and improve sustainability for the plastics industry. For masterbatch producers, Ti - Pure TS-1510 enables energy and labor efficiencies that lead to a lower carbon footprint than traditional TiO2 pigment. In addition, to further advance the product's sustainability, Chemours is delivering Ti-Pure TS-1510 in packages designed to be recycled or reused.

Acrylic - Based Compounds for Medical Devices

Roehm's new Cyrolite GP-20 and MD zk6 copolymer compounds for injection molding and extrusion boast superior balance of properties.



Two acrylic - based copolymer compounds that reportedly offer a superior balance of properties for medical devices have been developed by Roehm. Showcased at the 2023 MD&M West trade show, they are the latest additions to the company's Cyrolite portfolio of advanced medical actylics:

- Cyrolite G20CP is a PMMA-based copolymer that is said to ensure integrity of photosensitive substances such as oncology drugs, antibiotic, and antifungal agents that require superior UV-light protection. It is designed for UV - light transmission applications like dialysis cassettes, lenses, test packs, filter housings, microfluidics, tube connectors, IV catheter hubs, and Y sites. Moreover, it boasts five times the impact resistance of unmodified acrylics. Excellent dimensional stability and processability, improved tensile elongations, as well as bonding to PVC tubing are claimed. It can be thermally bonded, ultrasonic, and laser welded, and is reportedly resistant to EtO, gamma and E-beam sterilization.

- Cyrolite MD zk6 is an amorphous, impact modified compound based on PMMA that boasts high - impact resistance and ductility /toughness making it ideal for applications like dialysis cassettes, test packs , filter housings, microfluidics, lenses, tube connectors, IV catheter hubs, and Y sites. High light transmission with little haze is claimed. MD zk6 polymer can be processed in injection molding machines and extrusion lines with three-zone general purpose screws.

Available in 1500-lb gaylord boxes, with other packaging available on request, both materials meet U.S. Pharmacopeia Class VI; ISO 10993-1 and FDA for food contact for all use conditions up to and including hot - filled or pasteurized above 150°F (e.g., Condition 21 CFR 176.170) for all food types except those containing more than 8% alcohol.

Polyspectra Launches World's Most Rugged Resin for Desktop 3D Printers

Ultra - rugged photopolymer 3D printing moves to the desktop with all-new 405nm compatible resin offering.

Today we are very excited to announce the launch of our flagship material in a new formulation compatible with desktop DLP and LCD resin 3D printers. Previously available solely for use on 385nm wavelength 3D printers, limiting use to industrial hardware, the new formulation expands availability to 405nm wavelength systems.

“We founded polySpectra with a mission to democratize manufacturing. Today, we are very excited to announce the 405nm version of COR Alpha – which now gives engineers the ability to access the world's most rugged photopolymers on a wide array of resin 3D printers spanning every price point,” said polySpectra Founder and CEO Raymond Weitekamp, PhD.

Real End - Use 3D Printing

While many “production-grade” resins available today for 3D printing can create high-resolution parts with unique geometric complexity, they are often too brittle for demanding real - world applications. This inherently limits their use to prototyping and other less-demanding use cases. COR stands for “Cyclic Olefin Resin,” a new family of engineering - grade materials for additive manufacturing developed by polySpectra. COR Alpha relies on Nobel - winning chemistry to offer durability, high impact strength, high - temperature

performance, and moisture - and chemical - resistant capabilities – all without brittleness. Satellite components, consumer products, electronics connectors, and highly durable tooling for injection molding are just a few of the high - value applications where COR Alpha can tip the scale from prototyping to production.

COR Alpha has been commercially available since 2022 in a 385nm wavelength, compatible with and validated on a catalog of industrial -grade 3D printers.

Democratizing Production-Grade Additive Manufacturing

This ruggedness is now more accessible than ever before. The new COR Alpha resin 405nm formulation dramatically expands the list of compatible 3D printers. For the first time, inexpensive desktop 3D printers will have the capability to print with truly rugged resin.

R&D labs, small businesses without industrial budgets, and other users – many who already own desktop 3D printers – now gain the ability to create end - use parts in -house.

“The only difference between a toy and a tool is what it can produce,” Weitekamp said. “Whether you are running a \$250 LCD printer or a \$250,000 DLP machine – COR Alpha unlocks a step-change in ROI.”

As of launch, 405nm COR Alpha is fully validated for use on Asiga 3D printers. Additionally, many of the best - selling desktop 3D printer models out there are on the list of polySpectra's exploratory 3D printers, including systems from Anycubic, Elegoo, Nexa3D, Phrozen and Shining3D.

Over the next few weeks, polySpectra will announce validated print profiles for COR Alpha for many specific 3D printer models, in collaboration with these hardware manufacturers and others.

Petrochina again Selects Differentiated LyondellBasell Polyethylene (PE) Technology

LyondellBasell announced that PetroChina Jilin Petrochemical Company will again license LyondellBasell's polyethylene technology at their facility located in Jilin City, Jilin Province, P.R. of China. The newly licensed technology will comprise of LyondellBasell's leading high - pressure Lupotech process technology which will be used for both a 100 kiloton per year (KTA) Autoclave and a 300 KTA Tubular line. Both production trains will produce mainly low-density polyethylene (LDPE) with ethylene vinyl acetate copolymers (EVA). Furthermore, an additional 400 KTA Hostalen "Advanced Cascade Process" (ACP) line for the production of high density polyethylene (HDPE) will be built at the same time.

"We are pleased to be able to license additional LyondellBasell polyethylene technology in this project as PetroChina Jilin Petrochemical Company is an important existing licensee with whom we have had a long and successful history," said Neil Nadalin, Director Global Licensing and Services at LyondellBasell. Nadalin added: "The newly added lines will include our state-of-the-art high - pressure Lupotech technology as well as our multi-

modal HDPE technology enabling PetroChina to produce differentiated polyethylene resins".

Decades of experience in high-pressure application design makes the LyondellBasell Lupotech process the preferred technology for EVA/LDPE plant operators. High reliability, unmatched conversion rates and effective process heat integration are key attributes of the Lupotech process, designed to ensure this technology's on - going energy efficiency. More than 15,000 KTA of LyondellBasell high pressure LDPE technology has been licensed by LyondellBasell in over 80 lines around the world.

The Hostalen ACP process technology manufactures high performance, multi - modal HDPE resins with an industry - leading stiffness / toughness balance, impact resistance, high stress cracking resistance and process advantages are used in pressure pipe, film and blow molding applications. The PetroChina HDPE plants will commence operations using Avant Z 501 and Avant Z509-1 catalysts to produce a full range of multi - modal HDPE products.

New licensees take advantage of LyondellBasell's in-house expertise of continuous production improvement, product development according to the latest environmental regulations, and our know - how in high pressure design, by optionally joining our Technical Service program.

In addition to the Hostalen ACP, Lupotech T and Lupotech A process technology, the LyondellBasell licensing portfolio

of polyolefin processes and catalysts includes:

Spherizone – The breakthrough multi - zone circulating reactor provides a unique and innovative platform to manufacture polypropylene products with novel architecture and enhanced properties.

Spheripol – The leading polypropylene (PP) process technology with more than 33 million tons of licensed capacity. With globally recognized quality grades featuring leading monomer yield and investment costs to make it the technology of choice.

Avant – Advanced Ziegler-Natta, including non - phthalate, chromium and metallocene catalysts for entire range of polyolefin production.

Anti - Hydrolysis Additives for Nylon, Polyesters and Urethanes

CAI's ST-H10 and ST-HT13 boasts long - durability of products exposed to moisture.

Two new anti-hydrolysis additives designed for use with nylons, polyesters and urethanes in automotive, industrial and medical products that have a high possibility of exposure to moisture are newly available from Massachusetts - based CAI Performance Additives. The company is the sole distributor in North America for a broad portfolio of high - performance additives produced by China's Starbetter Chemical Materials



PLASTIC MACHINERY

Turning Table for Tool Handling

PTXPO exhibitor RUD Ketten Rieger & Dietz says the TECDOS turning table can turn, rotate and tilt up to 140,000 lb. of molds.

RUD Ketten Rieger & Dietz GmbH (Friedensinsel Aalen, Germany) says the TECDOS turning table can be used anywhere in the plant due its compact size with lift points for a hoist or insertion points for a forklift. Thanks to the low supporting surface, open tools can be cleaned directly on the table. Able to handle tools and objects weighing up to 140,000 lb, the table features a siren to indicate that it is in operation.

The tables are available in nine different sizes, ranging from 31.5 by 39 in. with a table height of 21 in., up to 98 by 138 in. with a table height of 82. The smallest unit has a load-bearing capacity of 1100 lb. The new industrial TECDOS TMB workbench allows moving and maintaining molds and objects weighing up to 5500 lb with a cordless screwdriver. RUD Ketten Rieger & Dietz will exhibit at the PTXPO (March 28-30; Donald E. Stephens Convention Center; Rosemont, Ill.)



RUD TECDOS's turning table can handle tools and objects weighing up to 140,000 lb..

All - in - one Flexible Packaging Recycling Machine

Polystar will showcase flexibility, ease of use at PTXPO 2023

Polystar Machinery, of Taiwan, will highlight the ease of use and flexibility of their Repro - Flex recycling system at PTXPO in March. The Repro - Flex is a high efficiency, one-step recycling machine designed to reprocess PE and PP flexible packaging material including cutting, compacting, extrusion, degassing, filtration, and pelletization. It can handle both printed and non - printed materials. The integrated cutting and pelletizing system eliminates the need to pre - cut material, requiring less space and energy consumption. The output range is 220 to around 2600 lb/hr.



Polystar's Repro-Flex Recycling Machine integrates process steps into a compact footprint.

Baumüller Will Showcase AMR System Solutions for Increasing Productivity in Manufacturing and Intralogistics at Logimat 2023

At LogiMAT, the International Trade Show for Intralogistics Solutions and Process Management, which will take place in Stuttgart from April 25 to 27, 2023, Baumüller Anlagen - Systemtechnik will present AMR system solutions for manufacturing and intralogistics in hall 5, stand B32.

The engineering company Baumüller Anlagen-Systemtechnik has been developing and implementing solutions for manufacturing automation for many years. One of its fields is the development of flexible and

easy-to-integrate systems in the fields of intralogistics and manufacturing. Here, Baumüller offers autonomous mobile robots (AMR) as turnkey solutions for agile modern production. AMR systems can lower process costs & significantly boost productivity, e.g. in intralogistics, testing and diagnostics technology, the manufacturing industry, and the pharmaceutical and healthcare sectors.

AMRs can efficiently perform many tasks with low added value in manufacturing, healthcare, and commercial facilities. Their use can mitigate manpower shortages and help to achieve a higher machine utilization rate in manufacturing operations.

Together with SESTO Robotics, Baumüller offers the entire service spectrum ranging from design to integration at the customer site, as well as other relevant services. AMRs can be combined with collaborative articulated-arm robots to perform assembly tasks, for example, or used for internal material flow. They increase productivity in manufacturing and logistics thanks to shorter walking distances, faster transport times, and improved flexibility in the use of materials and tools.

Compact mobile robot with one of the highest payloads in its class

The AMRs can be equipped with different structures of up to 300 kg and increase productivity in production and logistics thanks to shortened walking distances, faster transport times, and flexibility in the use of materials

and tools. As an experienced systems supplier, Baumüller contributes its know-how for successful and smooth integration into the existing environment and the available automation concept and realizes the customer-specific structures.

As an entry-level device and for smaller payloads, Baumüller offers a Lite variant with the same compact dimensions. It is designed for smaller payloads of up to 100 kg with technical options that are otherwise identical regarding navigation, safety, connectivity, and accessories. It is perfectly suited for transport tasks.

The AMRs are available with collaborative robots (HRC) of various manufacturers, lifting units, intelligent racking systems, and other individually implementable structures. The AMRs are also suitable for use in class 100 clean rooms and offer a rechargeable battery with a life of 10 hours. If a configurable battery charge level falls below the permitted level, the AMR automatically drives to the charging station and requires a maximum of 90 minutes for an 80% charge.

AMR experts live and on site

At the LogiMAT in Stuttgart, Baumüller, together with the intralogistics provider Fb Industry Automation GmbH, will be showing the direct cross-system interaction between an AMR and a shuttle storage system. The loading and unloading process from a small load carrier takes place without additional mechanical components.

Underwater Pelletizer for Color Masterbatches

ECON offers workflow and uptime advantages.

Austria-based ECON will present its underwater pelletizer at PTXPO 2023. It is specifically designed to work with color masterbatches. The machine offers straight forward accessibility, enabling fast and efficient material changeover. All important materials can be cleaned in less than 20 minutes, contributing to the equipment's high uptime availability. By preventing sedimentation, output is high quality and lump-free.



ECON Underwater Pelletizer for Color Masterbatches



ECON will also present its drum filter (EDF), which ensures continuous and automatic filtration of process water. The filtration technology achieves a high level of filtration down to 2 thousandths (55 um). The system is self-cleaning and maintenance-free, with fully automated operation. No additional process water and no fleece are required.

ECON's drum filter for process water.

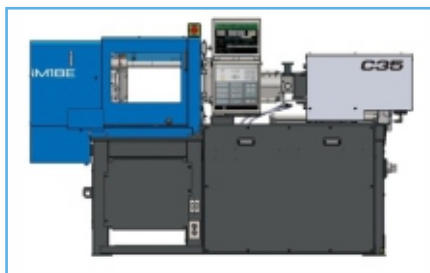
Compact Hybrid Injection Molding Machine Launched

Sumitomo Heavy Industries Ltd. (SHI) has introduced the iM18E, promising the smallest footprint in 20-ton machines.

Sumitomo Heavy Industries Ltd. (SHI) of Japan launched the 20-ton iM18E compact hybrid injection molding machine with a footprint of just 88 by 30 in. on Jan. 31, 2023. Designed especially for molding connectors, precision gears and other electronic parts, the iM18E has a maximum injection speed of 600 mm/sec. A company spokesperson told Plastics Technology that at this time the machine will only be sold in Japan and other Asian markets.

SHI says the iM18E occupies approximately 21% less space than the company's equivalent model SE18DUZ. Floor space required for the iM18E is greatly reduced thanks to a redesigned injection unit and a machine frame that allows peripheral equipment to be housed under the machine.

The iM18E's features a hydraulic direct - pressure clamp, with an electric plasticizing unit featuring a low - inertia servomotor. Controlled by the ISCII direct - drive system, SHI says the iM18E reduces shot - to - shot weight variation to about one - third of that of an equivalent hydraulic machine. The hybrid design reportedly reduces power consumption by 50% in comparison with the equivalent hydraulic machines.



The 20-ton iM18E compact hybrid injection molding machine occupies approximately 21% less space than the company's equivalent press.

Photo Credit: Sumitomo Heavy Industries Ltd.

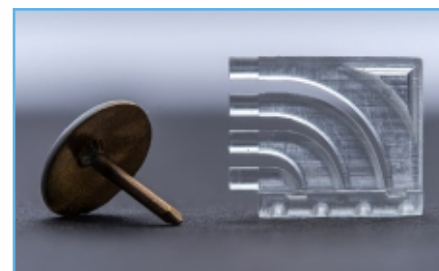
Micro 3D Printer Creates Microscale Features

B9Creations' Elite Micro 3D printer provides native pixel size of 20 μm with the ability to create wall thicknesses down to 30 μm and holes down to 100 μm .

B9Creations (Rapid City, S.D.) has launched the B9 Elite Micro 3D printer platform, delivering micro holes and thin wall thicknesses that push feature size capabilities for an economical price. The company says the Elite Micro enables users to 3D print geometries that would be impossible to create any other way, with the ability to fabricate truly novel medical and industrial applications.

The company says the Elite Micro 3D printer's feature size capabilities are at the scale and tolerances that nearly meet or exceed those of micro injection molded parts. The machine offers native pixel size of 20 μm with the ability to create wall thicknesses down to 30 μm and holes down to 100 μm .

B9 says the system is ready to print in just 15 minutes after opening thanks to factory startup assistance, and it never requires recalibration. Included software provides print preparation, management, and monitoring, as well as a streamlined workflow with automated cleaning and curing post-processing units.



This part was printed on the B9 Elite Micro from the company's HD Clear material, which allows for fully transparent parts with polishing or coating.

The printer can use B9Creations resins or third-party materials, or B9Creations can develop a custom resin. A company spokesperson told Plastics Technology that the machine uses photopolymer resins that come in 1-kg bottles. The B9 Elite Micro can print from the company's HD (high detail), HD Clear, and Robust PC/ABS resins. The annual service package includes on - site training and installation, a dedicated customer success specialist, hot swap program, and more. The units are customizable by build volume, resolution and accuracy, materials, software, and more.

Regarding customization, the spokesperson said resolution and build volumes for tailored platforms range widely depending upon customer needs. Historically, the company has customized machines from 127 mm all the way to 320 mm in z height,

depending upon the application. It has also developed semi-custom platforms that enable high-resolution printing for elastomeric materials, and customized software for healthcare, aerospace, and jewelry customers to integrate into their workflows.

After parts are printed, they must be cleaned with isopropyl alcohol to get rid of any excess resin, and then cured in a UV post-curing unit. B9Creations offers automated post-processing accessories that include the B9Clean, an automated cleaning unit where parts can be transferred directly from the printer to the while still on the build platform or as loose models on the part tray, and the B9 Model Cure, a multi-wavelength UV post-curing solution for resin models.



This part was printed from B9's HD Slate high-detail resin, designed for microscale components with zero "bleed" in the z axis.

Quick - Change Shot Sizes for Injection Molding

Niigata will debut the patented Shot Maker technology at the PTXPO (March 28-30; Chicago), allowing molders to quickly change a press's shot size by swapping out the barrel's stroke section.

At the upcoming PTXPO (March 28-30; Donald E. Stephens Convention Center; Rosemont, Ill.), injection molding machine maker Niigata will offer the global debut of its patented Shot Maker technology that allows molders to quickly and easily change the barrel capacity of a press.

Installed on a 110-ton MD-S8000 all-electric injection molding machine, the Shot Maker will allow Niigata to change the shot sizes its running at the show from 2.75 to 4.37 to 6.53 oz. Niigata will be demonstrating the Shot Maker by molding a foldable phone holder from a family tool. The 6-cavity tool makes three different sizes of the phone holders, with two cavities forming one holder. The smallest shot size can make one holder, with the medium making four and the largest able to fill all six cavities. The tool was built to show off the both the Shot Maker and Niigata's Constant Pressure Flow (CPF) mode, which automatically compensates for the unbalanced tool.

A patented option that is only available on a Niigata machine, the Shot Maker works by swapping out the end section of the barrel, while the screw and the barrel's main section remain in place. Changeable by hand in approximately 15 minutes, Cunningham says the Shot Maker is roughly the size of a large end cap, with the three units currently available measuring approximately 6, 8 and 10 in. in length.

Encompassing the stroke section of the barrel from stroke forward, Shot Maker allows molders to alter that portion of the barrel's

diameter. Steve Cunningham, general manager Niigata USA Injection Molding Div., told Plastics Technology that the machine at PTXPO will have a 30-mm standard barrel, which is also the size of the screw. When the forward stroke section is changed via the Shot Maker, the barrel diameter is altered to either 35 or 40 mm.

More Flexibility for More Jobs

Cunningham says Shot Maker targets the molder who can tackle most jobs with a specific tonnage of machine but has some outlier molds that would require a different injection unit or an entirely new press. "I've sold machines for many, many years," Cunningham says, "and I'd sit down with an owner and he'd say, 'I want to buy a 110-ton machine, and 80% of my work can be done with smallest screw and barrel, but I do have a few jobs that need the bigger shot size.'"

Facing this situation, molders often choose to buy the larger injection unit and subsequently have too big of a shot capacity for 80% of their work, which makes it difficult to optimize their processes. Doing so accommodates all the tools that are going to run on the machine, but it often pushes the press out of its "sweet spot", Cunningham notes.

Easy Access to the Screw Tip

Another advantage pointed out by Cunningham: whenever you have any issue with the screw tip, you now have fast accessibility for inspection, cleaning, replacement or more. For medical molders that have to certify their machines annually, including the condition of

the screw tip, they can now do so in 15 minutes versus the hours that were typically used to pull the entire screw from the machine.



Niigata will display the all-new Shot Maker technology on this 110-ton MD-S8000 all-electric injection molding machine at PTXPO.

JW Products Upgrade Machinery for Printed Security Seals

JW Products have improved their in-house printing capability with the introduction of new machinery that will provide customers with improved lead times for custom printed plastic seals.

The newly developed print machine is based around a multi - station indexing rotary table, each holding 20 seals per mould. The print head operates an ultra-long transfer roller with 300dpi print resolution, giving a high print quality with every print transfer.

Tom Beresford, general manager, said: "The development of our new machinery will provide a whole new level of customisation potential for our customers. The demand for improved lead time has motivated us to invest in cutting edge print capability that will allow us to bespoke print on a range of security seal types.

"This new system will enable us to produce around 10,000 printed seals per hour, with the option to increase this capacity to 15,000 per hour if required. This increases our total in-house print capacity by 50% and dispatch custom printed seals within 1-2 weeks. This will be ideal for customers who require plastic security seals quickly to replace stock or fulfil unexpected and unforeseen demand."

The new machine was installed at JW Products factory in January and internal training was provided to key production staff for machine and software operation. The integrated software generates formatted print designs from artwork files and then incorporates it alongside the set sequential numbering ranges for printing.

Netstal Launches Adaptive Pressure Control Retrofit for Hybrid Machines

Adaptive system pressure reduction is a feature from NETSTAL that can be fitted onto hybrid machines that allows manufacturers to control the pressure used during the injection moulding process.



In order to handle peak loads without any problems, the company says its hydraulic, hybrid injection moulding machines are designed for a maximum operating pressure of

250 bar. Depending on the application, a lower value would also be sufficient. Daniel Wipfli, Product Manager at NETSTAL, said: "This is where we come in with the new system pressure reduction and make our machines even more energy efficient. In automatic mode, the adaptive control system determines the optimum point at any time and adjusts the system pressure accordingly. With the same or even increased productivity, the energy consumption for providing the system pressure is reduced to a minimum." The company believes lower load on the components can also have a positive effect on machine availability and maintenance intervals can be planned more efficiently.

Smaller carbon footprint and higher cash flow

In addition, NETSTAL claims there are further ecological and economic advantages for customers. The lower energy consumption of the machine, the lower the carbon footprint of the machine. In addition to this, in most cases, the small surcharge for adaptive system pressure reduction pays for itself within a few months.

According to the company, the payback period varies depending on the region and electricity costs. In some countries, investments in more energy - efficient and climate - friendly production facilities are subsidised with government grants. Wipfli added: "For customers, we are happy to calculate the individual savings potential and show how they can manufacture identical products at a lower cost and with a smaller CO2 footprint."

CIRCULAR ECONOMY/ BIO-PLASTICS/ RECYCLING

What Type of Recycling Technology Works the Best? it Depends

NREL scientists describe a framework for comparing recycling technologies.

An article published on January 12th in the ACS journal Sustainable Chemistry & Engineering quantifies and compares the merits of recycling technologies for major commercially produced polymers. The strategy, developed by a team at the National Renewable Energy Laboratory, illuminates differences in the technical performance of produced material as well as environmental and economic impacts.

The recycling of HDPE, LDPE, and PP by mechanical means and dissolution were compared with the production of virgin resin. For recycling PET, glycolysis, methanolysis, and enzymatic hydrolysis were also included. Notably, the researchers assessed only closed-loop recycling, and concluded that pyrolysis is currently too energy intensive and too low-yield in a closed-loop implementation.



The contamination level of available feed streams affects recycling processes differently across technologies.

The Multidimensionality of Recycling Technologies

Materials are less likely to leak out of waste streams if they are recovered and returned to production streams. Much of the momentum around recycling stems from this potential to reduce the burden on waste management and simply reduce leakage by reducing volume. But this is one environmental impact of production (of plastic or anything else). The NREL study also includes water use, land use, energy use, greenhouse gas emissions, and toxicity. Each process has its strong points, but mechanical recycling shines across the board when it comes to environmental impact.

In some of the technical merits, mechanical recycling lags other processes. For example, it is much less able to deal with

contaminated PET than any of the other evaluated technologies. The end product also sells for rather less, though the authors point out that the lower startup costs compensate for the price difference. Technologies are also scored for product material quality (by melt flow ratio), material retention, circularity, and readiness level (the maturity of the technology).

The One Recycling Process for Every Plastic Product

More investments are going toward recycling plastics using a variety of methods, bringing reactions from laboratory benches to industrial scale facilities. Whether the process is formalized in charts like those drafted by the NREL group or not, these decisions are based on the prioritization of performance, economic, and environmental metrics. The same holds for public policy.

This approach does not give one answer. I mentioned that mechanical recycling does well with respect to all the environmental metrics. But in a PET recycling scenario where land use is the critical method, perhaps enzymatic hydrolysis should be considered (especially if the feedstock is contaminated

with other plastics). Not only is everything dependent on the polymer and quality of the feed stream, but each technology is likely to mean something different for each manufacturer, policymaker, or citizen depending on their priorities.

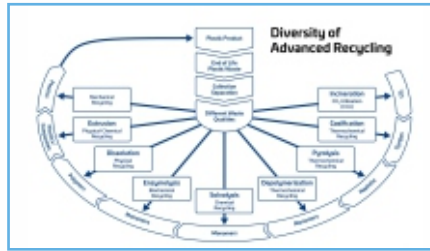
Adaption to Future Conditions

In considering the suitability of technologies for long-term use, we might think about how conditions are likely to change. Greenhouse gas emissions data are based on the current US energy mix, which is changing rapidly. Robustness to contamination is a must today, but could be less so in a world with improved sorting, a bottle bill or other enhancement to collection systems. The recycling processes themselves are likely to change as they are refined, scale up, and are joined by new developments.

Advanced Recycling: Beyond Pyrolysis

Consumer-product brand owners increasingly see advanced chemical recycling as a necessary complement to mechanical recycling if they are to meet ambitious goals for a circular economy in the next decade. Dozens of technology providers are developing new technologies to overcome the limitations of existing pyrolysis methods and to commercialize various alternative approaches to chemical recycling of plastics.

Advanced recycling technologies span a broad gamut.

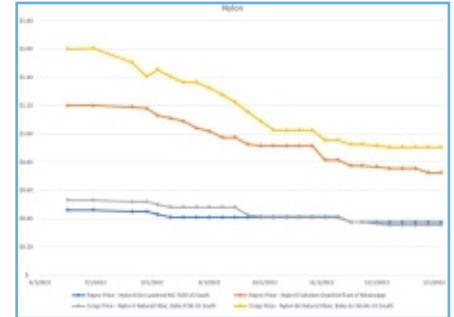


We are currently witnessing a growing acceptance of advanced chemical recycling technologies as complementary solutions to mechanical recycling. Brand owners in the FMCG (fast-moving consumer goods) sector acknowledge the role chemical recycling can play in unlocking the use of post-consumer recycled (PCR) content and we see several leading chemical companies investing in and / or partnering with advanced recycling technology providers. All eyes are now on the ongoing legislative discussions and deliberations on the status of chemical recycling and mass-balance accounting. The industry is hoping for a well-defined and inclusive policy framework, as it is clear to the entire plastics value chain that achieving plastic circularity will require a whole gamut of solutions.

The diversity of advanced recycling solutions is akin to the complexity of plastic waste, which comprises different types of plastics with diverse polymer chemistries. The largest advanced recycling capacities are currently achieved only via thermochemical methods using gasification or pyrolysis. On account of tech maturity, the total number of tech providers, and the average plant size, pyrolysis sits at the top of the list. It can process streams of mixed polyolefin waste and transform them into virgin-equivalent recycled grades for food-contact applications. This has been an important factor

driving its growth, with FMCG brands that rely heavily on PE- and PP-based packaging looking to meet the ambitious recycled-content targets for their product packaging.

FEATURED CONTENT



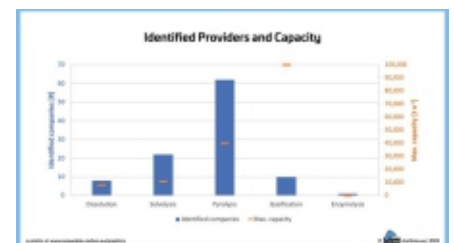
Recycled Material Prices Show Stability Heading into 2023

Resin Grade	¢/lb
POLYETHYLENE (ralcar)	
LDPE, LINER	62-64
LDPE BUTENE, FILM	75-77
HDPE, G-P INJECTION	74-76
HDPE, BLOW MOLDING	69-71
HDPE, HMBB FILM	74-76
POLYPROPYLENE (ralcar)	
G-P HOMOPOLYMER, INJECTION	51-53
IMPACT COPOLYMER	53-55
POLYSTYRENE (ralcar)	
G-P CRYSTAL	96-98
HIPS	104-106
PVC RESIN (ralcar)	
G-P HOMOPOLYMER	69-71
PIPE GRADE	71-73
PET (truckload)	
U.S. BOTTLE GRADE	79.5-81.5

Prices of Volume Resins Drop-- Except for PE



New Technology Enables 'Smart Drying' Based on Resin Moisture



Pyrolysis leads the pack.

Pyrolysis technology has been around for a while and is now being fine-tuned to meet the needs of the petrochemical industry. More than 60 pyrolysis technology providers have been identified in the report published in June 2022 by nova-institute in Germany and this list continues to grow. Many are working on enhancing the process and minimizing the environmental footprint. For instance, innovative catalysts are being used to lower the process temperature (and thus the energy demand) and reduce processing time. Advances in pretreatment of waste feedstock and post-treatment of process output are also ongoing to further improve the quality and quantity of the yield.

The Alpla Group, Together With its Joint Venture Partners Ecohelp and UPT, has Opened its First Pet Recycling Plant in Romania

The ALPLA Group, together with its joint venture partners Ecohelp and UPT, has opened its first PET recycling plant in Romania after a construction time of nine months and investment of around 7.5 million euros. The state-of-the-art plant is now producing around 18,000 tonnes of recycled material per year from household waste. The joint undertaking PET Recycling Team Targu Mures supplies the southeast European market with food-grade rPET and thus promotes the circular economy in the region.

ALPLA, Ecohelp SRL (Romania) and United Polymer Trading AG (Switzerland) commence

operations at their first PET recycling plant in Targu Mures, Romania, with an annual capacity of around 18,000 tonnes of rPET.



Around 18,000 tonnes of post-consumer-recycled PET (rPET) per year – the packaging and recycling specialist ALPLA, Ecohelp SRL (Romania) and United Polymer Trading AG (Switzerland) begin production at their joint recycling plant in Targu Mures. The three companies invested around 7.5 million euros in the construction and equipping of the plant on an adjacent site to the existing Ecohelp site in Targu Mures. Now, the first extrusion line for the production of high-quality rPET granulate from PET flakes has entered into operation. The joint venture partners will host the official opening ceremony on 4 May 2023.

'The growing importance of local recycling processes calls for increased commitment in the region. Together with our partners, we combine strengths, increase the processing quality of the recycled PET material and ensure the long-term supply of the southeast European market,' says Georg Lässer, Director Business Development, Procurement and Sales Recycling at ALPLA. Expansion potential has already been identified – the plant has space for a second extrusion line, which would double capacity.

Successful partnership

The joint venture, which was established in autumn 2021, combines the skill sets of the three companies involved. ALPLA brings its many years of expertise as a global recycling specialist and packaging manufacturer, while United Polymer Trading (UPT) has an extensive distribution network for plastics and recycled material. The local company Ecohelp supplies the material in the form of recycled PET flakes based on PET bottles from household waste. The food-grade rPET granulate obtained from this process then serves as the starting material for new preforms and bottles.

At the new plant, the joint venture PET Recycling Team Targu Mures run by ALPLA, Ecohelp and UPT produces recycled PET granulate based on bottles from household waste for the production of new preforms and bottles.

'The collaboration is a great example of how to improve local recycling and ensure sustainable economic development. We are filling a gap in the market for high-quality recycled material in Romania and neighbouring countries,' says Mihail Moloiu, General Manager at PET Recycling Team Targu Mures. The new recycling plant has created around 20 new jobs.

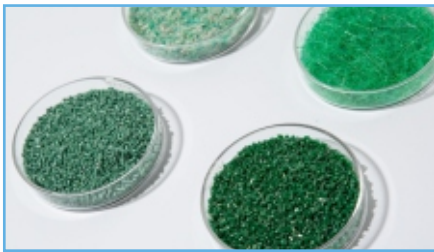
Global expansion of recycling activities

ALPLA is investing 50 million euros a year until 2025 in the ongoing expansion of its recycling activities. With its activities for the production of high-quality recycled materials, the global

company is promoting complete recycling in as many parts of the world as possible. In total, the annual production capacity of ALPLA's recycling companies and collaborations around the world amounts to approximately 203,000 tonnes of rPET and 74,000 tonnes of rHDPE.

LG Chem Makes Recycled Plastic with Marine Wastes

Together with NETSPA the company anticipated that using 50,000 tons of marine wastes generated every year in Korea as materials for recycled plastic will help reduce marine wastes while reducing carbon emissions.



LG Chem will recycle marine wastes, which have been a huge problem for the ocean, to produce plastics.

LG Chem announced that it entered into an MOU for building a resource circulation system by recycling marine wastes with NETSPA, a leading company in resource circulation.

Through this MOU, LG Chem will be able to stably secure raw materials for its Seokmun National Industrial Park pyrolysis oil plant in Dangjin, Chungnam, which is scheduled to begin operations in 2024. Once NETSPA sorts and processes plastics from marine wastes, LG Chem will use it to produce recycled plastics.

The two companies hope to not only protect the marine ecosystem but also reduce carbon emissions through this resource circulation partnership.

About 50,000 tons of marine wastes, such as discarded fish nets, are generated every year in Korea. But collecting the wastes has been difficult due to the costs of discarding, and even if they are collected, it has been difficult to treat. Therefore, most of the wastes were left neglected or incinerated.

LG Chem and NETSPA anticipate that using it as materials for recycled plastic will help reduce marine wastes while reducing carbon emissions by three-fold compared to other fossil fuel-based products.

LG Chem Petrochemicals Company President KUG LAE, NOH stated, "We will further accelerate eco-friendly technologies and businesses for sustainable growth in the future such as marine waste resource circulation."

Meanwhile, since declaring 2050 Net Zero, LG Chem has been putting the spurs to new sustainable, eco-friendly businesses such as launching eco-friendly plastics using bio-materials, establishing a bio-mass power plant joint venture, producing plastics through carbon capture, etc.

Austrian Mechanical Recycler Gets ISCC Plus Certification

Ecoplast is first mechanical recycler of polyolefins to be certified in Austria.

Ecoplast Kustoffrecycling GmbH, of Wildon, Austria, received the International Sustainability and Carbon Certification (ISCC) Plus. The certification covers the entire supply chain, from raw material to final product and recognizes standards of ecological and social responsibility, reduction of greenhouse gas emissions, and traceability.



Ecoplast recycling in Austria.

Ecoplast is the first mechanical recycler of polyolefins in Austria to gain the certification. "We're pleased to be able to stay ahead of our customers' demands for high-performance, sustainability-assured circular solutions," said Chris McArdle, vice president of circular economy solutions and new business development at Borealis.

Ecoplast is a subsidiary of Borealis, since its purchase in 2018. The certification will also help Borealis meet its own circular economy goals. Mechanical recycling at the Ecoplast site is a key component of the company's circular cascade model, complementing its core business as a PO producer.

Borealis is targeting a six-fold increase in its share of circular products and solutions by 2025.

Energy Capital Partners buys recycling firm Biffa



Biffa claims to be one of the UK's leading integrated waste and recycling firms.

US-based energy investment firm Energy Capital Partners (ECP) has completed its acquisition of British recycling company Biffa for £2.1bn (\$2.6bn).

Based in High Wycombe, Biffa claims to be a leader in sustainable waste management in the UK and focuses on improving the circular economy.

The company supports the entire waste management process, from recycling, treatment and energy generation to collection, disposal and surplus redistribution.

It serves 100,000 business customers and two million households in the UK, processing around eight million tonnes of resources a year.

ECP partner Andrew Gilbert said: "We are pleased to complete our acquisition of Biffa and to partner with such an exceptional leader in the waste management space.

"We share the Biffa team's vision to promote a more sustainable, circular economy, and are excited to partner with the company in its next phase of growth.

"We are impressed by Biffa's visionary leadership, talented employees and commitment to safety.

"ECP and Biffa will remain focused on providing the highest levels of service to the company's customers."

Biffa CEO Michael Topham said: "The closing of the transaction marks an important milestone in this exciting next chapter for Biffa.

"As we continue to invest in our leading position in UK sustainable waste management, leveraging ECP's deep environmental infrastructure - focused expertise will allow us to accelerate our growth, enhance our capabilities and continue to change the way our customers – and our economy – thinks about waste."

Lyondellbasell Announces Collaboration to Invest in Recycling Technology

Plastics and chemicals company, LyondellBasell and KIRKBI A/S, the family - owned holding and Investment Company of the LEGO brand, announced that they have signed an agreement to make an investment in APK, which specializes in a unique solvent-based recycling technology for low density polyethylene (LDPE).

Key Highlights

- LyondellBasell and KIRKBI to become minority shareholders in APK as they plan to invest 130 million Euros into the company
- construction of new recycling plants are planned to increase capacity

APK has developed the unique solvent - based Newcycling process

Yvonne van der Laan, LyondellBasell Executive Vice President claims the partnership will aid the value chain

APK aims to increase the recycling of multi-layer flexible packaging materials .

APK has developed the unique solvent - based Newcycling process, which separates the different polymers of multi-layer packaging materials and produces recycled materials with a high degree of purity suitable for new packaging materials. approximately 130 million Euros in APK. Further Newcycling Plants are planned to be built to increase the production capacity.

Yvonne van der Laan, LyondellBasell Executive Vice President, Circular and Low Carbon Solutions said: "We need to advance the recycling of all types of plastic waste material generated today to support the goal of a circular economy and meet the increasing demand for high quality recycled products, Advancing this technology, through our investment in APK, will enable more plastic packaging waste to be reintroduced back into the value chain and will address the demand from consumers and brand owners for more sustainable packaging. Products made using this unique Newcycling solvent - based technology will be a great complementary addition to our existing Circulen product portfolio, which currently offers mechanical and advanced recycling solutions to our customers."

U.S. Plastics Pact Reports Status Relative to 2025 Targets

Report aggregates data from members aiming to increase recycling and decrease use of problematic materials.

The U.S. Plastics Pact, a consortium working to bring about a circular economy for plastics, has released its annual report. The report compiles data for 2021 from 101 businesses, governments, and nonprofit organizations including some of the most prominent consumer brands. Members of the pact, called activators, represent 5.9 million tons of plastic packaging in the U.S. market.

The U.S. Plastics Pact, launched in August 2020, has set four targets for 2025:

1. Define a list of unnecessary or problematic materials and take steps to eliminate.

The U.S. Plastics Pact's list of unnecessary and problematic materials was released in January 2022. As of 2021, **14%** of packaging marketed by the activators contains one or more of the materials.



The U.S. Plastics Pact's list of problematic materials takes into consideration how a product is used. For example disposable

plastic straws provided free with a beverage are considered problematic / unnecessary, straws sold directly to consumers are not. Photo Credit: Getty

2. All plastic packaging will be reusable, recyclable, or compostable.



Clorox refillable household cleaner won a Sustainable Packaging Innovation Award.

Photo Credit: Matt Stonecash

36% of plastic packaging brought to market by the activators was reusable, recyclable, or compostable. The pact uses a definition of recyclable which requires that a system be in place for recycling at scale, so materials that theoretically can be recycled but in practice are not, do not qualify. Sustainable Packaging Innovation Awards were used to recognize new package designs in four categories: recyclability, refill, compost ability, and reuse.

3. Take steps toward recycling or composting 50% of packaging.

A baseline U.S. recycling rate of **13.3%** for packaging was calculated based on data from the EPA, the Association of Plastics Recyclers, and the National Association for PET Container Resources.

4. Achieve 30% recycled or bio-based content in plastic packaging.

The average recycled content used by U.S. Plastic Pact activators was 8%. The report notes that activators are focusing on recycled content, as none have identified a responsibly sourced bio-based alternative.

Tracking Progress Toward the Four Plastics Packaging Targets Activators of the U.S. Plastics Pact will continue to evaluate and report their progress annually through the World Wildlife Fund's Resource Footprint Tracker.

“We must continue to push the boundaries of collaboration and transparency to build the circular economy for plastics packaging.” says Emily Tipaldo, executive director of the U.S. Plastics Pact.

Siegwerk partners with Wildplastic and Hamburg University of Technology to increase recyclability of plastic waste

Of the billions of tons of plastic that have been produced worldwide, only about 9% has been recycled, and about 12% ends up in landfills. The rest can end up leaking into the environment, polluting oceans and rivers and breaking down into microplastics that are hazardous to human health. There is a clear and urgent need to improve recycling processes and to ensure that more packaging enters the recycling stream. Deinking packaging prior to regranulation helps to prevent the packaging inks from contaminating the materials to be recycled, and ensures that the packaging stays in the recycling stream.

The partners to the initiative recognize that it is only through cross-industry collaboration that progress can be made. Wildplastic is a German startup founded in 2019 aiming to clean the environment from plastic waste. In cooperation with communities of collectors, the start-up works globally to collect “wild” plastic from beaches, landfills, and illegal dumpsites. In spring 2019, Wildplastic started selling the first trash bag that is 100% made of recycled plastic. Currently, their focus is on sourcing Low Density Polyethylene (LDPE) such as bubble wrap or certain food packaging. LDPE cannot yet be widely recycled, so the market collection incentive for it is still limited. Wildplastic wants to change this by creating a demand for this material and showcasing the potential of post-consumer LDPE recycling. After collection, the plastic is transported to a recycling partner who washes, melts and processes it into granules. These recyclate granules are then sent to a production partner and used as a substitute for virgin LDPE material. This material is then used to create trash bags and mail bags. A broader scope of applications may be possible if the materials could be successfully deinked first.

In 2021, Wildplastic and the Institute of Circular Resource Engineering and Management (CREM) of TU-Hamburg started a cooperative research and development project, financed by the Investment and Development Bank of Hamburg (IFB) to study the feasibility of improving the quality of LDPE-recyclates from post-consumer sources. Evonik is supporting this project as a cooperative partner.

Resource Engineering and Management (CREM) from TU-Hamburg during a kick-off meeting between the partners in November 2022.

Siegwerk is supporting Wildplastic in this initiative by providing the deinking chemistry and knowledge to enable the creation of clean recyclates. In order for successful deinking to occur, a precise combination of the right ink chemistry, the right deinking detergent and the right process needs to be applied. Inks on packaging can often be a hindrance to recycling, as the inks degrade during the recycling process and can contaminate the recyclates, leading to unpleasant odors or unsightly colors.

Even if the inks are not totally removed, the opportunities for recycling are increased exponentially.

Pet Film Producer Evertis Obtains The Retray Certification, Quantifying Recycled Content From The Tray - To - Tray Loop

RETRAY is the Ecosense Foundation's certification scheme to consolidate a circular economy model in the value chain of thermoformed PET packaging by quantifying the content of recycled material, from the tray-to-tray circuit and other sources, in accordance with the EN 15343 standard and the verification of its recyclability according to the guidelines published by the Foundation.

Evertis, present in the polymer industry since 1959, is specialized in the production of

monolayer and multilayer PET film for food packaging applications. The purpose of the company has always been to offer packaging solutions that close the loop and contribute to a circular economy in the PET thermoform sector. Their sustainability strategy integrates the UN Sustainable Development Goals and boosts the product innovation in terms of circularity, recyclability and eco-design, as is the case of their latest product launches, EcoBar™ and Ecoseal™.

EVERTIS's commitment to the circular tray-to-tray model promoted by the foundation dates back to 2019, when the company obtained the ECOSENSE certification for the first time. Under the RETRAY scheme, heir to ECOSENSE, a Certification Entity has audited the processes of film manufacturing, verifying compliance with the following requirements of the RETRAY Procedure for sheet producers:

The traceability of the recycled raw materials involved in the manufacture of the film and the management of plastic waste resulting from the production process.

The percentage content of recycled plastic incorporated into the film manufactured over a certain period of analysis, in accordance with the EN 15343 standard.

Evertis has the objective of increasing the recycling content incorporated in their products and reaching an average of 50% by 2023.

The ultimate purpose of RETRAY is to increase the volume of waste from the tray-to-tray circuit to be recycled.



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