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PLASTISCOPE

The Official Journal of the Organization of Plastics Processors of India

Volume No. 12

• Issue No. 04

• Mumbai

• October 2023

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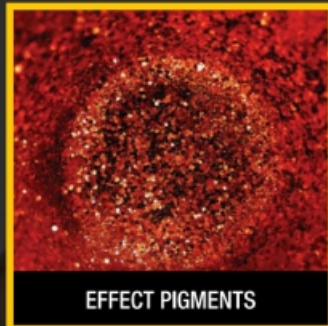


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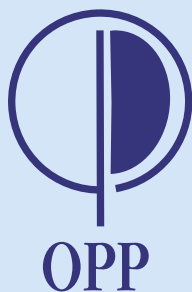


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FROM THE PRESIDENT'S DESK

Mr. Dilip Parekh



Dear Members,

Greetings from Organization of Plastics Processors of India!

In my last message to you I had mentioned about our Representation seeking deferment of QCOs on Polyethylene and other products. It has been already informed to you that as per our request the implementation of QCOs for Maleic Anhydride, Ethylene Vinyl Acetate Copolymers and Polyethylene Material for Moulding and Extrusion will now be implemented on 24th April 2024, 3rd April 2024, 5th January 2024 respectively. OPPI is grateful to Joint Secretary (PetroChemicals) for accepting our requests.

OPPI Secretariat had sent to you "Zero draft text of the international legally binding instrument on Plastic Pollution, including in the marine environment". The purpose of this document is to end plastic pollution including in the marine environment & to protect human health and the environment.

Our Executive Committee Member Mr. Pankaj Poddar has summarized this document as given below:-

1. End of plastic pollution, approach to address the full life cycle of plastic, prevention / progressive reduction and elimination of plastic pollution throughout the life cycle of plastic by 2040- utilization of plastic and plastic waste.
2. Intent to take steps to reduce demand and production of primary plastic polymer by various means including removal of subsidies & other fiscal incentives and establishment of regulatory requirements.
3. Not to allow and eliminate use of 'chemicals & polymers' that may hinder safe and environmentally sound management including their reusability, reusability, recyclability.
4. P9 – 2(a) Measure to ensure that production or use is carried out in a manner that prevents and minimizes human exposure > chemicals are managed in a safe and environmentally sound (b) 'producers' & 'importers' to provide to govt – additional info on transparency, tracking, monitoring, and labelling about hazards to human and environment (d) mark and label – to enable environmentally sound use and handling.
5. Problematic and avoidable plastic products, short-lived, SUP and intentionally added microplastics except (where a party has a registered exemption for the relevant production), production, design, and performance with a view to reduce demand of PPP, plastic, and plastic products – reduce, reuse, refill and repair of plastic and plastic products and alternative plastics (safe), non-plastic substitute, EPR – development of National EPR System (Govt).
6. Prevention of emission of hazardous substances (microplastics), release to soil & water from lifecycle, chemicals & polymers
7. Waster Management – ref. to 'Basel Convention' – parties to ensure taking effective measures – not to allow waste disposal leading to emission and release of hazardous substance – invest in waste management systems and infra to enable environmentally sound management of plastic waste.
8. No export – listed chemicals & polymers, plastic product containing listed chemicals & polymers and microplastic or products addressed (problematic, avoidable – short lived & SUP, intentionally added microplastic (except permitted and with the prior consent of importing state).
9. No transboundary movement of plastic waste except for its safe and env. Sound management with the prior consent of importing state, will develop export permit.

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Printed, Published and Edited by:

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

Editor: **DEEPAK LAWALE**

10. Dealing with existing plastic pollution – identification of accumulation zones, sectors, hotspots etc. – most affected, where litter pose a threat to species or habitats, take steps for mitigation and remedial measure. Just transition, Transparency, tracking, monitoring, and labelling – producers, importers to disclose harmonized info on their chemical composition of plastic and plastic products.
11. Every country shall establish a plastic pollution fee to be paid by plastic polymer producers – Govt to setup mechanism for implementation of 'global plastic pollution fee'; decrease financial flow towards projects result in emission and release and increase financial flow projects to prevent or reduce emission –
12. Parties to co-operate for capability building, technical assistance and technology transfer.
13. National Plan – Each Party shall develop and implement a national plan to fulfil its obligations under this instrument.

OPPI Secretariat has submitted detailed inputs on Zero draft text of the International Legally Binding Instrument on Plastic Pollution, including in the marine environment to the Joint Secretary (Petrochemicals), who will be attending third session of Intergovernment Negotiating Committee (INC - 3) scheduled from 13th to 19th November 2023 in Nairobi.

Organization of Plastics Processors of India is in the process of becoming UNEP – accredited organization.

With Best Wishes,

Dilip Parekh
President

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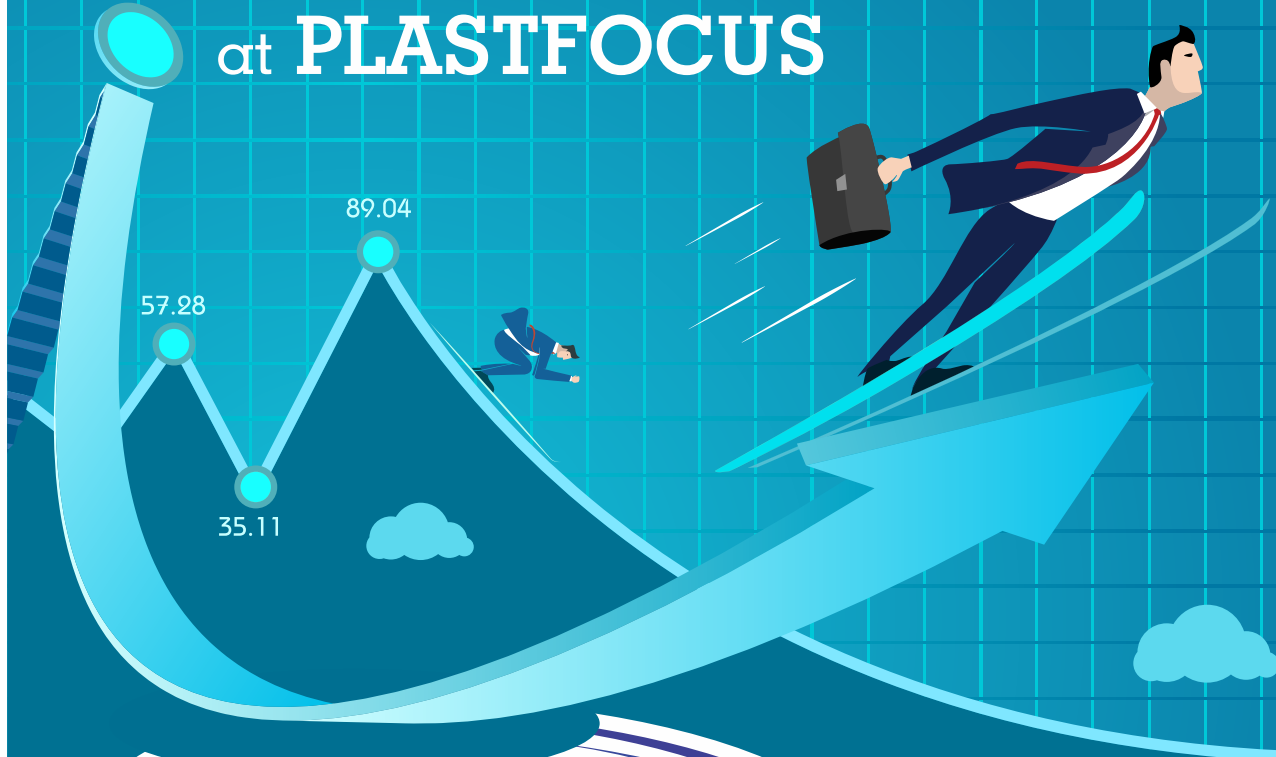
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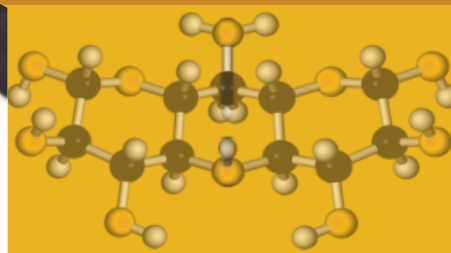
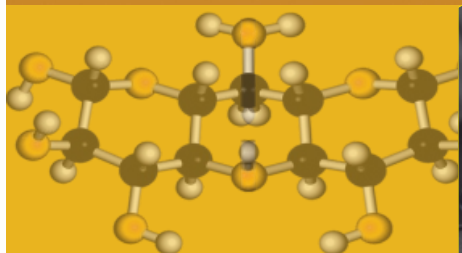
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NEWS FROM INDIA

Plastindia Foundation Announces New Managing Committee for the Term 2023 – 2026



The Members of the Managing Committee for the term 2023-26 are – President Mr Ravish Kamath, Vice President Dr Raju Desai, Hon. Treasurer Mr Dharmendra Gandhi, Imm. Past President Mr Jigish Doshi, Mr. V K Taparia, Mr Hemant Minocha, Mr. Jayesh K. Rambhia, Mr. Alpesh Bipinchandra Patel, Mr. Rashmikant Kishorchandra Mehta, Mr. Ramesh Kumar Rateria, Mr. Sisir Jalan, Mr. Abhay Upadhye, Mr. Anil Reddy Vennam, Prof.(Dr.) Shishir Sinha, Dr. P.S.G. Krishnan, Mr. Kamal P. Nanavaty and Mr. Raj Kumar Lohia

Mr Ravish Kamath took over from Mr Jigish Doshi. As President, Mr Ravish Kamath will lead the Foundation in its mission to advance growth in innovation, sustainability, and responsible practices within the plastics

sector and its verticals. He brings with him a wealth of experience and a deep commitment to the industry's growth and development. Mr Kamath is the Founder/CEO of Big Bags International Private Limited, one of the major manufacturers and exporters of Flexible intermediate bulk containers (FIBC's) operating since 1993. He was the Chairman of Plexconcil between September 2018 and December 2020 and currently he is the Panel Chairman FIBC, Plexconcil. He was the founder President of IFBCA (Indian Flexible Bulk Container Association) in the year 2002 and again between 2012 to 2014. He is the past President of AIFTMA, the association of plastic woven sacks manufacturing of India.

Dr Raju Desai who has taken over as Vice President is the Chairman & Managing Director of Jyoti Group, He is also Vice President of Plastindia International University & Past President of AIPMA (All India Plastics Manufacturers Association)

Mr Dharmendra Gandhi, the new Treasurer of Plastindia Foundation is a co-founder of the Mutual Group. With over four decades of

experience, he has been instrumental in introducing the latest machine technology to the Indian polymer industry. Having been actively involved in the Polymer community, in particular firstly as President of the Organization of Plastic Processors of India and now being part of Plastindia Foundation, Mr. Gandhi's Vision centers on providing innovative solutions while prioritizing environmental and energy conservation, which will prove to be invaluable to the growth of the Plastic Industry.

Economic Slowdown Stabilizes PVC Demand Growth in China, while India Leads from the Front

The consumption market for polyvinyl chloride (PVC) in Asia has undergone significant changes in recent months, primarily due to a greater emphasis on domestic market growth over exports. The shrinking population in China, coupled with a maturing market in Northeast Asia, is leading to a shift in PVC consumption patterns toward neighboring countries like India and Vietnam.

The increasing population will drive additional infrastructure and housing requirements in both

Southeast Asia and the Indian Subcontinent, supporting the demand for PVC. Ultimately, the Indian Subcontinent holds the highest potential for growth.

Mainland China PVC demand versus GDP growth			
Particulars	Historical		Estimate
	2000-2009	2010-2019	2020-2032
PVC demand, annual average (%)	11.5	6.6	2.6
GDP growth, annual average (%)	10.3	7.7	4.4
Elasticity (PVC demand/GDP)	1.1	0.9	0.6

Source: Industry

Apparent consumption down in China

According to industry sources, China's apparent PVC consumption declined by 2.6 percent to 19.3 million tonnes in the calendar year 2022, down from the 19.8 million tonnes reported in the previous year. China's PVC production was reported at 21 million tonnes in 2022. Due to the slowdown in global demand, Chinese producers lowered their operating rate by 4 percentage points year-on-year to 74 percent in 2022, compared to 78 percent reported in the previous year.

Notably, overall PVC exports from China tripled over the last three years. Starting from the level of around 800,000 tonnes in the calendar 2020, China's PVC exports jumped to around 2.4 million tonnes in 2022. According to reports, weakening domestic demand due to the coronavirus (Covid-19) - induced lockdowns, coupled with several other restrictions imposed by the local

governments, impacted exports of finished goods where PVC was used as a raw material. Deep-seated issues in real estate and impacting the progress of under - construction and new infrastructure projects also hit the domestic demand for PVC in China.

China's PVC exports see increased diversification with shipments happening largely to the destinations countries that witness some difference from the producers in Japan, South Korea, and Taiwan. China and other Northeast Asian producers are likely to compete with suppliers in India, Vietnam, and Bangladesh. Interestingly, China in geographic advantage to prioritize central Asia (such as Uzbekistan), and Russia amid ongoing major projects like the Shanghai Cooperation Organization (SCO) and the Belt and Road Initiative (BRI).

China's Covid-related lockdowns suppress domestic consumption, exports increase for much of 2022. Also, PVC prices rise in late 2022, supported by brisk restocking from India, and relaxed restrictions in China. Presently, global PVC prices are depressed amid healthy supply and underperforming consumption in China. In the calendar year 2023, PVC production and consumption remained under pressure in China as slower-than - expected economic growth impacted the government's real estate and infrastructure allocations. During the first half of 2023, China's PVC demand continued to remain weak with sluggish recovery from periodic shutdowns despite minor steps to ease the country's zero-tolerance on Covid policies.

Maturing PVC market in mainland China

According to industry experts, PVC demand has entered its mature phase in China. The average next 10 years' growth elasticities with respect to GDP will fall below 1 percent, precisely to 0.6 percent. Changing socioeconomic and demographic changes over the next decade are expected to contribute to the deceleration in growth rate. Also, excess supply may persist over the next two to three years, which is expected to slow down supply-side expansion. With export demand coming in, the overall plant capacity utilization rate is likely to reach above 80 percent by 2025.

Experts believe that China has already reached its peak in terms of PVC demand, and the focus is now shifting to Asian countries such as India, Vietnam, and Indonesia. According to the World Bank's East Asia and Pacific October 2023 Economic Update released on Tuesday, the region's gross domestic product (GDP) growth may record at 5 percent in 2023 and 4.5 percent in 2024 as compared to its previous forecast of 5.1 percent for the current year and 4.8 percent for the next year. The regional growth this year is higher than the average growth projected for all other emerging markets and developing economies but lower than previously anticipated.

In spite of slowing global growth, India remained a bright spot in terms of economic growth, new investment in infrastructure projects and eventually support for PVC consumption. The Reserve Bank

of India (RBI) governor Shaktikanta Das, forecasted India's economic growth at 6.5 percent for the current financial year 2023-24 and around 5.5 percent the next year. India's population has surpassed that of China to claim the most populous country in the world.

Therefore, the increasing population points to the need for a series of new infrastructure and housing projects. In the last few years, the government of India has launched schemes like 'Har Ghar Nal se Jal Yojana', and AMRUT 2.0, in addition to a host of other infrastructure development projects. The nature of India's economy ensures pipe demand growth for the next decade, with the main drives being the agriculture and infrastructure sectors.

The Indian plastic pipe market, including polyethylene, polypropylene, PVC, etc., is forecasted to grow at 11 percent by the financial year 2024-25 due to phenomenal growth being recorded in the economy. Pipes are likely to remain the largest end segment in India, accounting for 75 percent of all PVC demand. Chlorinated PVC continues to be of interest in India.

India's PVC demand is projected to continue its acceleration in the future, with volumes expected to reach 4 million tonnes in the financial year 2023-24 and further increase to 6 million tonnes by the end of the current decade. The consistently rising demand is poised to encourage investors to establish greenfield projects and expand existing capacity through the brownfield route. Analysts also foresee the possibility of mergers and acquisitions in this sector in the coming years.

Overall, India's PVC production capacity is anticipated to remain stagnant at 1.6 million tonnes until 2024-25, but it is expected to ramp up thereafter, reaching 4 million tonnes by 2029-30. Consequently, India is expected to persistently face a supply deficit until the end of the current decade, comprising at least 33 percent of its demand compared to the current figure of almost 58 percent. To address this deficit, India will continue to depend on imports for the next seven to eight years. However, considering India's increasing emphasis on infrastructure development and its aspiration to become a developed economy by 2029-30, the demand for PVC demand is likely to sustain its growth trajectory in the future.

RadiciGroup Inaugurates New Production Plant in India

It is the **first industrial site owned by RadiciGroup in India**, employing over 100 collaborators and situated in the municipality of **Halol** in the federal state of **Gujarat**: after 15 years of sales presence in the country, the Group has inaugurated a **new industrial complex of 19,000 square metres, 11,000 square metres** of which is **dedicated to the manufacture of engineering polymers**, the fundamental "ingredients" for numerous application sectors, such as **automotive, electrical and electronics, consumer and industrial goods, and telecommunications**. A decision made on the basis of **RadiciGroup's multiyear experience in India**, which has allowed the Group to get to know the local market

better and better, while growing steadily year after year. Today, **RadiciGroup High Performance Polymers** is a **leading partner for many customers** and, thanks to its new facility, is even better equipped to take on global challenges.

SIG to Setup First Aseptic Carton Plant at Ahmedabad

SIG, a world-leading packaging solutions provider, laid the foundation of its first aseptic carton plant in India. Expanding its presence in the country, the company plans to invest approximately Rs 525.98 crores in the facility being constructed in Ahmedabad, Gujarat.

The investment will be made in a phased manner over the period of 2023 - 2025 to reach a production capacity of up to 4 billion packs per annum. Subsequent investments are expected to increase capacity up to 10 billion packs per annum.

SIG's investment of about Rs 880 crores encompasses state-of-the-art production technology for printing and finishing aseptic carton packs. All the packages will be made adhering to stringent environmental, quality, and safety standards to meet the diverse needs of food and beverage producers and consumers.

Land and buildings for the new facility will be financed through a long-term lease with a Net Present Value (NPV) of approximately Rs 263 crores. Meanwhile, commercial production is anticipated to commence by the end of 2024. The first phase of the construction is projected to generate around 300 jobs.

India holds a key position in the global milk market and juice production. According to the Food and Agriculture Organization Corporate Statistical Database (FAOSTAT), India is the world's top milk producer. In the 2021-22 period, it accounted for twenty-four per cent of global milk production. Simultaneously, the country is also recognized as one of the largest juice producers worldwide. SIG's new aseptic carton plant in Ahmedabad aims to cater to its growing dairy and non-carbonated soft drink filler base in the country.

Profitability of the Flexible Packaging Industry to Reach a Decade - low Due to Oversupply and Weak Demand

The profitability of the Indian flexible plastic packaging industry is likely to remain under pressure in the financial year 2023-24, reaching the lowest in the last 10 years due to oversupply in the domestic market and weak demand overseas. A Crisil research report published earlier this week estimates the Indian flexible packaging industry to record decadal low profitability of around 8 percent in the current financial year.

India's flexible packaging industry has recorded double-digit growth over the last eight years due to increased demand for consumer products in recent years. During the pandemic-induced lockdowns and supply chain disturbances in the financial year 2020-21 and 2021-22 when the entire manufacturing sector struggled

for survival, the flexible packaging industry saw a substantial increase of approximately 20 percent in profit margins. With consumers facing lockdowns and employees preferring to work from home (WFH), there was a massive surge in demand for flexible packaging products.

However, capacity expansion work on stalled projects continued. The Crisil report suggests that the industry added a significant capacity over the past few years, despite lower - than - expected demand for consumer products. These substantial capacity additions, coupled with the resulting oversupply, is expected to push the profitability of the Indian flexible packaging industry to a decadal low of around 8 percent this fiscal year.

Furthermore, the weakness in export demand will contribute to the decline in profitability, with revenues expected to decrease by 3-5 percent as realizations remain subdued due to the supply glut, as mentioned in the report. Crisil's analysis of eight major flexible packaging players, accounting for over 75 percent of the domestic capacity, supports this assertion.

The industry has historically experienced cycles of substantial capacity additions and oversupply. For instance, during the last fiscal year, capacity expansion led to a drop in the industry's operating margin, from 18-20 percent during the pandemic, to around 10.5 percent. Meanwhile, the credit risk profiles of manufacturers will remain under pressure until an expected

recovery in operating performance takes place toward the end of the fiscal year.

Diverse end - use

The industry comprises biaxially oriented polypropylene (BOPP) and biaxially oriented polyethylene (BOPET) films. BOPET films have diverse end-use applications due to their higher oxygen retention power, high tensile strength, longer shelf life, and better print quality compared with BOPP films. However, BOPP films have higher moisture resistance properties and are cheaper, making them ideal for packaging food products.

While food packaging, pharmaceuticals, and personal care segments are likely to help maintain domestic demand resilience, exports may recover slowly towards the end of this fiscal year. With no major capacity coming online this fiscal year and the next, the demand-supply balance is expected to gradually improve over the next 6-12 months. Given these dynamics, volume growth is expected to be moderate at 5-6 percent this fiscal.

On the supply side, raw material prices typically follow the movement of crude prices. The average raw material prices this fiscal year will be lower year-on-year, which will also impact the realizations. Consequently, the industry's revenue is expected to decline by 3-5 percent. This comes after stagnant revenue performance in the previous fiscal year. Manufacturers will need to rely on balance sheet liquidity and financial flexibility to navigate through this cyclical downturn, said the report.

Raksha Pipes Unveils Aggressive Growth Strategy, Aims for Tenfold Capacity Surge

Raksha Pipes, a leading player in the piping solutions industry and a flagship brand of The Shand Group of Industries, is embarking on an ambitious journey to expand its capacity tenfold within the next five years. The company is executing a robust overhaul of its agri-pipe market strategy in pursuit of this goal. The overarching objective is to position the group for an impressive turnover of Rs 3,000 Crores by FY29, with a projected annual growth rate of 20 percent. Furthermore, the company is strategically planning the construction of warehouses in key locations such as Odisha, Bihar, and Jharkhand, augmenting its strategic preparations for the agri-pipe market. Capacity Expansion Fuels Raksha Pipes' Growth Momentum

Raksha Pipes has demonstrated exceptional resilience and forward-thinking, achieving a remarkable 20% year-on-year revenue growth over the past two years, even amidst the challenges posed by pandemic-induced lockdowns. According to Crisil Ratings, plastic pipes find extensive use in various sectors, with agriculture accounting for the largest end-user segment, followed by plumbing for real estate (both residential and commercial) at 38%, sewerage infrastructure at 12%, and other industrial applications comprising the remaining share.

As of 2022, the agri-pipe segment held a substantial 45.2% share of India's total plastic pipes market. With the agriculture sector experiencing robust expansion and the Indian government investing in water transportation facilities for agriculture, a significant surge in demand for plastic pipes is anticipated.

Market Dynamics and Raksha Pipes' Success Story

In FY23, Raksha Pipes reported revenues of Rs 950 crores, marking it as a profitable and debt-free entity. Sanjay Shand, Managing Director - Raksha Pipes, highlights the diversified sales distribution, with 50% attributed to construction/ building solutions, 25% to agriculture, and 25% to industrial infrastructure solutions. He said, "Raksha Pipes, embodying its tagline 'Raksha - Jeevan Bhar Ki Suraksha,' stands as a beacon of trust and quality among stakeholders, particularly distributors and dealers.

With a rich legacy of 44 years, Raksha Pipes boasts a robust PAN India distribution network of over 6500, ensuring widespread product accessibility. Our global presence extends to over 20 countries, underlining our commitment to international excellence. Raksha Pipes, known for its diverse product range, including Column / Riser Pipe, HDPE pipes, Casing pipes, Pressure pipes, and Suction pipes, is gearing up for an aggressive revamping. The group is aligning its capacities to meet the heightened demand in the agri-pipe market."

Anticipating Future Business and Industry Projections

With an eye on future business, Shand states that the additional capacity aligns with anticipated increased demand. Industry analysts project a 20% Compound Annual Growth Rate (CAGR) for Raksha Pipes' volumes over FY24 to FY29E, driven by a resurgence in rural demand and sustained demand from the plumbing segment.

India Initiates an Anti-Dumping Investigation into the Import of Epichlorohydrin from China, Thailand, and Korea

Triggered by a complaint filed by Meghmani Finechem Ltd (MFL), India has initiated an anti-dumping investigation into the import of epichlorohydrin (ECH) from China, Thailand, and Korea. These three suppliers met 100 percent of India's demand until last year. Industry sources have stated that Thailand alone accounted for approximately 80 percent of India's total demand until the financial year 2021-22, with China and Korea supplying the rest. MFL began commercial production at its Gujarat plant in June 2022, with a capacity of 50,000 tonnes per annum (TPA). However, due to the dumping of ECH from these countries at a price that stands cheaper than the prevailing market rate for domestically produced products, the MFL plant has been operating at only 40-50 percent of its installed capacity. According to industry sources, ECH from Thailand is priced at Rs 105-110

a kg in India, while MFL's cost of production stands at Rs 110-115 a kg, resulting in significant losses for the domestic manufacturer.

ECH is primarily used in the production of epoxy resins, accounting for nearly 80 percent of its consumption. It is also used in Active Pharmaceutical Ingredients (APIs), water treatment, paper chemicals, synthetic rubbers, surfactants, adhesives, elastomers, plastics, and rubbers, and as a strength additive in paper production. ECH can be produced using both propylene and glycerine as feedstocks.

Domestic Industry

Growing at a compounded annual growth rate (CAGR) of 6-7 percent, India's demand for ECH was estimated at 85,000 tonnes per annum (TPA) in the financial year 2022-23, an increase from approximately 80,000 TPA in the previous year. India's entire demand was met through imports until June 2022 when MFL started its sole manufacturing plant in Gujarat. Despite being an import substitute with the quality of domestic products matching the imported ones, Indian consumers prefer imports over buying from MFL, resulting in stockpiling, which increases the overall cost burden on the company. Producers from China, Thailand, and Korea also receive significant subsidy support from their respective local governments, thus keeping the cost of production lower. In the absence of any government subsidy, the cost of production stands higher in India, allowing a cost advantage to overseas suppliers.

India Mulling its Own Carbon Tax on Exports Along the Lines of CBAM

In keeping with the European Union's proposed Carbon Border Adjustment Mechanism (CBAM) principles, India is planning its own carbon tax, particularly for exports to European nations, according to a report by The Hindu Businessline (BL).

Senior officials were quoted by BL as saying that India will collect the tax proceeds itself instead of sharing them with the EU. A tax on imports or goods coming into India from the EU is also being planned. Officials are reportedly concerned about the legality of such a move if the World Trade Organisation challenges it.

Indian officials will selectively levy a tax "applicable only on EU exports affected by CBAM." The tax will thus remain within India and will be accounted for at the time of export, either through carbon credit or certification. According to the proposal, the tax will be levied only on "select products that will be exported from India to European nations."

An official told The Hindu Business line that the constitutionality of such selective taxation is also under discussion. Indian officials have already stated that they would like the EU to return any carbon tax collected from Indian exporters. The argument presented was that the repatriated revenue would be used to fund India's climate objectives.

An official noted that the EU is not looking at the equivalence of emission reductions but at the

equivalence of price. An agreement needs to be in place to ensure the EU's acceptance of such a law, he added.

The Carbon Border Adjustment Mechanism Regulation of the European Union was recently notified. It will be enforced in a transitional phase from 1 October this year, where traders will only have to provide information on the emissions embedded in their imports subject to the mechanism without paying any financial adjustment. The full implementation of CBAM is planned for January 2026, which will result in a levy on CBAM-covered imported products.

Source: Business Standard

43% of India's Exports to EU to be Hit by Green Regulations: Report

India's exports to the European Union (EU), worth \$37 billion, could be impacted due to the trade bloc's proposed Carbon Border Adjustment Mechanism (CBAM) and other green initiatives, a Delhi-based think tank's report has said. The impact would translate into 43 per cent of India's exports to the EU, which is among India's key export markets after the United States (US). The Centre for Energy, Environment and Water's report noted several categories in India's foreign trade at risk due to the EU regulations. These include textiles, chemicals, certain consumer electronics products, plastics, and vehicles which account for 32 per cent of India's exports to the EU in 2022.

India Emerging as Export Powerhouse for U.S. Firms: BCG

India is among the emerging future export powerhouses for U.S. companies as the world's biggest economy looks to significantly cut imports from China, according to a report by Boston Consulting Group.

India, Mexico, and Southeast Asia are quickly emerging as export manufacturing powerhouses led by competitive cost structures, deep pools of labour, and growing scale and capabilities across diverse industries, the report titled 'Harnessing the Tectonic Shifts in Global Manufacturing' says.

First movers in such countries often gain the opportunity to establish capacity while labour, land, and other factors are abundant and very affordable, the report points out.

"India is very cost competitive, however, and it has recently negotiated trade deals with Australia and the United Arab Emirates. Although India is just starting to emerge as a major exporter, it has a broad manufacturing base that supplies everything from electric vehicles and heavy machinery to chemicals and appliances for its domestic market," the report says.

From 2018 through 2022, U.S. goods imports declined by 10% from China, but rose 18% from Mexico, 44% from India, and 65% from the 10 countries of the Association of Southeast Asian Nations (ASEAN).

Source: Fortune India

India and Saudi Arabia Sign an MoU for Green Energy Generation and the Supply of Equipment

Over nineteen months after India signed a Comprehensive Economic Partnership Agreement (CEPA) with Saudi Arabia, the two countries have been strengthening ties with bilateral business deals for mutual benefits. In their latest move, India and Saudi Arabia signed a Memorandum of Understanding (MoU) in the fields of electrical interconnections, green / clean hydrogen, and supply chains. The agreement was signed between India's Union Minister of Power and New & Renewable Energy, R K Singh, and the Minister of Energy, Government of Saudi Arabia Abdulaziz bin Salman Al-Saud, in Riyadh.

This MoU aims to establish a general framework for cooperation between the two countries in the field of electrical interconnection, exchange of electricity during peak times and emergencies, co-development of projects, co-production of green / clean hydrogen and renewable energy, and also establishing secure, reliable, and resilient supply chains of materials used in green/clean hydrogen and the renewable energy sector.

The two countries also decided that mutual Business-to-Business (B2B) Summits and regular B2B interactions will be conducted to establish complete supply and value chains in these areas of energy sector cooperation. In order to strengthen bilateral and regional business, India signed a CEPA agreement with Saudi Arabia on February 18, 2022.

India further called upon MENA countries to join the Global Biofuel Alliance, in order to advance international cooperation in sustainable biofuels to realize the full potential of the alliance, which aims to facilitate cooperation in intensifying the development and deployment of sustainable biofuels, to facilitate trade in biofuels and much more, in collaboration with international biofuels organizations.

Advancing Starch - based Biomaterials: Steer's Innovative Approach



At STEER, we are constantly gearing up efforts towards evolving starch-based biomaterials through innovative compounding methods using STEER Omega twin screw extruders.

Biomaterials can help meet the rising expectations of the consumer markets, especially in populous countries and mature markets, and can be an effective alternative to non - degradable plastics.

STEER has expertise working with a wide set of materials, such as carbohydrates (sugar, starch, cellulose), lignin, proteins and fats to develop biopolymers, such as PBAT, PLA and those that are environment-friendly in nature.



PLASTIC PRODUCTS AND NEW TECHNOLOGIES

Mauser Packaging Solutions Invests to Revolutionise Sustainable Plastic Drum Manufacture



Investment in multi-layer plastic drum machine expands capacity for growing demand of Infinity Series products manufactured with recycled resin.

With the increased demand for post-consumer recycled plastic (PCR), the introduction of the Plastic Packaging Tax (PPT) in the UK, and companies making highly visible commitments to cutting back on virgin plastics, businesses are looking for a reliable, quality supply of packaging solutions manufactured from PCR.

By investing in a state-of-the-art multi-layer plastic drum machine at its plant in Littleborough, UK, global company Mauser Packaging Solutions is at the forefront of meeting the growing demand for products containing

recycled resin, helping your business to be more sustainable too. The new extrusion blow molding machine can produce a much more sustainable 3-layer tight-head plastic drum (also known as an L-ring drum) using recycled resin in the middle layer of the drum.

By using the UN-certified PCR drums, you can reduce the consumption of virgin plastic and CO2 emissions.

The 220-litre drums are part of Mauser Packaging Solutions' Infinity Series which includes IBCs, medical waste containers, plastic pails, tight-head containers, and lube oil cans, offering the most comprehensive portfolio of industrial packaging made from recycled resin.

This investment does not only boost UK manufacturing and support global sustainability efforts, but it is also helping to solve the very real issue of PCR supply (which is itself recyclable). The high-quality, recycled resin, used in the drums is manufactured in-house at a Mauser Packaging Solutions facility.

The resin, called Recolene, is made from empty industrial packaging that has been

collected, shredded, washed, sorted by colour and extruded on-site at one of the company's six recycling centres as part of its global packaging return programme. This unique closed-loop process ensures a consistent, high-quality supply of recycled resin that gives plastic materials new life, reduces industrial waste, conserves raw materials, and has a smaller carbon footprint.

Mauser Packaging Solutions is committed to supporting you in moving from the linear "take-make - dispose" model to the circular "reduce - reuse - recycle" model and will continue to invest in technologies and equipment that extends the life cycle of industrial packaging and supports the circular economy.

Another positive aspect is that by using the Infinity Series you reduce your carbon footprint and save raw materials. You also do not have to compromise on quality and safety.

As more regulations, such as the PPT in the United Kingdom, are introduced around the world to encourage the use of recycled plastic, Mauser Packaging Solutions' Infinity Series of products offers companies the most comprehensive portfolio of

industrial packaging made from recycled resin to help meet these regulations.

Lightweight 100% rPET Bottle Design, Tooling for CSD



Sidel's improved base and stretch-rod designs for StarLITE R are said to widen the process window for making high-quality CSD bottles with 100% rPET.

Greater variability in rPET resins leads to a narrower process window and lower bottle quality. Higher temperatures required to process rPET also tends to reduce control over material stretching and distribution in the blow molding process. Both these challenges are said to be overcome by the new StarLITE R bottle design and tooling from Sidel, an extension of its StarLITE ultralight PET bottle technology. Aimed specifically at 100%r PET bottles for carbonated soft drinks, StarLITE R is easier to blow as it can be done with a wider process window to achieve a high - quality CSD bottle. StarLITE R technology is available for both single-serve and multiserve CSD bottles. Sidel says the bottle weights are the same as for comparable sizes of StarLITE Ultralight bottles in virgin PET, but the company notes that StarLITE Ultralight is a low-cost bottle for hard discount markets

with shorter shelf life, while StarLITE R addresses mainstream markets with longer shelf life.

A key feature of StarLITE R is an optimized mold-base profile that improves material distribution and a high base clearance for optimum stability, according to Sidel. Also, advanced stretch-rod end design is said to improve stretching in the base and ensure accurate injection-gate centering. A special combination of grooves and venting holes enables precision base feet formation. A second important feature is the internal/external base cooling. A mold - base cooling circuit in the mold focuses on the warmer bottle base zones, while the hollow stretch rod requires to additional air supply. Sidel says the StarLITE R design can be easily installed on existing production lines with the company's EvoBLOW, Universal and Series 2 stretch - blow machines and can be adapted to fit current bottle designs.

Recycled Plastic Applied In Composite Railroad Ties



Granite Peak Plastics announced the launch of Triton Ties, an alternative to wooden ties.

The recycler Granite Peak Plastics has announced the launch of Triton Ties to manufacture a carbon fiber-reinforced railroad tie. The companies will be co-located and operated by the same leadership team.

According to the company, the extrusion process is fed by automated feeding systems for each component, enabling tight process control. Triton projects that the products should have a useful life of around 50 years, and will be impervious to many of the problems associated with traditional wooden ties, such as rot, moisture and insects. Granite Peak Plastics announced the launch of its new business Triton Ties. Photo Credit: Granite Peak Plastics

Danimer Scientific and Chevron Phillips Chemical to Collaborate to Make Biodegradable Plastic Products

Chevron Phillips Chemical is expanding its collaboration with Georgia - based bioplastics company Danimer Scientific to explore development and commercialization of high-volume biodegradable plastic products using Danimer's Rinnovo™ polymers via CPChem's loop slurry reactor process at its Bartlesville, Okla. facility.

Danimer is a pioneer in creating renewable and sustainable biopolymers, which have helped create plastic products that are biodegradable and compostable.

Rinnovo™ is a type of polyhydroxyalkanoate (PHA) synthesized from lactones produced using Danimer's proprietary Novo22™ catalyst technology, which can be used in the production of biodegradable alternatives to traditional plastics.

The collaboration expands on Danimer and CPChem's previously announced agreement, in which

Danimer is evaluating the use of CPCChem's loop slurry reactor design to develop a continuous reactor system in the manufacturing process for Rinnovo™.

“Our business relationship with CPCChem continues to yield results, and we're excited for the further opportunities that lie ahead,” said Stephen E. Croskrey, chief executive officer of Danimer. “CPCChem's Research and Technology lab in Bartlesville, Okla., is a premier facility staffed with world-class talent, which we believe will accelerate the path toward adoption of Rinnovo™ materials in high - volume applications that will assist in lowering the cost to serve key markets.”

Opened in 1950 by Phillips 66, CPCChem's Bartlesville facility contains first - class research equipment allowing for rapid testing of products across various processing conditions. Additionally, the facility's testing and analytical capabilities provide a more rapid feedback loop, accelerating the development and optimization of resin formulations.

“We continue to be excited about the potential of our MarTECH® process technology and related collaborations to advance Danimer's Rinnovo™, another CPCChem initiative that can help accelerate change for a more sustainable future,” said Venki Chandrashekar, CPCChem Vice President of Research and Technology.

Source: POLYMERS Communique - 03 October, 2023

Recycled Big Bags Made in Türkiye with Starlinger Technology



Gaziantep-based big bag producer Prof Sentetik manufactures big bags with recycled polypropylene. To meet the high standards for heavy-duty tape fabric, Starlinger's eqoCLEAN melt filter at the tape extrusion line ensures the purity of the melt.

Big bags, also called FIBCs, are omnipresent in logistics as a lightweight and economical type of packaging for free-flowing bulk goods. Made predominantly from polypropylene (PP), they show a CO2 balance per 1,000 liters of transported goods that is far below that of rigid containers such as drums or octabins. Turkish big bag producer Prof Sentetik is making them even more sustainable by adding post-industrial and post-consumer PP waste in the production of various types of big bags. The company has recently installed Starlinger equipment for woven PP bags and big bag production, including a Starlinger PP tape production line equipped with the new eqoCLEAN filter system for processing recycled granulate. With this new tape extrusion line, Prof Sentetik produces PP tapes for FIBC fabric with recycled polypropylene (rPP) that meet all the specifications required for heavy-duty packaging applications.

“Plastic waste is a valuable resource, and instead of depositing it in landfills or incinerating it, it should be used in the best possible way”, said Fahri Şengül, General Manager of Prof Sentetik. “For us, Starlinger's holistic approach to packaging production is very helpful. Being a supplier of both production machinery for woven plastic packaging and plastics recycling equipment, they understand the product cycle of plastic packaging from the beginning right to the end. They know how to produce high-quality recycled plastics, and their woven packaging production equipment is designed for processing virgin as well as recycled input materials, even if they stem from post-consumer plastic waste.”

Prof Sentetik currently processes in-house production waste and additionally buys recycled PP granulate, produced also from post-consumer plastic packaging waste.

“As big bags have to meet special safety standards, the quality of the recycled material plays an important role in tape production”, confirmed Fahri Şengül. “The Starlinger tape extrusion line with the eqoCLEAN filter module ensures that the tapes we produce meet the specifications regarding tensile strength and elongation required for big bags in heavy-duty applications.”

Melt filtration – a must when processing recycled materials

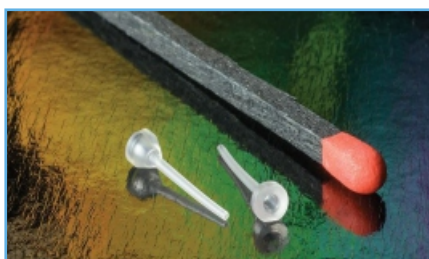
The extrusion of heavy-duty PP tapes with recycled content, especially from recycled post-consumer plastic waste (PCR waste), requires adequate melt

filtration. The share of rPP materials that can be processed depends on various factors, for example from which waste stream the post-consumer waste comes from, or how the waste was handled during collection and storage. Fine filtration already before tape extrusion, i.e. during the recycling process, is crucial. Solid contaminants that can occur in PCR materials, as well as foreign polymer particles in the melt – e.g. from polyester sewing yarn – compromise tape quality and cause problems in the tape production process.

The eqoCLEAN filter module developed by Starlinger takes into account all the requirements for producing high-quality PP tapes with post - consumer recycled PP. It consists of a SPB single - piston power - backflush filter, a melt pump, and a second filter unit, called HS 2.0 filter. The SPB filter has one piston and four cavities for filter screens and can be used for processing polyolefins such as PP or PE. During the hydraulic power-backflush procedure the line operates at full production speed without interruption of the production process. The regular automatic high - pressure backflushing procedure cleans the filter screens thoroughly, increasing their lifetime and reducing machine downtime significantly. The melt pump in combination with the additional HS 2.0 filter, which is positioned directly before the extrusion die, ensures stable production and high operational reliability of the line. It also enables the processing of high shares of CaCO₃ and post - consumer recycled PP of 50 % and more.

Following the tape production process, the tapes are wound onto bobbins and turned into big bag fabric on Starlinger's heavy-duty circular looms. In the last step, the woven fabric is converted to big bags. Properties such as tensile strength, weight and safety factor of Prof Sentetik's big bags with rPP content meet all required safety standards and are continuously tested using standard testing procedures and certified equipment.

Novel Micromolding Process Reduces Cost, Boosts Production Volumes



A novel approach for micromolding thin - wall cannulas has been developed by precision micromolding company Accumold. The new process is expected to reduce costs and failure rates while increasing production volumes. The thin-walled cannula design is also said to be customizable to meet specific applications and project lengths, material requirements, and head design.

Small - scale parts with tight tolerances

Conventional production of cannulas typically involves extrusion, tipping, and gluing to a metal hub, all of which introduce limitations in efficiency and quality, said Accumold. Extrusion, which involves forcing

material through a die to create the cannula shape, becomes especially challenging for small dimensions because of the risk of material inconsistency, wall thickness irregularities, and potential defects. Tipping, the process of adding a plastic or metal tip to the cannula, introduces variability in terms of bonding strength and tip alignment, which can impact the precision required for medical procedures. There have also been general concerns about the gluing process, as adhesives can degrade over time and lead to safety issues if the cannula detaches from the hub.

With today's demand for smaller, thinner components continuing to rise, micro injection molding can play a significant role within the medical industry, particularly as minimally invasive procedures and the need for smaller devices become more prevalent. Micro injection molding also enables the production of intricately designed medical components that often require tight tolerances.

Officials at Accumold anticipate that this molding approach will be applicable to applications in other industries, including electronics and automotive, because of its ability to produce small - scale parts in tight tolerances and consistent quality. Miniaturization and manoeuvrability

Demand for small, thin-walled cannulas is projected to grow to facilitate invasive patient - care procedures, such as laparoscopic surgery, endoscopy, and catheter insertions. The diminutive size and thin walls of the cannulas also allow for minimal tissue disruption during insertion, as

well as reduced pain, faster recovery times, and decreased risk of complications. The specialized cannulas play a particularly important role in fields where manoeuvrability is essential, such as neurosurgery and cardiovascular interventions. Their slender design enables access to complex anatomical structures that could be challenging to reach with larger instruments. Additionally, as medical technologies continue to evolve toward miniaturization and minimally invasive techniques, small and thin-walled cannulas become essential components for innovative medical devices.

Process particulars

Perfected over five years of research at Accumold, the micro injection molding process requires several design for manufacturability (DFM) considerations to be addressed for effectiveness. Ensuring uniform wall thickness is paramount, as variations can lead to warping, cooling inconsistencies, and inadequate filling. Proper gate placement is essential for influencing material flow and minimizing stress points, while suitable venting channels are crucial to prevent air traps that can result in surface defects. Incorporating appropriate draft angles facilitates seamless ejection from the mold and prevents potential damage.

Maintaining accurate parting line alignment prevents flash and surface mismatches. Strategic placement of features such as ribs and supports enhances structural integrity without compromising the overall design, while carefully considering the positioning of ejector pins prevents interference with critical features during demolding.

Addressing assembly considerations in some instances can be vital, particularly if the cannula is part of a larger device. Ensuring mating surfaces, alignment features, and interlocking mechanisms are well designed enables smooth integration.

An appropriate aspect ratio directly impacts the manufacturability and quality of the molded part. Maintaining a balanced aspect ratio is essential to avoid challenges associated with flow dynamics, cooling, and structural integrity. An excessively high aspect ratio can lead to difficulties in material flow and cavity filling, potentially resulting in uneven thickness and defects. Conversely, an aspect ratio that is too low might hinder proper cooling and cause warping, making it vital to strike the right balance that promotes both accurate molding and structural stability.

Achieving the ideal aspect ratio is crucial not only for the successful filling of the mold but also for ensuring consistent quality throughout the production process. A well-balanced aspect ratio minimizes the risk of defects such as sink marks, flow lines, and uneven surfaces that can compromise the cannula's functionality and overall performance. Additionally, the aspect ratio affects the ease of demolding and assembly, contributing to efficient production and reliable end products.

Material Selection

During the five-year development process, particular attention was paid to material selection, which is paramount in optimizing outcomes. The unique challenges

posed by micro-scale manufacturing, such as precise cavity filling and intricate geometry replication, require materials to possess specific properties such as low viscosity, excellent flowability, and minimal shrinkage. Material selection also affects the durability and biocompatibility of medical devices, ensuring they can withstand the rigors of use while being safe for patients. By choosing materials that align with the intended application and manufacturing process, manufacturers can achieve consistent quality, dimensional accuracy, and functional reliability, ultimately driving the success of micromolding endeavors, according to Accumold.

Current Medical Applications

The micromolding process reportedly has been successfully performed in a range of end-use applications in a variety of materials. One example cited by Accumold is an ophthalmological cannula application in which polycarbonate was used to produce short cannulas for use in eye surgery. The cannula had an outer diameter of 0.035 in. (0.889 mm), inner diameter of 0.027 in. (0.6858 mm), and a wall thickness of 0.004 in. (0.1016 mm). The company also prototyped a molded cannula for a drug manufacturer's cancer-drug - delivery device using polypropylene. The device has an inner diameter of 0.027 in. (0.6858 mm), outer diameter of 0.015 in. (0.381 mm), and wall thickness of 0.006 in. (0.1524 mm). For this application, the wall thickness tapered down to the needle, and was thinner at the tip.

A prototype of two molded cannulas for a large diabetes company's drug-delivery devices also utilized polypropylene for a cannula with an outer diameter of 0.022 in. (0.5588 mm), inner diameter of 0.011 in. (0.2794 mm), and wall thickness of 0.0055 in. (0.01397 mm). The cannulas were molded on conventional presses and on Accumold's proprietary micromolding presses. Accumold's researchers discovered that conventional micromolding presses had difficulty with non-fill and flash. Through the use of the company's fully automated in-house presses and 16-cavity micromold tooling, reliable, repeatable, and high - volume production of 40 million parts per year from a single production cell was reportedly achieved.

Source: Plastics Today

Klöckner Pentaplast Beats UK EPS Ban with Fully Recyclable kp Infinity®



Ahead of the ban on Expanded Polystyrene (EPS) food containers in the UK from 1 October, Klöckner Pentaplast (kp) has confirmed that the conversion of its St. Helens site to fully recyclable Expanded Polypropylene (EPP) is complete. kp Infinity® is fully recyclable and marked with consumer 'Recycle Me' messaging on packs and trays. Crucially, kp Infinity® is exempt from the impending EPS ban and is now

available through wholesalers and distributors, creating a seamless like-for-like switch for foodservice businesses. The kp Infinity® range has undergone extensive testing and trialling in today's recycling infrastructure with RECOUP, the UK's leading authority on plastics waste and resource management. Sally Molyneux, Sales Director Trays & Flexibles – UK, Ireland, Benelux and Australia at kp, comments: “From 1 October, we are complying with the impending ban and ceasing the supply of EPS trays. However, our customers won't be left adrift. kp Infinity® is EPP-based, fully recyclable, manufactured in the UK and complies with all relevant laws and regulations. “kp Infinity® offers the convenience of EPS, but without the associated recyclability drawbacks. Packs are also easier to recover in one piece, as they won't splinter or fracture as easily as other plastics. The technology is a fantastic showcase for the way that material and design innovation are directly responding to the needs of today's foodservice industry.” Supporting customers in the UK foodservice industry, kp aims to show that sustainable design doesn't mean compromising performance. kp Infinity® is designed to keep food piping hot and still comfortable for consumers to handle. “We're proud to play our part in the sustainable packaging economy, and with kp Infinity®, we're beating the EPS ban and ensuring our customers are not caught out.”

British Flooring Manufacturer Altro Uses Vinnolit Greenvin® PVC to Produce Floor and Wall Systems for Commercial and Residential Use

Altro, an established UK manufacturer of sustainable floor and wall systems for commercial



and residential spaces, is committed to significantly reducing its carbon footprint for Scope 1 and Scope 2 greenhouse gas emissions through a combination of efficiency improvements and the use of renewable energy to reduce. A component of Altro's sustainability strategy is the use of lower carbon Vinnolit GreenVin® PVC in the manufacture of Altro flooring, which is produced in both the UK and Germany. Altro supplies flooring to a wide range of sectors including healthcare, education, hospitality, leisure and retail.

Vinnolit GreenVin®PVC is used in the formulation of 90% of Altro's flooring products worldwide. To produce GreenVin® PVC, Westlake Vinnolit purchases electricity from renewable energy sources, such as wind or hydropower, which is fed into the shared power grid and secured by high-quality renewable energy certificates (guarantees of origin / HKNs). In this way, GreenVin® PVC is produced with 100% renewable electricity and offers customers a material with reduced CO -emissions. Depending on the PVC type, the carbon dioxide savings of GreenVin® PVC are approx. 25% compared to conventionally produced® Vinnolit PVC.

The respective carbon footprint for the entire Vinnolit product portfolio was calculated by Sustainable AG according to the ISO 14067 standard. The

inspection and certification is carried out by TÜV Rheinland. “As we aim to reduce our carbon footprint by 2030, the partnership with Westlake Vinnolit is a key to our success. Our innovation and product development team is constantly looking for high-quality, carbon-reducing materials, and Vinnolit GreenVin® PVC meets these requirements,” said Sarah de los Rios, Commercial and Marketing Director at Altro. “With our GreenVin® product line, all Vinnolit PVC types are also available to customers as GreenVin® and GreenVin® bio-attributed products – with identical technical specifications and processing properties,” confirms Dr. Thomas Brock, Head of the Vinyls, Innovation, Technology Business Unit at Westlake Vinnolit. “Vinyl floor coverings are the ideal material for demanding applications: durable, easy to clean and available in many designs.”

With GreenVin® we have created an interesting opportunity for environmentally conscious companies like Altro to reduce their own CO₂. At the same time, we support the goals of VinylPlus®, the European PVC industry's voluntary commitment to sustainable development.”

Aptar Beauty and Pinard Beauty Pack Introduce the First Fully Recyclable, Omnichannel and High Capacity Airless Pack

A joint development by Aptar Beauty and Pinard Beauty Pack, it unites the two companies' respective strengths in airless dispensing systems and plastic bottles. The result is a modern

packaging solution for personal cleansing, body, hair and sun care products.



Aptar's award-winning Future pump is mono-material PE, fully recyclable** and omnichannel capable*. The actuator is optimized for ecommerce, with a locking / unlocking ring and 360-degree, free-spinning actuator, which helps minimize potential breakage during transportation.

Pinard's patented airless PET bottle-in-bottle technology is deployed to create a flexible bottle within a rigid outer container. This new bottle provides all the benefits of an airless packaging solution: formula protection, good compatibility with cosmetic formulas, a high restitution rate and usage at any angle. The full package is also e-commerce capable* as it passed the rigorous Amazon ISTA-6 protocol. The PET (polyethylene terephthalate) bottle and PE pump are also available with PCR (post-consumer recycled) material for greater sustainability.

The bottle-in-bottle can be entirely made of rPET, while the metal-free pump can contain up to 52% PCR – all can be offered in food-grade material. Future Airless PET has been reviewed by RecyClass to comply with the highest standards in recyclability. Future Airless PET comes with numerous customization options to conform with brand identity. Its

high-end aesthetics thanks to the transparent PET makes it an ideal solution for brands who want a differentiated pack on shelf.

The product will be available in a 400ml bottle and a 28 Snap on pump, with the possibility to add an optional non-detachable tamper evident system. The launch is expected mid-2024.

Dyneema® by Avient Unveils Breakthrough Innovation to Enable Weight Savings of up to 20% in Protective Body Armor

Dyneema®, owned by Avient Corporation, a leading provider of specialty and sustainable material solutions, announced the launch of a next-generation unidirectional (UD) material innovation based on its third-generation fiber: a groundbreaking development poised to enhance the safety and mobility of law enforcement officers and military forces.

Through molecular engineering, Dyneema® was able to innovate its third-generation fiber at the polymer level. This breakthrough evolution enabled a higher-tenacity fiber – resulting in increased ballistic stopping power when used in the new UD material, Dyneema® SB301, for protective armor applications. The seismic shift in performance enables body armor manufacturers to design soft armor vests 10–20% lighter than previous protective solutions.

“In every situation, weight is now considered to be the top priority after ballistic stopping power,” said Marcelo van de Kamp,

global business director for personal protection at Avient. "That's because survivability is directly tied to weight savings when speed and agility determine outcomes. We've long been known as the 'world's strongest fiber™,' but that won't stop us from finding new opportunities to get stronger. This new product is the latest demonstration of our commitment to both innovation and protection."

Dyneema® SB301 is part of a long line of innovation, surpassing the performance of Dyneema® Force Multiplier Technology, which itself marked a radical step-change in ballistic performance.

Beyond strength, Dyneema® SB301 has the additional advantage of being made from bio-based Dyneema® fiber, which enables a carbon footprint up to 90% lower than generic high modulus polyethylene (HMPE) fiber.

Now available for use in law enforcement vests for the US market, Dyneema® SB301 material is manufactured in Greenville, North Carolina, in compliance with the Berry Amendment, with additional markets to follow.

Dyneema® remains at the forefront of ballistic protection, and hard ballistic product grades based on the new third-generation fiber, suitable for military vests, insert panels, ballistic helmets, and vehicle armor, will be available in early 2024.

Berry Launches Recycled Content Large Containers With Additional UN Approvals



Berry Global's technical and manufacturing skills have achieved a significant breakthrough in the packaging of hazardous liquids. The company has now launched the first 20 and 25 litre containers containing 35% recycled material, which have UN Approval for the transport of hazardous goods for five of the six model liquids in the UN assessment.

In addition to the existing UN approval for water, the new containers also have approval for wetting solution, acetic acid, white spirit, and N-butyl acetate.

The introduction of these new containers into the company's popular Optimum range will support companies both in meeting their sustainability goals and satisfying consumer demands for more sustainable packaging solutions. It will also help businesses comply with forthcoming legislation covering the required minimum amount of recycled material in a pack.

The inclusion of 35% recycled HDPE (rHDPE) into the Optimum containers provided a technical challenge in order to achieve UN accreditation. Typical processing of

the material can sometimes produce varying results due to its composition, but UN approval requires processing to be stable and repeatable to ensure the quality and consistent performance of the finished container.

To ensure this, Berry is taking its rHDPE from controlled sources, focusing on post - industrial packaging such as IBCs, drums, and HDPE canisters. This minimises any variations in the material. In addition, the containers retain their low weight, both reducing the amount of material required in production and maximising ease of handling for the end-user.

The new Optimum containers are available with standard DIN61 and ASTM63 neck finishes, suitable for a range of standard and vented closures, and can also be specified in a range of colours. The containers' design with interlocking top and base allows safe and easy stacking.

Typical applications include chemicals, hazardous goods, agriculture and horticulture, automotive care and pool care. Berry says additional container sizes are now in development.

Solvay's High-Barrier PVDC Coating Boosts Blister Pack Sustainability

The new coating, with ultra-high water vapor barrier, enables thinner thermoforming films and reduced carbon footprint for pharma packaging.

Pharmaceuticals companies looking for more sustainable packaging materials have a new option in Diofan Ultra736, a polyvinylidene chloride (PVDC) coating with ultra - high water vapor barrier from Brussels-based Solvay.

The coating's robust barrier properties enable reduced coating thickness vs. competing mid- to high-barrier PVDC coatings, with no adverse effects on package performance. Reduced coating thickness, in turn, enables thinner, more sustainable films for blister-pack thermoforming.

Films coated with the material feature a lower carbon footprint than conventional PVDC-coated films for similar applications. Solvay reports that Diofan Ultra 736 coating, in duplex barrier films, enables processors to halve the number of base-coat layers without sacrificing water vapor barrier. Consequently, the final blister film's carbon footprint can be decreased by up to 13%.

Diofan Ultra736 contains no fluorine and meets regulatory requirements for direct pharmaceutical contact. Sensitive solid - dose pharmaceuticals are a primary packaging application for the coating, which can also be used on films used to package delicate foods.

“Consumers and legislators are requesting increased efforts related to carbon footprint reduction from the packaging industry, and one of the most effective means to this end is to reduce the size and weight of packaging products,” says Federico Baruffi, global marketing manager, packaging, Solvay Specialty Polymers.

Baruffi adds that Solvay's new PVDC coating “can help packaging - film manufacturers achieve superior barrier properties with thinner structures, leading to a significant carbon footprint reduction of the blister film.”

Solvay engineered Diofan Ultra736 to maximize water-vapor barrier while maintaining high oxygen barrier, chemical resistance, and transparency. Films coated with the product have excellent thermoformability, and smaller packages with higher pill density are possible, compared with alternative coatings.

Diofan Ultra736 may be applied to both plastic and paper-based substrates.

Sidel Unveils StarLITE R – a New, Ultra - Efficient 100% rPet Bottle for Carbonated Soft Drinks

To help carbonated soft drink (CSD) packaging producers embrace material circularity, Sidel has launched StarLITE R – a 100% rPET bottle. Sidel's signature StarLITE family is evolving to address the challenges associated with working with recycled content.

StarLITE R allows CSD producers to switch to rPET bottle production with ease and efficiency, while significantly reducing the impact on product quality or packaging integrity.

Embracing 100% rPET

With over 45 years of experience in the blowing and PET packaging sector, Sidel has developed a

deep understanding of recycled PET resin characteristics and its impact on bottle production. Laurent Naveau, Packaging Innovator Leader at Sidel, comments on the challenge rPET resin can present the packaging industry, “The characteristics of rPET are impacted by several factors. Firstly, by seasonality. Consumption habits fluctuate over the course of the year impacting the product category mix. And secondly, by different PET collection models which means that post-consumer PET material bales will vary from region-to-region and even country-to-country. The recycling process and equipment used will also influence PET resin. All these factors can pose new challenges for manufacturers looking to produce bottles with rPET content.”

In addition to common CSD bottle manufacturing challenges such as stress cracking, roll out and bursting during blowing, a higher temperature is also required to process rPET. Consequently, packaging manufacturers can experience reduced control over rPET material stretching and distribution of the substance in the bottle - making process.

Traditionally, greater variability in rPET resin leads to a narrower process window and lower bottle quality.

However, Sidel's innovative base, StarLITE R uses leading technologies to ensure efficient rPET bottle production by restoring a much wider process window. The StarLITE R design is easier to blow as it can be done within a wider range of parameter settings on the blower achieving a much higher quality bottle.

High performance rPET bottle base

To achieve a high performing rPET bottle base, StarLITE R features an optimized mould base profile and uses an advanced stretch rod end design.

The new mould base profile allows for perfect material distribution through advanced stretching and a high base clearance for optimum stability. The advanced stretch rod end design has improved the preform end-cap material stretching and ensures accurate injection gate centering on the bottle. Finally, the perfect combination of grooves and venting holes allows for high-precision base feet formation.

The new bottle solution also utilizes dual external and internal bottle base cooling to ensure a perfect shape. Externally, the process uses a mould base cooling circuit that focuses on the warmer bottle base zones and internally a hollow-stretch rod requiring no additional air supply is used.

Laurent Naveau adds, "StarLITE R is designed to offer carbonated soft drink manufacturers the opportunity to embrace rPET. Sidel's new design bottle base achieves greater protection against deformation, increased resistance to bursting and optimum stability, while guaranteeing product quality."

Seamless Transition

Utilizing Sidel's expertise, the new bottle can be easily installed on existing production lines and adapted to fit current bottle designs. The solution is compatible with Sidel's signature blow

moulders, EvoBLOW, Universal and Series 2 and suitable for high-speed productions.

Carbon Footprint Reduction

Lifecycle analysis shows that PET already has the best carbon footprint of all the packaging materials currently available and is the only food-grade, bottle-to-bottle plastic resin. Achieving full circularity at scale will make PET an even more sustainable choice since rPET reduces environmental impact up to four times more than virgin material.

Thermoplastics in Aircraft Construction



Every gram counts: In aviation, a weight reduction of just one kilogram can save up to 25,000 litres of fuel annually. Plastics can be the key to this. The German Aerospace Center, for example, uses carbon fibre - reinforced thermoplastics to make aircraft fuselages more resource-efficient. Within the framework of the Large Passenger Aircraft project, fundamentally new technologies have even been developed for this purpose.

In an interview with K-MAG, Dr.-Ing. Frederic Fischer talks about the current challenges for aviation, the extent to which the use of plastics and the newly developed manufacturing technologies are more climate-friendly and cost-effective.

Dr Fischer, what challenges is aviation currently facing? To what extent do you address them in the Large Passenger Aircraft project?

Dr.-Ing. Frederic Fischer: Aviation is facing the urgent task of becoming more climate-friendly and sustainable. For decades, we relied on aluminium as the main material. But in today's world, with its increased focus on environmental protection and resource efficiency, this is no longer enough. The Large Passenger Aircraft project aims to reduce fuselage weight by 10 % and running costs by 20 %, which will revolutionise aviation.

In the project, you developed a fuselage component. What is it made of? What are its special features?

Fischer: Our multi - function fuselage demonstrator (MFFD) is made of a special plastic: carbon fibre - reinforced thermoplastic (LM_PAEK) . Compared to aluminium, this material is lighter and also has the ability to be reshaped when heat is applied again. This makes repairs and recycling easier.

What impact does the use of CFRP have on sustainability compared to aluminium?

Fischer: CFRP offers numerous advantages over aluminium. Not only is it lighter and thus more fuel - efficient, but it is also recyclable. This leads to less waste and reduced energy consumption over the life cycle of the aircraft.

You have redeveloped some of the technologies and tools used to manufacture the MFFD. To what extent was this necessary and what were they in detail?

Fischer: Our main motivation was to make aviation more sustainable. To achieve this, we had to make the transition from aluminium structures to carbon fibre-reinforced thermoplastics in aircraft production. This transition also required the development of new manufacturing technologies. The three core innovations are:

- Laser - based in - situ fibre deposition: Here we use a robot that precisely heats material strips by means of a laser and deposits them in layers. This technique minimises material waste.
- Continuous ultrasonic welding: Instead of riveting, we use this method to connect the longitudinal reinforcements, the so-called stringers, to the outer skin.
- Electrical resistance welding: We use this method to weld the transverse reinforcements, the so-called formers, to the skin. To do this, a welding element in the joining zone made of carbon fibre is exposed to electricity, which heats it up and melts the components.

By using these technologies, we can fully exploit the advantages of the new materials and significantly reduce the production effort.

What were the individual production steps for the MFFD?

Fischer: The production took place in several specific steps:

- Fibre deposition: A ceiling-mounted robot used a laser to heat strips of material and lay them down in layers. This formed a laminate of fibre-reinforced plastics.

- Reinforcement of the outer skin: The next step was to reinforce the finished outer skin with the continuous stringers. They were attached by means of the newly developed ultrasonic welding. A robot with a precise path correction was used for this to effectively join the stringers.
- Application of the transverse reinforcements: Following this, the transverse reinforcements, our formers, were added by electric resistance welding.
- Final connection: Finally, the longitudinal and transverse reinforcements were welded together. Due to the confined working space, we combined a standard robot with a smaller lightweight robot to ensure precise welding of the fasteners.

What advantages do these new manufacturing processes bring over conventional methods in terms of production costs and sustainability?

Fischer: Our new manufacturing processes reduce production time by up to 40 %, which brings significant cost savings. Since we have less material waste and can do without the autoclave process, we are also more resource-efficient. Overall, these processes increase both the economic efficiency and sustainability of production.

What happens now with the MFFD shell?

Fischer: After successful completion, the MFFD shell was delivered to Premium Aerotec, where the final machining took place. It will now be transported to the Fraunhofer Institute in Stade for further processing.

Finally, Airbus will validate the technologies in Hamburg. These are exciting developments and we look forward to driving progress in this area.

Source: K-Online 19th October 2023

Plastics in Bicycles and Current Best Practices



Anyone who chooses the bicycle as a means of transport instead of the car every day saves the environment 3.2 kilograms of climate - damaging CO₂. Researchers have determined this with a sample analysis based on data from the PASTA project (Physical Activity through Sustainable Transportation Approaches).

In addition, plastics can help reduce CO₂ emissions from the production and transport of bicycles. They can be used in all components and therefore make cycling even more environmentally friendly. This is shown by the following examples:

Off to new adventures: Lion Bike from KraussMaffei

The Lion Bikes, developed by former professional racing cyclists Marcel Kittel and Tony Martin, ensure more safety for our kids in road traffic. The bike is manufactured by Weber Fibertech on an MX 1600 from KraussMaffei and has a clean look with a special paint that makes the frame glow.

The frame and front wheel fork of the sustainably produced bikes are made of a new, resource-saving material mixture of high-performance polymers and recycled carbon fibres. Comparing the production of Lion bikes with conventional frames and front wheel forks made of aluminium, the CO2 emissions for each bike produced are 67 % lower. In addition, thanks to the "Made in Germany" seal of quality, supply chains and transport routes are shortened, which is also an important aspect of sustainability. **After all, with a bicycle you can not only explore the world, but also improve it.**

Source: K-Online 19th October 2023

Sportswear with Reduced Carbon Footprint



Team Sonnenwagen, a student team from RWTH Aachen and FH Aachen, Germany, is committed to more sustainable mobility using renewable energy. With a self-constructed solar racing car, they once again took part in the Bridgestone World Solar Challenge in October 2023 in Australia. The team also attaches great importance to a more sustainable sports kit. Huafeng, a leader in textile technology, supports this request by providing more sustainably made athletic shoes and shorts for team outfits. For this purpose, Huafeng used a

partly bio - based polyurethane (PU) dispersion from Covestro, the main sponsor of Team Sonnenwagen.

The new official team equipment provided by Huafeng features shorts and sports shoes with designs using Huafeng's newly launched HAPTIC® textile coating system, which contains partly bio-based INSQIN® PU dispersions from Covestro. In addition, fabrics for the garments and shoes are made by Huafeng based on Cyclone recycled polyethylene terephthalate (rPET) yarns derived from post - consumer plastic bottles. The shoe upper material is made of 100 percent Cyclone rPET, while the shorts consist of 86 percent Cyclone rPET and 14 percent Spandex for ensuring a comfortable fit.

The design of the sports shoes for Team Sonnenwagen was produced using Huafeng's proprietary HAPTIC® Art textile coating system with partially bio-based INSQIN® PU dispersions from Covestro. Source: Huafeng

Developed by Huafeng using Covestro's partly bio-based PU Impranii® CQ DLS/1, the HAPTIC® Art textile coating system used for the shoes enables especially outstanding aesthetics, improved mechanical performance, and reduced production - related emissions. Thanks to its high solids content and thixotropic properties, the system allows manufacturers to achieve a high coating thickness, making it well-suited for creating coatings with detailed images and sophisticated 3D effects on apparel and footwear.

Images and textures applied using the HAPTIC® Art ink system have undergone a series of tests for

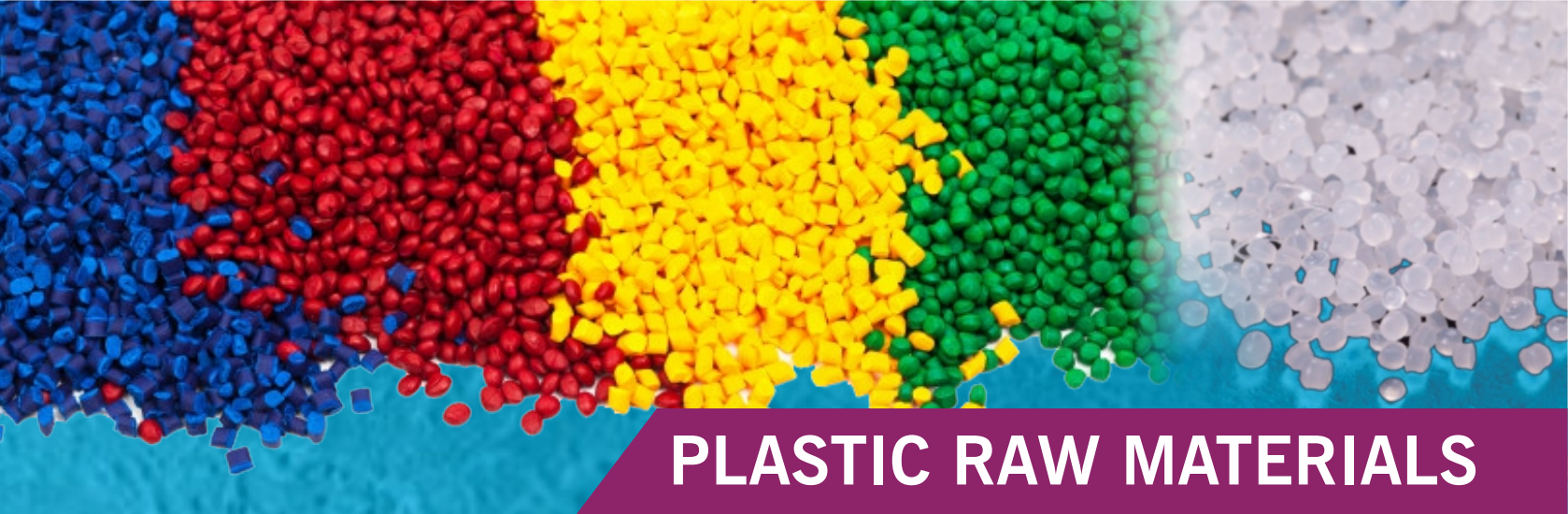
properties such as flexibility, adhesion, and resistance to hydrolysis, washing, and abrasion. The excellent results demonstrate that the Art ink is particularly suitable for coating on high-performance sports footwear. In recognition of its excellent mechanical properties, Huafeng's ink coating system recently received the ISPO Best Product Award.

Source: K-Online 19th October 2023

Trinseo's Bio PS Leads Sustainable Development of Plastic Cutleries in Japan

Japan's leading plastic cutlery manufacturer, Tosho Chemical, has cooperated with its supply chain partner, Iwatani Corporation, in 2023 to pioneer the use of Trinseo's bio-based polystyrene (bio PS) in making plastic cutleries. This is a significant milestone for the sustainable development of the plastic cutlery industry in Japan. Tosho Chemical is a leading resin processing manufacturer in Japan, with disposable plastic cutleries as its major products. With its output leading the industry, Tosho Chemical's products are widely used across Japan.

Trinseo's bio PS products were brought to market and made available to Iwatani Corporation a few years ago. Trinseo's bio PS is produced using bio-naphtha, which is made from renewable resources such as wood pulp. It is not only environmentally friendly and safe for food contact but has also passed International Sustainability and Carbon Certification (ISCC) requirements and is a bio-based material certified in Japan.



PLASTIC RAW MATERIALS

Scientist Develop an Ecofriendly Method to Make Building Blocks of Polyamides

Researchers at Mainz University and Evonik have developed an innovative method to cleave and oxidize double and triple-bonds in hydrocarbons. Polyamides are present in many different products, such as ropes for mountaineering, parachutes of nylon, and materials for 3D printing. Dicarboxylic acids are used as chemical building blocks for these polyamides.

Sustainable Way to Produce Carboxylic Acids

The production dicarboxylic acids have been challenging to date because current methods of generating dicarboxylic acids from saturated or unsaturated hydrocarbons frequently involve multiple steps as well as the use of heavy metals and strong acids, while the related energy consumption and costs are extensive.

Furthermore, the process often results in the release of nitrogen oxides (NOx), which are among the most problematic greenhouse gases as far as the climate is concerned. Researchers at Johannes Gutenberg University

Mainz (JGU) and Evonik have recently developed an environmentally friendly way to produce (di)carboxylic acids. They report on this in a paper recently published in Nature Communications.

“Our technique is the first-ever process to make the building blocks for polyamides from petrochemical compounds and even unsaturated fatty acids using a fairly sparing approach,” said Professor Siegfried Waldvogel, speaker of the SusInnoScience – Sustainable Chemistry as the Key to Innovation in Resource-efficient Science in the Anthropocene, research focus at Mainz University.

The new technique involves an electrochemical method in which hydrocarbons with double or triple bonds are transferred to an electrolysis cell filled with a solvent. Oxygen is then added, whereby the greater the oxygen concentration, the more efficient the process.

Heavy Metals & Strong Acids are No Longer Necessary

“What is really fascinating about our process is that electrochemical intervention is needed at both the anode and the cathode,” explained Waldvogel. While oxidative radicals

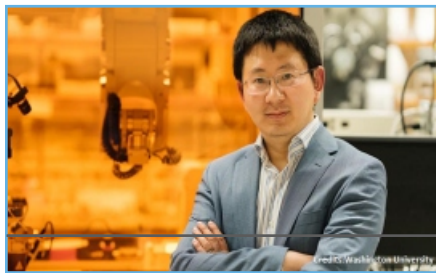
are created at the anode, the oxygen at the opposite electrode is reduced to superoxide anions.

The radicals and the superoxide anions come together in the solution and react to form the desired product, carboxylic acid. The researchers have repeated the process successfully in both standard and flow electrolytic cells.

This new technique has many advantages: Heavy metals and strong acids are no longer necessary while no nitrogen oxides are generated. The only starting materials needed are oxygen, electricity, and hydrocarbons with double bonds. Because no byproducts are created and the solvent can be recovered and recycled, the process is very cost-effective.

Stretchable Hydrogel to Impart Flexibility & Rigidity in Polymers

Chenfeng Ke, an incoming associate professor of chemistry in Arts & Sciences at Washington University in St. Louis, developed a unique design for tough but stretchable hydrogels. The new material is both flexible and



durable thanks to a ring-shaped sugar molecule that encases its polymer network and allows it to stretch without sacrificing strength.

Making Material Stronger & Durable

Ke can 3D-print the so-called crystalline - domain reinforced slide-ring hydrogels, or CrysDoS-gels. He and his co-authors also created a materials library and offered methods for how the material can be added to existing materials to enhance their durability, such as in plastic additives to enhance the durability for parts in automobiles in the future.

New Additives for Polycarbonates to Strengthen the Global Capacity from Tosaf

Tosaf strengthens its commitment around additives for polycarbonate (PC), which are mainly used for the extrusion of transparent sheets, profiles and films. This includes the development of new, market-driven specialties as well as the development of new markets worldwide. A recently commissioned cutting - edge compounding line at the Alon-Tavor site in Israel increases the company's flexibility in meeting customer requirements, while at the same time shortening delivery times and expanding options for producing sophisticated masterbatches.

Additional Functionalities

Tosaf's new developments include light diffuser masterbatches for PC and PMMA. Thanks to a high loading level, low dosing quantities are sufficient, enabling particularly economical solutions. On top of that, they offer a good compromise between high hiding power and high light transmission. Other innovations are heat blockers for the near IR range (NIR blockers) and additives for creating matt surfaces with either a fine or rough structure. Both of the latter are intended to be applied to the surface of PC sheets by coextrusion, each in combination with a UV absorber. As a 50 μm to 100 μm thick toplayer, they work much more efficiently there than when added directly to the sheet bulk. Beyond, Tosaf also offers two types of anti-block that are tailored to prevent corrugated sheets from sticking together, again providing high efficiency even in small doses.

In addition to the aforementioned products for UV stabilisation as well as for achieving matt surfaces, near-IR blockers and anti-block additives, Tosaf's portfolio of compounds and masterbatches for PC also includes flame retardants, glass fibres and a wide range of color masterbatches.

Supply Security Worldwide

To meet the strictest quality requirements, Tosaf produces its entire portfolio of polycarbonate compounds for global demand exclusively in its Alon-Tavor additives factory, which is state-of-the-art regarding the production and quality assurance of these sensitive products. All new and further developments are also carried out in Tosaf's development

centre at the same location, which makes the scale-up to production conditions much safer and easier. Only the production of color masterbatches for PC takes place in a dedicated color compounding site, which is also located in Israel. Local supply to PC sheet manufacturers is handled by sales offices in Europe, South America, North America, Turkey, Asia, China and India, the Persian Gulf and the Israeli market.

Says Gabi Bar, polycarbonate product manager: "For some years now, we have been registering a steadily growing demand for our products on the part of PC processors. We see the reasons for this in our consistently high level of quality as well as in the continuous development of new, demand-oriented specialties that fill gaps. Added to this is our worldwide development of new markets, which we serve at the local level with efficient logistics. Our new facility in Alon-Tavor will increase our flexibility in supplying our broad portfolio of polycarbonate products and further reduce lead times."

SABIC and SINOPEC Announce Commercial Operation of PC Plant at Joint Venture SSTPC



SABIC and SINOPEC announced the commercial operation of a new polycarbonate (PC) plant at their 50-50 joint venture (JV) –

SINOPEC SABIC Tianjin Petrochemical Co. Ltd. (SSTPC). Khalid Hashim Al-Dabbagh, SABIC Chairman and Ma Yongsheng, SINOPEC Chairman attended the ceremony.

Established in 2009, SSTPC is a mega-size petrochemical complex that already consists of nine world - scale production plants producing chemicals, polyethylene, and polypropylene. With an annual designed capacity of 260 kT, the new PC plant is a vital component of SABIC's PC growth strategy in China, allowing for further collaborations with global and local customers. The development of the PC plant marks the next chapter of the JV and strengthens the partners' capability to meet regional PC market demands.

The availability of SABIC's polycarbonate will primarily be for customers in the Greater China region, targeting major PC-related industries such as Electricals & Electronics, Consumer Goods & Appliances, automotive, healthcare products and Building and Construction applications. SABIC's portfolio of PC materials produced at SSTPC will be marketed under its LEXAN™ resin brand.

Polycarbonate is a transparent, high-impact, and strong yet lightweight material, used widely in automotive parts, home appliances, medical products, and many everyday products. Future demand for polycarbonate and other engineering plastics is expected to grow in China, to support the increasing production of electronics, automotive, information technology and building materials.

SSTPC has served as the epitome of close China-Saudi economic ties. In 2016 and 2017, during King Salman bin Abdulaziz Al-Saud Custodian of the Two Holy Mosques, and Xi Jinping, President of China's mutual visits, SABIC and SINOPEC signed a series of memorandums of cooperation under the patronage of the leaders of two countries, with the polycarbonate plant's joint construction being underlined as one of the most important projects.

'Smart Drying' Based on Resin Moisture



Novatec is moving to redefine resin drying with new, economically priced technology that detects moisture levels in the material before it hits the dryer and then adjusts the drying parameters accordingly. Called the DryerGenie, Novatec debuted the system at the 2023 Plastics Technology Expo. The DryerGenie consists of two sensors: one that's installed near the bottom of the suction probe or lance, which is typically used by molders to pull resin from gaylords to the dryer to prepare the material for processing; the second is mounted to the lance handle to measure ambient conditions. Both rely on capacitance or near - infrared technology to measure moisture in the resin on a parts/million (ppm) basis long before it's drawn into the dryer.

The sensor constantly communicates with the dryer controller and automatically adjusts drying residence time, airflow and temperature to account for the moisture reading. The system is retrofittable to Novatec dryers purchased since 2016. At its laboratory in Baltimore, Novatec has run the DryerGenie on various nylons, PC, PC/ABC, acrylic and TPUs.

As Novatec explains, the patent-pending sensor apparatus also includes accelerometers, pressure sensors, temperature / humidity sensors and a gyroscope to assist in reliable inline moisture measurements. Since moisture presents a very high dielectric constant compared with the low dielectric constant of plastics, the presence of moisture can very reliably be detected, and then instructions are coordinated with the connected dryer to change drying parameters and residence time according to the moisture levels — by the time the material reaches the drying hopper.

The DryerGenie also takes aim at conventional wisdom about drying to dewpoint levels. Explains Haynie, “Most processors think drying performance is all about dewpoint. That's a fallacy. Dewpoint is a measurement of the moisture in the air, not pellet moisture. Low-dewpoint air is useful in drying plastics but has nothing to do with the inherent moisture in the pellet. Dewpoint measurements indicate the dryer's performance, not pellet moisture result. PPM or moisture percentage in the pellet is the only real way to measure dryness of the resin.”

He adds, “With the use of the Genie wand in your material input source, the dryer will know the

moisture content of your resin immediately prior to processing and detect the changes in moisture over time. The Genie will use this information to automatically adjust the dryer control to achieve the most efficiently, properly dried material possible." Adds Bessemer, "Drying should not be independent of moisture control. You don't want to dry more than you need to. You don't want to dry less, either. The DryerGenie is a marriage of moisture measurement and resin drying that will eliminate the guesswork."

"If you know the moisture is already low in the resin, you can start making parts sooner." Able to run unattended, the DryerGenie sensor takes a sample of up to a pound of material at a time. According to Bessemer, other types of online capacitance-based sensors only measure perhaps 1/8 in. from the wall, whereas offline devices often only measure a few grams from a vial.

With DryerGenie, residence time can be increased if there is room in the hopper; if not, production needs to be slowed. Key is knowing inlet moisture level so you can adjust before making bad parts.

Home screen for Genie-equipped dryer, indicating the actual processing rate, target resin moisture, the residence time and the gaylord moisture level. On rollout, Novatec will focus on gaylord applications. In the works are systems that will apply the core technology to applications that feed materials from bins and silos. Novatec is also working on combination technologies of capacitance and microwave.

A Thermal Processable, Self Healing, and Fully Bio - Based Starch Plastic

The transfer of plastic waste from land to oceans and its subsequent accumulation within the food chain poses a major threat to both the environment and human health. Consequently, the development of renewable, low - cost and eco - friendly alternative materials has garnered tremendous attention and interest. Starch is a highly desirable material for the production of bioplastics due to its abundance and renewable nature. However, limitations such as brittleness, hydrophilicity and thermal properties restrict its widespread application.

Addressing these concerns, a group of researchers from State Key Laboratory of Pulp and Paper Engineering at South China University of Technology presents a novel strategy for fabricating a fully bio-based starch plastic that exhibits numerous advantages, including superior flexibility, waterproof capability, excellent thermal processability and self-adaptability. "Native starch exhibits great stiffness due to the strong hydrogen bonding between its molecular chains, resulting in challenges during thermal processing," explains Xiaoqian Zhang, the first author of the study published in *Green Energy & Environment*. "A covalent adaptable network was constructed to effectively weaken the hydrogen bonding and improve the stress relaxation of starch chains."

"In the production of the fully bio - based starch plastic, dialdehyde starch was subjected

to a mild Schiff base reaction with a plant oil - based diamine. This reaction resulted in the formation of dynamic imine bonds, which exhibited the ability to be cleaved and reformed reversibly under heat stimulation. Consequently, the starch plastic demonstrated remarkable thermal processability," Zhang said. "Additionally, the presence of long aliphatic chains in the diamine enhanced the steric hinderance of the starch molecule chains, leading to improved flexibility and hydrophobicity of the starch plastic." Xiaohui Wang, corresponding author of the study, added, "Our transparent starch plastic, which contains imine bonds, also demonstrates self - healing capability. It can repair not only scratches but also large-area damage with a simple heat-pressing treatment." Notably, the self-healing efficiency reached more than 88% in terms of mechanical properties. Such desirable properties render the starch plastic highly appealing for various practical applications. "Through this study, we have successfully introduced a novel design strategy for developing sustainable, thermal processable, and degradable bioplastics using fully bio-based materials," concluded Wang.

Ionomer Resins From Waste for Perfume Packaging

Dow launched two new grades of Surlyn, one from biowaste material and one from chemically recycled plastic waste.

Dow Chemical Co. has announced a pair of new grades for its Surlyn ionomer resin. Surlyn Cir

are ionomers produced from plastic waste using chemical recycling. Surlyn Ren are ionomers produced from biowaste such as used cooking oil. Both grades are aimed at cosmetic packaging. Surlyn is a copolymer of ethylene and methacrylic acid (EMAA). Dow intends its new products for cosmetic packaging applications.

LVMH Beauty will be the first user of the new brands. Dow has started to supply the new ionomer grades, which will be integrated into several applications at LVMH.

Dow has set a goal of delivering 3 million tons of circular and renewable solutions by 2030. Surlyn Ren and Cir are both certified on a mass balance basis by the International Sustainability Carbon Certification (ISCC Plus).

Experience, Expertise, and Equipment: GRAFE is an Expert in Colouring Translucent Plastics

Decades of experience, the highest level of technical expertise, and state - of the - art technical equipment – these are the three pillars on which the comprehensive competence of the GRAFE GROUP, Blankenhain, in the colouring of transparent technical plastics rests. Compounds are predominantly used, with masterbatch only being used in special cases. “The demands on dispersion and homogenisation are much higher for transparent materials than for opaque colourings,” explains Sales Manager Lars Tonnecker.

“Thus, in product manufacturing, a compound is the better and cleaner solution compared to a

masterbatch. This is because error patterns on the component, such as uneven colour distribution, streaks, and differences in concentration, can be avoided or eliminated, as there is no need for additional dosing of the masterbatch at the plant.” “Whether headlights, rear lights, or displays – mostly the coloured transparent plastics are used in lighting applications. For this, there are precisely defined wavelength ranges from the manufacturers that must be adhered to, and no deviations are acceptable,” adds project manager Elke Milus.

“We can adjust our compounds so that each batch matches the other, with minimal tolerances, with the greatest reproducibility and thus the best quality.” This is ensured by an exceptional production control and quality assurance process developed by GRAFE itself, which ensures the highest level of repeatability in recurring process steps. Tonnecker also points to the high availability of the right raw materials and the comprehensive production know-how at GRAFE:

“Not only do we have a large selection of colourants and additives for transparent polymers, but also a huge stock of existing formulations that we can draw on. This enables us to make the appropriate adjustments very quickly.” GRAFE has also recently made extensive investments in its laboratory equipment and now has, among other things, a high-resolution spectrophotometer for measuring transmission in different wavelength ranges (UV/VIS/NIR = ultraviolet / visible / near infrared).

Thus, thanks to its higher optical resolution in an extended wavelength range of 350 to 1,050 nanometres, the device even measures in five-nanometre steps instead of the usual ten-nanometre steps and is thus much more precise. “To evaluate the colours, you don't measure the reflection, i.e. what is absorbed, but the transmission, what passes through,” explained Milus.

Salt Water - Degradable Plastics to Help Oceans

University of Queensland researchers are developing a plastic that breaks down in seawater to help turn the tide on marine waste. Dr Ruirui Qiao from UQ's Australian Institute for Bioengineering and Nanotechnology is refining new polymerisation techniques for an affordable and biodegradable plastic to replace existing products.

Dr Qiao is working with AIBN colleague Professor Tom Davis and Professor Xuan Pang and Professor Xuesi Chen from the Changchun Institute of Applied Chemistry on the project.

The team is developing a range of high - value, customised seawater - degradable plastics using 3D - printing techniques developed by Dr Qiao's research group at AIBN, and polymeric materials generated by the Chinese Academy of Sciences.

The collaboration has received \$125,000 from the Queensland-Chinese Academy of Sciences Collaborative Science Fund to accelerate the work over the next two years.



PLASTIC MACHINERY

Interchangeable Needle Valve Pre - Chamber Simplifies Hot Runner's Maintenance



Hasco has expanded its Vario Shot hot runner nozzle range to include a new model with an interchangeable needle valve pre-chamber — the Vario Shot Xgate. The wear-resistant Xgate extends the service life of the gates, and it features precision needle guidance with a pre-centering function. The interchangeable pre-chamber is also highly resistant to abrasive and chemically aggressive materials.

Individually geared to specific applications, Hasco says the two versions of the Vario Shot Xgate can work for either amorphous or semicrystalline plastics, and the gate area and contact surfaces can be altered for application-specific temperature control.

Hasco says the Xgate's needle valve pre-chamber complements the Vario Shot range, which provides compact dimensions, precise temperature control, simple servicing and modular design. There are more than 1,000 nozzle variants — from gating on lower distributor manifolds up to high-end needle-valve solutions. The wide selection of nozzle lengths, including runner and individual nozzles, offers greater freedom in mold design.

In-Mold Labeling Applied to Medical



In collaboration with multiple partners, Arburg showcased IML for centrifuge tubes at Fakuma 2023, eliminating printing or other downstream steps. At Fakuma 2023, Arburg exhibited an all-electric Allrounder 520 A running a centrifuge tube featuring in-mold labeling (IML) decoration. Working in conjunction with KEBO (tooling),

MCC/Verstraete (labels), Beck (automation) and Intravis (camera inspection), Arburg featured a clean-room-designed cell designed to satisfy class ISO 7 requirements.

The all - electric 170 - ton Allrounder 520 A Ultimate will run an 8-cavity tool from KEBO to mold 15-mL tubes from PP. An applicator head from Beck applies the labels with optical inspection from an Intravis camera system. Arburg notes that while IML is widely used in the packaging market, its use in medical is more rare. Integrating the labels during molding not only eliminates additional downstream steps but it also saves time, space and money, while also reducing contamination possibilities.

Individual codes on the labels can be used to track data on processes, quality and patients, with 100% traceability for each individual part. The project managers from Arburg, Beck, Intravis, Kebo and MCC will explain the advantages and potential of IML products for medical technology at expert talks during the trade fair. The companies say that using medical - grade materials and special labels, in conjunction with advanced automation and a quality control system, resulted

in a process that will provide traceability, risk reduction and clean production. An Arburg all-electric Allrounder 520 A is at the center of a cell to display in-mold labelling (IML) for the medical market.

How to Use Thermal Management to Improve Mold Cooling

With ever-increasing energy and materials costs, manufacturers are more motivated to improve productivity by streamlining processes, dramatically cutting human resources and budgets and optimizing production processes. For example, shops pay more attention to a mold's thermal dynamics during design, molding and preventative maintenance (PM) to reduce cycle time, decrease energy consumption, improve plastic part quality and increase yield. Manufacturers have optimized hot runner systems, gating and finite element method (FEM) simulations to control better fill and cycle times. However, what is rarely discussed is cooling. The cooling cycle can be as much as 70% of a part run cycle, so thermal management to reduce overall cycle times is critical for process optimization. Lower cycle times and lower scrap rates equate to higher part production.

The Cooling Challenge

Adding and removing heat is a fundamental and critical part of the molding process. Most molders and designers are so accustomed to the process that good thermal management practices are often overlooked, and are not always scrutinized the way they should

be to optimize the molding process. With higher expectations on designers and manufacturers and lead times progressively becoming shorter, companies simply cannot afford to ignore any solution that might help create a scenario where optimum part quality, less scrap and less human interaction can be achieved. All of these requirements are now being built into the organization's production specifications so that no stone is left unturned.

At one point in time, cooling the part surface was generally an afterthought, usually squeezed in with room available after all of the mold design and action components were in place. With this tactic, designers addressed cooling or warping issues after the project went to tryout, sometimes leading to frustration and added cost. Ultimately, these practices resulted in parts that could not be qualified and lead times that could not be met. Some things may never change when building molds — for example, drilling channels into mold blocks. Designing channels in the cavity (or A side) is easier because outside of the drop or sprue (and some screw holes), there is usually less interference in those plates. The real challenge is the ejector half (or B side) because ejection, lifters, core pins and other components present obstacles to addressing those hard-to-reach areas and keeping the part surface at an even temperature.

When developing a new mold or hot runner system, the design engineer routes the cooling channels to deliver the most effective cooling of the cavity. The goal is to maintain the integrity of the polymer and cool the part to

the ejection temperature as quickly as possible. Often the waterlines are gundrilled. This approach can yield suboptimal cooling and a finished mold with a narrow process window, increasing the risk of deterioration in the watercooling line performance over time. The molding process is impacted when the mold temperature shifts from its upper or lower process limits. So, to avoid part quality issues, process conditions may need to be modified.

The calcium impurities of water also impact cooling lines. For example, the oxygen inside the water attacks the mold's surface, causing corrosion that form "traps" in the cooling channels that capture impurities and create scale. Scale has an insulating effect that significantly reduces heat transfer, forcing a change to molding process variables that often increase cycle times.

Even with the best-filtered water and anti-corrosion agents, cooling channels corrode over the mold's life. Advanced cooling channel flow monitoring systems reveal this degradation, but current PM programs often have no effective way to correct this. A robust mold cooling design and a predictive mold maintenance program will yield major benefits and increase the ROI of any molding project.

3D-Printing Cooling and Cleaning Solutions

Today's sophisticated cooling channel monitoring devices can be a harbinger to detecting cooling channel degradation if they are effectively integrated into manufacturing control processes. They help to monitor the pressure, temperature and flow rate of

both the input and return cooling lines, which indicates the cooling process' stability and verifies efficiency. This method can identify wasted energy and variations in pressure noting blocked waterways, enabling manufacturers to make calculated changes with real data and adjust temperatures and / or pressures to achieve desirable results. Then, when the mold is removed from production, steps can be taken to clean and remove any blockage that may have reduced mold efficiency.

Recent advancements in cooling channel cleaning technology have met this need. The cleaning process must unplug any blocked line by removing debris and descaling the surface of the channels. Traditionally, toolrooms use acids to break down scale to open clogged channels. However, this often perpetuates the problem long-term, as the acid can pit the cooling channel surface, worsening scale buildup.

Modern water - based cleaning equipment uses a closed - loop system and a unique pulsating action with heated water to attack a plugged channel from both directions. This approach overcomes an airlock and dislodges the blocking material. A three - component system removes scale and rust: (1) heated water with (2) a mild chemical agent and (3) a pulsating action of the water.

Like mold design, the molded parts also present challenges that hold up cycle time, such as the features of bosses, cores, deep ribs, and lifter and die locks. Conventionally, these features are cooled with baffles or cascades, which can fall short of cooling

the entire feature, leading to hot spots. Cooling is the largest portion of the molding process, so considering alternative approaches, such as conformal cooling, can yield improvements and savings.

However, using direct metal laser sintering (DMLS) and sinter-based additive manufacturing (SBAM) to create these components solves these problems. For example, printing conformally cooled metal inserts — for core features or isolated areas holding up cycle time or affecting the part quality — with elaborate channel designs that allow cooling closer to the part surface. (Note: 3D-printed inserts are also used for heating applications such as connector plugs with high percentages of glass fillers. Higher temperatures are introduced to these areas for a better surface finish for mating conditions.)

This technology can also be used in **lifter heads and slide noses**. The methods in which we deliver liquid media to lifter systems may vary, but introducing complete cooling coverage to these components effectively shortens cycle time while improving part quality. Slides can also be very limited for cooling via conventional means, but 3D-printed slide noses are highly accessible to provide even cooling.

Regarding hot halves, the design engineer intends to route the cooling channels to deliver the most effective cooling of the cavity to maintain the integrity of the polymer. Insulating the hot runner system is a relatively easy and non-invasive way to lower melt processing temperatures, reducing part cooling time and power

consumption. Some insulating products are ineffective, while others contain harmful substances. Still, with advancements in nano-microporous insulating materials, great strides have been made in reducing energy consumption and minimizing thermal transfer from manifold systems to mold blocks.

For example, cold spots exist in even the most advanced hot runner systems. The resin is often processed at higher - than - necessary temperatures to prevent freezing in these cold spots. **Effectively insulating the hot runner** can minimize thermal variation across the system, which in many cases allows the resin to be processed at lower temperatures. Getting the melt into the cavity at a lower temperature means less cooling time to ejection. Case studies have proven that temperature reductions of only a few degrees can significantly impact cycle time, resulting in a less expensive part and increased capacity of the molding cell (see "Case Studies Using Hot Runner Insulation" sidebar).

3D printing also has **advanced gating applications**. Much time is spent at mold tryouts waiting for the press to open because the material in the sprue has not solidified. Those sprues can now be cooled with conformal bushings, which cools the sprue 40% faster. And conformal gate bushings — designed to target the tip, so the heater bands do not work harder to sustain minimum temperatures — reduce stringing and blemishing. Average cycle time reductions concerning conformal-cooled inserts are about 30% and can be as high as 70%.

These higher reductions are enabled more with standing core features. However, this technology has countless practical applications for driving cycle time down.

Plan During Design

Understanding that even a thin layer of scale on a cooling channel can change the thermal transfer to the mold is essential to maintaining consistent process windows over periods of time. Regimented, targeted maintenance can ensure process windows have only slight fluctuation and scrap rates are low. With pre-thought in the initial stages of the design process and PM, the thermal integrity of molds will be sustainable for extended periods creating higher quality parts. And assessing part geometry in the design phase to include conformally cooled inserts can deliver higher yields of part production. The ROI on these components can be relatively short in some cases and can even create a scenario where production quotas can be met months earlier, releasing molding machines for other product runs.

Cool Effects

Cooling is a critical phase of the molding process. It sometimes represents 70% of the overall cycle and impacts part quality. The cooling design should be considered upfront in the design phase and maintenance cannot be ignored. For example, conformal cooling can greatly aid the balance of a mold's thermal transfer. However, processing water over time causes scale and debris buildup. This buildup is accentuated by the complex circuitry associated with conformal cooling, so it must be

removed to control the thermal process. A robust mold cooling design and a predictive mold maintenance program will yield major benefits and increase the ROI of any molding project.

Source: MoldMaking Technology

KraussMaffei's Brings New Machinery to the UK for the First Time at Interplas



In partnership with Soniplas and Matrix Plastics, a 120T precision Molding machine ran throughout the event, showcasing the latest in energy-saving and cycle time reduction technology.

185 Years of KraussMaffei

KraussMaffei is one of the world's leading manufacturers of machinery and systems for producing and processing plastics and rubber, with a portfolio covering all technologies in the injection moulding, extrusion, reaction process machinery and additive manufacturing sectors and the company displayed its versatile machinery portfolio to Interplas visitors.

At Interplas 2023, the KraussMaffei UK team showcased its expertise with a series of planned demonstrations, the feature being a precision Molding 120-380 machine running on the show floor for the first time live at a UK exhibition.

Along with partners Soniplas, Piovan and Matrix Plastics, the moulding cell demonstrated the latest in injection moulding technology with the addition of APC plus from KraussMaffei, and a Soniplas system supplied by Matrix Moulding Systems, to further increase the efficiency criteria of the precision Molding range.

Using a single cavity spiral flow test tool with complex geometry, the KraussMaffei team was moulding from the Interplas floor.

Precision Molding at a Glance
 Optimised price-performance ratio
 High levels of energy-efficiency
 Realisation of challenging delivery times
 All-electric clamping unit
 5-point toggle system
 Intelligent MC P1 control system
 Enlarged mould mounting platen sizes
 High-performance and versatile servomotor
 Billed as 'the perfect introduction into all - electric moulding' the precisionMolding machinery, it is claimed that range provides high levels of performance and efficiency, at a reasonable entry point for the market, and can be fitted with all of KraussMaffei's digital tools and industry 4.0 connectivity.

Transform your Moulding Process with Ultrasonics
 The Soniplas Ultrasonic Unit supplied by Matrix Moulding Systems used ultrasonic technology to bring a variety of benefits to the moulding process. The precision Molding machine on display at Interplas was fitted with the Soniplas system, allowing show visitors to see the process in action, live from the event floor.

The Soniplas unit applies ultrasonic energy to the molten polymer as it is injected into the mould tool, causing a temporary reduction in

viscosity as the polymer melt fills the tool. This enables manufacturers to reduce melt temperatures by say, 30 degrees, meaning there is less of a heat requirement in the moulding process, as well as less heat to remove after injection, giving benefits in both energy use and cooling time.

Further benefits include improved part quality and reduced scrap for difficult to mould parts, by reducing injection pressures making complex features more readily moulded. With injection pressure often defining the clamp force requirement, Soniplas can also reduce the clamp force requirement for a given tool.

Erema Technology Processes Contaminated PET Fiber



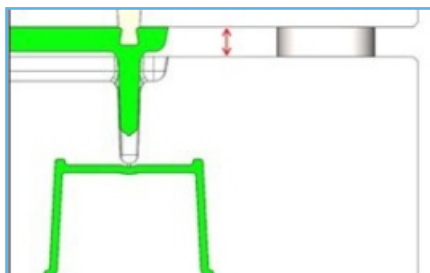
The Intarema FibrePro:IV offers gentle material preparation and efficient removal of spinning oils.

Intarema FibrePro:IV This Erema technology can process shredded PET fiber materials that have been heavily contaminated by spinning oils and turn them back into pellets. It features a new technology for optimizing the viscosity of the PET melt to the precise level that is needed for fiber production.

Benefits Especially gentle material preparation and efficient removal of spinning oils. Compared with

conventional PET recycling processes, the technology allows a longer residence time of the PET melt, providing more time for the removal of the spinning oils and other additives used to improve the handling of the fibers during manufacturing. Thanks to the process, the Intarema FibrePro:IV produces rPET that can be reused in proportions of up to 100 percent for the production of very fine fibers.

How to Design Three - Plate Molds: Part 2



There are many things to consider, and paying attention to the details can help avoid machine downtime and higher maintenance costs, and keep the customer happy. The order in which the parting lines separate in a three-plate mold is critical to the mold's function and the quality of the parts it makes. With that said, the parting line between the runner stripper plate and the A-plate needs to separate first, as shown in Figure 1.

The runner remains attached to the runner stripper plate because of sucker pins. The purpose of this initial stroke is to break the gate and dislodge the runner drop(s) while the parts are still confined between the cavity and the core. If the gate doesn't break first, it can cause a problem if the mold opens between the cavity and the core plates first. One such problem is distortion or

even a fracture on the top of the part. Another problem is a higher gate vestige. The worst - case scenario is when the gate is so firmly attached to the part, it can pull it completely off the core and remain in the cavity, which obviously makes it impossible to eject. Initially, this parting line opening usually doesn't need to be any more than 1/8 in to 1/4 inch.

That's why it is often referred to as the initial "break" and not the initial parting line opening — and why I call it "Parting Line 1A." There are several methods available to ensure the mold opens at this correct parting line first.

Some of them are urethane springs, die springs, latch locking mechanisms (both internal and external), plate retainers, roller pullers, friction pullers, and plate locks. Some of these devices only separate the plates a short distance. Others separate the plates the full amount.

And others simply retain two plates — forcing other plates to open first. They each have their own application and functioning method. It's just a matter of what you are comfortable with or have had good experience with. The first parting line opening breaks the gate. Sometimes the mold design and mold size enable you to use any of these various methods. But sometimes the mold design or mold size limits which methods are physically possible. The weight of the plates you want to retain must also be considered.

Source: PT Insider -09 October 2023

Aerodry Introduces Gravimix for IMM Applications, a Revolutionary Technology in Gravimetric Dosing and Mixing Technology with Patented Easy Cleaning System



AGB Series Gravimetric Dosing & Blending unit is economical, reliable and user friendly blending systems. It is suitable for Large extruders, blow molding machine, The system is designed for efficient dosing of free flowing thermoplastic materials.

Aerodry

Presents new Gravimetric Dosing & Blending System AGB series in collaboration with M/s Ferlin B.V. Holland.

The AGB Series blender are economical, reliable and user friendly blending systems.

It is suitable for large extruders, blow molding machines and as central blender to feed several processing machines where consistency and high quality of the finished product is required.

Configuration

Due to the modular construction, the AGB series can be supplied upto nine different configurations, maximum 7 hoppers with slide valves and in addition 2 hoppers

with patented tube feeders. Parts, which are in contact with the raw materials, are made of stainless steel. Dependent on the process, the AGB can be delivered with an economic plug-in interface (microprocessor controlled) or a sophisticated industrial PC with touchscreen. All material hoppers can be equipped with low-level sensors for an additional warning (option). If necessary the system can be supplied complete with hopper loaders.

Accuracy

The system will weight accuracy of 1/100 of a gram. Depend on the interface, display will show the weight of each component in 1 gram or 1/10 of a gram.

Source: Aerodry

Davis-Standard, Leading the Way in Extrusion Coating Technology



Davis-Standard's extrusion coating and laminating expertise is second to none. With the industry's most versatile equipment platforms, Davis-Standard delivers cost-effective extrusion coating packages to support construction, consumer products and packaging industries.

Extrusion coating machinery of Davis-Standard fulfills even the most demanding flexible

packaging, non-wovens, paper and board coating and laminating applications. This includes everything from laboratory-size systems for R&D to five-meter-wide systems for industrial materials.

Davis-Standard are innovators in automatic profile control (APC), deckle and die options, multi-coating solutions, web handling, transfer unwinds and winders. Quality, efficiency and value enable Davis-Standard to improve coating and laminating processes for customers worldwide.

Source: Davis-Standard

The TEX-aR Series, a New Global Standard in Twin Screw Extruder by JSW, Japan



The TEX-aR series is new global standard twin screw extruder with a great value and provides high quality, reasonable price, shortest delivery and high return on investment.

The TEX-aR series follows the TEX brand, which has a long valuable history, tradition and has delivered more than 2,700 units all over the world. Therefore, TEX-aR Series have excellent stability, safety and high quality.

Since the basic dimensions of the screw and barrel, which greatly affect extrusion process, are the

same as TEX series, the basic performance of the TEX-aR series is based on the extrusion know-how cultivated in the TEX series.

Feature

- JSW Japan have only achieved compatibility between customized machines (TEX series) and global standard machines (TEX-aR series). High cost performance
- Following the TEX brand
- Excellent stability, safety and high quality
- Operation panel with excellent visibility and operability
- Achieves compatibility between customized machines (TEX series) and global standard machines (TEX-aR series)

Extrusion Process

Providing comprehensive process knowledges from extrusion experience that JSW has designed for various applications for many years to meet customers' requirements.

TEX-aR can be widely used for various kinds of applications. JSW has standardized barrel and screw configurations for each application. JSW can provide customers appropriate extrusion system to achieve sufficient throughput and excellent kneading performances. JSW extrusion system gives customers decent solutions for compounding products by extruders.

Barrel & Screw Material

Standard barrel, Feed barrel, Vent barrel, Side Feed barrel, Plate barrel are arranged according to

the raw material Barrel temperature is controlled by the control box with electric heaters and cooling water.

Barrel is Sleeve type and wear resistance materials of special steels are used to enable long term service life.

The function of screws includes Feeding, Melting, Mixing, Dispersing, Congesting, Degassing and Pressurizing.

Screw elements are assembled individually in shaft which strong power is transmitted by involutes splines.

Wear resistant materials are selected for this series.

Control System

HMI SYSTEM automatic control system are equipped with TEX-aR to control the operation according to the inputs / outputs set up that entered by the user. The control system which is based on PID controls the temperatures of the extruder components, screw speed, raw material feed rate and raw materials feed ratio at optimal conditions.

Source: The Japan Steel Works, LTD.

Shibaura Machine's Call for Anti - Counterfeit Sustainable Solution

Shibaura Machine has always been at the forefront of the plastics industry in providing long - lasting solutions for our partners in the plastics industry.

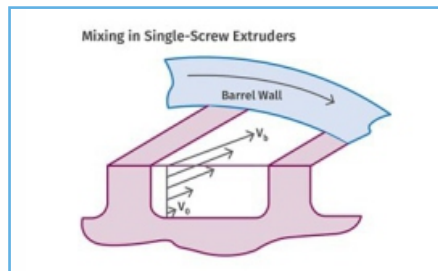


Products like the De-Tech, Aswa, S-Tech (Innovation award winner in 2011) have always been a signature of high precision and energy - efficient machines.

Our flagship model, the TD series is so modular that it answers most of the customers' needs varying from PET preform moulding, thermoset / DMC material moulding. CPVC/RPVC fittings to the extended arm of the TD multi series.

Shibaura Machine has been lauded by the Department of Chemicals and Fertilizers, Government of India yet again ten years down the line, in 2021 as the Winner of the National Award for Technology Innovation for the development of our TD multi series multi colour, multi component moulding solution for anti-counterfeit article production technology. This innovation is about a unique design and development of multi - material/multi - colour injection moulding machine to produce parts which need unconventional moulding sequence along with in-mould automation functionality. Apart from the functional requirements, these moulding objects feature good aesthetics, and tamper evident and anti-counterfeiting features.

Single vs. Twin - Screw Extruders: Why Mixing is Different



There have been many attempts to provide twin-screw-like mixing in singles, but except at very limited outputs none have been adequate. The odds of future success are long due to the inherent differences in the equipment types.

I'm frequently asked why the mixing or compounding performance of a counter-rotating parallel twin can't be duplicated on a single-screw extruder. Let me try to explain why.

First and foremost, the twin can essentially transfer the entire channel full of polymer from one screw to the other multiple times, permitting full - channel mixing. This can be done while imparting little shear to the bulk of the transferred polymer and very high shear to just a small segment of the polymer by simply changing the opposing channel depths or with mixing lobes. Additionally, the screws are run starved so that there is available volume for such transfers. It's also done with very little pressure drop and resultant loss of output due to the intermeshing flights.

In single screws the pressure drop through high - shear areas — necessary for intensive mixing — is a limitation due to the loss of output and elevation of melt

temperature. By repeating that process multiple times, the twin mixing can be made quite intensive and complete without overheating. Regardless of the extruder type, intensive mixing with high shear is required to fully disperse additives or even other polymers as many materials are only partially miscible in one another or form agglomerates that require high shear to break them up.

Mixing in single screws is first limited by the channel(s) the polymer follows down the screw. The shear rate and resultant downstream velocity is maximum at the barrel or the top of the channel, and minimum or potentially zero at the screw root. Because the polymer strongly adheres to the barrel and screw surfaces after melting, the shear developed by the polymer rotating with the screw in the barrel is the moving force. Essentially, in a force balance on the polymer the barrel is rotating around the screw and the moving surface of the barrel in contact with the polymer provides the transport. In the accompanying figure, these are shown as V_b and V_o .

More: Venerable Maddock Mixer Still an Extrusion Workhorse

Some stratification of velocity also results in only partial “turnover” of the polymer in the channel. That alone makes it difficult to completely mix the contents of the screw channel. Additionally, the channel contents tend to stay in relatively the same radial position in the single - screw channel due to continuing shear thinning of the viscosity decreasing from the barrel to the screw root.

Flow Resisters Raise Temperature, Lower Output

To try to overcome this limitation, various types of mixers and additional flights are used to offer some interruption and redirection of the polymer melt flow. However, these devices cause resistance to flow and reduce output as well as elevating melt temperature. All the polymer must flow through such devices repeatedly for uniformity of mix.

Mixing in single screws is first limited by the channel(s) the polymer follows down the screw.

Twin screws can apply high shear in small increments through multiple changes in channel depth and/or mixing lobes while subjecting the overall melt mass to limited shear. This is difficult and in most cases impossible with the single screw as it requires a tight clearance or restriction in the channel to develop the high shear rates.

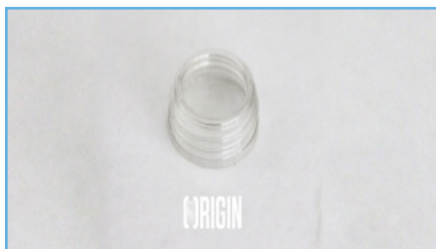
Single screws must have essentially specific channel depths to reach their desired output and melt temperature. This limits the use of multiple high shear areas that are so useful in twin screws because of the screw-to-screw turnover that permits high shear on a small portion of the polymer by transferring the polymer to the other channel.

other single screw mixers simply divide the melt at low shear, basically homogenizing the temperature without the high shear necessary for intensive mixing.

Source: PT Insider -18 October 2023

CIRCULAR ECONOMY/ BIO-PLASTICS/ RECYCLING

Origin Materials Creates Sustainable PET Bottle Caps, a Breakthrough in Recycling and Circularity



Origin Materials, a carbon negative materials company with a mission to enable the world's transition to sustainable materials announced that it has created “all PET” (polyethylene terephthalate) bottle caps, making “100% recycled PET” possible from cap to bottle to improve post-consumer recycling.

Origin's PET caps are more sustainable than common alternatives because they may be produced with any type of PET, from recycled PET to Origin's 100% bio-based, carbon-negative virgin PET. PET offers better oxygen and CO2 barrier than HDPE and PP, common cap materials.

Origin's patent - pending, cost-competitive design and manufacturing innovation aids in

producing “mono - material” products. These are composed of only a single type of material, are typically easier to recycle than products made from multiple materials, and are highly sought-after for consumer packaged goods to improve recycling.

“We identified a global sustainability challenge and an opportunity to solve it,” said John Bissell, Co-Founder and Co-CEO of Origin Materials. “An all-PET bottle and cap and closure system is an obvious, necessary next step in beverage packaging and recycling. With our process, we can make caps from 100% recycled PET or 100% bio-based PET, unlocking important sustainability and potentially performance benefits for our customers.”

Origin's innovation is expected to begin to address an approximately \$65 billion global caps and closures market, anticipated to grow to \$96 billion by 2030.

Polyplastics Launches DURACIRCLE Sustainability Initiative for Recycling of Engineering Plastics

Polyplastics Group, a leading global supplier of engineering thermoplastics, has launched the

DURACIRCLE™ initiative for recycling of engineering plastics. This effort applies to a wide variety of sustainable solutions that contribute toward achieving a 100% recycling rate for engineering plastics, without being confined to the existing business model of manufacturing and selling plastics. Polyplastics' goal is to achieve carbon neutrality by 2050. Phase one of the sustainability initiative consists of the opening of Polyplastics' new DURACIRCLE™ Re-compounding Service business which will offer high-quality mechanically recycled materials starting by March 2024. Mechanical recycling is a method to melt plastic waste with heat and process it back into pellets for reuse.

DURACIRCLE™ Re-compounding Service is a clear departure from conventional recycling. Its aim is to perform horizontal recycling which is considered difficult with engineering plastics since these materials require high quality in subsequent uses. Horizontal recycling is a recycling method to recycle products into the same products, such as recovering plastic bottles and recycling them back into plastic bottles.

Pre - consumer materials with manufacturing histories that can be traced and pose no concerns of contamination from

environmentally hazardous substances are anticipated for use as the raw materials. Pre-consumer materials are raw materials such as hot runners and non-conforming products that arise in manufacturing processes before products reach consumers, also referred to as post-industrial recycling (PIR) materials.

In addition to expanding DURACIRCLE™ to markets outside of Japan, Polyplastics plans to develop and offer recycling technologies for post-consumer recycled materials (PCR) which are even harder to reprocess. As environmental needs evolve, Polyplastics is developing future solutions for mechanical recycling, chemical recycling, and biogenic carbon cycles.

For more information, visit

<https://www.polyplasticsglobal.com/en/approach/21.html>

Hurricane – Proof House Made From Over 600,000 Recycled Plastic Bottles



This eco-friendly building is capable of resisting a Category 5 hurricane. Canadian construction firm JD Composites has completed its first concept home, made from about 612,000 recycled plastic bottles. Dubbed Beach House, the home is located in Nova Scotia, Canada,

and is not only a great example of how recycled plastic can be put to good use, but it's also hurricane resistant. JD Composites co-owners David Saulnier and Joel German came up with the Beach House concept to provide an economic and fast building solution that is simple, modern and durable.

"Our idea isn't to make custom homes for couples looking to build a new dream home," Joel German tells New Atlas. "Our goal is to get in line with projects that allow for volume sales – smaller dwellings, shelters, sheds, offices, sleeping barracks. Disaster relief shelters are definitely on our radar." The duo worked closely with Ontario-based firm Armacell, who created the prefabricated wall panels for the home using PET (polyethylene terephthalate) core foam green technology. These panels were made by melting down approximately 612,000 recycled plastic bottles into small beads, before placing them through an extensive extruding process.

"100 percent recycled PET foam from Armacell Canada is then engineered and developed to create layouts and laminate schedules accordingly," says Saulnier. "It goes through an extruding process that gives it its density depending on its secondary application – like aerospace, commercial windmills, or in this case walls for a home," German explains.

These prefabricated panels also provide the home with excellent insulation, durability, protection from moisture and mildew, and the ability to be assembled onsite within a couple of weeks, or even days. Furthermore, the panels were

tested at the Exova engineering facility in Mississauga, Ontario, and proven strong enough to withstand extreme wind force, similar to a category 5 hurricane.

"We were able to send in a 2.43 x 2.43 meter [7.97 x 7.97 ft] panel for our ASTM test," says Saulnier. "We maxed out their wind testing machine as it put out max pressure on our panel. This was the equivalent of 326 mph [524 km/h]. Our panel deflected 6.2 mm [0.24 inches]."

Over 184 panels were used to build the home, with each individual panel being shaped and cut manually and according to the home's design. The end result is a modern family home boasting a simple facade, seaside-themed interior, energy efficiency and hurricane resistance. The interior of the home features a large modern kitchen, open living, three large bedrooms, two bathrooms, indoor BBQ room and rooftop terrace. The Beach House also has large windows throughout, capturing the beautiful bay views, while also filling the home with an abundance of natural light and good airflow.

"A stairway that leads to the top of the living room, reveals a rooftop terrace overlooking St. Mary's Bay, Nova Scotia," says Saulnier. "It's my favorite feature. As well as the home's energy efficiency and the way it keeps outside noise at bay." The Beach House is currently being tested out as a demo home and holiday rental, in order to triple check its durability and how the home's interior and exterior wear over time.

"We want to watch how the different materials we use on the homes react over time, things like

CIRCULAR ECONOMY/ BIO-PLASTICS/ RECYCLING

paints and primers, monitoring the efficiency and different components," says German.

The overall build of the Beach House, including land, cost approximately CAD 490,000 (about US\$ 373,850).

Compostable Bottle Helps Reduce Plastic Pollution



French packaging company is manufacturing bottles made from a completely plant-based, fully biodegradable and recyclable bioplastic.

VEGANBOTTLE is a range of packaging (bottles, jars, pill bottles, bottles, caps) made from residues of different co-products from the plant world.

We use flax, hemp, reed, bagasse, shells, seeds, cores, wood fibers, miscanthus, etc. which we micronize to make biomaterials.

These materials from nature are transformed into bioplastic material to make containers which will be blown or injected in the same way as traditional plastics processing. The end of life, the "organic recycling" of this bioplastic differs. In our workshop, the decommissioned bottles are crushed to become raw material again, "a recycled vegetable bioplastic", unique in the world.

These biobased plastics have been around for more than 20 years, but the first ones were made from corn (cob), intended for food.

Developing an ecological product must take the resource into account. Agricultural land is intended to feed living beings and not to produce biomaterials. This is why Nicolas Moufflet, president of LYSPACKAGING has sought renewable resources and bio-waste to develop his innovation and place his VEGANBOTTLE brand in a new circular economy "from earth to earth".

All our containers are biodegradable and industrially compostable. This innovation was designed and developed to provide solutions to serious environmental problems related to:

- To the pollution of petrochemical plastics (oxo - fragmentable plastic, microplastics)
- Ensuring the post-oil era
- The bankruptcy of recycling (Plastic is not infinitely recyclable, waste sent to Asia, a poor material that cannot be sold, an exorbitant cost for communities, water, landfill, etc. ...)

Disposable Plastic Pollution

- This pollution produced on land ends up at sea, generating plastic gyres, called the 7th continent, and microparticles found in all living beings.
- We ingest 5g of plastic per week.
- Plastic production is 359 million tons per year.

- After 2-3 loops, they will end up buried or incinerated.
- The cost of sorting this waste and the pollution weighs heavily on local communities.

Thanks to its characteristics, VEGANBOTTLE is a new generation of optimized bottles that reduces CO2 emissions and therefore the impact on the environment with significant advantages throughout the production - consumption - disposal cycle.

A VEGANBOTTLE bottle generates at least 50% less CO2 throughout its life cycle compared to petrochemical plastic.

- Food certified (global and specific migration)

This plant-based container will compost industrially to give certified compost without toxic residue.

- Standard EN 13 432
- NFU 44-051 standard
- Don't abandon yourself in nature

It is obviously possible to integrate our packaging into the landfill or incineration sector, which represents more than 70% of cases in France.

Composting Organic Waste

The French territory is organizing itself for the treatment of bio-waste following the directives of the energy transition law for green growth.

Here you will find the map of French bio-waste management structures.

Certified suitable for food contact and we have the necessary migration tests as mandatory documentation for our customers.

Mosaic Tiles Produced From Discarded Plastic Bottles



After 3 years of research, Rivesti have launched a range of interior wall tiles produced from recycled PET bottles. PET bottle recycling can be useful in a large variety ways, but now it can be used to produce mosaic tiles. A Brazilian company called Rivesti uses discarded plastic bottles to create a range of interior wall tiles.

Available in 33 different colors, the mosaic tiles beautify your home while helping the environment at the same time. Devoted to ecological reinvestment, Rivesti has been researching how to do this for three years. PET resin taken from old plastic bottles is purified and treated with other recycled polymeric materials. This results in a high quality and uniquely finished product.

By recycling PET plastic bottles, Rivesti saves landfill space and cuts down on carbon dioxide emissions. In addition to this green initiative, Rivesti has also developed a faster tile-mounting method to further appeal to consumers.

Trend Themes

Pet-bottle-recycling - PET bottle recycling can be transformed into a range of creative and colorful products.

Eco - friendly - interior - design - Rivesti's recycled wall tiles offer a unique way to achieve eco-friendly interior design.

Sustainable-building-materials - Rivesti's usage of recycled PET bottles presents an opportunity for the sustainable building materials industry.

Industry Implications

Construction - Rivesti's recycled wall tiles provide a new product for the construction industry's sustainable building materials niche.

Interior-design - Rivesti's eco-friendly interior design tiles may appeal to consumers interested in green living and sustainability.

Waste-management - Rivesti's use of recycled PET bottles and unique tile-mounting methods present an opportunity for innovation in the waste management sector.

Complete Plastics Recycling Solutions from Coperion and Herbold Meckesheim Making the Plastics Economy Even More Circular

At PRSE 2023, Coperion and Herbold Meckesheim had exhibited some of their innovative technologies for recycling PET. Complete PET recycling solutions from Coperion offer throughput



performance of up to ten tonnes per hour. One unique feature is that virgin material and various recyclates such as regrind, agglomerates or flakes can be processed together, even if they exhibit different IV values. Coperion and Herbold Meckesheim are able to offer modular system and plant solutions that combine the complementary technologies of both companies to benefit customers.

From mechanical processing shredding, washing, separating, drying and agglomerating of plastics - to bulk material handling as well as feeding and extrusion all the way to compounding and pelletising, the systems that both companies have developed together cover the entire process chain for reclaiming plastics. Moreover, the plastics industry will profit from this cumulative expertise thanks to their combined global sales and service network.

Coperion will combine its strengths as an international industrial and technological leader with Herbold Meckesheim, a specialist in mechanical recycling of plastics and plastic waste. Herbold will continue to operate at its existing location and retain its name. Both companies will combine their capabilities in the field of recycling and integrate to build modular systems and plant solutions that cover a broad sector of the circular economy, as well as large sections of the globe with their combined sales and service network.



For You. Right Through.

A central collage of various plastic products in different colors. It includes a red car bumper, a kiwi slice on a white plastic doily, colorful plastic cutlery (forks, spoons) in containers, yellow and green plastic beads, a red plastic table and chairs, blue plastic beads, and a red plastic bucket filled with various cleaning products like sprays and bottles.

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