



R.N.I. No. MAHENG/2012/45652

PLASTISCOPE

The Official Journal of the Organization of Plastics Processors of India

Volume No. 12

• Issue No. 02

• Mumbai

• August 2023

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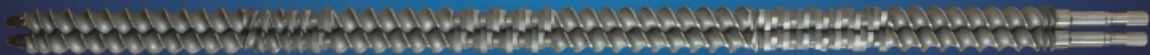
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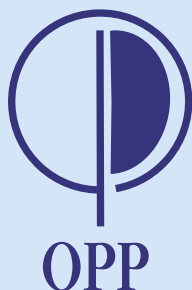
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FROM THE PRESIDENT'S DESK

Mr. Dilip Parekh



Dear Members,

Greetings from Organization of Plastics Processors of India!

During OPPI Annual Meet held on 4th August 2023, I had an opportunity to interact with the Indian Plastics Fraternity at Taj Santacruz.

The talk by Mr. Sunil Kant Munjal, Chairman, Hero Enterprise on – “Managing Transition In Family Owned Business” was exceptionally good and very well received by all the participants.

A detailed report with photographs of OPPI Annual Meet 2023 appears in this issue of Plastiscope.

Hon'ble Minister for Commerce and Industry has set the target for exports of value added products to Rs. 10 Lakh Crores by 2025. However, On the export front, India exported plastics worth USD 899 million, lower by 18.6% from USD 1,103 million in June 2022. Cumulative value of plastics export during April 2023 - June 2023 was USD 2,785 million as against USD 3,276 million during the same period last year, registering a decline of 15.0%. What is true for the plastic sector is also true for exports of other products. Thus it appears that the economic situation in various countries is under stress resulting in less demand.

In view of the above Organization of Plastics Processors of India is considering taking delegations to various countries to import value added plastic products and plastics processing machinery in substantial quantity. Kindly suggest the names of various countries to which OPPI should take delegations.

Govt. of India is notifying and implementing BIS for Plastic Polymers.

Quality Control Order on ABS was implemented with effect from 12th June 2023. BIS has introduced minimum Quality Standards for the manufacturing and imports of Polypropylene as well as PVC.

Quality Control Order on Polyethylene is due for implementation from 3rd October 2023. OPPI has strongly represented to the Department of Chemicals and Petrochemicals to defer the implementation of Quality Control Order on Polyethylene. We will keep you informed regarding further developments in this regard.

With Best Wishes,

Dilip Parekh
President

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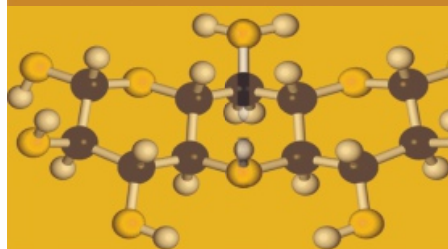
Printed, Published and Edited by:

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.

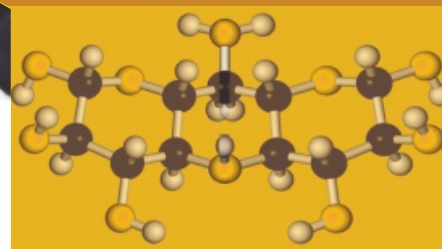
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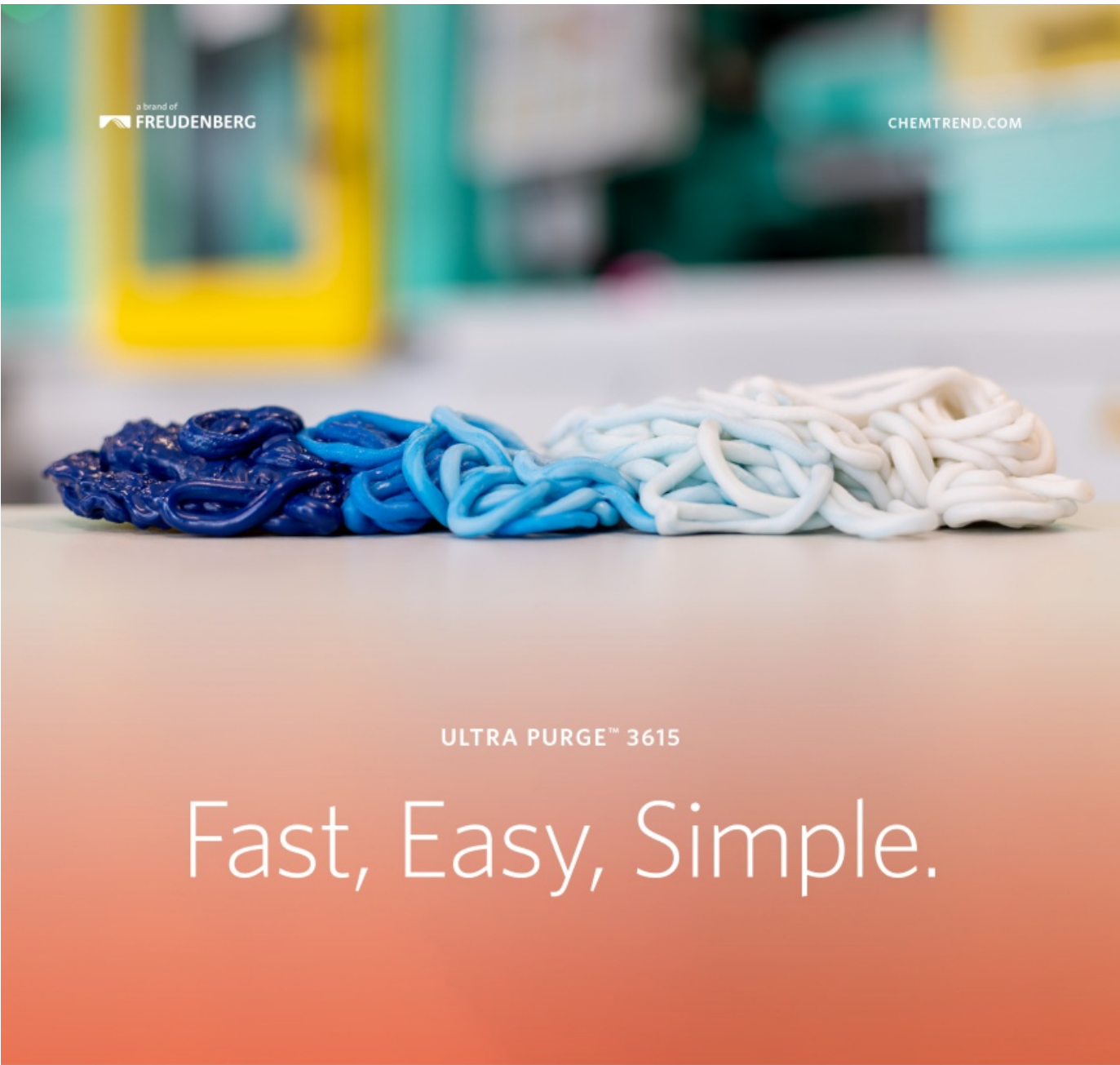
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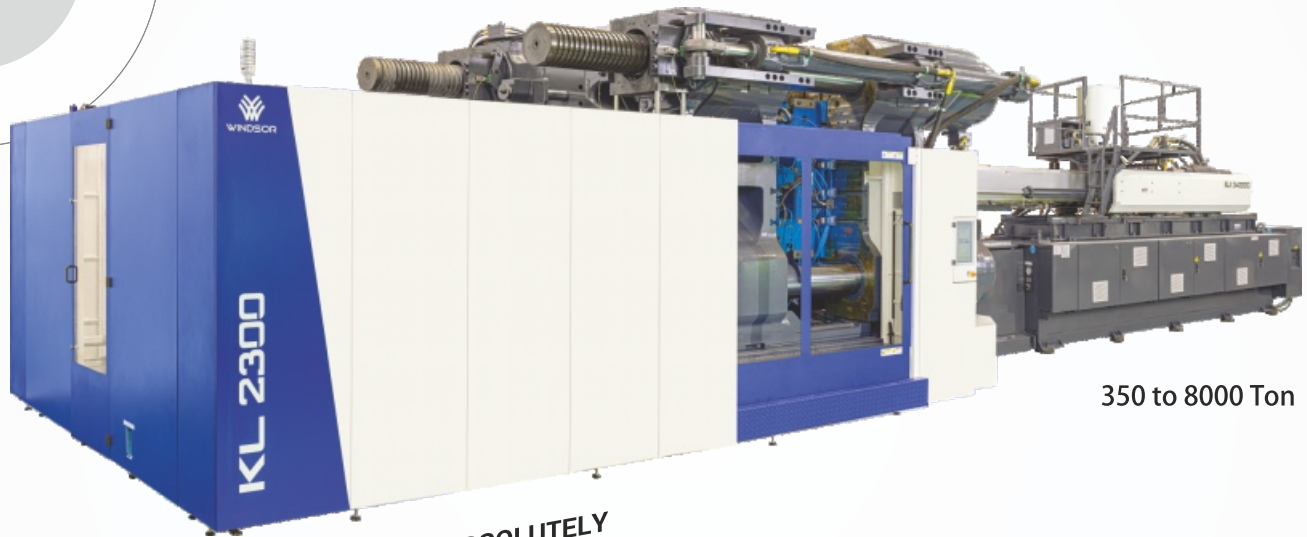
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A D V E R T I S E M E N T



39th Annual Meet of Organization of Plastics Processors of India (OPPI)

39th Annual Meet of Organization of Plastics Processors of India (OPPI) was held on Friday 4th August 2023 at Grand Ballroom, Taj Santacruz, Mumbai.

Mr. Sunil Kant Munjal, Chairman, Hero Enterprise was the Chief Guest and delivered a talk on -“Managing Transition In Family Owned Business”.

Mr. Dilip Parekh in his Welcome Speech said - “Mr. Sunil Kant Munjal is a second-generation member of the family that founded the Hero Group, India's premier automotive manufacturing group that has evolved from being the world's largest bicycle-maker to the largest two-wheeler maker. He is now the Chairman of Hero Enterprise, with interests in insurance, distribution, steel-making, real estate, corporate training and an active Investment Office”.

President, OPPI further informed the participants - “Mr. Munjal sits on the boards of the Indian Institute of Management, Ahmedabad(IIM-A), Indian School of Business(ISB) which is a leading Business School in India, Shri Ram College of Commerce(SRCC), India's leading College for Commerce and also University of Tokyo. He is also on the board of trustees of the Carnegie Endowment for International Peace”.

Mr. Sunil Kant Munjal in his talk on - “Managing Transition In Family Owned Business” made extremely important and highly educative observations. Some of these observations are as given below :-

- Only 6% Family Owned Companies survive beyond 3rd Generation.
20 years after the best seller book -“In Search of Excellence” was published, a research was done by Mr. Nitin Nohria, Dean of Harvard University. It was observed that 20 years later most of the Companies mentioned in “In Search of Excellence” were doing badly.
- There is difference between “Ownership & Management”
- It is necessary to train the next generation to be Good Managers & Good Owners.
- “Building & Retaining Relationships” played very important role in Family Owned Businesses.
Transition is a turbulent time for the Organization, next generation as well as the teams coming in because they do not know how the next leader will behave. Therefore it is necessary to encourage the youngsters to spell out there interests, likes & dislikes as well as aspirations.
- Communication is an amazing tool. It helps to resolve the issues. Clear & Open Communication is very important. Over Communication is preferable to Under Communication.
- One should be willing to be criticized because that is the best tool for improving yourself.
- Learning is a very important part of transition. We ask our people when they go out to find out what others are saying about the company and who is doing better than us.
- When one steps back, he should stay step back. However he should be available as a guide, sounding board, as a safety net, as a mentor but not as an operator. Change the position from the driver's seat to that of the navigator / passenger on the rear seat.
- Different groups of Managers in the company taking pot shots at each other is a sure shot formula for disaster.
- Try and train yourself. Constant learning is available online, and through many other sources. Consulting firms can advise families to define the roles better.
- Family is the custodian of the value and philosophical underpinning.



MR. S.K MUNJAL BEING RECEIVED BY MR.V.K.TAPARIA



(RIGHT TO LEFT) M/S. M.P TAPARIA, VAMANBHAI PAREKH, S.K MUNJAL & SURESH BHOJWANI



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(RIGHT TO LEFT) M/S. V.K TAPARIA, S.K.MUNJAL, VAMANBHAI PAREKH & KAMAL NANA VATY



MR. V.K TAPARIA PRESENTING BOUQUET TO MR. S.K MUNJAL



MR. DILIP PAREKH, PRESIDENT, OPP DELIVERING WELCOME SPEECH



(LEFT TO RIGHT) M/S. DILIP PAREKH, S.K. MUNJAL & MANISH CHHEDA



MR. S.K.MUNJAL DELIVERING HIS TALK



MR. ASHOK GOEL & Ms. SHRIYA PAREKH DURING Q & A SESSION





MR. SITAL THAKKAR, DIRECTOR, TIPCO INDUSTRIES PRESENTING MEMENTO TO MR. S.K. MUNJAL



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MR. S.K.MUNJAL PRESENTING MEMENTO TO MR. JIGISH DOSHI, PRESIDENT, PLASTINDIA FOUNDATION ON BEHALF OF OPPI



MR. AJAY SHAH, CHAIRMAN, NEC PLASTINDIA 2023 RECEIVING MEMENTO FROM MR. S.K.MUNJAL.



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MR. DILIP PAREKH RECEIVING MR. P.P. KHARAS. MR. NIRMAL THAKKAR IS IN THE CENTER.



(L TO R) M/S. DILIP PAREKH, V.K. TAPARIA, GAUTAM GANDHI, & PANKAJ PODDAR.



NEWS FROM INDIA

Auto Component Industry Reports Highest Turnover in FY23; Aims to Log Double-Digit Growth this Fiscal

The domestic auto component industry expects to log in double-digit sales growth in the current fiscal after having reported its highest-ever turnover in 2022-23, as demand is expected to remain robust. As per the Automotive Component Manufacturers Association (ACMA), the sector reported a turnover of Rs 5.6 lakh crore last fiscal, registering a growth of 33 percent over Rs 4.2 lakh crore in 2021-22.

In 2022-23, exports grew by 5 percent to Rs 1.61 lakh crore while imports grew by 11 percent to Rs. 1.63 lakh crore, it added.

The aftermarket, estimated at Rs 85,333 crore also witnessed a steady growth of 15 percent while component sales to OEMs in the domestic market grew by 39.5 per cent to Rs 4.76 lakh crore, ACMA said.

"With significant mitigation in the supply-side issues of availability of semiconductors, input raw-

material costs and logistics, the vehicle industry is expected to continue to perform well in FY24, which augurs well for the auto components sector," ACMA President Sunjay Kapur noted.

Tata AutoComp Posts \$2-Billion Revenue in FY23, its Highest Ever

Tata AutoComp System (TACO), a Tata Sons-owned auto parts manufacturing company which has announced its ambitions to be a \$ 3 billion (about Rs 20,000 crore) company by 2024, is adopting a fresh strategy to deal with the impact of the slowdown.

According to Mr. Arvind Goel, Managing Director and Chief Executive Officer, the company has re-aligned its focus on electric vehicles for major future growth. While exports and aftermarket are seen as other drivers of the \$3 billion aspiration, the company, whose last year turnover was Rs 6,000 crore, expects generate \$2.5 billion from the domestic operations, even though the time doesn't seem so favourable.

PepsiCo India Introduces Pepsi® Black™ Bottles Made from 100% Recycled Plastic



PepsiCo India, a leading global consumer packaged goods company, reinforced its commitment towards sustainability and plastic circularity by introducing India's first 100% rPET (recycled plastic) bottles* in the Carbonated Beverage category with Pepsi® Black™. This launch is part of PepsiCo India's mission to build a positive value chain through a circular, inclusive economy where packaging never becomes waste.

George Koor, Senior Vice President, Beverages and Sustainability, PepsiCo India said, "We are encouraged by the measures taken by the Government to promote a circular economy in India. We are proud to launch the 100% rPET bottles

of Pepsi Black. This an important milestone in our sustainability journey, backed by our intent to create a positive value chain and this launch is yet another step in that direction.

We shall learn and evolve as we continue our endeavors to build a robust ecosystem while expanding the use of recycled content in our packaging.” The Pepsi Black rPET bottles* are made from 100% recycled plastic and are manufactured in India in partnership with Srichakra Polyplast (India) Private Limited with the bottling partner, Varun Beverages. Driven by its 'Winning with pep+' philosophy, the company recognizes the importance of taking comprehensive efforts to reduce, recycle and re-invent its packaging. PepsiCo India is dedicated to developing innovative solutions, reducing its carbon footprint, and embracing sustainable practices like reuse and refill, that will inspire consumers, aligning with its long-term commitments to protect the environment.

Tata Consumer Products Joins Canada Plastics Pact as New Stakeholder

The Canada Plastics Pact (CPP) has confirmed the joining of Tata Consumer Products as its newest stakeholder. The CPP is a multi-stakeholder, industry - led collaboration platform that aims to tackle plastic packaging waste and contribute to a circular economy system in the country.

By joining the CPP, Tata Consumer Products, Tata Group's fast - moving consumer goods

company, intends to take proactive measures to boost its use of recycled materials to tackle the plastic waste and pollution crisis. The latest move will further contribute to the CPP's efforts to expand its network of stakeholders while advancing its roadmap towards packaging waste circularity.

The CPP's managing director Cher Mereweather said: “We are pleased to expand our network of stakeholders and are actively seeking to engage all key players of the value chain who have the potential to drive significant change in the way we use and manage plastics. Following this collaboration, Tata Consumer Products, now one of the 90 CPP partners, will work together with a large group of CPP stakeholders belonging to the plastics value chain. Since its launch in 2021, the CPP has introduced various efforts that are currently underway. It includes the formation of nine working groups to bring all its key stakeholders together for combating plastic waste and pollution issues.

Another recent effort includes the release of two studies by the CPP to help provide a better understanding of plastic waste management and sustainable packaging. The studies include the 'British Columbia Industrial, Commercial and Institutional Packaging and Paper Products' report and the 'Reuse and Refill Plastic Packaging in Canada' study.

Prince Pipes and Fittings Limited

Revenue of Rs. 6,041 millions was achieved in Q1 of Financial Year 2023-2024 by Prince Pipes And Fittings Limited.

The annual turnover for the year 2022-2023 was Rs. 27,108 millions.

Compounding Starch - Based Biomaterials for a Sustainable World

In today's world, sustainability is the buzzword in every industry, especially those directly utilizing natural resources to serve the growing population's needs. While developing nations are still facing technology - related challenges to ensure that long-term initiatives relating to sustainability are successfully implemented, local innovation is emerging as key solutions. In the world of polymers, leading R&D companies are extensively exploring natural alternatives to plastics and have made significant progress. These alternatives have the potential to reduce our reliance on natural resources.

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. Bioplastics can be derived from multiple biomass sources. The primary source for Biopolymers is starch, a natural polymer, which can be assimilated into various petroleum - based polymers or biopolymers. These starch-based biopolymers can in turn be used in various materials and applications. Starch - based polymers are found to be cost-competitive compared to other biopolymers. Starch - based biopolymers exhibit various physical and mechanical properties, which are not found in other biopolymers. Impact

strength and elongation at break are better in starch - based biopolymers. In addition, recycled biomaterials incorporate to starch.

The positive impact of using starch - based biomaterials is multifold - replace petroleum - based polymers with naturally occurring ones. Starch - based biopolymers are highly degradable, which means that they can be used alongside a compostable polymer without interfering with the degradation process. At STEER, creator of advanced materials platform technology that effectively transforms and functionalizes materials in the field of plastics, pharmaceuticals, food & nutraceuticals and biomaterials. we are constantly working towards evolving Starch - based biomaterials through innovative compounding methods using STEER Omega twin screw extrusion.

Case Study

Starch based biopolymers had several process- related challenges with standard bio - lobed technology with existing screw geometry, it is evident that shear-sensitive material like biopolymers cannot be processed effectively. The reasons can be many, prime among them being that peak shear rate results in degradation of biopolymers. In the process, the development of new materials is compromised. However, at STEER, we successfully overcame most of these challenges by adopting fractional geometry technology (FGT) in the extruder. The advantages are many – by controlling the peak shear, we can enable high output, lower melt temperature and high-speed operation.

We have worked with a wide set of materials, such as, carbohydrates (sugar, starch, cellulose), lignin, proteins & fats to develop biopolymers, such as, PBAT, PL A and Bio- polymers, which are environment - friendly in nature. We have overcome challenges relating to feeding (no choking of hopper), degradation (sensitive to temperature), and foaming (shear sensitive) by effectively balancing the starch component in PBAT (50%- 80%) and PLA (20%-50%).



Consistent tests with Fractional geometry technology showed a higher concentration of starch with PBAT lead to higher mechanical properness and better miscibility in PBAT/Starch composite. The addition of wood powder to PBAT increased tensile strength and flexural modules. The addition of Lignin powder to PBAT increased the impact strength and flexural modules.

There is multiple bio-degradable starch-based applications in use today, such as containers, food packaging, compostable bags, starch foam, and colorants masterbatch. The opportunity for starch - based composting is immense considering that plastic consumption stands at 500 billion single- use plastic bags annually. The global thermoplastic starch market is expected to reach a value of 255.82 kilometric tons by 2025, at an estimated annual growth of 7% over 2020-2025.

The film segment is the major consumer of the thermoplastic starch market, with a share of more than 48%. The starch blended with the PLA segment holds more than 50% in the global Starch - based Bioplastics Films market. The Asia Pacific region is likely to dominate the thermoplastic starch market during the forecast period and witness the fastest growth.

The potential for use of biopolymers in South Korea is immense considering the amount of waste being generated. According to a report published by Korea Maritime Institute, every year, 200,000 tons of plastics are discharged into the ocean. The government in Korea is taking multiple initiatives to prevent plastics from entering the oceans and damaging the marine life. However, the need of the hour is permanent fixes to end the use of harmful plastics by replacing them with bioplastics. Many countries across the world have banned the use of lightweight single- use plastic bags or have begun imposing taxes on them. Under the prevailing circumstances, it is imperative for the industry to move towards sustainable alternatives, such as bioplastics and STEER can help provide the technology support and intervention.

Recycled PET for India's First 100% rPET Beverage Bottle Produced by Srichakra Polyplast on Starlinger Equipment

Coca-Cola India recently launched its new 100% rPET bottle for water – the first time that a

packaging made of 100% recycled plastic is used for food or beverages in India. The food-grade rPET for the new bottles is produced by Srichakra Polyplast (India) Pvt Ltd on a Starlinger PET bottle-to-bottle recycling line.



Coca-Cola India uses the new rPET bottle for its packaged drinking water brand Kinley, which is currently sold in one-litre bottles. The launch of the rPET bottle became possible after the Food Safety Standards Authority of India (FSSAI) approved the use of recycled PET in food packaging, following a thorough review of the material regarding food safety and compliance with its guidelines.

The Starlinger Recostar PET 165 iV+ PET bottle-to-bottle recycling line at Srichakra's production facility in Hyderabad, Telangana State, has taken up production in 2021 and was the first bottle-to-bottle recycling line Starlinger installed in India. It features technology for processing post-consumer PET bottles and has positive scientific opinions from the European Food Safety Authority (EFSA) and approvals from FSSAI. The produced rPET pellets are suitable for food-contact and can be used for food and beverage packaging like bottles for water and carbonated soft drinks, food trays, etc. The use of recycled plastics helps to reduce the need for virgin plastics significantly and avoids plastic waste going to landfills or polluting the environment.

Srichakra has already ordered another two Starlinger PET bottle-to-bottle recycling lines which will be delivered beginning of 2024.

India's Imports from China Across at Least 25 Major Commodity Groups Rise on Year



India's imports from China across at least 25 major commodity groups such as consumer electronics, auto components, and iron and steel products rose in fiscal 2023, the government told parliament on Wednesday.

The statement, which listed Chinese imports in a total of 31 commodity groups, comes amid New Delhi's concerted efforts to reduce its trade deficit with China since border tensions flared in 2020.

Imports of electronics instruments from China grew 14% year-on-year in fiscal 2023, while imports of organic chemicals imports and iron and steel products rose 9% and 12.3%, respectively, as per the statement. Imports of all listed commodity groups were higher than shipments in fiscal 2021.

Last week, India mandated a licence for the import of laptops, tablets and personal computers to boost domestic manufacturing and curb supplies from China.

The mandate, which comes into effect from November 2023, is part of a string of measures over the past few years targeting Chinese products and investment.

India's trade gap with China widened 13.5% in fiscal 2023 year-on-year, as India's strong domestic demand continued to support Chinese imports while COVID lockdowns in China crimped imports from India.

Govt has Started Trade with Neighbouring Countries in INR, Says Hon'ble Minister – Ms. Anupriya Patel



The government has started trade in the rupee with neighbouring countries, including Nepal and Bhutan, Parliament was informed on Wednesday. Replying to a question in the Lok Sabha, Minister of State for Commerce and Industry Anupriya Patel said a significant part of the India-Nepal trade is being carried out in Indian Rupee (INR) and all bilateral trade with Bhutan is also transacted entirely in INR.

"Rupee trade mechanism has been initiated to facilitate trade in national currency with Russia. As of July 2, RBI has approved 34 applications from different Russian banks for opening SRVA in 14 Indian commercial banks," the minister said in a written

reply. RBI has issued guidelines for opening Special Rupee Vostro Accounts (SRVA) by foreign banks in Indian commercial banks.

She said Sri Lanka has included INR in its list of designated foreign currencies.

Authorised dealer (AD) banks in India have been permitted to open rupee vostro accounts. Accordingly, these accounts "of eight corresponding banks from Sri Lanka have been opened with respective AD banks in India, with prior approval of the RBI," she added. With Iran, she said that an arrangement to facilitate bilateral trade payments between India and Iran was adopted on November 5, 2018.

India and Bangladesh have also formally launched a new mechanism to settle trade in INR on July 11. Two Indian and Bangladeshi banks each have been designated to settle bilateral trade in INR.

These are SBI and ICICI Bank from India; and Sonali Bank PLC and Eastern Bank Ltd from Bangladesh. "To formally launch trade in INR, a formal Exchange of the Letters of Credit, i.e, LC documents in INR between the first exporter and importer through their banks was also carried out on July 11, 2023," she said.

India Imposes BIS Quality Norms for Import - Dependent Polypropylene

The Bureau of Indian Standards, a quality monitoring body under India's Ministry of Chemicals and Fertilizers, has introduced

minimum quality standards for the manufacturing and import of polypropylene (PP), a valuable raw material used in plastic product manufacturing. PP stands as one of the most frequently utilized thermoplastics globally, serving as the basis for a diverse array of plastic packaging, lightweight machinery, and equipment components, as well as fibers and textiles.

A global notification issued on Tuesday by the World Trade Organization (WTO) on behalf of the Indian government states, "The order aims to ensure the compliance of PP with Indian Standards. Locally produced or imported goods (PP in this context) are required to adhere to Indian standards and bear the standard mark, granted under a license from the Bureau of Indian Standard (BIS), which will serve as the certifying and enforcing authority."

Scheduled for implementation after a six-month period, starting from February 15, 2024, the BIS quality standard is anticipated to impact both PP production and imports in India. As a member of the polyolefin family, PP shares similarities with polyethylene due to their analogous monomer – propylene and ethylene, respectively. Despite these resemblances, significant differences exist in terms of density, service temperature, rigidity, resistance to environmental stress cracking, and susceptibility to oxidation.

Polypropylene demand in India	
Financial year	Volume ('000 tonnes)
2019-20	5,260
2020-21	5,358
2021-22	6,089
2022-23	6,615
2023-24(f)	6,971

Polypropylene boats have commendable mechanical properties, exceptional chemical, thermal, and electrical properties, as well as aesthetic appeal in applications like transparent films. Its lower cost per unit weight and greater yield on a volumetric basis due to its low density offer substantial economic advantages to converters and end-users.

Rising Demand

According to industry sources, India's demand for PP reached 6.6 million tonnes during the financial year 2023-24, marking a 6 percent rise from the 6.1 million tonnes reported in the preceding fiscal year. PP accounted for more than 37 percent of the overall polymer demand in India during the financial year 2022-23. In the January - March 2023 quarter, India's PP demand was approximated at 1.9 million tonnes, in contrast to the 1.7 million tonnes recorded in the same period of the preceding year.

However, India's increasing demand revealed domestic PP production to be insufficient. Consequently, the total PP imports for India were documented at 960,000 tonnes in the financial year 2022-23. As a result, PP emerged as the second most imported polymer in India, trailing only behind polyvinyl chloride (PVC), which accounted for a total import volume of 1.44 million tonnes during the financial year 2022 - 23.

PP consumption in India has been steadily ascending in recent years, driven by its

extensive range of applications. The Indian plastic industry projects the country's PP demand to escalate by 5.4 percent in the financial year 2023-24, following a 6 percent upsurge reported in the financial year 2022-23. PP finds extensive use across various industries, with approximately 40 percent dedicated to packaging and a cumulative 29 percent utilized in consumer and institutional applications. The transportation sector consumes roughly 10 percent, while the remaining 21 percent is allocated to miscellaneous sectors, districts from the aforementioned segments.

Capacity Expansion

A recently published report reveals that Indian producers have been consistently devising strategies to expand their production capacity, aiming to cater to the escalating domestic demand and foster self-sufficiency in polypropylene. Consequently, the Indian industry could potentially witness an additional capacity of approximately 3 million tonnes per annum (MTPA) within the next three years, facilitated by Nayara Energy's 0.5 million tonnes project, set to commence operations in 2023.

Three projects, one from each Hindustan Petroleum Corporation Ltd (HPCL), Chennai Petroleum Corporation Ltd (CPCL), and Indian Oil Corporation Ltd (IOCL), are anticipated to become operational in 2024. HPCL is slated to commence commercial production with its 1 million TPA project, while both CPCL and IOCL are projected to initiate their 475,000 TPA and 450,000

TPA of PP production, respectively, in 2024. Furthermore, IOCL and Gail India Ltd are preparing to launch commercial production for their 200,000 TPA and 500,000 TPA PP projects in 2025.

Nevertheless, these capacity expansions might prove insufficient to meet India's mounting demand across existing and emerging applications. The projection indicates that India's PP demand will continue its growth trajectory, thereby offering a promising prospect for global exporters. The consultancy firm TransGraph has estimated that the transportation, rubber, and plastic sectors will be pivotal in driving India's PP demand to reach 7.84 million tonnes by the financial year 2026-27.

Experts' Comment

Deepak Balani, Director General of the All Indian Plastics Manufacturers Association (AIPMA), remarked, "India is a deficit country, compelled to resort to imports due to inadequate domestic production. The country's production capacity falls short of its overall demand. Indian entities import specific, limited quantities of unique PP grades to fulfill highly specialized applications that are not presently manufactured domestically. Consequently, the imposition of BIS quality standards is poised to adversely impact the availability of these specific grades, as well as PP overall. The costs associated with such materials will inevitably rise."

"In terms of quality standards, international companies have already adhered to the quality regulations of the European Union, alongside other Asian and American guidelines. Given their adherence to these standards, there appears to be no rationale for introducing an unnecessary quality standard that could obstruct the process. However, predicting the context of Indian companies' compliance with BIS standards is challenging. Such quality norms are traditionally applied to products with surplus domestic production in order to discourage imports. Yet, India's local PP production falls short of consumption, rendering such a quality standard unnecessary," Balani elaborated.

An expert, speaking to Polymerupdate, conveyed that the government should not deter PP imports through superfluous quality standards. "By importing PP at competitive prices, we are able to manufacture high-quality finished products for export, positioning ourselves to compete effectively with global counterparts in foreign markets. Imposing restrictions on imports would drive up our production costs, making us less competitive internationally and thereby undermining our export potential."

He further commented, "The government should prioritize the finished product sector, which generates maximum employment. Import of raw materials should remain obstructed. However, the government should consider regulating the import of finished products based on quality and other standards."

India Imposes BIS Quality Norms On PVC to Restrict Sub - standard Resin Imports and to Encourage Domestic Producers

At a time when the Indian plastic industry is preparing to accelerate in sync with overall economic growth, the government of India has imposed Bureau of Indian Standards (BIS) quality norms on locally manufactured or imported polyvinyl chloride (PVC) resin. The levy is expected to restrict the import of sub - standard resins and encourage investments in greenfield projects in India, albeit with some initial challenges.

A recent notification issued by the Department of Chemicals and Petrochemicals (DCPC), under the Union Ministry of Chemicals and Petrochemicals, states, "The order seeks to ensure conformity of the PVC homopolymers with the Indian Standard for both locally manufactured and imported products, and to bear the standard mark under the license from the BIS, the sole certifying and enforcing authority."

Issued by the World Trade Organization (WTO) on behalf of the DCPC, Government of India, the notification is set to come into force 180 days from the date of the official gazette, i.e. February 11, 2024. PVC is manufactured through the polymerization of vinyl chloride monomer (VCM) and is used extensively for various applications, becoming an indispensable part in daily life. The manufacturing of PVC resin involves the use of initiators, catalysts, suspension agents, chain transfer agents, etc.

PVC resins are combined with a range of additives and ingredients during downward processing for conversion. Final products are created from PVC resin through various processors like extrusion, injection, blow, dip moulding, coating, thermoforming, calendaring, etc. These end products serve various applications including pipes and fittings, with some of them being in direct contact with food and drinking water.

Deepak Balani, Director General of the All Indian Plastics Manufacturers Association (AIPMA), commented, "India is a deficit country, hence is compelled to import due to inadequate domestic production. Presently, Indian entities import a large quantity of PVC. The imposition of BIS quality standards is poised to adversely impact the availability of these specific grades, as well as PP overall. The costs associated with such materials will inevitably rise."

India's PVC demand-supply (million tonnes)			
Financial year	Domestic demand	Total capacity	Operating rate (%)
2021-22 (a)	2.8	1.6	89
2022-23 (p)	3.7	1.6	90
2023-24 (f)	4.0	1.6	89
2024-25 (f)	4.3	1.7	90
2025-26 (f)	4.6	2.0	88
2026-27 (f)	4.9	3.0	77
2027-28 (f)	5.2	3.5	75
2028-29 (f)	5.6	3.5	83
2029-30 (f)	6.0	4.0	81

Source: Industry report; a = Actual, p = Projection, f = Forecast

Rising Demand

The demand for PVC in India rebounded after two years of pandemic disruptions during the

financial years 2020-21 and 2021-22. Industry sources estimate India's PVC demand to have reached 3.7 million tonnes in the financial year 2022-23, marking a 32 percent increase from the 2.8 million tonnes reported in the previous year. This growth momentum is expected to persist due to the government's sustained focus on infrastructure development, the primary sector driving the growth in PVC demand. With the Indian economy achieving the size of the fifth - largest in the world and targeting to reach the third-largest by the financial year 2029-30, India's PVC demand is expected to move in harmony with the overall economic growth.

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.

Widening Deficit

A recently released report from one of the country's largest PVC resin producers has estimated India's total import of this plastic raw material to be 1.96 million tonnes in the financial year 2023-24, marking an increase of over 37 percent from the 1.43 million tonnes reported in the preceding year. Due to a staggering gross domestic product (GDP) growth, India continued to absorb the entire global surplus that emerged after a slowdown in the global economy.

Country-wise share in India's 1.96 MTPA PVC imports				
Country	Absolute import quantity ('000 tonnes)		Share in India's overall import (%)	
	2021-22	2022-23	2021-22	2022-23
Japan	280	304	20	16
Taiwan	259	304	18	16
China	209	645	15	33
South Korea	175	160	12	8
USA	6	152	0	7
Thailand	95	109	7	6
Indonesia	48	28	3	3
Vietnam	37	37	3	1
Others	318	201	22	10
Total	1,427	1,960	100	100

Source: Industry report; MTPA = million tonnes per annum

“Regarding quality standards, international companies have already adhered to the quality regulations of the European Union, in addition to other Asian

and American guidelines. Given their compliance with these standards, there seems to be no justification for introducing an unnecessary quality standard that could impede the process. However, predicting the level of compliance of Indian companies with BIS standards is challenging. Such quality norms are traditionally applied to products with surplus domestic production in order to discourage imports. Nevertheless, India's local PVC production falls short of consumption, making such a quality standard unnecessary,” elaborated Balani.

China captured the largest market share in India's rising PVC demand, supplying both high and sub - standard quality resin. The volume of sub-standard PVC resin was significantly higher than that of the high - quality products. India's primary producers consistently claim that sub - standard Chinese goods are being dumped into local markets at competitive prices, eroding the market share of high high-quality raw materials from domestic producers and lowering the quality of final products in circulation. Polyvinyl chloride (PVC) is a prime example of a product that witnessed a sharp increase in Chinese imports during the financial year 2022-23.

Industry sources have reported that India's PVC imports from China tripled to 645,000 tonnes in the financial year 2022-23, compared to 209,000 tonnes reported in the previous year. Consequently, China's share in India's PVC import market has more than doubled to 33 percent this year, up from 15 percent in the previous year. In addition to PVC, China has supplied a

significant quantity of other polymers such as low-density polyethylene (LDPE), for which an anti-dumping duty (ADD) is being worked out.

PVC-End segment landscape – India (%)		
Particulars	2021-22	2022-23
Pipes	74	75
Wire and Cable (W&C)	7	7
Fittings	6	5
Calendering	6	6
Profiles	3	3
Films	1	1
Sheets	1	1
Others	2	2

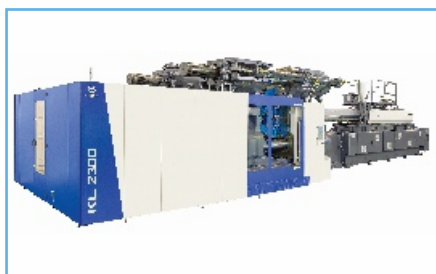
According to an industry report, China has gained a substantial market share in India's imports, particularly at the expense of Japan, Taiwan, and South Korea. This implies that Indian PVC importers have redirected a considerable number of purchase orders from Japan, Taiwan, and South Korea to China in the financial year 2022-23. The report further indicates that India's PVC imports from the United States also surged to 152,000 tonnes, capturing 7 percent of India's market share in the financial year 2022-23, a significant increase from the mere 6,000 tonnes or almost 'zero' percent share in the previous year.

Conclusion

Both China and the United States have experienced a slowdown in factory activity, a decrease in housing sales, and a high unemployment rate, leading to an economic deceleration. The diminishing demand from the domestic sectors of China and the United States has compelled manufacturers to offload PVC resin to India. Thankfully, India has maintained its capacity to

absorb surplus materials from around the world due to its robust consumption. Nevertheless, the introduction of the BIS quality standard is poised to curtail imports and significantly favour local primary resin producers.

Windsor Rolls Out Industry's Highest Tonnage KL-2000 and KL-2300 Patented Two Platen Injection Moulding Machines, Made in India Absolutely.



On the 22nd June, 2023 Windsor launched the highest tonnage patented two platen Injection Moulding Machine in India amidst the who's who of plastics processing industry in the country. With the expanding horizons of thermoplastic industry and demand for a bigger shot size plastic components in a limited space, there has been a rising demand to make higher tonnage machine and offer the customers more benefits and ease of operation. Innovation, just like change, is the only constant for us at Windsor Machines Ltd.

It was a gala function wherein we introduced KL2000 and KL2300 ton machines and this is sure to open up new vistas in manufacturing thermoplastic products. This will specially cater

to bigger plastic components requirements in Automotive, White goods, Construction, Logistics and Dust Bins industry with a generous specification and a footprint akin to that of a clamp unit.

In the recent past, there has been a constant demand from customers for two platen technology in 1500 tonnage and above sizes of machines. With feature - rich and future - ready technology, by introducing KL-2000 and KL-2300, Windsor has initiated plugging the gap from 1600 to 3200 ton machines. KL-2000 and KL-2300 can deliver more without occupying extra space, and it's easy to manufacture at competitive pricing standards eventually benefiting customers. Technology, by itself isn't a magic. It's the imagination that works wonders. Time and again Windsor has proved that.

Key highlights:

- Higher reliability
- Patented jaw clamping system
- Generous specification with multiple benefits
- Lubrication free short tie bars

Paradigms don't shift overnight. It takes decades of innovation to drive change. With its proven technological prowess, both KL-2000 and KL-2300 ensure higher productivity wherein the machine footprint is reduced by 15-20% hence saving on the floor space and making room for installing more machines on the shop floor. And both these machines are surprisingly compact and reliably efficient.

The large distance between tie-bar and platen dimension of KL-2000 & 2300 enables universal utilities of different moulds and more versatility and high degree of flexibility. The optimized parts with documented element analysis help our customers achieve high strength to weight ratio, apart from ensuring lesser downtime in day-to-day operation. Currently the designing KL-2800 and KL-3200 machine are underway, which will further enhance the range for the two platen machines from 350 to 3200 ton.

Before we launched KL1600 In January 2023, the industry was mainly reliant on China for the heavy and big parts like clamp & injection castings, tie bars, cylinders, etc. For the past 60 years, Windsor was always in favour of developing parts locally benefitting the local industry. In the making of KL 1600, KL 2000 and KL 2300, Windsor has set the new standards of nurturing and developing the Indian MSME ecosystem to make all the parts in India. The biggest and the highest parts were manufactured by our proud business partners and thus paved way for others to follow and benefit the industry towards making **"India Atm Nirbhar"**.

As forerunners of the plastics processing industry, we combine our legacy of top quality with the agility of responsiveness to build machines that are synonymous with trust. We are committed to consistently transform and reinvent ourselves and our capabilities. Over the past year, we have made significant investments and reinvented the way we operate. On the anvil is a model that would range from 350 - 3200 ton with a better price - to - performance ratio, improved reliability and optimum performance.

Meanwhile, Windsor continues to explore newer avenues of applications and developing sought after machines and technologies to stay ahead of the curve to benefit our customers.

India's GDP Likely to Have Grown 7.8-8.5% in June qtr: Economists

The Indian economy is expected to have grown 7.8-8.5 per cent in the April-June quarter on the back of robust capital expenditure by Centre and states and a pickup in services sector, economists said. Some drag to growth, however, is expected from weaker momentum in mining, and exports, and a possible slowdown in momentum of government capex as the country will approach the elections, which could dampen economic growth in the second half of the ongoing financial year 2023 - 24, they said. The growth estimates are higher than the projection of the Reserve Bank of India (RBI), which has estimated Q1 FY24 real Gross Domestic Product (GDP) growth at 8.0 per cent and full year FY24 growth at 6.5 per cent. Barclays has estimated Q1 GDP growth at 7.8 per cent, while SBI Research and ICRA have pegged Q1 growth at 8.3 per cent and 8.5 percent, respectively.

ICRA said economic activity in Q1 FY2024 was boosted by a "continued catch-up in services demand and improved investment activity", particularly front-loading of the government capital expenditure. "We peg GDP growth

in Q1 FY2024 at 8.5 per cent, exceeding the Monetary Policy Committee's (MPC's) forecast of 8.0 per cent. However, we are circumspect that erratic rainfall, narrowing differentials with year-ago commodity prices, and possible slowdown in momentum of Government capex as we approach the Parliamentary elections, could dampen GDP growth in H2 FY2024 below the MPC's forecasts. Overall, we maintain our FY2024 GDP growth estimate at 6.0 per cent, lower than the MPC's projection of 6.5 per cent for the fiscal," Aditi Nayar, Chief Economist, Head-Research & Outreach, ICRA said.

State Bank of India Research said in its Ecowrap report said that economic activity remained resilient mainly driven by the services sector. "More importantly, there has been a surge in capital expenditure in Q1, with Central government spending 27.8% of budgeted, while states at 12.7 per cent of budgeted. States like Andhra Pradesh, Telangana, Madhya Pradesh where are elections are due have registered capital expenditure growth up to 41 percent," Soumya Kanti Ghosh, Group Chief Economic Adviser, SBI said in the report. The growth in incremental deposits growth has almost doubled at Rs 11.3 lakh crore, compared to Rs 5.0 lakh crore last year (Rs 2.73 lakh crore received through Rs 2000 banknotes and Rs 1.5 lakh crore from HDFC merger), the report said. "Despite rising interest rates, the overall economic growth led to higher credit demand leading to banks reporting a robust rise in advances. Both the PSBs

and private sector banks logged in equal pace of loan growth during Q1FY24. All the major financial parameters viz., credit deployment, profitability, asset quality, capital adequacy etc. indicate that the performance of PSBs has significantly improved," it said.

Barclays India in a note said that construction sector will standout in April-June GDP data, as it is likely to post its second straight double-digit growth print amid front - loaded capital expenditure by both central and state governments, and a pickup in non - financial corporate investments. "Some drag to growth is expected from weaker momentum in mining, and exports, the latter given external headwinds and ebbing reopening demand. We think robust domestic demand is anchoring economic growth, with strong momentum in areas such as construction, underpinned by government capex... this should ensure that growth remains anchored close to trend levels, giving enough room for RBI to be on a long pause. We continue to believe that the window for rate cuts is closed for now, and the RBI is likely to be on hold for the rest of the fiscal year, in our view, with only a strong growth shock likely to stir it into action," Rahul Bajoria, MD & Head of EM Asia (ex-China) Economics, Barclays said. India's GDP growth had clocked a higher-than-expected growth rate of 6.1 per cent in January-March, in turn pushing up the growth estimate for full year 2022-23 to 7.2 per cent. GDP data for April-June is scheduled to be released on August 31.

A New Invention by JJ Plastalloy Revolutionises Recycling with a Masterbatch that Detects Black Plastic Articles




Introducing NIR Detectable Black Masterbatches by JJ Plastalloy - Specially designed for recyclability & sustainability. Plastic waste is usually pre-sorted according to grades at recycling facilities using near-infrared (NIR) optical sorters to facilitate recycling of plastic packaging.

These sorters have limitations in identifying and separating plastics containing carbon black, a commonly used black pigment, due to its absorption of significant amounts of ultraviolet and infrared light. The result is that non-detected black plastic waste goes to landfills or incineration.

Consequently, black plastic products are not widely recycled. Therefore, we found that there is a pressing need to develop technology that can detect black carbon in the optical sorting process. Earlier this year, JJ Plastalloy developed a NIR Detectable Black masterbatch solution that enables and facilitates effective sorting

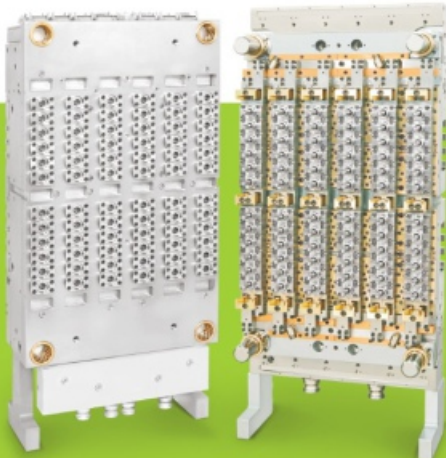
of plastic waste as it becomes detectable using existing sorting technology.

This technology has been certified according to the COTREP recyclability test protocol. Designed for circularity, this certification demonstrates that plastics containing these masterbatches can effectively be separated using automated Near-Infrared (NIR) sorting equipment to avoid plastic waste. We are proud to announce that JJ Plastalloy, is the first Indian masterbatch company to develop NIR Detectable Black Masterbatches. A pioneering move in green technology and sustainability, we hope to strengthen the recycling process in India.




PET Preforms Molds end Application


- > Water
- > Carbonated
- > Pharma
- > Juices
- > Edible Oil
- > Liquor
- > Cosmetics
- > Wide Mouth Jars




PET Preforms
Molds upto 96 Cavitations



Caps & Closure
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PLASTIC PRODUCTS AND NEW TECHNOLOGIES

The NCC Develops a Pipeline of Hydrogen Innovation to Enable the Energy Transition



As the transition from fossil fuels to a hydrogen (H2) economy accelerates, so does the need to repurpose the existing network infrastructure to transport H2 from generator to consumer. It's in this context that using composite pipes can help unblock both economic and technical barriers. To this end, the NCC has invested in developing its capability and knowledge of manufacturing thermoplastic reinforced piping to support the energy industry on its journey to a hydrogen economy.

Challenge

As part of the Hydrogen Innovation Initiative (HII), a collaboration bringing together the strengths and capabilities of the Catapult Network and partner innovation centers, the NCC is working to help industry and customers overcome the

technical and economic barriers to innovation in areas that include hydrogen pressure vessels, cryogenic storage tanks, and composite pipes.

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Because of its low density, hydrogen needs to be liquified or compressed to high pressures to be stored. This means developing cryogenic tanks, high - pressure storage vessels and a distribution network. This is where composite materials' low - weight, mass - efficient qualities have a big part to play, not only in storing hydrogen but also in transporting it through a next - generation pipe network to where it will be needed.

Innovation

At the NCC, our cross - sector hydrogen team is working to overcome the challenges of deploying composite pipe

solutions with a programme of work that will help establish a robust supply chain in the UK. Two years into our journey, we've already developed our own manufacturing capability in line with a clear roadmap to 2025 and beyond. Our on - site facility now offers consulting, as well as a functional and structural design capability, which puts us in a great position to help customers and industry make the most of both the technical and market and opportunities the hydrogen economy will bring.

Impact

In 2023, we're designing and prototyping pipe concepts to meet the DNV - ST - F119 industry standard for the use of thermoplastic composite pipes in critical offshore applications. And by 2025, we're aiming to have a comprehensive prototyping and fully qualifiable product design capability based on a regulatory framework currently being developed.

Beyond that, we'll be looking to reduce the through - life burden of infrastructure by developing 'smart pipes' with integrated sensors that provide real - time data monitoring and

feedback on flow and pipe performance. It's this type of pipe that will enable the new and next - generation hydrogen infrastructure we're going to need to power our homes and industry.

Atop the Plastics Pyramid

Allegheny Performance Plastics specializes in molding parts from high - temperature resins for demanding applications as part of its mission to take on jobs 'no one else does.' In satellites, in jets, in automotive transmissions - the parts that Allegheny Performance Plastics molds for the roads, skies and outer space operate at the boundary of the harshest environments that plastics can inhabit. The list of materials that can survive in these environs is short, as is the list of molders that can successfully run them. Allegheny gladly, intentionally calls this rarefied air home. "We don't like easy; we want difficult," explains Robert Stutzman, Allegheny CEO. "We want something no one else does."

One common means for organizing polymers that's familiar to those in the industry is the "plastics pyramid." From a large base of commodity resins, the pyramid builds upward, getting smaller as it goes with engineering plastics in the middle and high - temperature plastics - those with melt temperatures typically above 300°C (572°F) - occupying the smallest space at the pinnacle. Within this capstone, you find resins like PEEK, PEI, PPS, PI, PBI and PAI with familiar trade names such as Ultem, Ryton and Torlon. For

these materials, Allegheny offers its customers assistance in selection, design optimization, sample production / testing and cost - competitive production.

"The key is that we can't be everything to everyone," Stutzman says. "So you focus on a certain type of material offering. The reason being that if you mold PP and PE, thousands of people in the country can do that. You use a commodity material, and you're one of many - you become a commodity yourself."

Early Innovators

Established in 1936, Allegheny Plastics Inc.'s initial focus was using plastics to print and laminate reusable charts. Based in Leetsdale, Penn., the Allegheny Performance Plastics division has been in injection molding since the 1960s. In 2016, Allegheny executives Greg Shoup and Shevey Westbrook, with the backing of two investment firms, completed a management buyout of the molding unit. Shoup and Westbrook remain at Allegheny, serving as chief technology officer and director of operations, respectively, with Stutzman hired on in October 2022 to act as CEO.

Allegheny Performance Plastics CEO Robert Stutzman and CTO Greg Shoup on the company's molding floor, which applies lean and scientific molding principles.

Since Stutzman's hiring, Allegheny has added a network of 17 external sales agents, and laid out a 5 - year plan with four key pillars: people, where / how

will the company grow, operational excellence and continuous improvement. To support this plan, the company is seeking to update its ERP program, and add other operations and manufacturing software, including MES, this year.

"We're at the point now in our business that we need to be able to have some things integrated," Stutzman says. "Not just ERP and MRP to handle our purchasing - we're tight on space so we don't want to have a warehouse full of stuff - but an MES system. I want data off the manufacturing floor and I want it all tied together. The business is going to grow and for us to maintain what we have - our performance financially but also for our customers - we can't get bogged down doing stuff manually."

Parts Potpourri

In the eight months he's been on the job, Stutzman walks the floor every day, and virtually every day he has seen a new part in production as the company maintains several hundred active molds. When Plastics Technology visited, the manufacturing floor - which features 30 injection molding machines (mostly Nissei, ranging from 20 to 500 tons), seven CNC machining work cells for post - mold processing, and 40 ovens for post - curing parts molded from Solvay's Torlon PAI resin - was humming with production of an array of parts. Seal rings; a satellite bound

insert - and over - molded part; nylon gears and brake pistons; an Ultem transmission component; and an elastomer pad whose surface texture, imparted by the mold, imitates the grip of a gecko's feet, were among just a few of the jobs in production.

Using high - temperature materials means that Allegheny runs oil through the molds instead of water, with longer cycles required and more expansion and contraction of the molds over time, demanding vigilance in preventive maintenance. How hot do these resins run? As we pass a hot runner temperature control unit in front of a press, the display's set point reads 750°F. "We don't like easy; we want difficult. We want something no one else does. "The manufacturing floor is divided into three "teams," with all 19 presses in Team #2 utilizing RJG's eDART process monitoring technology,

with molds featuring temperature and pressure sensors. This team focuses on high - volume jobs, while Team #3 targets low - volume / high - mix jobs. Team #1 handles lower volume aerospace work. The Haas CNC machining centers are utilized to machine in part features post injection, where molding them in would have required more expensive tooling with longer lead times.

Running three shifts, Monday to Friday, with the occasional Saturday, Allegheny has roughly 50 employees, with the goal to be at 57 by the end of the year. Thanks to automation and process monitoring, Stutzman notes that in Team #2, two employees can keep tabs

on 19 machines. All the workers on the floor are cross trained such that they can take on all the production roles: mold setup, process technician, inspection and more.

That inspection also happens on the floor simultaneous to production. In the middle of the molding cells, an inspection station (including a CMM), moisture analysis and more, resides. "It's more about quality assurance than quality control," Stutzman says. A lean manufacturing concept, this cell ensures good parts as they're molded. Allegheny also operates a full quality control lab in a climate - controlled space off the molding floor.

Dow's Sustainable Packaging Solutions Enable Mengniu to Launch all Polyethylene Yogurt Pouch Designed for Recyclability in China



Dow and Mengniu have partnered to introduce a yogurt pouch made entirely from polyethylene (PE) in China. Mengniu developed its first all - PE yogurt pouch with Dow's Innate TF - Bope resins "to help ensure that packaging maintains its superior appearance and productiveness," said Dow.

The new packaging solution, which is designed for recyclability, allows previously

"hard - to - recycle" packaging to be integrated into closed - loop recycling systems. This is achieved through responsible recycling and mechanical recycling technology, providing consumers with more options for sustainable packaging.

Bambang Candra, Asia Pacific commercial vice president of Dow packaging and speciality plastics, said: "This partnership with Mengniu is a milestone for both brands to pioneer all - PE dairy packaging designed for recyclability in China. The country's ambition to work towards zero - waste cities has changed how it tackles plastic waste."

Mengniu aims to achieve 100% technically recyclable packaging by 2025, seeking to adopt low - carbon packaging in all of its product lines. Mengniu introduced its yogurt pouches with PE packaging for the first time during the 2023 International Dairy Forum, held from 4 - 7 August in Hohhot, China. These pouches will soon be accessible at supermarkets throughout the city.

Fraunhofer Researchers Develop New Formulations for Recyclate Films



Researchers from Fraunhofer Institute of Structural Durability and System Reliability LBF gave information about newly developed new formulations for enhancing the quality of

new recyclate films at Plastics World Expo Europe, Essen, 2023. The use of recycled plastics is becoming increasingly popular due to its potential to reduce the environmental impact of plastic waste. However, the quality of recyclate materials significantly affects their application. The recycled material's stability and processing ability for its intended application often require post-stabilization with suitable additives.

Benefits by Additive Restabilization Plastic films, such as bags and wraps, are one of the most common types of plastic waste generated by households, supermarkets, and other commercial and industrial sectors. According to the European Plastics Converters Association (EuPC), around 25 percent of all plastic packaging waste in Europe comes from plastic films. However, these materials can be recycled and transformed into new products such as furniture, bags, and even building materials, which contribute to a circular economy. The recycling process involves collecting, sorting, and cleaning plastic films, which are then melted down and reshaped into pellets for manufacturing.

The use of additives such as stabilizers, compatibilizers, and reactive agents can significantly improve the quality of recyclates, making them comparable to virgin materials. For instance, polyethylene (PE) films made from recycled plastic require no defects during their manufacture to ensure their reliability and durability. Researchers at the Fraunhofer Institute for Structural Durability and System Reliability

LBF in Darmstadt have successfully enhanced the quality of these films through the addition of a suitable additive formulation.

Formulation Development for Recycling Materials. The development of a formulation of multiple additives is a key approach for enhancing the properties of plastics, including those made from recycled materials. This involves combining several different additives, each with a specific function, to create a customized solution that meets the specific needs of the application. For example, a formulation of additives may include a processing aid to improve the melt flow of the plastic, a UV stabilizer to protect the plastic from UV degradation, and an antioxidant to improve the plastic's durability.

By combining these additives in the right proportions, manufacturers can create a plastic with enhanced properties that is suitable for a wide range of applications. Developing such a formulation is a complex process that requires careful consideration of the properties of the plastic, the performance requirements of the application, and the potential environmental and health impacts of the additives used. As such, research and development efforts in this area are focused on finding sustainable and environmentally friendly solutions that can be used in the production of plastics.

By adding the appropriate formulation, which is a composition of different additives, the researchers at

the Fraunhofer LBF achieved significant improvements in the quality of the recycled PE films. The resulting films are reliable, durable, and can be efficiently manufactured at a lower cost. This achievement provides a significant boost to the use of recycled plastics, making it an attractive alternative to virgin materials.

Enabling Carbon Footprints Reduction. In Europe, there are several companies dedicated to recycling plastic films, although they are not named here. These companies also play a vital role in reducing plastic waste and promoting sustainability. With growing efforts to decrease plastic waste in Europe, the recycling of plastic films is becoming increasingly crucial.

The successful utilization of innovative and specialized additives to enhance the quality of recycled plastics is a significant step towards sustainable and environmentally friendly production processes. It enables industries to reduce their carbon footprint by applying recycled materials instead of virgin ones. Therefore, the use of additives to improve recyclate properties should be encouraged and promoted. Looking further down the line, the variables of the compounding (exact composition, process parameters) raise the complexity once more, because they influence the efficiency of the recycling additives.

As a result, it becomes only clear in the very late stages of the development cycle if and how all targeted properties (aging resistance, mechanics) can be achieved and if these

are continuously under control considering further variables (batch - to - batch variation, incoming streams). Despite trial and error being still widely used in this process, the best path for a successful additivition is an analytical characterization of the available recycling material. The result of such targeted screening delivers the then needed information for a tailor - made additivition.

Berry Global Introduces Spray Through Over - Cap with 50% Recycled Content

Plastic packaging manufacturer Berry Global has launched a new spray - through overcap, which is made using 50% recycled content. This recycled plastic stock option has been introduced as part of the company's Bmore Circular Solutions portfolio, which showcases Berry's commitment to providing sustainable solutions.

The overcap will serve as a solution for the vehicle, homecare and other industrial markets. Berry Global Product Line Management vice - president Jonathan Reitman said: "As demand for post - consumer resin (PCR) in packaging grows, we continue to prioritise recycled content in our innovation and investment strategies across our product lines.

"The drive toward sustainability is critical in helping our customers meet their goals and for us to meet our own. "The spray - through overcap stock option fits 211 / 65mm necked - in aerosol cans and serves a range of markets, including homecare, automotive, and industrial.

"With its pre - inserted button feature, this spray - through overcap is ready to apply from the factory, offering convenience benefits to Berry customers, and simplifying the end - user experience. "Berry's PCR stock caps and closures portfolio currently comes in a wide range of styles and sizes, including seven overcaps designed to support different container types.

The company confirmed that all its PCR stock caps and closures are made using kerbside - collected material. The recycled plastic that is used for making Bmore portfolio products first undergo an extensive evaluation under the supervision of product development and engineering experts.

This testing process helps ensure that the recycled materials used for making new products have the same functionality and performance as that of its virgin resin counterparts. Aside from its Bmore portfolio, Berry Global is taking on other initiatives to offer sustainable packaging solutions to its customers.

Under its sustainability strategy, the company aims to minimise greenhouse gas emissions, boost recyclability and promote the use of recycled contents to achieve its goal to have at least 30% of circular plastics in its range by 2030.

Berry launches NordiVent FFS Film and FormiFor Insulation Compression Film

Berry Global's European flexible films arm has introduced a new generation of its patented

NordiVent form - fill - seal (FFS) film with up to 50% recycled plastic content for powdered products. The new film is expected to meet customer and consumer demand for goods with increasing recycled content. It also aligns with Berry's sustainability strategy for 2025 and its commitment to developing solutions to meet and exceed customers' sustainability goals.



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According to the US - based plastic packaging products maker, the recycled material content has not affected the user benefits of NordiVent. Its durable and patented design offers consistently reliable performance. The film, which is completely waterproof and guarantees dust-free air release, provides efficient moisture protection for products that must be kept dry and enables bags to be stored outside.

Due to its strong tear resistance, the product is further protected, and spills and product waste are prevented throughout the supply chain, Berry said. The film is equipped with an anti-static feature that allows it to handle even the most challenging products and applications. NorDiVent's quality also enables printing in up to eight colours, which enhances on - shelf visibility and allows for impactful branding.

Berry Global sales director Frank Heseding said: "NorDiVent provides a reliable, long - term dust - free and moisture - free solution for the filling and packing of all types of powdered products, such as chemicals and construction materials. "In addition, the company unveiled the next generation of its FormiFor insulation compression film that has now more than 30% of post - consumer recycled material.

FormiFor's latest version, which has secured RecyClass accreditation to confirm the legitimacy of the recycled content, contains up to 30% of Berry's Sustane premium recycled polymer.

This guarantees that FormiFor will continue to offer its high weld and holding force capabilities as well as its ability to be printed in up to eight colours to boost brand awareness and on - shelf appeal, the packaging products maker added.

Suitable for the insulation, glass wool and stone wool product markets, FormiFor's lightweight structure uses up to 50% less material when compared to other traditional packaging films.

Berry Global business development director Neal Geryl said: "In line with our Impact 2025

sustainability strategy, this latest version of FormiFor demonstrates our ability to design for circularity with a film that maintains all its benefits while helping our customers meet and exceed their sustainability goals."

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ADBioplastics Develops Together with Borges International Group Compostable Single - Use Packaging for Extra Virgin Olive Oil

ADBioplastics has participated in the development of compostable single - use packaging for extra virgin olive oil together with a

team led by the oils and dressings producer and marketer Capricho Andaluz, part of the Borges International Group. In the manufacture of this single - use packaging, it has used the bioplastic PLAPremium, which has been developed by ADBioplastics, is 100% compostable industrial and is able to be disposed of in the organic bin. These single - use products will be marketed in the coming months, initially under the Capricho Andaluz and Borges brands, but with the plan to launch new references on the market in the near future.

This important innovation adds to the already consolidated sustainability strategy of the Borges group, which works daily to reduce its environmental impact, through the TecnoBi product line, which consists of grades specifically designed for processing by cast extrusion and blow moulding technologies. These grades are OK Compost certified by TÜV Austria, which guarantees that, under industrial conditions, the material reaches the disintegration stage within a maximum of 3 months.

In addition, this material is suitable for food contact in accordance with the applicable European legislation (FCM), allowing its use in packaging applications for food, beverages, cosmetics, pharmaceuticals and other products. Other advantages of the material are its suitability to the requirements of the product to be packaged and the packaging line and its excellent performance compared to virgin PLA in the transformation processes thanks to its process ability in conventional equipment. It also offers a substantial improvement in the mechanical properties of

virgin PLA, achieving good finishes and optimum transparency. AD Bioplastics offers a packaging solution to meet national and European sustainability objectives, which imply that by 2030 all packaging on the EU market must be reusable or recyclable, including compostable, also known as organically recyclable, among the latter.

Sustainable Packaging Concepts for the Food Industry – Südpack at Pack Expo in Las Vegas



SÜDPACK will be taking part in PACK EXPO, the international packaging trade show, once again this year. From September 11 to 13, the film manufacturer will be presenting its entire portfolio - this time in Las Vegas - of both conventional and sustainable high - performance films and packaging concepts for the food industry on the 640 square feet of booth SL-5972. In addition, at the exhibition booth of PPI Technologies, the US representative of SN Maschinenbau, film made by SÜDPACK will be processed into stand-up pouches with zipper reclosure on an SN horizontal pouch packaging machine.

“Sustainability” – a Central Topic at PACK EXPO

One of SÜDPACK's main points of focus at the exhibition this year is on sustainable packaging

concepts for the food industry, in particular because the topic of sustainability is gathering momentum in the United States as well. For that reason, SÜDPACK is enhancing the focus on its material - efficient and recyclable packaging concepts. Due, among other things, to its consistent commitment to a comprehensive sustainability roadmap and a functioning circular economy, SÜDPACK offers a portfolio of packaging solutions and business models in the area that is unparalleled in its breadth.

With a large assortment of high-performance mono - materials, films made from renewable resources and particularly thin and therefore resource - conserving film structures, the manufacturer is bringing powerful innovation to the US market. From stand-up pouches to flow packs to thermoformed packaging - SÜDPACK's modern material structures optimally protect the packaged products. They can be equipped with different features and barrier properties to ensure that products can be safely protected from external factors when packaged. For example, packages can be easily opened and closed by using the reliable Multipeel film concepts.

The SÜDPACK site in Oak Creek has its own printing and laminating facilities - and thanks to tight organization and excellent service, they are able to respond to customer requests with very short lead times.

LIVE stand - up pouch production at booth C - 4828

SÜDPACK will be coming together with SN Maschinenbau and their US representative Ppi

Technologies Group in the Central Hall to present an attractive solution for the efficient and sustainable packaging of products such as beef jerky, air - dried sausages, grated cheese, nuts, snacks and also non - food products in practical stand - up pouches with zipper reclosure. Because both the film and zipper reclosure are based entirely on PE, the packaging can be fed into the appropriate material cycle as a true single - material solution.

Thanks to a relatively large processing window, efficient packaging and rapid cycles are ensured without any issues on conventional standard machines. In Las Vegas, SN Maschinenbau's high-performance FM 060 horizontal pouch packaging machine will be in use. The horizontal operating rotary machine provides maximum flexibility and excellent packaging quality on a small footprint. It can be used to manufacture flat pouches, bottom-gusseted pouches and stand - up pouches.

How to Extrusion Blow Mold PHA / PLA Blends



You need to pay attention to the inherent characteristics of biopolymers PHA/PLA materials when setting process parameters to realize better and more consistent outcomes. In the current legislative climate of bans on petroleum - based plastics and consumer requests for sustainable

alternatives, bioplastics offer a unique opportunity. In prior decades, there has been significant resistance to bioplastics because of cost as well as unique, and often difficult, processing characteristics. Now, however, the development of many polyhydroxyalkanoate (PHA) - based resins - often combined with polylactic acid (PLA) - has resulted in bioplastic solutions that are well suited to current market needs. PHAs are a naturally occurring biodegradable material produced via bacterial fermentation, similar to brewing alcohol. During fermentation, when nutrients and food sources are optimized, the bacterial strains start making and storing PHA as a food source, eventually producing a peak amount of PHA. At this point, the PHA is separated from the cellular components and processed, resulting in a light, white powder that can be combined with other materials like PLA to produce processable and usable bioplastic resins. These materials are typically compostable in home and industrial environments, and degradable in soil and marine environments.

One of the opportunities to use PHA and its compostable characteristics is in blow - molded articles. The positive end - of - life scenarios offer one possible solution to the overabundance of plastic in the market. PHA can be blow molded into various shapes, sizes and designs for many applications, from personal use to food and drink storage. To successfully extrusion blow mold PHA/PLA bottles you need to take heed of the unique processing characteristics of the material. Photos: Danimer Scientific Recently, many processors have been

experimenting with running PHA/PLA blends in their blow molding operations, with mixed success due to the blends' unique characteristics. However, proper attention to the inherent characteristics of PHA / PLA materials when setting the processing parameters can lead to better and more consistent outcomes.

PHA can be blow molded into various shapes, sizes and designs for many applications. When combining PHA with PLA, you will find that the processing requirements for the PHA will drive most of your processing strategies. PHA is hygroscopic and needs to be dry. It is sensitive to residence time and requires a warm (120-130°F) mold to crystallize. At Danimer Scientific, most of our research effort has been with extrusion blow molding (EBM), which is the process covered here.

Material Handling

As noted, PHA is a hygroscopic polyester that will absorb environmental moisture. Having the material dry before processing will prevent degradation and melt thinning. A moisture content of less than 0.04% (400 ppm) is required. Recommended drying conditions are four hours at no greater than 170°F (80°C) with a desiccant dryer.

Purging

It is recommended to purge the machine completely with LDPE to remove the previous resin and, after cooling the extruder to the process set points referenced below, introduce the PHA / PLA blend. This procedure should get you into the production material

without degrading the resin. PHA/PLA blends have an upper temperature limit of around 400°F and will rapidly degrade around this temperature.

Because PHA can degrade quickly under heat and shear, it is recommended that you purge fresh material forward anytime the machine is idled for more than five minutes before starting up again. It is not only the temperature of the melt that matters but also the residence time. High residence times will cause the material viscosity to decrease and can cause problems with machine startup. At the end of production, the machine should again be purged clear of the PHA / PLA blend - using LDPE at process temperatures - before increasing temperatures to go to the next resin.

Extruder Temperature Settings

Once more, the PHA component will drive your temperature strategy. To achieve a stable and workable parison, you must keep your heat near the low end of processing temperatures for PHA.

Suggested conditions to start:

First Zone	310-320°F (155-160°C)
Middle Zone	310-320°F (155-160°C)
End Zone	300-320°F (150-160°C)
Head	300-320°F (150-160°C)
Mold Temperature	110-140°F (40-60°C)

The low melt temperature aims to achieve a parison with enough melt strength to hold together. You will find that PHA / PLA blends are sensitive to the smallest temperature changes, and viscosity will drop rapidly as melt temperature increases. We

typically advise processors new to PHA / PLA blends to think of adjusting temperatures by two or three degrees at a time, not the usual five-degree changes.

Extruder Speed

While extruder speed is directly related to cycle time, it should be noted that PHA is a shear heating material similar to PVC (polyvinyl chloride). As production rates and extruder speeds increase, you will see temperature override in your extruder zones. If your machine has heat cool bands, you can employ those to keep temperatures inline or you can try to introduce some heat earlier in the extruder to reduce friction and shear heating.

It would also be helpful to look at your extruder screw design and avoid screws with higher compression ratios or very short, aggressive compression sections.

Mold Temperature

This area requires particular attention. The PHA component of the PHA / PLA blend requires a warm tool to promote timely crystallization. If you process into a cold tool at 40-60°F, the parts will come out soft and pliable and then, over the next 60 - 90 sec, become firm. What is happening is the part is crystallizing in your hand. The cold temperature is retarding the crystallization rate. When working with PHA/PLA blends, crystallizing and cooling are different. Parts can be cold and not crystallized.

The PHA component of the PHA / PLA blend requires a warm tool to promote timely crystallization.

To aid the crystallization rate, keeping the mold at 110 - 140° F (40 - 60°C) is recommended. The strategy is to get the mold warm enough to promote crystallization yet cool enough to enable part ejection and handling.

Another reason to keep the tool warm is that most blow - molded PHA / PLA blends will stick to a cold mold surface, making it difficult to eject them.

Part Handling

Cure time before packaging may be required for PHA / PLA blow molded bottles.

An important part of any blow-molding process is how you handle the parts once molded. The handling of parts made from PHA / PLA blends will become more difficult as production speeds increase.

As cycle and crystallizing times decrease, the bottles will become softer and easier to damage. It may require some engineering and automation adjustments to enable some post - molding cure time before the parts are bulk packaged.

You may also have to explore some forms of ejection and part holding as the mold opens to keep the bottles releasing consistently due to some variability in whether the bottles will stick to one side or the other or release cleanly.

Hopefully, this outline will provide some basis for developing a process for your parts. If you go at it slowly and methodically, you should be able to create a stable process and then improve from there. Remember

that PHA / PLA blends are relatively new and different materials that require some new and different processing techniques.

Foam - Core Multilayer Blow Molding: How It's Done



Learn here how to take advantage of new lightweighting and recycle utilization opportunities in consumer packaging, thanks to a collaboration of leaders in microcellular foaming and multilayer head design. Use of recycled plastics materials is a critical factor in the move toward a fully closed - loop economy in the plastic industry. Simply put, producers must reduce their energy and raw-material consumption to meet strict new legislation touted for introduction in 2025, as laid out in the proposed packaging regulation published in November 2022 by the European Commission. Cosmetic products that are contact - sensitive, for example, will contain 40% postconsumer regrind (PCR) and all other bottle packaging will contain 35% and 65% by 2030 and 2065, respectively. This is a tall order.

The challenge is not only the supply, availability and quality of recycled resins but also the development of new processes to enable their use and exploit their potential.

With the sudden requirement for PCR and the need for respectable quality, cost will likely be an issue. Brand owners, in particular, are looking for ways to remain cost - competitive with the virgin product configurations of today's common packaging specifications. Light - weighting through foaming has also gained growing attention and process adoption in recent years as an alternative to down - gauging, which may compromise top load performance.

Expert Partnership Facilitates Adoption

Trexel, a market leader in foaming technologies for lightweighting, and W. Müller, a market leader in blow molding multilayer head design, have partnered to create a lightweighting solution for inclusion of PCR and lowering the cost of bottle production without significantly sacrificing mechanical properties. Trexel has been delivering both physical and chemical foam lightweighting solutions for injection and blow molding. Its MuCell physical foaming technology is now standard or optional on many OEM injection molding platforms. With a recent focus on packaging solutions in injection molding, plus the company's history of foaming blow - molded automotive ducts with the accumulator-head process, Trexel has implemented a MuCell foaming solution for extrusion blow molding (EBM) on shuttle and wheel machinery. Trexel is now working with brand owners on scale - up bottle projects.

The multilayer solution involves metering nitrogen into the barrel of the EBM machine and foaming the core layer of a

three - layer sandwich such that the layer ratio (by thickness) remains similar to the solid predecessor three - layer design but with reduced weight in the PCR core. There is also reduced core extruder speed associated with a given volumetric bottle output. By specifically coupling the MuCell process with a proprietary patented additive, impact strength, toplod and ESCR will pass the necessary industry tests. Typically, there has been an improvement of up to 3 times in impact performance over previous foaming technologies, which is driving the ability to make larger foam - core bottles. The system and method are license-free and may be retrofitted to the existing screw and barrel, as depicted in Fig. 1. In addition to weight savings, TiO₂ and other white masterbatches can often be reduced or eliminated, because foam adds an opaque appearance, as shown in Fig. 2.

Lightweighting through foaming is an alternative to downgauging, which may compromise toplod performance.

W. Müller's multilayer head and extruder systems can be retrofitted to most monolayer systems as well as on a new system. W. Müller, which built its first three - layer head in 1990, brings significant process experience with PCR - laden products through its RECO head series. MuCell is a physical foaming process, depending partially on the pressure events in the head or multiple heads in structure of three or more layers. As noted by Jens Schlueter, president of W. Müller USA, "Although there are many standard three - layer extrusion

head designs out in the market, it is essential to have the experience with how to create designs that accommodate the foaming process.

Understanding melt flow, melt pressure and how to perfectly dimension the flow channels inside the head is critical to a successful foaming application. Our expertise in providing custom - designed heads for different materials and designs ensures that our customers get the right solution for their needs and particular specifications."

Of particular importance to the process is the ability of the Trexel SCF (supercritical fluid) delivery system to respond to pressure fluctuation that may arise from the addition of some lower - grade PCR to the extruder. Trexel's proprietary system will "learn" process patterns and react to real - time events to keep foaming levels consistent to ensure process stability and consistent bottle geometry. To enable this, simple process timing signals from the blow molding machine are used.

W. Müller has installed two lab foaming systems, one at its headquarters in Troisdorf, Germany, and the second at its U.S. office in Agawam, Mass. They are both equipped with Trexel's latest B120 SCF delivery system and handled bottle mold for use in demonstrations. Clients may also pick from other standard molds or supply their own molds to test out the technology.

Of particular importance is the ability of the gas - injection system to respond to pressure fluctuation that may arise from addition of some lower-grade PCR to the extruder.

To retrofit the pumping system, a hole is drilled in the existing barrel in a position so there is enough residence time to dissolve nitrogen gas in the melt. Trexel has conducted background research to mathematically define the exact parameters required to ensure homogeneous gas diffusion in such processes through work with its recently patented injection molding screw designs. Because almost 10 times less gas is used in the foam blow molding process than in injection molding, there is usually enough residence time to mix gas with the existing blow molding screw design, and therefore the process will not typically require a new screw and barrel.

It is anticipated that in the future Trexel's SCF delivery system controls will be integrated into the W. Müller control system to provide a one - stop foaming add - on which will convert an existing monolayer system to a full multilayer foam system.

PET Food Tray Packaging Circularity Gains Momentum with Indorama Ventures and AMB Partnership

A new technology to improve the recycling of PET food trays is gaining traction as **AMB Spa** becomes a partner with **Indorama Ventures Public Company Limited**

to use flake from recycled PET trays to produce film suitable for food packaging trays.



AMB Spa, a leading European supplier of sustainable solutions for rigid and flexible for the food packaging market, is the most recent company to partner with Indorama Ventures, one of the world's leading sustainable chemical companies. Industry collaborations to produce recycled PET (rPET) flake for the food packaging market are helping Indorama Ventures to forge the next step towards a circular economy for PET trays.

The partnership with AMB aims to divert more than 150 million post-consumer PET trays away from landfill or incineration by the end of 2025. New technology allows Indorama Ventures to supply recycled PET flakes from post - consumer trays for AMB to use in making food - grade transparent film. This increases the recycled content sourced from trays in AMB's end - products.

After more than 72 months of research and development, Indorama Ventures was able to produce rPET flakes from post - consumer trays commercially

at its facility in Verdun, France. The resulting recycling technology will divert millions of post - consumer PET trays from landfill or incineration.

As a precursor to the partnership, in 2022, AMB launched its tray - to - tray recycling brand 'AMB TrayRevive' to develop infrastructure supporting recyclable packaging. The project which AMB developed as part of its overall sustainability strategy supports the EU target to have all packaging recyclable at scale and to be converted into recycled raw materials by 2035.

As the world's largest producer of recycled resin used in plastic beverage bottles, this announcement is in line with Indorama Ventures commitment to increase PET recycling rates globally, with an ambition to achieve 750,000 tons of post-consumer PET bale input every year by 2025.

Investments and collaborations of this type gives consumers the confidence that their food packaging is recyclable and allows brands to invest in building circular economies by having the opportunity to choose recycled products. As momentum grows, the number of applications also expands to form a new industry built on recycled PET as a sustainable packaging option.



PLASTIC RAW MATERIALS

Integrated PET Plant Due Onstream in 2025



Corpus Christi Polymers Plant to produce 2.4 billion lb/yr of PET and another 2.8 billion lb/yr of PET precursor purified terephthalic acid. Construction has been resumed in Corpus Christi, Tex. on what's been dubbed the plastics "jumbo" project. Initiated by the now-bankrupt Italian company Mossi & Ghisolfi Group 10 years ago, the plant is currently owned by Corpus Christi Polymers (CCP). This will reportedly make it the largest vertically integrated PET / PTA facility in the world.

CCP bought the plant in February 2019 and initially said it would begin construction later that year, with a target start - up date of May 2020. However delays in the project and the onset of the pandemic put those plans on hold.

CCP is a partnership of Indorama Ventures PCL (subsidiary of Indorama Ventures Corpus Christi Holdings LLC); Alpek SAB de CV (subsidiary of DAK Americas LLC); and Far Eastern New Century (subsidiary of APG Polytech USA Holdings).

The plant is expected to generate up to 2400 jobs at peak construction.

Lubrizol Invests \$150 Mn to Accelerate Growth Across Multiple PVC Projects

The Lubrizol Corporation, a global leader in specialty chemicals, is advancing its commitment to continued growth in India with several significant projects across its portfolio. The company is pledging more than 150 million USD of in - region investment, including breaking ground on India's largest CPVC resin plant in Vilayat, Gujarat, doubling capacity at its site in Dahej, Gujarat, opening a grease lab in Navi Mumbai and enabling significant in - country job growth and innovation.

Lubrizol's work in India dates back to 1966 when the company initiated in-region manufacturing

for chemical additives supporting transportation and industrial markets. The company's work in India has expanded significantly since that time, supporting a wide variety of industries through products and solutions purpose built for the region.

The company has steadily grown its employee base in India with roles supporting both regional and global needs. It expects to enable 4,000 direct and indirect jobs through several new investment projects:

- **Enabling World's Largest CPVC Resin Production with Grasim Industries Limited.** In 2001, Lubrizol introduced CPVC into the India market, which has represented a significant economic development opportunity for the region. Today India is amongst the largest consumers of CPVC, primarily in the form of plumbing pipe and fittings, and growing needs for clean water in all residential and commercial buildings will drive continued growth. Lubrizol and Grasim Industries Limited, a flagship company of the Aditya Birla Group, will break ground on the first phase of a 100,000 metric - ton state - of - the - art

CPVC resin plant at Grasim's site in Vilayat later this year. This will be the largest single-site capacity for CPVC resin production globally. The CPVC resin produced at Vilayat will enable product sold under Lubrizol's FlowGuard® Plus, Corzan® and BlazeMaster® brands.

- Providing Access to Clean Drinking Water by Doubling CPVC Capacity, Establishing R&D Capabilities in Dahej, Gujarat.** Lubrizol will double its existing CPVC compound capacity at Dahej, Gujarat, from existing 70,000MT to 140,000MT. Lubrizol also plans to setup a local R&D center, which will be its second global R&D center after North America. With this investment, Lubrizol becomes the only company in India with end-to-end CPVC capability and well poised to serve the needs of local Indian customers. This capacity will also cater to neighboring high-growth markets like Nepal, Bangladesh and Indonesia.
- Supporting Transportation, Industrial Customers Across the World with Mumbai India Grease Lab, Turbhe Expansion.** Lubrizol is committed to supplying alternative high-performance, cost-effective industrial grease-thickening solutions to grease manufacturers around the world. Earlier this year Lubrizol announced the opening of a new grease lab in Navi Mumbai, India, to support the testing and development of calcium sulfonate greases with strong potential in the industrial grease market. Since 2020,

the company's Additives business has introduced more than 35 new blends for transportation and industrial applications localized in India, adding a new storage facility and filtration capabilities at its production site in Turbhe.

- Meeting Personal Care, Home Care Needs of a Growing Middle Class and Doing it Sustainably.** As the middle class in India continues to expand, demand is increasing for beauty and home products in region. As a leading solutions provider for the beauty and home care industries, the company will continue to innovate sustainable solutions unlocking in-region opportunities for its partners. As a recent example, using detergent bars is a common practice for cleaning dishes and laundry in India. While these bars are economical, they can become soft and lose their usefulness if they remain wet for too long, leading to inconsistent cleaning and significant waste. The Lubrizol Home Care team established a Center of Excellence for laundry bars in Mumbai, part of which helped a global home care leader meet its sustainability goals while streamlining processes, earning Lubrizol a sustainability award from the customer earlier this year.

In addition to these significant projects, the company plans to continue to invest in Centers of Excellence capabilities in the years ahead to capitalize on the growth opportunity within the region.

PBT - based Compounds with Radar Absorption Properties



SABIC announced polybutylene terephthalate - based composite materials with application in assisted driving systems. SABIC announced two new composite materials with applications in the automotive sector. LNP STAT - KON WDF40RID and WDF40RI are polybutylene terephthalate based with 20% glass fiber and proprietary filler.

The compounds address a key challenge of millimeter wave radar technology for advanced driver assistance systems. The high dissipation factor of the material provides efficient absorption, minimizing interference. Compared to other semi-crystalline glass filled materials, SABIC's new glass fiber-reinforced grades deliver higher absorption and lower reflectivity. In addition, they offer ultra-high flow and very low warpage, empowering customers to create new designs for internal and external single-layer absorbers, or to optimize traditional metal-backed absorbers.

The radar absorbant component reduces interference.

The LNP STAT - KON WDF40RID compound exhibits high absorption (up to 75 percent at

77 GHz) and controlled reflection (as low as 25 percent at 77 Ghz), which together can significantly reduce noise. By maximizing noise dissipation, the new compound can help minimize ghost images and sidelobe interference, resulting in greater ADAS radar resolution and accuracy.

The LNP STAT - KON WDF40RI compound is formulated for metal - backed radar absorbers. LNP STAT - KON WDF40RI compound can raise radio wave absorption to nearly 80 percent, while lowering reflection below 20 percent, and provide total shielding when working with metal backs.

Both grades' noise shielding performance is consistent across mmWave frequencies between 75 and 110GHz.

Incumbent radar absorber materials typically exhibit high viscosity and reduced flow stemming from the use of conductive additives, placing a design constraint on thin - wall internal absorbers or large external absorbers that surround the radar sensor. The LNP STAT - KON WDF40RID compound has an improved flow rate enabling walls down to 1mm for interior radar absorbers that can free up space for additional electronics.

SILVIN : Pioneering PVC Innovation, Customisation and Sustainability

SILVIN is one of India's leading lead - free additives manufactures and suppliers for three decades, providing pioneering solutions to help produce PVC & CPVC pipes and pipe fittings. The Super1Pack is an all - in -

one additive containing stabilisers, internal and external lubricants, impact modifiers, and other essential chemicals or additives, apart from PVC resin, CaCo3 (filter) and pigments.

Super1Pack is calcium - zinc or methyl tin or metal - free stabiliser based, depending upon different applications. Regardless of size or combination, SILVIN assures customized batch quantities to suit specific requirements. The Super1Pack is completely lead - free, hence environment - friendly too.

Super1Pack comes with many advantages :

- Logistics benefits.
- Increases capacity and profits.
- Super saver on time and labour.
- No wastage of chemicals.
- Quality consistency.
- Lower mixing benefit.
- No human error.

With a great in - house R&D team in place we are constantly trying to incorporate global standard innovations into our processes. At SILVIN, we believe in providing only the best to our customers. SILVIN is dedicated to bringing innovation, Customisation and Sustainability to the PVC application industry.

SKZ Expands Cross - Linked Materials Research

Cross - linked materials, such as thermosets or elastomers, are currently coming into focus. SKZ has founded a research group to support development in this area, which the company claims supports industry with extensive services.



The development of cross - linked plastics with precisely adapted property profiles is increasingly coming into focus for many applications in electro-mobility, medical technology, fuel cell technology or the generation of renewable energies. The German Plastics Center SKZ is responding to increasing customer inquiries in this area with its own research group. The offer now also includes services for industrial customers.

We are already looking forward to the first inquiries," explains Dr. Andreas Köppel, head of the "Cross - linked Materials" research group. Current services for industrial clients include :

- Conducting material research
- Formulation development
- Process design for compounding of cross - linking plastics
- Development of recycling concepts
- Continuous compounding of silicone (elastomers)
Continuous compounding of casting compounds and thermoset molding compounds

"Furthermore, in cooperation with EZD in Selb, we have now also built up expertise in the production and modification of powder coatings," adds Köppel.

ASA Grade for Small, Mobile Medical - Device Housings



INEOS Styrolution has introduced grade of ASA designed specifically for small medical device housings and casings. Luran S MED 797S SPF30 is the latest member of INEOS Styrolution's ASA product family. It reportedly offers strong chemical resistance, UV resistance, and impact strength. Suitable for injection molding, Luran S is said to provide excellent flowability for easy processing. Luran S MED 797S SPF30, available in NR (Natur) and in white (WT000112), is said to show excellent chemical resistance against alcohols (e.g. IPA, ethanol, propanol) or alcohol - based disinfectants. It also shows good resistance against quaternary ammonium or glutaral based disinfectants making it a material of choice for clinical environments.

High impact strength, specifically at room temperature and at lower temperatures (5°C), contribute to a better protection of devices, e.g. avoiding cracking failures when a device drops to the floor. INEOS says this particular performance trait makes Luran S MED 797S SPF30 a viable alternative to standard ABS materials.

Renewable Feedstock

The new Luran S grade is also available using renewable feedstock, based on a mass balance process certified under ISCC PLUS. Luran S ECO MED 797S SPF30 BC40 contains 40% renewable content resulting in a carbon footprint reduction of up to 52% compared to fossil - based Luran S. Says Bernd Elbert, market development manager at INEOS Styrolution: "The market segment of small, mobile medical and hospital devices is growing rapidly. The properties of our new Luran S MED 797S SPF30 make it a very strong contender for device housings and casings in this specific category. I invite every application designer to explore our new product for their next project."

ExxonMobil Introduces Novel HDPE Grade to Help Converters Create Mono - material Machine Direction Oriented (MDO) Flexible Films

ExxonMobil has developed a novel high density polyethylene (HDPE) grade, ExxonMobil™ HD7165L, for Machine Direction Oriented (MDO) PE film applications. Designed for recyclability*, HD7165L can help converters create mono - material laminates to replace multi - material laminate structures which can be difficult to mechanically recycle.

Offering excellent optical properties and outstanding mechanical properties,

ExxonMobil™ HD7165L is well suited to help enable mono-material laminated packaging that can be used to package products like nuts, crackers, condiments, granola bars, and potato chips.

- Designed for recyclability, ExxonMobil™ HD7165L can help converters create mono material MDO laminated packaging structures which:
- Offer excellent optical properties and outstanding mechanical properties
- Can be used for packaging products like nuts, crackers, condiments, granola bars, and potato chips

"The development of new HD7165L has been driven by market demand from brand owners and processors looking to develop all - PE packaging which, in turn, has created a need for print webs made of blown MDO - PE films," said Nilesh Savargaonkar Principal Customer and Application Development Engineer, ExxonMobil.

ExxonMobil™ HD7165L can help enable converters to produce blown MDOPE films with 60 - 70 percent HDPE for enhanced stiffness and high heat resistance**. High output rates in excess of 400kg/hr are possible, while bubble stability is maintained.

High MDO stretch ratios as high as 7:1, with very high stiffness (1% secant modulus as high as > 200 kpsi) can be achieved. With haze less than ten percent and gloss higher than 60 percent,

ExxonMobil™ HD7165L offers excellent optical properties. Used as a print web of a PE - PE laminate, ExxonMobil™ HD7165L offers high heat resistance, stiffness for a lack of extensibility, and excellent printability for optimum brand promotion. In blown MDO - PE film applications, ExxonMobil™ HD7165L offers high, uniform orientation, gauge stability, and low gels for easy processability. Compared to a market reference HDPE grade (density 0.962 g/cm³), ExxonMobil™ HD7165L (density 0.961 g/cm³) delivers better shear thinning behavior and extrudability, higher melt strength for bubble stability, excellent orientability, and gauge uniformity.

“Brand owners and the value chain globally have ambitious goals around the development of packaging that can be recycled,” said Justin Schmader, CANUSA Market Development Manager. “Our ongoing innovation to develop new polyethylene grades that can help enable the creation of monomaterial packaging structures is one step in helping them potentially achieve those goals.”

Access Datasheet

- Recyclable in communities with programs and facilities in place that collect and recycle plastic film
- Compared to films with a lower percentage of HDPE incorporated

About ExxonMobil Polyethylene

ExxonMobil's polyethylene portfolio offers converters and brand owners an extensive range of performance polymers as well

as specialty co - polymers and additional polyethylene grades for numerous applications. Our performance polymer flagship brands offer superior mechanical performance and unparalleled properties.

With critical properties such as strength, durability and toughness, ease of sealing, and outstanding optics, our leading-edge polyethylene formulations help create, protect, and promote products throughout the packaging, agriculture, industrial, personal care, and hygiene markets. From store shelves, to harvesting, to shipping, to the factory, products made with our performance polymers can help reduce the risk of waste, breakage, and spoilage across the value chain.

AI-based Software Now to Speed up New Polymers' Discovery

A programme to advance the discovery of new polymers has been developed by a team of interdisciplinary researchers across King's Faculty of Natural, Mathematical and Engineering Sciences. The software called PySoftK uses AI to identify new polymer materials, which could be used across a wide range of applications including in medical technology, pharmaceuticals, energy storage and more.

Professor Chris Lorenz from the Department of Physics and lead researcher on the technology said :

PySoftK will allow us to accelerate the development of novel polymers for a whole range

of applications, from using polymers with embedded nanoparticles to stitch human tissue together, to improving energy storage methods. These materials will help form a building block to tackle large scale challenges that we face in health care, in developing biodegradable home and personal care products and in creating more environmentally friendly energy storage systems”.
– Professor Chris Lorenz, Department of Physics Polymers are large molecules made up of smaller repeating molecules called monomers, which bond together in a chain - like fashion to form a long polymer molecule. Polymers can be naturally occurring, such as proteins and DNA, or they can be synthetic, such as plastics and synthetic fibres. This new software development could change the way we investigate the relationship between the chemical structure and function of new polymeric materials, by providing a robust dataset for researchers to train artificial intelligence (AI) to identify desirable polymer properties.

Synthetic polymers can be designed to interact with changes in their environment or make use of certain properties. For example, Gore - Tex, a polymer used in clothing was developed as an improvement to nylon, a traditional polymer. While both materials are waterproof, Gore-Tex is also breathable, because it has been designed with a particular chemical property to perform a specific function. This is known as a designer polymer.

Other areas where designer polymers are used, include medical ointments, paints,

coatings, food packaging, biomedical imaging and energy storage. Designer polymers have the potential to have a wide range of different functions due to their underlying physical and chemical properties, which originate from the type and arrangement of monomers which build the polymer. To advance our discovery of these types of materials, high - performance computers (HPCs) are used to simulate and predict the behaviour of polymers, which then informs researchers how best to build polymers with the desired properties for fulfilling certain tasks.

Over the past several decades, molecular scale simulations, computer simulations representing 3D structures of molecules, have improved our understanding of the relationship between chemical structure and function in increasingly complex polymers. However, more recent advances in computing power and computational algorithms have enabled scientists to investigate more complex systems and provide more accurate predictions using molecular - scale simulations at speed. This can lead to faster and more cost - effective design of materials, as less time is devoted to rounds of experimentation.

Professor Chris Lorenz suggests:

“Normally, maintaining a large, diverse and accurate molecular database can be a hugely costly and time intensive process, as researchers race to label and categorise models correctly.

By offering a set of tools and programming modules to automate the process of curating,

modelling and creating libraries of polymers, PySoftK facilitates the generation of large databases on which to train future machine learning (ML) and deep learning (DL) models. This allows researchers to move their focus away from exhaustive library maintenance and onto discovering new materials.”

Dr Alejandro Santana Bonilla, Research Software Engineer within the Faculty of Natural, Mathematical and Engineering Sciences, and one of the lead researchers on the project said, “The software package is versatile, flexible, and easy to install. It can generate a wide range of polymer topologies and perform library generation in a fully parallelised manner, making it highly efficient,” Researchers hope that these models will be the driving force of new designer polymer development. PySoftK could also play a significant role for researchers in nano - and bio-technology, who are searching for new functional materials. But without reliable data to train the AI, they risk making inaccurate predictions.

MIT Scientists Enhance Tear Resistance in Polymer Building Blocks with Weaker Bonds

A team of chemists from MIT and Duke University has discovered a counterintuitive way to make polymers stronger : introduce a few weaker bonds into the material. Working with a type of polymer known as polyacrylate elastomers, the researchers found that they could increase the materials' resistance to tearing up to tenfold, simply by using a weaker type of

crosslinker to join some of the polymer building blocks. These rubber - like polymers are commonly used in car parts, and they are also often used as the “ink” for 3D-printed objects. The researchers are now exploring the possible expansion of this approach to other types of materials, such as rubber tires. “If you could make a rubber tire 10 times more resistant to tearing, that could have a dramatic impact on the lifetime of the tire and on the amount of micro plastic waste that breaks off,” says Jeremiah Johnson, a professor of chemistry at MIT and one of the senior authors of the study, which appears today in Science.

A significant advantage of this approach is that it doesn't appear to alter any of the other physical properties of the polymers. “Polymer engineers know how to make materials tougher, but it invariably involves changing some other property of the material that you don't want to change. Here, the toughness enhancement comes without any other significant change in physical properties - at least that we can measure - and it is brought about through the replacement of only a small fraction of the overall material,” says Stephen Craig, a professor of chemistry at Duke University who is also a senior author of the paper. This project grew out of a longstanding collaboration between Johnson, Craig, and Duke University Professor Michael Rubinstein, who is also a senior author of the paper. The paper's lead author is Shu Wang, an MIT postdoc who earned his PhD at Duke. Polyacrylate elastomers are polymer networks made from strands of acrylate held together by linking molecules. These building blocks can be joined together in different ways to create materials with different properties.

One architecture often used for these polymers is a star polymer network. These polymers are made from two types of building blocks : one, a star with four identical arms, and the other a chain that acts as a linker.



PLASTIC MACHINERY

Milacron Introduces eQ Series, the Ultimate Solution for Precision Moulding



The eQ-Series is Milacron's latest globally available all - electric injection molding machine. with a tonnage range of 50 to 650 tons (500-5.500 KN), the eQ-Series is built to perform in a wide array of applications and configurations. Based on Milacron's highly reliable Injection Molding Machines, the eQ-Series is a true culmination of high efficiency, consistency, and globally engineered technology.

In 2021, at the 10th National Awards for Technology Innovation in Petrochemicals & Downstream Plastics Processing Industry, Milacron's eQ Series 280 All-Electric Injection Molding Machine was named runner-up from among 273 entries under the category of "Innovation in Polymer Processing Machinery, Equipment, Robotics & Automation."

Recipients were chosen based on meritorious innovations and inventions in the field of polymeric materials, products, process areas of national and social importance. The ultimate objective is to develop and maintain the petrochemical industry as a globally competitive industry using eco - friendly processes & technologies.

Milacron holds a strong presence in India as the country's largest injection molding machine builder, having supplied more than 21,000 injection molding machines in 25 years and a current capacity to develop 3,000 machines per year. The Indian plastics processing market continues to be a key geographical area of focus for Milacron's brands both for sales and manufacturing capabilities. Milacron's manufacturing plant in Ahmedabad has experienced significant growth and continues to expand to meet both local and international demand.

Vertical Injection Molding Machine Range Extended

LS Mtron's expanded range of LSG-V vertical machines has 13 models with a variety of injection and rotary table formats. LS Mtron Injection



Molding Machines USA (Duluth, Ga.) has added several new models to its line of LSG-V hybrid vertical injection molding machines, with 13 models of machines ranging in clamp force from 35 to 660 tons and including options for vertical or horizontal injection, and rotary table, shuttle or single - station designs. The LSG-V, which is known outside North America as the WIZ-VR II, was previously available in three models, from 100 to 350 tons and only as vertical rotary machines. The LSG-V Series can reduce overall cycle time by enabling operators to simultaneously perform product take-out and insertion processes during injection. The machines also feature a servo pump system for reduced power consumption, which uses an AC servo motor for reproducibility within 0.1% through feedback control. The rotation motor also enables low noise and precise control, and LS Mtron says that by optimizing hydraulic oil tanks and lines,

the machines operating flow and cooling water consumption. Constructed with a four-post tie-bar structure, the LSG-V can support up to four injection fixtures, and the slide-type guide bar design minimizes transfer resistance. At NPE 2024, LS Mtron will feature a 170-ton LSG-V molding an electric vehicle component for sister company LS Automotive. The expanded line of LSG-V vertical injection molding machines from LS Mtron includes 13 models with a variety of injection and table styles.

Challenging Projects Require Experienced Mold Makers



Canon has been designing, making and using high - precision, high - volume injection molds for more than 30 years. Led by dedicated teams of engineers, Canon Virginia, Inc. uses the latest technology to deliver the quality needed to create world - class products for the customers. Canon Virginia specializes in molds for complex parts, such as thin wall closures with living hinges, multi - cavity unscrewing molds and multiple styles of overmolded inserts. Delivering micron-level precision, cross-functional Canon Virginia production teams work to seamlessly tie together all steps in the manufacturing process and attain the ideal in mold design

and production. The result? Successful production of tight-tolerance, highly cosmetic, multi-cavitation parts that benefit from innovative Canon Virginia solutions.

High Volume, High Efficiency

Tackling the most demanding applications, Canon Virginia applies the latest technologies, designs and production capabilities to every precision mold project it undertakes. The goal at all times is to deliver a robust mold that meets your volume, achieves peak efficiency, and ensures reliability and durability.

Complex Parts, Advanced Technologies

Production of ultra-precise molds requires the kind of commitment to innovation that keeps Canon Virginia a step ahead of ever-changing demands. While we continually utilize the latest technologies to attain success in even the most challenging applications, Canon Virginia draws heavily on decades of experience and technical expertise to bring projects home on budget and on time.

Committed to Quality

Manufacturing quality products means following rigorous standards at every stage of the mold-making process. Bringing together dedicated engineers and a unique tool library, Canon Virginia uses laser confirmation for all high - speed machining centers. The result is higher production efficiency with cutting-edge measurement technology ensuring high precision. Canon Virginia is ISO 9001, 14001 & 13485 certified and EAR/ITAR compliant.

Experience, Resources, Expertise

For more than three decades, Canon Virginia has been driven to attain the ideal in metal mold design and production. Using various analytic software packages, Canon Virginia views designs from a multitude of perspectives, including:

- Gate scenarios
- Heat transfer
- Deformation
- Strength
- Mechanical function

Our team members make the difference. Which is why, at Canon Virginia, we continually challenge ourselves to exceed expectations with a goal that extends from our most skilled craftsmen to our newest members, who are developed internally through our state-certified apprenticeship programs.

CALIBRIS: A Legacy of Excellence in Circular Weaving and Knitting Machines, Packaging, and Customised Solutions



Calibris an industry legacy since 1973 manufactures world class circular weaving machines knitting machines and packaging machines.

A series of circular looms, performance - built for weaving light to heavy - weight tubular or flat PP/HDPE fabrics. From 4 to 12 shuttles, for a wide variety of applications across sectors. CALIBRIS machines employ the latest technology, offering high standards of operational efficiency, fabric quality, and productivity.

The advantages go far beyond excellent weaving quality:

Better operating efficiencies

Low wastage

Low power consumption

Low maintenance easier operator control

Applications

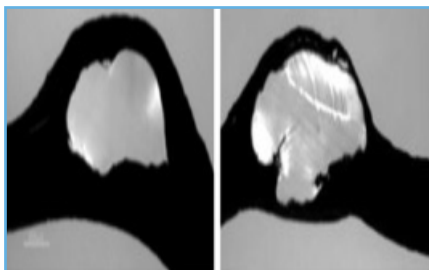
As the range offers various fabric types, the applications span many sectors.

Cement, Fertilizers, Polymer granules, Chemicals, Food grains, Animal feed, Geo textiles, Agri textiles, special / general use Tarpaulins, wide width fabric for Jumbo bags (FIBCs), and narrow width fabrics.

The CALIBRIS KS-252 R/F series Knitting Machines produce high quality netting and special fabrics for specific uses. They are more flexible than earlier versions, without limitations on yarns. These new models are equipped with both round yarn and flat yarn let - off systems. The efficiency of the knitting machine is optimised to more than 10% when it is synchronised with the slitting and extension machine.

Due to the steady yarn feeding system, the machine can raise the quality of fabric. Moreover, wastage is half that of the creel stand version. If there is already a flat yarn making machine, we can offer creel as a yarn let-off system.

How Polymer Melts in Single - Screw Extruders



Understanding how polymer melts in a single-screw extruder could help you optimize your screw design to eliminate defect-causing solid polymer fragments. The melting (or devitrification) process can be a rate - limiting process for some single - screw extruders. For these situations, the extruder drive train, extrudate temperature and downstream equipment are not rate limiting. As the screw speed and rate are increased, a maximum rate will occur where the extrudate is completely molten and free of solid polymer fragments. At slightly higher screw speeds, solid polymer fragments start to appear in the extrudate, causing defects in the product.

If fresh resin and masterbatch resins or color concentrates are fed to the extruder, the defects will be solid polymer fragments from one of the resins. But since the fresh resin is added at the highest level, statistically the defects are likely to be from the fresh resin. If the drive train is not limiting, this defect can be eliminated via screw design.

Solid polymer fragments are likely to be discharged from the extruder at high screw speeds because of the processes governing solid conveying, melting, and the metering sections. For example, if the screw speed is doubled the pumping capacity of solids conveying and the metering sections will also double. The melting flux, however, will only increase by a factor of about 1.4 times. The melting flux has units of $\text{kg}/(\text{hr m}^2)$ where the unit area term is the area of the barrel wall where melting is occurring. The melting capacity is defined as a melting flux times the barrel area available for melting.

The melting capacity is defined as a melting flux times the barrel area available for melting. As the screw speed is increased and because the melting flux does not increase at the same rate as solids conveying and metering, additional area at the barrel wall is needed for melting. Thus, the solid bed is forced downstream such that more area at the barrel wall will be used to melt the additional resin.

Because of limited barrel surface area, eventually some solids will not be melted and will instead discharge with the extrudate. A photograph of a black-tinted HDPE thin-wall pipe cross section is shown in Fig. 1. Here the large white areas do not contain pigment because they were discharged from the extruder as a solid fragment. The fragments exited the extruder because the rate was higher than the melting capacity of the machine. Short term, the only solution to mitigate these fragments is to decrease the extrusion rate.



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 car seat, a red plastic table and chairs, blue plastic beads, and a red plastic bucket filled with various cleaning products like sprays and bottles.

Every Colour Tells A Story

MASTERBATCHES • COMPOUNDS • TOLL COMPOUNDING

■ Innovation ■ Technology ■ Precision ■ Performance

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ALL INJECTION MOULDING ELECTRIC MACHINE

The ultimate solution for precision moulding.

THE BEST KNOWN SOLUTION FOR APPLICATIONS



Medical



Automobile



Thin Wall Packaging



eQ-SERIES
50-650 TONS

ADVANTAGE MILACRON

- M-Powered enabled
- Integrated power pack
- Energy efficient regenerative servo drive technology
- Mould mounting platen and injection on LM guides
- High mould weight capacity
- Advanced mould safety
- Cleaner operations through grease free tie bar
- Unmatched reproducibility
- Shot weight consistency
- Manufacturing flexibility
- Smaller footprint

M-POWERED: MILACRON'S PROPRIETARY IOT TECHNOLOGY



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SCAN TO FOLLOW US

