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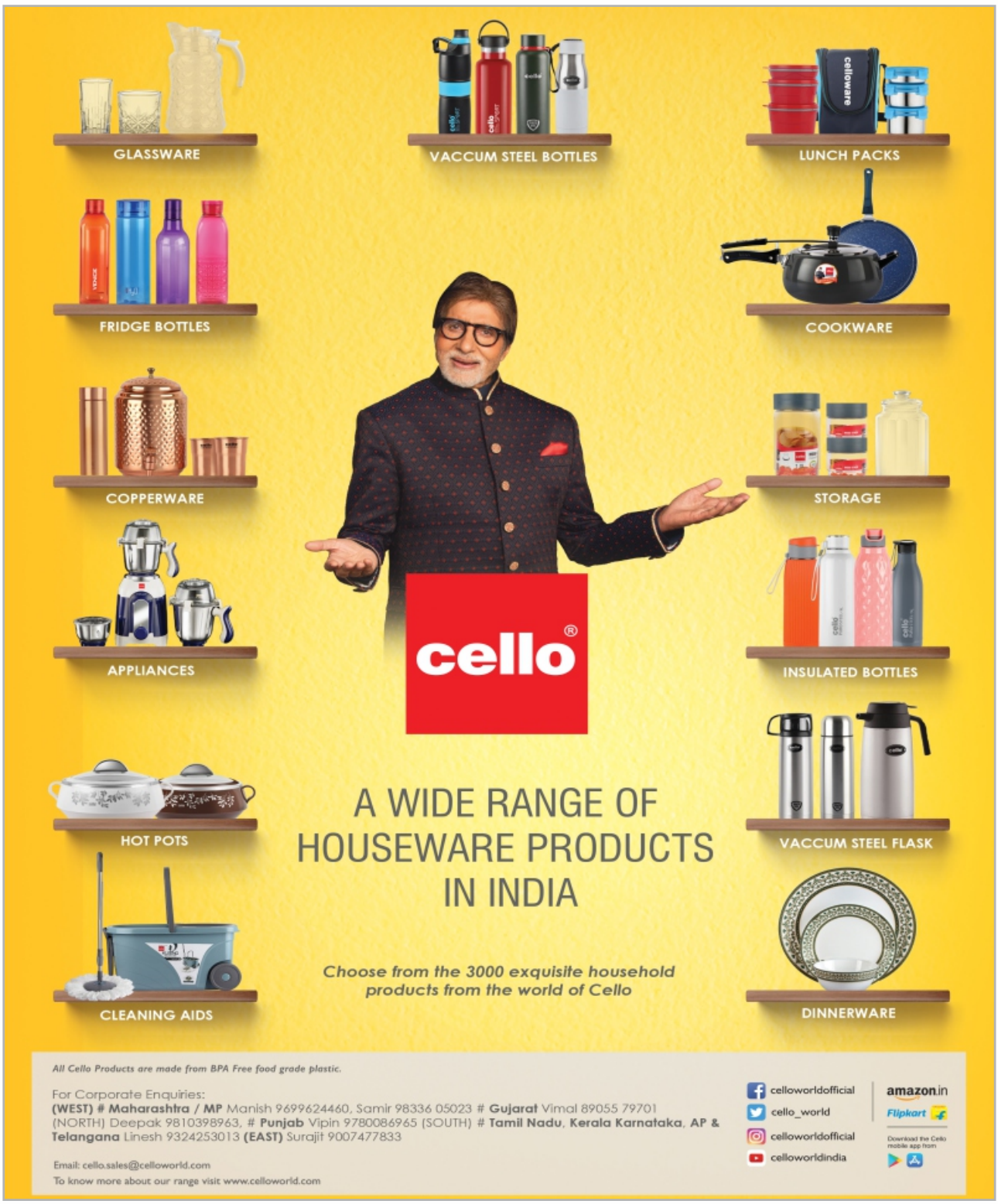

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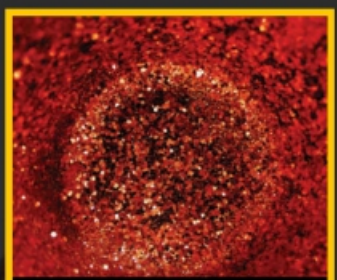

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FROM THE PRESIDENT's DESK

Mr. Dilip Parekh

OPP

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Dear Members,

Greetings from Organization of Plastics Processors of India!

Department of Chemicals and Petro Chemicals issued order on 4th January 2024 to amend the Polyethylene Material for Moulding and Extrusions (Quality Control) Order, 2022- Polyethylene Material for Moulding and Extrusions (Quality Control) Amendment October, 2024.

The following grades of Polyethylene have been exempted from the provisions of the QCO:-

a. Low Density Polyethylene Extrusion (LDPE) Coating;

b. Low Density Polyethylene (LDPE) Film Grades (Blocon / Cast) or Pharma;

c. Linear Low Density Polyethylene (LLDPE) Butene Grades;

d. Linear Low Density Polyethylene (LLDPE) Hexene / Octene Grades;

e. Metallocene Polyethylene Grades;

f. Base Resins of Power Cable, Jacketing and other applications; and

g. Compounds for Cable Jacketing/ Sheathing/Polythelene-80 and Polythene-100 (Black and Pigmented) / Reinforcement Fillers;

Thus, all the demands of the Plastic Processing Fraternity have been complied with.

OPPI has also represented to Joint Secretary (Petro Chemicals) to consider deferment of the QCO pertaining to POLYCARBONATE for 1 year as there is no local production and none planned in near future. Due to non-completion of the inspections and BIS approvals, local processing industry will face severe raw material crunch, if QCO is implemented on 12th March 2024.

We have sent Pre-Budget Proposals to the Ministry of Finance and other relevant authorities. However this will be the Interim Budget. Thus, there will not be any Drastic Changes in the Interim Budget.

With Best Wishes,

Dilip Parekh
President

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Organization Of Plastics Processors Of India

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The 36th International Exhibition on Plastics and Rubber Industries

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The 36th International Exhibition on Plastics and Rubber Industries

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In CHINAPLAS 2024 it will once again be an important event on the industry's calendar and the starting point for decisions that shape future products, processes and solutions.

Organization of Plastic Processors of India has tied up with Tibro Tours Pvt. Ltd. for CHINAPLAS 2024 packages. All Companies booking Tibro Packages CHINAPLAS 2024 through Organization of Plastic Processors of India will be eligible for discount.

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

Deepak Lawale, Secretary General,
Organization of Plastics Processors of India
404/5, Golden Chambers, New Link Road, Andheri (West), Mumbai 400053 INDIA
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Seminar On-"Crucial Role Of Maintenance In Plastics Processing Industry" Held On Friday 19th January 2024 At The Lalit Ashok, Bangalore.

Organization of Plastics Processors of India organized 11th Edition of Seminar On-"Crucial Role Of Maintenance In Plastics Processing Industry" at The Lalit Ashok, Bangalore on 19th January 2024.

The Inaugural Session of the Seminar was chaired by Mr. V. K. Baheti, Director- Operations MANJUSHREE TECHNOPACK LTD. Lighting of the Traditional lamp was done by all Session Chairmen.

During the Seminar the following Presentations were made: -

Sr. No.	Topic of Presentation	Speaker
1	New Innovation And Technology Towards Energy Efficiency	Mr. T. Nandkumar, Director, **Wittmann Battenfeld India Pvt. Ltd.**
2	Elevate Manufacturing - Operational Excellence Through Digitalization	Mr. Upendra Potdar, Director - Business Development, **KNEO Automation Pvt. Ltd.**
3	Adding Life To Your Machines: The Trends To Best Practices	Mr. Pravin Patel, **B & R Industrial Automation Pvt. Ltd.**
4	Increase Your Uptime And Profitability By Automatic & Accurate Dosing	Mr. Chintan Mehta, Business Head, Projects & Automation, **Prasad Koch – Technik Pvt. Ltd.**
5	Mobilserv Solutions – Beyond Lubrication	Mr. Sounak Sasmal Territory Manager **Exxonmobil Lubricants Pvt. Ltd.**
6	Adding New Lease Of Life To Old Machines With Energy Conservation - Alternatives For Conventional Systems	Mr. Prashant Kolte (Deputy General Manager) **Baumuller India Pvt. Ltd**
7	Best Maintenance Practices For Improving The Productivity And Reliability Of Injection Moulding Machines	Mr. CK Vijayan (Senior Manager, Customer Care Cell) **SHIBAURA MACHINE INDIA PVT LTD**
8	Role Of Maintenance To Ensure Safety And Part Quality In Injection Molding Machines	Mr. Balamurugan. K General Manager- Plant Engineering & Maintenance **Toyoda Gosei South India Private Limited (TGSIN)**
9	Importance Of Appropriate Metallurgy For Extruder Processing Zone Parts	Mr. Rajesh Narasimhan, Product & Strategy Lead – EPZ & Parts **STEER Engineering**
10	Importance Of Maintenance In Multi-Layer Film Processing Industry	Mr. Krishna Prasad, Manager **KABRA EXTRUSION TECHNIK LTD.**
11	Importance Of Maintenance In PVC / HDPE Pipe Processing Industry	Mr. S.S. Diwakar, Deputy General Manager **KABRA EXTRUSION TECHNIK LTD.**
12	Mould Maintenance	Mr. GuruPrasad Puranmath (VP International Sales & Strategic Initiative) **MUTUAL ENGINEERING PVT. LTD**

At the end of the day long Seminar "Lucky Draw" was held. Gifts were sponsored by Cello World Limited. The "Lucky Draw" prizes were won by Mr. Aravvinth R, MANJUSHREE TECHNOPACK LTD. and Mr. Dilip Kumar M. N., Shashwati Plastics.

Mr. V. Vijay Kumar, President, KSPA proposed Vote of Thanks.

Cello World Limited sponsored Mementos presented to the Speakers and to the Session Chairmen. OPPI also thanked Gold Sponsor –EXXONMOBIL Lubricants Private Limited and KABRA Extrusion Technik Ltd. and Silver Sponsor-- MANJUSHREE TECHNOPACK LTD.

All participants appreciated the Quality of presentations and also the arrangements made for the Seminar.

Mr. V. K. Baheti, Director - Operations MANJUSHREE TECHNOPACK LTD delivering Keynote Address during the Inauguration.

Mr. Deepak Lawale conducting the proceedings of the Seminar

Participants at the Seminar

Mr. Hariram Thakkar, Managing Director, SRI SHIVAM POLYPLAST PVT LTD presenting bouquet to Mr. V. K. Baheti on behalf of OPPI

Mr. Nitin Gupta, Global CEO, STEER ENGINEERING presenting memento to Mr. V. K. Baheti on behalf of OPPI

Lighting of the Traditional Lamp

Mr. V. Vijay Kumar, President, KSPA proposing Vote of Thanks behalf of OPPI

Mr. T. Nandkumar, Director, Wittmann Battenfeld India Pvt. Ltd making his Presentation

Mr. Upendra Potdar, Director - Business Development, KNEO Automation Pvt. Ltd making his Presentation

Mr. Pravin Patel, B & R INDUSTRIAL AUTOMATION PVT LTD making his Presentation

Mr. Deepak Lawale presenting memento to Mr. Subba Bangera, Chairman, Active Biz Solutions. Pvt. Ltd

Session I Speakers with Session Chairman and others

Mr. Nitin Gupta, Global CEO,
STEER ENGINEERING addressing the participants

Mr. Sounak Sasmal, Territory Manager-B2B Sales,
Exxonmobil Lubricants Pvt. Ltd making
his Presentation at the Seminar

Mr. Chintan Mehta, Business Head, Prasad Koch –
Technik Pvt Ltd receiving a memento from Mr. Nitin Gupta

Mr. Nitin Gupta, Global CEO, STEER ENGINEERING
presenting memento to Mr. CK Vijayan, Senior Manager,
CCC, SMI, Shibaura Machine India Private Limited

Mr. Sounak Sasmal, Territory Manager-B2B Sales,
Exxonmobil Lubricants Pvt. Ltd receiving
a memento from Mr. Nitin Gupta

Mr. Prashant Kolte, Deputy General Manager,
Baumuller India Pvt Ltd receiving
memento from Mr. Nitin Gupta

Mr. Deepak Lawale presenting memento to
Mr. Nitin Gupta, Global CEO, STEER ENGINEERING

Mr. Balamurugan. K, General Manager-
Plant Engineering & Maintenance,
Toyoda Gosei South India Private Limited (TGSIN)
making his Presentation at the Seminar

Mr. Rajesh Narasimhan,
Product & Strategy Lead – EPZ & Parts
STEER ENGINEERING making his Presentation

Mr. Hariram Thakkar, Managing Director,
SRI SHIVAM POLYPLAST PVT LTD
making his introductory remarks as Session Chairman

Mr. Deepak Lawale presenting memento
to Mr. Hariram Thakkar.

Mr. V. Vijay Kumar, President,
KSPA introducing the Speakers of his Session

Mr. S.S. Diwakar, Deputy General Manager
KABRA EXTRUSION TECHNIK LTD making his Presentation

Mr. GuruPrasad Puranmath, VP International Sales &
Strategic Initiative, Mutual Engineering Pvt Ltd.
making his Presentation on Mould Maintenance

Mr. V. Vijay Kumar, President,
KSPA receiving memento from Mr. Deepak Lawale

Mr. Aravvinth R, MANJUSHREE TECHNOPACK LTD
receiving his Lucky Draw gift

Mr. Dilip Kumar M. N., Shashwati Plastics
receiving his gift as Lucky Draw Winner

NEWS FROM INDIA

Reliance Industries Becomes First in India to use Chemical Recycling for Circular Polymers

Reliance Industries Limited (RIL), operator of the world's largest integrated refining and petrochemical complex, has become the first Indian company to chemically recycle plastic waste - based pyrolysis oil into International Sustainability & Carbon Certification (ISCC) - Plus certified Circular Polymers. This new innovation is a testimony to RIL's commitment in reducing plastic waste and supporting Circular Economy in India. RIL shipped its first batch of ISCC - Plus certified Circular Polymers, name CircuRepol™ (Polypropylene) and CircuRelene™ (Polyethylene).

RIL paves the way in India by using new technology to recycle plastic by converting plastic waste into special Circular Polymers, thereby making a positive impact on the environment. RIL's commitment to sustainability is demonstrated through its innovative methods like chemical recycling which help create a Circular Economy. The company firmly believes in finding smart solutions to reduce plastic waste and inspire others to join in this journey towards a greener future. CircuRepol™ and CircuRelene™ have been designed to lead the way in Circular Economy practices. RIL's Jamnagar refinery became the first refinery to get the important ISCC - Plus certification, proving that it can produce Circular Polymers through chemical recycling.

The ISCC - Plus certification guarantees that traceability and rules are followed in making Circular Polymers. RIL has developed a technology that turns different types of plastic waste, including singleuse and multi - layered plastics, into pyrolysis oil. The company is working with trusted partners to increase the production of this oil and turn the yield into Circular Polymers. Chemical recycling has many benefits, including turning plastic waste into high - quality materials for new plastic. These materials can be used for packaging that comes into contact with food. About Reliance Industries Limited Reliance is India's largest private sector company, with a consolidated revenue of INR 9,74,864 crore (US$118.6 billion), cash profit INR 1,25,951 crore (US$ 15.3 billion) and net profit of INR 73,670 crore (US$9.0 billion) for the year ended March 31, 2023. Reliance's activities span hydrocarbon exploration and production, petroleum refining and marketing, petrochemicals, advanced materials and composites, renewables (solar and hydrogen), retail and digital services. Currently ranked 88th, Reliance is the largest private sector company from India to be featured in Fortune's Global 500 list of 'World's Largest Companies' for 2023. The company stands 45th in the Forbes Global 2000 rankings of 'World's Largest Public Companies' for 2023, the highest among Indian companies. Reliance is the top-ranked Indian company and the only one in the top 100 on Forbes' 'World's Best Employers' 2023 list. Additionally, it is featured among LinkedIn's 'Top Companies 2023: The 25 Best Workplaces to Grow Your Career in India.' Website: www.ril.com

Indian Toy Industry Witnesses 52% Decline in Imports and 239% Rise in Exports in FY 2022 - 23 in Comparison to FY 2014 - 15

Govt. efforts for the toy industry lead to doubling of manufacturing units, reduction in imported inputs from 33% to 12% and increase in gross sales value by a CAGR of 10%

The Indian Toy industry witnessed remarkable growth in FY 2022 - 23 in comparison to FY 2014 - 15, with the decline in imports by 52%, rise in exports by 239% and development of overall quality of the Toys available in the domestic market. These observations have been noted in a Case Study on "Success Story of Made in India Toys" has been conducted by the Indian Institute of Management (IIM) Lucknow at the behest of Department for Promotion of Industry and Internal Trade (DPIIT).

The report states that the efforts of the Government have enabled in creation of a more conducive manufacturing ecosystem for the Indian Toy industry. It highlighted that in a span of 6 years, from 2014 to 2020, these dedicated efforts have led to the doubling of the number of manufacturing units, reduction in dependence on imported inputs from 33% to 12%, increase in gross sales value by a CAGR of 10%, and overall rise in labour productivity.

The report analyzed that India is also emerging as a top exporting nation due to the country's integration into the global toy value chain, along with zero-duty market access for domestically manufactured toys in countries including UAE and Australia. The report stated that in order to position India as a viable alternative to current toy hubs of the world, i.e., China and Vietnam, consistent collaborative efforts of the Toy industry and the Government are essential for advancements in technology, embracing e - commerce, encouraging partnerships and exports, investing in brand-building, engaging with educators and parents to communicate with children, valuing cultural diversity and collaborating with regional artisans, etc.

The report emphasized that to address these issues and foster growth in the Indian toy industry, a strategic plan of action was needed. The government has implemented several interventions and initiatives, including:

- Formulation of a comprehensive NAPT having 21 specific action points, and implemented by 14 Central Ministries/Departments, with DPIIT as the coordinating body.
- Basic Customs Duty (BCD) on toys (HS code 9503) was increased from 20% to 60% in February 2020, and subsequently to 70% in March 2023.
- Directorate General of Foreign Trade (DGFT) has mandated sample testing of each import consignment to curb the import of sub - standards toys.
- A Quality Control Order (QCO) for Toys was issued in 2020, with effect from 01.01.2021.
- Special provisions were notified by BIS on 17.12.2020 to grant licences to micro sale units manufacturing toys without testing facility for one year and without establishing in - house testing facility, which was further extended by three years.
- BIS has granted more than 1200 licences to domestic manufacturers and more than 30 licences to foreign manufacturers for manufacture of toys with BIS standard Marks.
- Cluster - based approach adopted to support domestic Toy industry. The Ministry of MSME is supporting 19 Toy clusters under the Scheme of Funds for the Regeneration of Traditional Industries (SFURTI), and the Ministry of Textiles is providing designing and tooling support to 13 Toy clusters.
- Several promotional initiatives have also been undertaken to promote indigenous toys and encourage innovation, including The Indian Toy Fair 2021, Toycathon, etc.

In line with the recommendations made in the report, the Government has already initiated / undertaken measures under the NAPT.

Prime Minister Shri Narendra Modi during his "Mann ki Baat" address in August 2020, expressed his desire to establish India as a global Toy manufacturing hub. To fulfil the vision, the Government has undertaken a series of initiatives including formulation of a comprehensive like the National Action Plan for Toys (NAPT) to promote designing of toys, using toys as a learning resource, monitoring quality of toys, promoting indigenous toy clusters, etc.

The policy initiatives of the Government together with the endeavours of the domestic manufacturers have resulted in remarkable growth of the Indian toy industry.

Plastic Pollution is Growing Relentlessly as Waste Management and Recycling Fall Short, says OECD

Globally, only 9% of plastic waste is recycled while 22% is mismanaged Share of plastics treated by waste management category, after disposal of recycling residues and collected litter, 2019

OECD countries are behind 14% of overall plastic leakage. Within that, OECD countries account for 11% of macroplastics leakage and 35% of microplastics leakage. The Outlook notes that international co - operation on reducing plastic pollution should include supporting lower-income countries in developing better waste management infrastructure to reduce their plastic leakage.

The report finds that the COVID-19 crisis led to a 2.2% decrease in plastics use in 2020 as economic activity slowed, but a rise in littering, food takeaway packaging and plastic medical equipment such as masks has driven up littering. As economic activity resumed in 2021, plastics consumption has also rebounded.

Reducing pollution from plastics will require action, and international co - operation, to reduce plastic production, including through innovation, better product design and developing environmentally friendly alternatives, as well as efforts to improve waste management and increase recycling.

Bans and taxes on single - use plastics exist in more than 120 countries but are not doing enough to reduce overall pollution. Most regulations are limited to items like plastic bags, which make up a tiny share of plastic waste, and are more effective at reducing littering than curbing plastics consumption. Landfill and incineration taxes that incentivise recycling only exist in a minority of countries. The Outlook calls for greater use of instruments such as Extended Producer Responsibility schemes for packaging and durables, landfill taxes, deposit-refund and Pay-as-You-Throw systems.

Most plastics in use today are virgin – or primary – plastics, made from crude oil or gas. Global production of plastics from recycled – or secondary – plastics has more than quadrupled from 6.8 million tonnes (Mt) in 2000 to 29.1 Mt in 2019, but this is still only 6% of the size of total plastics production. More needs to be done to create a separate and well-functioning market for recycled plastics, which are still viewed as substitutes for virgin plastic. Setting recycled content targets and investing in improved recycling technologies could help to make secondary markets more competitive and profitable.

Some key findings from the Outlook:

Plastic consumption has quadrupled over the past 30 years, driven by growth in emerging markets. Global plastics production doubled from 2000 to 2019 to reach 460 million tonnes. Plastics account for 3.4% of global greenhouse gas emissions.

Global plastic waste generation more than doubled from 2000 to 2019 to 353 million tonnes. Nearly two-thirds of plastic waste comes from plastics with lifetimes of under five years, with 40% coming from packaging, 12% from consumer goods and 11% from clothing and textiles. Only 9% of plastic waste is recycled (15% is collected for recycling but 40% of that is disposed of as residues). Another 19% is incinerated, 50% ends up in landfill and 22% evades waste management systems and goes into uncontrolled dumpsites, is burned in open pits or ends up in terrestrial or aquatic environments, especially in poorer countries.

In 2019, 6.1 million tonnes (Mt) of plastic waste leaked into aquatic environments and 1.7 Mt flowed into oceans. There is now an estimated 30 Mt of plastic waste in seas and oceans, and a further 109 Mt has accumulated in rivers. The build - up of plastics in rivers implies that leakage into the ocean will continue for decades to come, even if mismanaged plastic waste could be significantly reduced. Considering global value chains and trade in plastics, aligning design approaches and the regulation of chemicals will be key to improving the circularity of plastics. An international approach to waste management should lead to all available sources of financing, including development aid, being mobilised to help low and middle-income countries meet estimated costs of EUR 25 billion a year to improve waste management infrastructure.

Source: OECD Global Plastics

Karnataka HC Rejects Plea Against GoI Notification Imposing Quality Control of Polyethylene and Necessitating BIS Seal

The Karnataka High Court dismissed a writ petition challenging the notification issued by Government of India imposing quality control on the import of polyethylene and aims to bring in quality usage by necessitating a seal of the BIS at the stage raw material. A Single Bench of Justice M. Nagaprasanna observed "If the product under the programme "Make in India" is sought to be exported under the tag "Made in India" quality insistence from the threshold would ensure that the final product would meet all the necessary global standards." Advocate N. Raghavendra Rao represented the petitioner, while DSGI H. Shanthi Bhushan appeared for the respondents.

The Department of Chemicals and Petro Chemicals of the Union of India issued a quality control order, requiring polyethylene to adhere to the standard mark under a license from the Bureau of Indian Standards (BIS) as per Schedule I and Schedule - II of the Bureau of Indian Standards (Conformity Assessment) Regulations, 2018. Also Read - Bombay HC Directs Students Who Allegedly Committed Theft In College To Undertake Community Service At Old Age Home For 2 Months; Sets Aside Their... The petitioner contended that such a clause will hinder the free movement and sale of raw materials, potentially creating a monopoly in the industry. The Court held that these submissions were untenable.

The Court rejected the petitioner's argument that there is no nexus with the production sought to be achieved by imposing quality standard on a raw material by calling it 'preposterous' and stated that "If quality is not in the raw material, it is ununderstandable as to how it can be found in a finished product. If raw material lacks quality it is trite that the finished product would be sub - standard." The Court pointed out that "the contention that it would lead to cartelization or monopoly by one industry is farther from truth"

Source: Verdictum

Reliance to Invest in Renewable Energy, Green Hydrogen in Tamil Nadu, says Mr. Mukesh Ambani

Global Investors Meet: Mr. Mukesh Ambani said that Tamil Nadu has become one of the most business - friendly states in the country and that he believes that the state would soon become a trillion - dollar economy. Reliance Industries Chairman Mr. Mukesh Ambani has said that they will make new investments in renewable energy and green hydrogen in Tamil Nadu. Ambani, who skipped the Global Investors Meet hosted in the state, sent in a video message, addressing the summit. He said that the conglomerate would work closely with the state government to promote sustainable development. Ambani said that Tamil Nadu has become one of the most business - friendly states in the country and that he believes that the state would soon become a trillion - dollar economy. "Reliance has proudly partnered in Tamil Nadu's growth over the years. We have opened nearly 1,300 retail stores across the state, investing over Rs 25,000 crores. Jio has invested over Rs 35,000 crores in Tamil Nadu, bringing the fruits of the digital revolution to 35 million subscribers in every town and village in the state," he said.

He further said that Reliance has partnered with Canada's Brookfield Asset Management and US-based Digital Reality to set up a state - of - the - art data centre that will be opened next week.

"Reliance has committed to making new investments in Tamil Nadu in renewable energy and green hydrogen. We shall work closely with the state government to promote sustainable development, which is necessary to save Mother Earth from the climate crisis," he said, adding that he is confident that the Tamil Nadu government will support them with viable policies.

Meanwhile, the Tamil Nadu government announced that it has signed investment pacts worth over $4.39 billion with firms such as Tata Electronics and Pegatron, both of which are suppliers for Apple, as well as auto major Hyundai Motors. Tata Electronics has committed to invest Rs 12,080 crore, while Pegatron has said it would Invest Rs 1,000 crore.

JSW Energy committed to invest Rs 12,000 crore to develop renewable energy projects. Hyundai Motors committed Rs 6,080 crore, some of it earmarked for electric vehicle battery and car manufacturing.

Vietnamese EV maker VinFast agreed to set up its first manufacturing facilities in India and work toward an investment of up to $2 billion in Tamil Nadu.

Additionally, Tata Power stated that it plans to invest Rs 55,000 crore in wind and solar power generation in Tamil Nadu in the next 5 - 7 years.

Source: Business Today

PLI Scheme for Automobiles, Auto Components gets 1 - Yr Extension

The centre has extended the Production Linked Incentive (PLI) Scheme for Automobile and Auto Components by a year. A statement from the Ministry of Heavy Industries (MHI) said this decision has been made after receiving the approval of the Empowered Group of Secretaries (EGoS).

These amendments aim to provide clarity and flexibility to the scheme. The incentive will now be applicable for five consecutive financial years, starting from fiscal 2023 - 24.

"Disbursement of the incentive will take place in the financial year 2024 - 25. The scheme also specifies that an approved applicant will be eligible for benefits for five consecutive financial years, but not beyond the financial year ending on March 31, 2028," the statement said.

It has also been decided that if a company fails to meet the threshold for an increase in Determined Sales Value over the first year's threshold, it will not receive any incentive for that year. The company will still be eligible for benefits in the next year if it meets the threshold calculated with a 10% year - on - year growth over the first year's threshold.

This provision aims to ensure a level playing field for all approved companies and safeguard those who preferred to front - load their investments, the statement added.

Marico Innovation Foundation Takes on Plastic Innovation and Circularity

We first became aware of the Marico Innovation Foundation in January 2023 when it held a function in New Delhi to announce its playbook for unlocking latent opportunities to address the swelling global challenge that plastic waste presents. At the lively event, a discussion moderated by Shereen Bhan took place among the three industry leaders who helped to bring about the playbook – Raghunath Mashelkar, Amit Chandra, and Harsh Mariwala, who are all part of the governing council of the Marico Innovation Foundation.

Mr. Mariwala said at the event that he started the Foundation in 2003, long before the current opprobrium for plastic and plastic packaging had reached out shores. He said the playbook and the search for innovators who made their presentations that evening, were "just a start". The Playbook and the recognition of the first batch of innovators with plausible solutions for developing a circular economy recognized the complexity of the problem and need for facts and data, documentation, social engagement, technology, economics, policy and investments. The report titled 'Innovation in Plastic: The Potential and Possibilities' provides actionable solutions across the plastics value chain that can aid and address the challenges of plastic sorting, to recycling and also providing viable alternatives to plastics.

Marico Innovation Foundation collaborated with the Indian Institute of Science and Praxis Global Alliance as Knowledge partners to develop the playbook. The partners assisted in identifying the challenges created by plastic waste to the macro and commercial level as well as outlining opportunities and recommendations in the plastic waste management space while dispelling myths, especially on bioplastics. The research methodology consisted of an in - depth assessment with corporate leaders, start - up ecosystem Players, industry experts and scientists.

Raghunath Mashelkar, Emeritus chairperson of the Governing Council of Marico Innovation Foundation and Jury Chair said, "This timely report succinctly captures not only the problem of Plastic Waste but also proposes very imaginative solutions that can not only stand to benefit our nation but the world. The report is a comprehensive playbook for both public and

private sectors alike on how plastics can be reimagined and repurposed now and in the future". The playbook also features 15 innovations that address plastic waste with their solutions. The report also lists models of communities and cities that have addressed the plastic waste challenge through a host of innovative initiatives.

Plastics are ripe for intervention - and innovators are looking for investment.

Speaking about the initiative, Harsh Mariwala, founder of the Marico Innovation Foundation and Chairman of Marico said, "We understand the critical need to build an ecosystem that can help deliver innovative solutions for global problems. It is why the Marico Innovation Foundation (MIF) came into existence and has been at the forefront of India's Innovation story. Plastics were ripe for the intervention. The playbook is the first step to help evolve an ecosystem for innovation within this sector. MIF is committed to creating long-lasting and meaningful change and will be actively involved in helping innovations in this endeavor thrive."

Apart from the winners from the 9th edition of the Marico Innovations for India Awards at Delhi, the IMF held another such event in Mumbai in March 2023 where it recognized winners across two broad categories – business and social. The business category entailed India – based 'for - profit' organizations, including start - ups and corporate innovators, and the social category included India - based 'not - for - profit' individuals or organizations. Seven winners were identified across the technology, healthcare and social impact areas. The business category saw applications from more than 20 sectors, including healthcare/ med - tech, agritech, waste management, robotics, manufacturing and others. On the other hand, applications in the social category presented solutions for 15+ social challenges across education and training, women's development, health and well - being, sustainability, and others. The applications saw women innovator apply significant numbers this year, with a considerable number of organizations featuring women and at least one woman founder.

PLASTIC PRODUCTS AND NEW TECHNOLOGIES

CAD / CAM Software Reduces Delivery Times by 70% With a Six-Month ROI

Single integrated CAD / CAM package reduces translation errors, simplifies design process, improves shop efficiency and shortens tool lead times. Romeo, Michigan-based TK Mold & Engineering Inc. was founded in 2003 by Tom and Krista Barr, who purchased assets and a building that had previously housed another moldmaker. Tom, who describes himself as a third-generation moldmaker, is president of TK Mold.

With a team of 25, seven CNC machines, multiple lathes and drills, and a five-axis sinker EDM housed in two facilities totaling 25,800 square feet/2,397 square meters of space, TK Mold designs tools and parts and builds up to six tools/month. The company also makes engineering changes and offers maintenance and repairs on anyone's tools. Last year, TK Mold added low-volume custom injection molding (up to 50,000 pieces/year) to ongoing mold sampling services using three presses of 200, 300 and 730 U.S. tons/181, 272 and 622 metric tons. Most mold customers hail from the automotive and consumer goods markets, but the company also makes tooling for the aerospace and medical segments. Most molded products are for consumer goods customers. Over the last two decades, 80% of the company's tooling has been produced in steel and the balance in aluminum. During that period, 80% of the tools were for injection molding (straight injection, two-shot, rotary and pick and place) ranging from one to eight cavities and frequently with side action.

The remaining 20% of production tooling was for compression molding. Injection tooling is typically sized for presses ranging from 85 to 730 U.S. tons / 77 to 662 metric tons, with the company's sweet spot falling between 200 and 500 U.S. tons/181 and 454 metric tons. Many of these tools are designed for precision molding to hold tolerances of ±0.050 millimeter / 0.002 inch on the AZ axis of a plastic fitting. Given its customer base, TK Mold is ITAR registered and ISO 9001:2015 certified. It was named the AMBA Mold Maker of the Year in 2022 and Trail Blazer of the Year in 2023.

Benefits of Integrated CAD/CAM

Since its inception, TK Mold has used integrated Cimatron CAD/CAM software to streamline its workflow from quoting and design straight through to machining and EDM to assembly. The company currently has 10 licenses: three Cimatron Designer Solution (CAD), five Cimatron NC Solution (CAM), one EDM Solution (electrode design and manufacturing) and two floating View Only licenses for personnel operating CNC and EDM machines. Since its inception, TK Mold has used integrated Cimatron CAD/CAM software to streamline its workflow from quoting and design straight through to machining and EDM to assembly. The company also periodically invests in advanced training to ensure its entire team is using the robust software to its fullest. This has paid off by shortening tool delivery lead times and increasing shop productivity.

Photo Credit: TK Mold & Engineering "Years ago, we had one guy using a different package, but we switched exclusively to Cimatron as we found that

managing data was much easier when everyone used the same software, especially for updates," notes Tom. "This way, we never have translation issues when moving data between packages. Also, because it was designed for the tool and die industry, Cimatron is very user-friendly for moldmakers." "The ability to take a part and start making parting lines with Cimatron's QuickSplit feature allows us to streamline designs from the time we kick off a job," adds Jonathan Salter, TK Mold CNC manager. "Cimatron offers many libraries from all the major vendors that allow you to design anything from gates to runners to ejector pins with just a few clicks of the mouse. The tools they've incorporated in their software really help with all aspects of design — from slides and lifters to waterlines and mold bases — and shorten the amount of time it takes to move from design to production to completion."

Source: Mold Making Technology

Quickly Change Robotic End - of - Arm - Tools by Hand

ATI's patent - pending MC-50 manual tool changer enables quick changes of robotic end-of - arm tools (EOAT) by hand.

ATI Industrial Automation has introduced the MC-50 manual tool changer for the manual exchange of robotic tooling. Using an ergonomic lever, the patent-pending MC-50 enables quick changes of robotic end-of-arm tools (EOAT) by hand. This compact tool changer is designed for applications on cobots that support payloads up to 25 kg, as well as small industrial robots with payloads up to 10 kg.

Featuring an ISO 50-mm mounting interface on the master and tool side, the low-profile MC-50 mounts directly to most cobots, enabling integration with many common cobot marketplace grippers and end - effectors.

The MC-50 also includes a safety latch button on the lever to provide secondary locking mechanism for increased safety and prevention of involuntary uncoupling. A variety of electrical and pneumatic utilities for downstream end - effectors are supported through four M5 integrated pneumatic pass-through ports and a mounting flat for optional ATI utility modules.

ATI Industrial Automation's MC-50 manual tool changer allows cobot EOATs to be changed by hand.

Source: Plastic Technology Insider

Catheter Specialist Finds Sweet Spot Serving Small, Medium - Sized Concerns

Medical - component specialist LightningCath has carved a niche meeting the needs of small to medium-sized entrepreneurs with complex catheter designs … quickly. When you have the word lightning as part of your company name, it's likely your customers will expect products quickly. That's

a critical part of the mission at LightningCath, a manufacturer of catheter components based on the "medical alley" of Maple Grove, Minnesota. Spun out of medical-device manufacturer Switchback Medical, in May 2022, LightningCath quickly filled a niche for helping small - to medium - sized companies bring medical device products to market quickly.

The medical component market is a huge, sophisticated and fast-growing space. On a global basis, market research firm Straits Research pegged the industry at more than $577 billion in 2022, and a projected compound annual growth rate of 5.1% through 2031. But, due to its dynamic nature, there is still room in the industry for entrepreneurs — some of them companies, while others clever engineers or even doctors — with nothing more than a concept sketched out on a napkin. That's LigthningCath's sweet spot, and it's filled a need because these companies or individuals with ideas usually can't get the bigger medical device firms interested in their projects.

Switchback Medical experienced this firsthand. Over the years, Brady Hatcher, Switchback CEO and co-founder of LightningCath, had received many requests from innovators deemed too small or too discreet for the bigger companies. Says Hatcher, “We saw a large unmet need in the

medical device development and component manufacturing space. Innovators that need prototypes or extrusions were having challenges getting the service they would like from the large company options, and there are not enough small companies with these capabilities to support them."

LightningCath's facility is equipped with two extruders from US Extruders, including this new medical line. Photo Credit: LightningCath So Brady moved Switchback out of the plant that LightningCath now occupies. It's 19,000 square feet and has an ISO Class 7-certified, 5,000 - square - foot cleanroom. LightningCath runs two lines with extruders from US Extruders, one purchased brand new and a second that Osten describes as "barely used." LightningCath designs all of its tooling, utilizing machining services provided by Switchback.

LightningCath processes extruded tubes in a range of materials, notably PEBA, TPU, nylon and PE at ODs ranging from 0.010 inch to 0.500 inch at tolerances down to ±0.0005 inch. Additional capabilities include multilumen and bump/taper tubing. It also has a wide range of catheter assembly, metal processing and finishing capabilities, as well as complete catheters in steerable or fixed - shape formats.

Says Osten, "Our value proposition right now is prioritizing smaller and mid - size companies that can't necessarily go to the bigger contract manufacturers because the bigger companies are working for the top-tier medical OEMs. LightningCath's in-house catheter process equipment, thermoplastic and FEP heatshrink extrusion capabilities, experienced R&D and process engineers give us vertical integration and speed not typically seen by the smaller to mid-sized contract manufacturers."

He adds, "The additional resources of Switchback's 100 - plus people, many of them catheter development engineers, along with its strong operations team, give us additional stability and security." LightningCath plans to add PTFE etched liner extrusion capabilities in 2024, where Osten says it has particular expertise. Osten notes the company will soon be expanding into Costa Rica, where costs are lower. He states, "LightningCath is a well-rounded company with a great base. We're excited to help our customers wherever they are — with quality and speed."

Source: Plastics Technology Insider

New European Producer of PET BCF Yarns for Automotive Carpet

Key Highlights:

- B.I.G. Yarns achieves a milestone in industrial production by introducing virgin polyester BCF yarns for automotive carpets, offering eco - friendly mono - polymer options that are 100% recyclable.
- The new PET BCF yarns meet stringent automotive standards, including abrasion and stain resistance, and offer durability, passing various tests such as the Taber test.
- B.I.G. Yarns places itself as a company to assist carpet manufacturers in meeting their sustainability targets amid the expected growth in the automotive carpet market.
- To expand its support for high-end and luxurious automotive interiors, B.I.G. Yarns has completed its first industrial production runs of virgin polyester BCF yarns for automotive carpet to complement its line of polyamide PA6 superior yarns.
- There is a growing market in PET for automotive interior applications, with polyester allowing automotive OEMs and Tier 1 to develop products that, from the outset, consider eco-design by building MONO-polymer carpets and flooring that are 100% recyclable at End of Life (EOL). These materials are helping to ensure improved and more sustainable EOL recycling of electric vehicles that are driving the future of the car industry.
- The new PET BCF Yarns offer high-performance for automotive carpets, including abrasion and stain resistance, and durability, passing all stringent automotive tests including the Taber test for abrasion performance, compressibility and recovery ability test, light fastness in automotive (DIN EN ISO 105-B06) and VOC (fogging) according the VDA 278 test on VOC and FOG emission. The

yarns can be color solution dyed, have a dTex between 1300 – 1500, 81 filaments and are ideally for mats with a composition of 400 to 800 gram per m^2, while the yarns for molded carpets have a dTex of 1200, 144 filaments for 380 gram per m^2.

- "As the industry continues its transition towards circularity, making the right material choice is crucial from the outset to ensure the best possible eco-design and recyclability. Our newcomer, PET BCF yarns, brings virgin material to automotive carpets, creating a new systemic approach towards MONO - polymer - based automotive applications," said Glenn Hyzak, global sales director Yarns.

- With the addition of PET BCF yarns, B.I.G. Yarns is now a one-stop-shop for 3 types of Solution Dyed BCF carpet yarns for the automotive industry: nylon (PA6), polypropylene (PP) and polyester (PET), and the Eqo-range of Pa6 yarns – the sustainability focused EqoBalance, EqoCycle and EqoYarn. This strategically positions the company to help carpet manufacturers meet their sustainability targets.

- The automotive carpet market is expected to grow strongly in the coming decade with the increased demand for vehicle customisation and personalisation driven by owners looking to upgrade and enhance interiors, including the flooring area.

- A growing awareness around car hygiene is also boosting the market as consumers become more conscious of maintaining cleanliness in their vehicles, including the floors. Automotive carpets provide an effective solution by trapping dirt and preventing it from spreading to other areas.

- B.I.G. Yarns supports manufacturers as they invest in research and development to introduce more innovative and improved products to cater to these evolving consumer needs.

- "From sustainability to enhanced functionalities and colour, we work closely with our customers, supporting them in design for vehicle customization and personalization, and in building new carpet designs that have never be seen before. Be inspired by our Sustainable Yarns and our monthly Catch The Color and let us help you open up exciting new opportunities with our continuous focus on innovation and sustainability," concluded Mélanie Monceaux, R&D manager B.I.G. Yarns.

- B.I.G. Yarns is proactive in developing new products that better serve customers' needs in a sustainable way. Its solutions are at the forefront of industry product design, and it is fully committed to achieving an improved climate impact in the full supply chain within the automotive interiors industry by focusing on what matters most.

Sustainable Injection Moulding Technology for High - Quality Plastic Parts

Key Highlights:

- FUSO leverages ultra-modern machine technology to produce sustainable and cost-efficient injection-moulded solutions for diverse industries.

- FUSO's production floor is equipped with injection moulding machines from WITTMANN BATTENFELD, demonstrating a commitment to quality and innovation.

- The four-decade collaboration between FUSO and WITTMANN BATTENFELD highlights the use of SmartPower series machines.

- Joh. Fuchs & Sohn – FUSO – was established in 1947 in Waidhofen on the river Ybbs in Lower Austria. In 1964, it started off into plastic injection moulding by producing the orange - coloured lids for Ovomaltine cans.

- The family-owned company managed by its CEO Maximilian Högn and its CSO Klaus Großtesner makes highly sophisticated plastic parts from a great variety of materials, including high - temperature plastics, for many different sectors of industry, with about 80 workers on a production floor of just under 3,000 m^2.

- The company makes a point of supplying technical plastic parts and assemblies to a solid, mixed industrial customer base. The various sectors served by FUSO include the automotive and railway industries, as well as consumer goods, electronics, medical technology, building construction, telecommunication, mechanical engineering and renewable energy generation.

- To make all these parts, a number of injection moulding machines ranging from 450 to 5,200 kN in clamping force are in operation, 17 of which have come from WITTMANN BATTENFELD. Moreover, FUSO is also a long-standing customer of the WITTMANN Group for automation equipment, using more than 40 handling devices with load capacities from 5 to 30 kg, including No. 7 robots as well as latest No. 9 series models with R9 control systems.

- The items produced range from micro parts weighing just 0.03 g right up to large parts weighing 2 kg. In addition to manufacturing complex plastic parts by 1- or 2-component injection moulding, the company offers insert moulding for functional parts, mounting of complete assemblies, as well as gluing and welding, plus decoration by 4-colour pad printing and laser printing, and 3D scanning for reverse engineering.

- Housing for aqua sensors to measure the water quality in BSH dishwashers

- 3D prints for rapid prototyping are also possible. Injection moulding tools and automation systems are planned, designed and manufactured in-house at the company's own mould-making shop. For ecological purposes, the company has made a special point of installing tool - friendly cooling water systems. Further evidence of FUSO's commitment to protecting the environment are waste heat utilisation and a photovoltaic system.

- Requirements from the customer base concerning quality standards and attributes of the parts in terms of tolerances, outward appearance and materials used are constantly becoming more and more stringent. FUSO scores with purchasers by its extensive technical know-how and many years of experience in making high - quality parts and assemblies. This wealth of expertise enables the company to offer top-quality solutions which are both sustainable and cost-efficient. FUSO also stands out on the market by its high supply availability and reliability towards its customers.

- With the rising demands from customers on the parts and assemblies produced, FUSO's own demands on the injection moulding equipment used are also increasing. The company's machinery is state-of-the-art, with a high level of automation on its production floor. All systems are fitted with matching robots to ensure careful parts handling.

- In addition to a good price-performance ratio, FUSO requires from injection moulding machines above all stability, as well as easy access for servicing and cleaning, a smooth, easy-to-clean surface, user-friendliness in operation and a high standard of repeatability. Other factors gaining increasingly in significance are the machines' energy efficiency, their networkability with robots and auxiliaries and availability of assistance systems.

- Last, but not least, the quality of the after - sales service including the possibility of using an online service also play an important part in the purchasing decision according to Klaus Großtesner. In the acquisition of robots, easy programmability is a top priority in addition to all other criteria which are also applicable to the machines.

- The cooperation between FUSO and WITTMANN BATTENFELD has already been in existence for four decades. The machines most recently supplied by WITTMANN BATTENFELD are exclusively models from the SmartPower series. The machines from the SmartPower series are hydraulic machines equipped with fast-responding servo motors and powerful constant displacement pumps. This technology, combined with the KERS (Kinetic Energy Recovery System) to recover the deceleration energy within the machine, which is included as standard, provides the SmartPower's high level of energy efficiency. Further characteristics of the SmartPower are its small footprint and its pivotable

injection unit, which ensures easy access to the barrel for quick and comfortable barrel change.

All SmartPower machines except one are designed as Insider cells, which means that they come with a WITTMANN robot and a conveyor belt integrated in the production cell. This variant offers a number of advantages, ranging from an enormous amount of space saved compared to systems with conventional automation solutions, all the way to cost advantages from the fact that all hazardous areas are already secured and certified ex works. Moreover, the robot cycle time can be minimised due to shorter travel distances and direct parts depositing on the conveyor belt.

The machines delivered in 2023 also come already equipped with the new B8X control system and the HiQ Flow assistance system. The B8X control system includes several control components developed in-house. These allow a higher internal clock frequency with shorter response times to sensor signals and consequently a higher standard of parts reproducibility, with user-friendliness and familiar visualisation remaining unchanged.

The HiQ Flow assistance system is an injection regulation function by which viscosity fluctuations in the material used can be compensated. This function enables automatic process automation and compensates even minimal fluctuations in the material quality. FUSO is so completely satisfied with this system that all of the company's other machines have been retrofitted with it, too, wherever technically feasible and economically advisable.

“The Insider cells based on the servo-hydraulic SmartPower and WITTMANN linear robots meet our requirements in every respect”, Maximilian Högn confirms. “The equipment is space-saving, highly energy-efficient, easily accessible and easy to operate.”

TekniPlex to Debut Pharma - Grade PET Blister Film with Recycled Content

Key Highlights:

Developed in collaboration with Alpek Polyester, the film is suitable for a wide array of primary packaging applications, with 30% of its PET polymerised from PCR-origin through chemical recycling.

TekniPlex will showcase their pharma - grade solution at Pharmapack Paris.

Adopting the new PET blister film with PCR content allows pharma companies to stay ahead of pending sustainability legislation.

TekniPlex Healthcare, which utilises advanced materials science expertise to help deliver better patient outcomes, has partnered with petrochemical specialist Alpek Polyester to introduce a pharmaceutical-grade polyethylene terephthalate (PET) blister film containing significant recycled content.

Suitable for a wide array of primary packaging applications, 30% of the PET blister film is manufactured using post-consumer recycled (PCR) monomers. When combined with TekniPlex's polyester lidding, Teknilid Push, the film plus lidding blister system is also fully recyclable in the polyester recycling stream where recycling infrastructure exists. TekniPlex Healthcare will debut the new solution at Pharmapack Paris, January 24-25.

To create the film, post-consumer plastic waste undergoes a depolymerisation process via chemical recycling, which reduces it back to monomers. After repolymerisation to PET, the result is a recycled resin that is essentially virgin material. Notably, such monomer - level deconstruction and repolymerisation is impossible to achieve via traditional mechanical recycling methods. The end product from Alpek's polymer reactor is a sheet in master reel made according to the melt - to - sheet process.

The benchmark - setting new blister film meets all pharmaceutical requirements for PET as outlined in the European Pharmacopoeia Section 3.1.15, and United States Pharmacopoeia Section 661.1. The achievement was the latest in a longstanding relationship

between TekniPlex Healthcare and Alpek Polyester, who frequently collaborate on projects involving the production and slitting of PET film for pharmaceutical and medical applications.

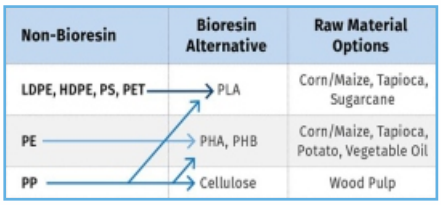
Among other benefits, adopting the new PET blister film with PCR content allows pharma companies to stay ahead of pending sustainability legislation poised to affect packaging in all industries. Perhaps most notably, the EU's forthcoming Packaging & Packaging Waste Regulation likely will impose recyclability deadlines on all industries and PCR content baselines for various sectors. Similar movements are progressing elsewhere, leading to demand for more sustainable pharmaceutical packaging solutions that do not compromise on material quality, product protection or patient health.

"This is the first time pharmaceutical companies have the option to incorporate a blister pack that is fully recyclable and, at the same time, contains a significant portion of recycled material – all while still meeting stringent pharmaceutical quality standards for product protection and consumer safety," said Melissa Green, head of global marketing for TekniPlex Healthcare.

"We anticipate high demand for this new, more sustainable film, as it meets ever-growing calls for elevated eco-friendliness in packaging across all sectors, including pharma."

Also at Pharmapack, TekniPlex Healthcare showcased its recently incorporated next-generation filling and sealing machine for plastic containers. The Pentafill A25 Filling & Sealing Machine offers several improvements over previous models, including improved sterility and a smaller footprint. Capable of producing up to 25 five-vial strips (125 vials total) per minute, the PentafIll A25 filling and sealing machine is suitable for filling a wide range of viscosities for applications serving the pharmaceutical, diagnostics, nutraceuticals and animal health markets.

How to Optimize Your Molds and Hot Runners for Processing Bioresins



Demand for bioresins is growing in molded goods, particularly as a sustainability play to replace fossil-fuel based materials, but these materials are not a drop-in replacement for traditional materials. Molds and hot runners need to be optimized for these materials.

Across multiple industries and applications, bioresins have become increasingly popular alternatives to the traditional resins used in injection molding. The global market for bioresins has risen steadily over the years and is expected to continue that growth at an impressive rate. Over the next five years, the market is expected to double in size, with a compound annual growth rate (CAGR) of 17% in the U.S. and 13% in Europe.

What's driving the growth in bioresin adoption? First are consumers who want to know that the product they purchased, as well as its packaging, is sustainable. Because bioresins are derived from relatively sustainable materials and can be engineered to biodegrade, many consumers feel bioresins are a more sustainable choice.

The second driver is environmental, social and governance (ESG) initiatives. Brands and molders are under increasing pressure to adopt an ESG strategy. Using bioresins for injection molded products and packaging can help organizations meet their ESG objectives and signal to consumers that they're doing their part for the environment.

The final driver is legislation. New legislation and regulations are placing pressure on manufacturers to reduce postconsumer waste and plastic pollution. In July 2021, for example, the European Commission implemented new laws that ban or restrict single-use products made from fossil-fuel - based polymers.

Putting the "Bio" in Bioresins

Bioresins — sometimes called bioplastics, biopolymers or biomaterials — refer to several categories of commercially available materials that can be used in injection molding and other processes. So, what makes these plastics "bio"? The materials are made in whole or in part

from renewable biological resources. These biological resources can include corn or maize, potato starch, tapioca starch, vegetable oil, sugar cane starch and wood pulp or cellulose among other feedstocks.

When planning to use bioresins, it's important to note a few distinctions in related terminology and features. Biobased refers to the fact that biomaterials are used to create the resin. Biodegradable means the item will eventually breakdown in the natural environment. Not all biobased resins are biodegradable. Compostable means the material is biodegradable and breaks down within three to six months in an industrial composting facility, releasing nutrients and leaving no toxicity in the soil. Not all biobased and biodegradable materials are compostable.

What Traditional Materials can Bioresins Replace?

In most applications, high- and low-density polyethylene (HDPE, LDPE), polystyrene (PS) and PET can be replaced by polylactic acid (PLA). PLA is one of the first bioresins to be commercialized, and its feedstock options include corn or maize, tapioca and sugar cane.

PE can be replaced with polyhydroxybutyrate (PHB) or polyhydroxyalkanoates (PHA), which are relatively newer resins on the market. These bioresins have more processing options and can offer compostability. PHA and PHB can be produced from corn; tapioca or potato starch; and vegetable oil. Many of the polypropylene (PP) parts molded today can be replaced with a cellulose resin made from wood pulp.

Bioresin Challenges and Best Practices

Bioresins come with unique and challenging physical properties that can make them difficult to incorporate into the injection molding process. For example, many bioresins are highly viscous and require high pressures to fill the mold cavities. They're also prone to weepage and leakage. In terms of manufacturability, some bioresins are very temperature sensitive, so the manufacturing process must avoid exceeding temperatures above a certain threshold.

One of the most frequent mistakes we see is people thinking because bioresins replace PP and PE, they process similarly to those resins. Bioresins are more thermally sensitive, and their process window is smaller, so running them requires equipment that's designed to deal with those constraints.

Any new materials also bring unknowns, especially in performance, and many bioresins may not perform as well as traditional materials in terms of product preservation, longevity, safety and other key metrics. These unknowns need to be addressed to achieve a successful bioresin adoption. Bioresins are not a straight replacement for PP and PE. Even within petrochemical based PE and PP, there is a wide variation in performance among the numerous grades. Make sure that the bioresin you're choosing matches the requirements of the product that you're bringing to market.

Equipment impact is another area where bioresins may not initially meet the same standards as traditional materials. Molten bioresins tend to be corrosive, especially in the case of PLA, which can compromise machinery and lead to quality issues, performance variation and even component failure.

This may require more frequent equipment inspection and maintenance to ensure consistent and predictable uptime. PLA can cause damage to not just the hot runner and the mold but the screw and barrel as well. Basically, anything that touches the melt needs to be stainless steel or have a nonreactive coating.

Weepage and leakage are also an issue. This is partly due to the material's corrosive nature, but also its molecular structure tends to weep or leak. In the case of a valve-gate system where there are moving parts, weepage is possible. When there are moving parts like valves, stems and bushings, their design needs to take into consideration the possibility of weepage.

Bioresin preparation includes drying to a moisture content of less than 250 parts per million (ppm) to prevent viscosity impacts and resin degradation. Bioresins are usually supplied in foil-lined bags or bags that are dried to less than 400 ppm in moisture. These resins should not be exposed to atmospheric conditions after drying.

About the author: Sheldon Alexander is hot runners business manager for Husky. He has more than 20 years of global industry experience, traveling the world to help optimize injection molding applications for customers in more than 40 countries. Alexander has experience managing highly

skilled teams across many functions in the injection molding value chain and holds several technical patents in the industry with specific expertise in hot runners. Contact: 905-951-5000; salexand@husky.co; www.husky.co

Source: Plastics Technology Insider

ZEBRA Consortium Unveils Second Recyclable Wind Turbine Blade, Advances Sustainability in Wind Energy

The ZEBRA (Zero wastE Blade ReseArch) consortium announces the successful completion of the full scale validation testing of the first recyclable blade and production of the second recyclable thermoplastic blade, further advancing the wind industry's commitment to achieving a circular economy.

The second blade, measuring 77 m in length, was made at LM Wind Power's blade plant in Castellón, Spain, using Arkema's **thermoplastic liquid resin Elium® known for its recyclability,** and Owens Corning's high performance glass fabrics. It features a new Carbon-Elium® resin spar cap technology and a new adhesive from Arkema's subsidiary Bostik specialized in adhesive solutions.

Importantly, **the second ZEBRA blade is a world-first in using recycled Elium® resin in the manufacture of a shear web,** which is a structurally important component of the blade, and demonstrates the potential of the resin technology to deliver sustainable blade designs and simulating the circularity of the Elium® resin.

"The ZEBRA project is proceeding according to schedule and will soon deliver its final results. The successful achievement of the test campaign on the first blade and the completion of this second blade represents a major achievement both for the consortium and for the wind energy industry as a whole. The next major milestones for the year 2024 will be the delivery of a complete life cycle analysis based on the blades produced in the frame of ZEBRA project, the focus on recycling activities and the completion of validation testing on the second blade containing the new Carbon-Elium® resin spar cap," emphasises Guillaume SANA, project leader at the IRT Jules Verne.

Following the manufacture of the first recyclable blade in March 2022, the ZEBRA consortium initiated a further intensive development and testing phase to develop the necessary technologies to manufacture a Carbon-Elium® resin spar design. This included material and process development to ensure that required mechanical properties could be achieved, and in close collaboration with LM Wind Power's skilled Castellon team, the necessary manufacturing process could be developed to ensure the manufacture of full-scale components.

The first recyclable ZEBRA blade **has successfully completed full-scale validation testing** at LM Wind Power's Test and Validation Centre in Denmark, with recycling tests currently ongoing. Full-scale structural lifetime testing of the second blade has already started with successful completion of static testing, where the blade is exposed to the extreme loads.

Launched in September 2020, the ZEBRA project is a unique partnership led by French research center IRT Jules Verne and brings together industrial companies including Arkema, CANOE, ENGIE, LM Wind Power, Owens Corning and SUEZ. The project's aim is **to demonstrate the technical, economic, and environmental relevance of thermoplastic wind turbine blades on a full scale**, with an eco-design approach to facilitate recycling.

Source: Arkema

New Film for the Airmove² Air Cushion System from Storopack Consists of 50 Percent Recycled Material

Storopack is adding an even more sustainable option to its film portfolio for the AIRmove² air cushion system: AIRmove² 50% Recycled consists of 50 percent recycled material and is suitable for the production of Void S type air cushions. The film uses fewer resources in its life cycle and can be fully recycled. With the 200 x 120 millimeter air cushions,

voids can be optimally filled, and the shipping goods are optimally protected in the carton. The AIRmove² air cushion system is particularly suitable for manufacturers of electrical and household appliances or e-commerce providers who want to perfectly protect their products in the shipping carton.

Saves 30 percent of CO2 emissions in developing AIRmove² 50% Recycled, protective packaging specialist Storopack focused on resource-saving film production. The result: the void film generates 30 percent less CO2 during production compared to the standard AIRmove² void film. It also uses about 40 percent less water and about 39 percent fewer fossil resources. The material thickness has been reduced to 20my delivering the same quality performance with a lessened impact on the environment. This new version of AIRmove² void film was designed to combine two requests in terms of sustainability: decreased material inside the box and increased recycled content.

Companies also benefit from a longer roll length: one roll holds 435 meters of film. High-performance air cushion system The AIRmove² air cushion system is the ideal solution to produce air cushions for up to 500 packages a day. The production output is around ten meters of film per minute. The particularly compact and lightweight machine can be easily integrated into existing packaging processes and can be used as a tabletop unit or mounted on the wall. Air cushions can be produced conveniently and ergonomically using a manual push button or foot pedal.

Kordsa's Fireproof and Sustainable Product Technology is Entering the Cabin

The long-term agreement covers the supply of fire - resistant, sustainable, epoxy-based products for use in aircraft cabins.

Kordsa (Izmit, Turkey) has signed a long - term commercial collaboration agreement with FACC AG (Ried im Innkreis, Austria). Under this agreement, Kordsa will introduce its epoxy-based product that meets stringent fire resistance and sustainability criteria in the aviation sector to the FACC ecosystem. The product, bearing the signature of the Composite Technologies Center of Excellence in Turkey, will be used in the production of cabin interior components in civil aviation.

Kordsa notes that its sustainable products enable the transition from phenolic - based volatile chemicals to flame-retardant, epoxy-based chemicals in cabin interiors. They prevents the emergence of harmful substances throughout various processes, from raw material production to the development of final components. The products also provide a significant cost and supply advantage by streamlining operational product development processes. In addition, they demonstrate high performance in one of the aviation industry's most critical and challenging criteria — flammability — ensuring the highest level of passenger safety in fire-related incidents or accidents.

“The path for Kordsa to become one of the world's leading companies in advanced materials involves seeing sustainability as a business model,” Kordsa CEO İbrahim Özgür Yıldırım says. “The vision we describe as 'Reinforcing Life' is not just a narrative summarizing Kordsa's development; it is a journey indicating Kordsa's contribution to the world, humanity and the ecosystem.”

Case Study: Right - shoring Supports Cucumber's Motion Sensor Venture

Key Highlights:

- Cucumber Lighting Controls, emphasises sustainability in manufacturing, as they opt for a rightshoring supply chain model with UK - based Broanmain Plastics.

- Broanmain collaborated with Cucumber for over 12 months, providing technical support for their UK launch of passive infrared lighting motion sensor range, showcasing the benefits of rightshoring, cost control, and quality collaboration.

- Cucumber prioritises sustainability, local economy support, and quality control by selecting Broanmain as their UK-based injection moulding tooling and manufacturing partner for motion sensor development, ensuring compliance with EU directives.

- Cucumber Lighting Controls is a company built on delivering energy - saving commercial lighting motion sensors. For the British - based business, this extends to all aspects of manufacturing.

- One factor Cucumber is fastidious about is ensuring that all components that make up their motion sensors are produced in the most sustainable way. From being made on British soil, to meeting all of the domestic REACH, RoHS, material, minerals and pollutants due diligence requirements, it can be challenging to maintain tight control when supply partners are based on different continents. That's why Cucumber made the conscious decision to opt for a resilient rightshoring supply chain business model. With Broanmain Plastics front and centre of it.

- Cucumber Lighting Controls is a company built on delivering energy - saving commercial lighting motion sensors.

- For over 12 months, Broanmain has delivered a hothouse of technical ideas to support Cucumber's innovative and ambitious UK launch strategy. Gearing up to unveil their first passive infrared lighting motion sensor range to the UK market, CEO Mark King reflects on their rightshoring rationale. Including the cost and quality control benefits of collaborating with UK - based manufacturing experts that can manage tooling projects performed the other side of the globe.

- Priding itself on being a quintessentially innovative British-business, Cucumber's founders intentionally hand-picked Broanmain as their injection moulding tooling and manufacturing partner. Eager to retain as much manufacturing domestically, having Broanmain based close to their headquarters has given the Cucumber product development team and investors complete oversight of every phase of the tool design, trials, and product testing.

- In the last year, Broanmain has project managed the entire process of developing 11 moulding tools in China to support the soft launch of Cucumber's passive infrared motion sensor range. Already, the Dorking - based team is working in close partnership with Cucumber on the next phase of 20+ product tools. Concurrently, the moulding workshop has been busy manufacturing the first MOQ, which Broanmain holds in stock enabling the motion sensor specialist to call off in batches as required.

- The benefits of sending the toolmaking to China, yet having the Broanmain team manage this from the UK have been multiple, notes Cucumber's CEO.

- “It's been the most logical way to approach the development of our commercial lighting sensors. We benefit from an experienced toolmaker and moulder who can manage the entire relationship with their Chinese toolmaker. Knowing that the tools are manufactured and tested to UK standards has enabled us to concentrate our efforts on preparing for the market launch, including the development of the Cucumber App that will control our energy-saving sensors,” explained Mark.

- Drawing on the Cucumber's extensive knowledge of the motion sensor market, the team has been able to configure a balanced supply chain model. One that is not only priced competitively, but delivers flexible localised production and 'Made in Britain' quality control.

- “The Cucumber ethos is focused on sustainability and supporting the local economy. Manufacturing components on UK shores is by far the most sustainable way to create a product that will be sold and used here,” added Mark.

- PIR sensors will play a massive role in addressing commercial energy waste and usage habits, forecasts Cucumber. Featuring snap-fit joints, and CE certified, the company's first range of PIR sensors feature five individual components.

- The sensor casings are made from virgin ABS so at the end of the product's lifecycle, the

component can be recycled, melted down and made into another product or part.

- Fully committed to supplying safe and environmentally friendly products that comply with the European Union RoHS and UK REACH directives, Cucumber has received number of compliance statements testifying that Broanmain has carried out all reasonable material due diligence.

- Most of the sensor's plastic components are moulded from an ABS Polycarbonate blend. As a thermoplastic polymer, this is recyclable notes Broanmain operations manager Thomas Catinat. “The sensor casings themselves are made from virgin ABS. However, at the end of the product's lifecycle, the component can be recycled, melted down and made into another product or part.”

- Shorter MOQs and local production runs can also minimise polymer waste notes Thomas. “Due to the precision aspects of these components, we typically run Cucumber mouldings on our energy-saving all-electric machine. It gives us much tighter processing control, shorter start - ups and consequently less material wastage.”

- Citing another benefit of local quality control, Thomas added: “If there's an issue with the component or consumer trends dictate a change, the Cucumber team can easily visit us on site. This makes it much simpler to relay information and point out design modifications. Our in-house tooling engineers can then amend the component and run off a new batch. Waste is kept to a minimum and production schedules are tightly maintained.”

- Broanmain has proved themselves to be much more than a propagation partner. Now in production, Cucumber is thankful that they have a moulding firm at their side with the capacity and 'can-do' attitude to scale up their manufacturing capacity when needed.

- “There's already a conveyor belt of new products on the horizon,” noted Mark. Although there are expected to be a number of common parts, another 20 Cucumber light sensor tools will soon be in development.

- “No business should ever underestimate the benefit of expert industry knowledge. For a small and growing supplier like ourselves, proximity to an extended team really makes commercial sense. It drives innovation and quality. And equally, the rapport we have built up means that we have the assurance of an extended team and manufacturing partner that can grow with us,” added Mark.

Plastics Industry to Boost Intelligentisation and Decarbonisation of New Energy Vehicle

Key Highlights:

- The Chinese NEV market exhibited strong growth in 2023, with a 30.4% market share, 99.1% YoY increase in exports, and a significant focus on intelligentised design elements, leveraging advancements in plastics technology.

- Plastics play a crucial role in the lightweighting and safety initiatives of NEV innovation, with developments such as resin frames, lightweight foam, and polymer - based solutions contributing to increased driving ranges and reduced costs.

- BMW and Volkswagen are gradually increasing the proportion of recycled plastics in new cars whilst Honda and Toray are exploring the potential application of chemically recycled nylon 6. The Chinese automotive market has gradually regained momentum in 2023 where the performance of new energy vehicle (NEV) is particularly eye-catching. Under the trend of “reverse joint venture” and “exporting technology", what are the materials and processing technologies needed for the NEV sector to bringing a safer, more comfortable and sustainable experience?

According to the data released by the China Association of Automobile Manufacturers (CAAM), China's automobile production and sales increased by 8% and 9.1% year-on-year from January to October respectively, while NEV production and sales increased by 33.9% and 37.8%, with a market share of 30.4%; and NEV exports reached 995,000 units, up 99.1% year - on - year.

Young consumers pay more attention to NEV. Relevant research studies show that consumers under 30 years old account for up to 43% of NEV users. In addition, young consumers prefer NEVs of high aesthetic appeal.

PLASTIC RAW MATERIALS

Borealis Among First to Complete Operation Clean Sweep Certification

Key Highlights:

- Borealis is among the first plastics producers to achieve the Operation Clean Sweep Certification.
- Third party external audits were successfully completed in two locations in Belgium.
- European Industry stewardship certification program brings entire plastics value chain together to achieve zero pellet loss.
- After extensive third - party audits according to the Operation Clean Sweep Standard in December 2023, both locations achieved the Operation Clean Sweep Certificate, a unified and equitable certification scheme for pellet handlers across the entire value chain. This recognition comes after contributing to the development of the Operation Clean Sweep Standard via a successful pilot audit in 2021 and underscores the company's commitment to environmental sustainability and responsible business practices. It also underscores the company's commitment to environmental sustainability and responsible business practices.
- The Operation Clean Sweep Standard is the next evolution of an international program dedicated to preventing the loss of plastic pellets during manufacturing, transportation and final conversion processes.
- Plastic pellets, also known as nurdles, are small pre - production plastic particles that, if improperly managed, can contribute to water pollution and harm aquatic/marine life. The program provides industry-specific guidelines and best practices to ensure the proper handling and containment of plastic pellets, ultimately minimising the risk of environmental impact.
- As part of its unwavering commitment to Operation Clean Sweep, Borealis has implemented all requirements to fully comply with the Operation Clean Sweep Standard and consequently put in place a comprehensive set of on-site measures aimed at preventing and responding to pellet spills, should they occur.
- Notable initiatives include the installation of big and small preventive measures to keep pellets in their designated systems as well as retention measures such as screens, pellet separators, and skimmers at various operating sites. These measures are consistent with the company's commitment to environmental stewardship and ensure that plastic pellets are contained within the facilities. Borealis' proactive approach is designed to test and refine processes to ensure that the company's operations meet the highest standards of pellet containment and prevent any unintentional release into the environment.
- Borealis aims to have all of its polyolefin locations Operation Clean Sweep certified by the end of 2024.
- "Receiving the Operation Clean Sweep Certificate is a testament to our ongoing commitment to environmental responsibility and emphasises our purpose of re-inventing essentials for sustainable living. By actively

participating in initiatives such as Operation Clean Sweep, Borealis continues to research and implement innovative solutions to reduce its environmental footprint across all its operations. The Operation Clean Sweep Certificate serves as a benchmark for our ongoing efforts to build a prosperous and sustainable future for all," says Thomas Gangl, Borealis CEO.

Asahi Kasei Acquires ISCC PLUS Certification for Several Additional Products

Key Highlights:

- Asahi Kasei and its affiliated company secure the ISCC PLUS certification for a range of products, including thermoplastic elastomers, rubbers, and engineering plastics.
- The Asahi Kasei Group will actively utilise biomass raw materials, recycled inputs, and renewable energy sources, contributing to the development of a carbon-neutral material value chain.
- The ISCC PLUS certification ensures proper management of biomass and recycled materials throughout the supply chain, allowing the company to offer ISCC PLUS certified grades for specified products.
- Asahi Kasei and an affiliated company have acquired the widely recognised international sustainability certification ISCC PLUS for several products in the fields of thermoplastic elastomers and rubbers, engineering plastics, and other materials.
- The Asahi Kasei Group aims to contribute to a carbon-neutral material value chain by focusing on initiatives such as the use of biomass raw materials, recycled raw materials, and renewable energy while deepening collaboration with other companies based on its medium-term management plan for fiscal 2024 focused on the theme "Be a Trailblazer."
- The ISCC PLUS1 certification ensures that biomass, recycled materials, etc. are appropriately managed in the whole supply chain including manufacturing. With the acquisition of this certification, Asahi Kasei will be able to provide ISCC PLUS certified grades of below products.

ISCC (International Sustainability and Carbon Certification) is an international certification system that offers solutions for the implementation and certification of waste and residue raw materials, non-bio renewables and recycled carbon materials and fuels. ISCC PLUS is a certification system that covers mainly bio-based carbon materials which are produced outside of the EU and supplied globally, and to manage and ensure sustainable raw materials in the supply chain.

The Fantasy and Reality of Raw Material Shelf Life: Part 2

For the vast majority of thermoplastics, the stability of the materials can be stated in years, not months. But there are exceptions where shelf life can be a serious issue. The idea of material expiring as it sits on the shelf in the warehouse is often a concept with no scientific basis. However, there are materials that do have a shelf life. The majority of these are thermosetting materials, either rigid or elastomeric.

The time-sensitive nature of crosslinked materials is related to the composition of these materials and specifically to the fact these compounds, as provided to the molder, are not completely formed polymers and the catalyst that aids in completing the polymerization and crosslinking process is a constituent in the compound. This catalyst, because it is chemically active, can react prematurely or it can volatilize and be lost to the system.

Most of my time in manufacturing was spent at a company that did both thermoplastic and thermoset molding. We were never concerned with the shelf-life stability of our thermoplastic materials. But some of our thermoset compounds were a different story. We processed a particular grade of melamine-phenolic resin that had to be

processed within nine months of being received from the supplier. Failure to do so would result in a material that would not crosslink. This was a demonstrable phenomenon and lab analysis confirmed that the energy associated with crosslinking would not be detected if an old sample of the material was tested.

Bulk molding compounds (BMC) and sheet molding compounds (SMC), a type of unsaturated polyester, utilize styrene as a key ingredient. The styrene is used to "dissolve" or soften the low molecular weight linear polyester pre-polymer and participates in the crosslinking reaction which is promoted by a free radical initiator. Walking past racks of this material in the plant, the smell of styrene is evident. This confirms that some of the styrene in the compound is volatilizing.

Styrene as a Plasticizer

Over time, while the material sits in storage, it will become less pliable and somewhat harder because the styrene is essentially acting as a plasticizer. This will influence processing of the material, affecting the time required to achieve minimum viscosity, gel time and degree of crosslinking. If it is stored for long enough, the material may become intractable. We achieved a much longer shelf life for this material in our facility by building a refrigerated storage room where we kept the raw material until a day or two before we were ready to run it. This also made the material more consistent over time.

I encountered an extreme version of this while working on some epoxy parts molded for field effect transformers. Some of the parts were exhibiting defects associated with premature curing that prevented the material from flowing into the mold properly. The problem was traced to the way the material was being handled prior to processing. This particular compound had to be kept at very cold conditions until three days before processing.

It was then brought out of the refrigerated storage room and gradually warmed to room temperature over a two-day period and then had to be processed on the third day. If it sat at room temperature for any longer, or if the temperature of the room increased due to seasonal fluctuations, the defects associated with premature crosslinking would appear. These are clear instances of true shelf life concerns. They apply to a wide range of crosslinkable materials (including rubber compounds) where — depending upon the polymer type and the cure system — shelf life of the pre-cured compound can be as little as 2-3 weeks.

In plasticized materials and particularly in crosslinked systems prior to processing, shelf life can be a real concern.

Another class of materials where shelf life of the raw material is a consideration are thermoplastic elastomers that rely on the use of plasticizers. Plasticizers are typically fluids that are blended with the polymer to achieve a balance of properties. They are usually of lower molecular weight than the polymer and are therefore prone to migration. The rate of this migration is increased at higher temperatures; and in molded components, the process can also be accelerated by direct contact with mating parts made from materials that can absorb the plasticizer. In the raw material, this migration will be governed by a variety of considerations which include temperature and humidity.

Therefore, storage conditions are a critical factor in determining shelf life, including whether the material is still in its original packaging and whether that packaging has been compromised. Flexible PVC and plasticized nylons are among the materials that can change over time. The suppliers of the raw materials tend to understate the amount of time the material can be stored without exhibiting a loss in performance, but problems have been shown to occur in materials of this type over a period of a few years even with good storage practices.

Storage Conditions Matter

This brings us to the topic of storage conditions. Generally, the lower the temperature and humidity at which the material is stored the longer it will maintain its integrity and processability. Exposure to ultraviolet light, ozone, and nitrogen and sulfur oxides produced by combustion will also shorten the shelf life of a material and potentially produce changes in the color of the product as well. Most warehouses where raw material is stored are not climate controlled. Therefore, depending upon the location, temperatures and humidity can become elevated for much of the year.

One February, I worked for a week at a plant in Chennai, India, where the outdoor daytime temperature was already reaching 90oF (32oC) and the temperature in

the warehouse was considerably higher. These types of conditions can have a variety of accelerating effects on the stability of a material.

When in doubt, testing will determine whether storage conditions influence the integrity of the material.

Silo storage introduces another set of variables that can include rapid changes in relative humidity. And, finally, there are the situations where due to a lack of indoor warehouse space, raw material is simply placed outdoors where the elements of sunlight, changes in temperature and humidity, and pollutants in the air can act with greater effect on the material — regardless of whether it is in its original package or has been transferred to a secondary container.

In summary, shelf life is a factor to be considered when managing material storage. For the vast majority of thermoplastics, the stability of the materials can be stated in years, not months, and the notion that a polymer expires like a food or a pharmaceutical is a fanciful notion that may be used by material suppliers to absolve them of responsibility for an out - of - specification condition. However, in plasticized materials and particularly in crosslinked systems prior to processing, shelf life can be a real concern and extra measures such as refrigeration can and should be used to extend the useful life of a product.

'Safer' Processing Aids for Range of PE Blown Film, Pipe and Wire & Cable

Baerlocher's new Baerolub AID additives aimed at transition from per- and polyfluoroalkyl substances (PFAS).

A new family of polymer processing aids (PPAs) from Baerlocher USA have been launched to ensure a smooth transition in a range of PE blown film, pipe and wire & cable applications from per - and polyfluoroalkyl substances (PFAS) , which have been found to present potential health hazards and face increased regulations for their use in both the EU and the U.S.

Available as neat additives (pastilles, rods, granules and powders), custom blends and in masterbatch form, the Baeolub AID PPAs have been shown to deliver rapid melt fracture clearing for metallocene and Ziegler-Nattia LLDPE and HDPE, reportedly equaling or surpassinc clearing times of traditional PPAs containing PFAS and siloxanes. Moreover, these additives are said to be cost-competitive with both traditional and new PPAs, and are said to be compatible with other key additives such as antiblock and slip agents commonly used in film.

Because they are soluble in the polymer matrix, these additives have been shown to provide better haze performance than insoluble PFAS - containing PPAs and excellent control of frost line height, and can also reduce die build-up and extruder pressure. Because they are designed for maximum compliance with global food contact regulations, Baerolub AID PPAs are well suited for applications including PE films for food packaging and resins for potable water pipe. Says technical director Robert Sherman, "To give our customers a choice, we developed two grades of Baerolub AID. If you're looking for the fastest time to clear the melt fracture in metallocene LLDPE, consider Baerolub AID 2201. In certain conditions, you may wish to select Baerolub AID 2202, which provides excellent melt clearing times compared to traditional PPAs."

Extreme Cold Weather Raises Concerns about the Freezing of Polypropylene Supplies in the United States

Polymer supply in the United States is facing a severe threat due to the temporary closure of polypropylene (PP) manufacturing plants in Texas amid bone-chilling cold waves. Temperatures across 30 states have fallen to minus 60-70 degrees. While cold waves are not uncommon in the United States, and most plants are typically prepared to handle such situations, plant operations at polymer units have become exceptionally challenging this year due to the record chill weather. At one point this season, all 30 states were under chill advisories or warnings. However, the temperature in the United States is forecasted to plummet again.

The chilling Arctic weather has exacerbated the difficulties already faced by US citizens. On Saturday, a series of intensified storms, coupled with unaccustomed travellers, including workers and executives, led to significant problems in reaching their destinations, whether it be the office or factories. Experts have labelled the latest cold

waves as an Arctic blast, causing the freezing of liquid transportation pipes and resulting in substantial supply disruptions.

Polymer plants closure

Headquartered in Houston, Texas, Enterprise Products Partners LLP, an American midstream natural gas and crude oil pipeline company, halted production at its propane dehydrogenation plant located in Mount Belvieu, Texas. In a filing with the Texas Commission on Environmental Quality (TCEQ), the company revealed a disruption in ethane supply due to extreme adverse weather conditions in the region. The disruption has led to the shutdown of the propane dehydrogenation plant, which has a considerable annual capacity of 750,000 tonnes of propylene. The interruption caused a necessity of gas flaring.

Earlier, the operation at the Mount Belvieu plant of Enterprise Products Partners LLP was suspended due to a fire accident. The fire prompted a shutdown of the propane dehydrogenation unit, which, similar to the recent case, caused gas flaring. The company attributed the fire accident to the power outage, underscoring the susceptibility of such facilities to various operational challenges. However, this plant was restarted on December 20, 2023. Also, the company faces other operational challenges such as adherence to environmental regulations, safety equipment, and inadequate preparations to handle extreme weather conditions.

It is worth mentioning here that the smooth functioning of the supply chain channel plays a pivotal role in the transition of raw materials for producing finished products. Therefore, supply disruption of raw material may have a ripple effect across downstream industries, for both captive manufacturing units or outside the same factory premises. Polypropylene (PP) is a derivative of propylene, and propylene is a product of propane. Polypropylene finds application in a wide range of products such as packaging materials, automotive components, textiles, and several others. Any interruption in the production of propane or propylene may have a substantial implication on the production and supply of polypropylene.

Deep Freeze Hitting the Oil Industry

According to reports, a US Gulf Coast refinery in Texas shut down operations due to a severe winter storm causing snow and rain across most parts of the nation. Several others including North Dakota halved their oil production as cold waves triggered the freezing of liquid through pipelines, and also in storage. Reports said that TotalEnergies' Port Arthur (Texas)–based refinery with a capacity of 238,000 barrels per day (bpd) also witnessed a plantwise power outage as a winter storm brought frigid temperatures to the US Gulf Coast. Additionally, several other plants witnessed malfunctioning at various locations across manufacturing units.

Extreme cold weather triggered North Dakota's oil production to fall by 50 percent and created other operational challenges. The State's Pipeline Authority said that oil production at this site was estimated to have fallen between 600,000 – 650,000 bpd. Similarly, ExxonMobil Corporation restarted a gasoline - producing fluidic catalytic cracker and coker at its 564,440 bpd refinery in the Houston suburb of Baytown, Texas, to normal operation after a malfunction triggered, following a massive cold wave crossed the area recently. Another refinery Flint Hills Resources having its capacity at 343,000 bpd in Corpus Christi, Texas, was significantly impacted by seasonably cold weather. The company's West Plant was affected by freezing rain overnight where instrumentation to operate equipment got severely damaged.

Force Majeure

Over half a dozen petrochemical plants across the United States have declared force majeure at their plants due to the frequent occurring of cold waves. Three refineries in Port Arthur, including Motiva Enterprises' 626,000 bpd plant, the largest refinery in the United States have announced a major unit shutdown. The Motiva Refinery began a crude unit-coker overhaul in the second week of January.

Marathon Petroleum Corp reported a technical failure on the 64,000 bpd residual hydrotreater at its 593,000 bpd Galveston Bay Refinery in Texas City, the company said in a regulatory filing. Later, the plant returned to its normal operation. Valero Energy Corp began a planned overhaul on the large crude distillation unit (CDU) at its 335,000 bpd refinery in Port Arthur. Delek reported a malfunction at its 73,000 bpd refinery in Bog Spring, Texas, due to cold temperatures, the company said in a regulatory filing.

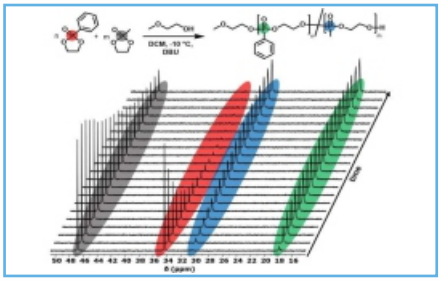
Also, Volero informed regulators of a technical snag at its 195,000 tpd McKee refinery. Additionally, Valero brought down a coker and a vacuum distillation unit (VDU) associated with AVU-146, in addition to shutting the 210,000 tpd AVU-146 CDU. The company informed residents near its 210,000 bpd Houston refinery that it may have to use the plant's safety flare system to manage excess material, as the refinery cannot process hydrocarbons normally. According to the regulatory filing, units across half of Valero's Port Arthur refinery will be affected by the shutdown of AVU-146. Which is the larger of two DCUs that begin the refining process by breaking down crude oil into feedstocks for all other units at the refinery..

US – a Low - Cost Producer

According to the International Energy Agency (IEA), a Paris-based autonomous intergovernmental organization, the United States has returned to prominence as a low-cost region for chemical production after two decades of stagnation and decline, thanks to the shale gas revolution. Today, the United States is home to around 40 percent of the global capacity to produce ethane - based petrochemicals. Led by Saudi Arabia and Iran, the Middle East remains the low-cost champion for key petrochemicals, with a host of new projects announced across the region.

China and Europe each account for around a quarter of the global capacity for naphtha-based, high-value chemicals, but they have only very small shares of capacity based on lighter feedstocks because of limited availability. China's burgeoning coal - based chemical industry, once a speculative proposition, now embodies steady technological improvements. India is poised to grow strongly from its current level of only 4 percent of global capacity to satisfy increasing domestic demand.

Researchers Develop Biodegradable Polymers That are Traceable Without Toxic Contrast Agents



Polyphosphoesters, molecules containing phosphorus as the central element, are easily traceable without the need for contrast agents, thanks to developments by researchers from the University of Twente (UT). Normally, these molecules display a similar molecular composition to our DNA, leading to considerable "noise" in the image.

The UT researchers provided a solution and developed unique polymers that are traceable with magnetic resonance imaging (MRI). Dr. Olga Koshkina, Project Leader in the Sustainable Polymer Chemistry Group, published this new concept of traceable polymers in Communications Chemistry.

The researchers adjusted the properties of polyphosphoesters (special polymers with a molecular structure inspired by DNA and RNA). As a result, the polymers acquired a different "MRI color," making them more distinguishable from the natural background. Additionally, they exhibit other physical MRI characteristics suitable for imaging.

For certain biomedical applications, polymers need to be traced within the body, a task typically accomplished through MRI. However, to effectively image body parts by MRI, toxic contrast agents are often required

MRI and MRI contrast agents

MRI is a radiation-free imaging technique routinely used in clinics today. Medical examinations using MRI typically require contrast agents. Current clinical contrast agents often alter the contrast of body water and tissues by employing paramagnetic heavy metals such as gadolinium to modify the signal from body water.

While efficient in imaging, the use of heavy metals raises concerns due to their accumulation in the body and the environment. Heteronuclear "hotspot" MRI does not require metals and directly detects other MRI-active elements. These elements serve as MRI dyes, creating a new color on an anatomical image.

Polymers in Biomedical Applications

Polymeric materials have enormous potential in medical applications, including the development of new therapies. However, to develop effective personalized treatments, it is crucial to track polymers in vivo. Until now, this was only possible with additional labeling, such as attaching radioactive

tracers for nuclear imaging or fluorine-containing molecules (also called "PFAS") for "hotspot" MRI.

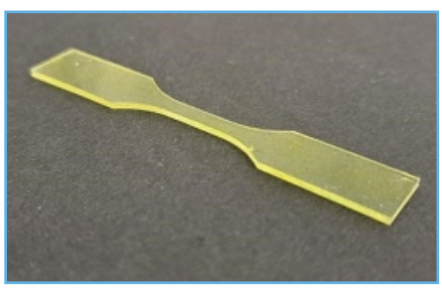
UT introduces a new concept, in which polymers can be tracked without a label, using directly the phosphorus signal in the polymer's molecular structure.

New Possibilities

The research opens a new avenue for traceable and sustainable polymers with MRI. They can be used as new MRI agents, as drug delivery vehicles, or as biomaterials for tissue regeneration. The researchers at the University of Twente plan to conduct further fundamental research in this area and have opened up new possibilities for biodegradable, traceable polymers.

In addition, they are currently working on establishing a spin-off company to ensure that this groundbreaking research can be applied to real patients in the long term.

Scientists Utilize Waste CO2 as Monomer to Produce Recyclable PU



A scientific team has developed a new polyurethane production technique using CO2 to create new types of easily recyclable plastics. The study, published in the Journal of the American Chemistry Society (J.A.C.S.), could provide a solution for the development of truly sustainable plastics.

Commodity plastics have transformed global industry. Whether in construction, clothing, vehicles or food packaging, these plastics are everywhere in our daily lives, so much so that their global use has been estimated at around 460 million tons in 2019.

This number is staggering, but not surprising, because plastics, also known as synthetic polymers, have met a large success thanks to their irreplaceable characteristics: they are light, cheap and incredibly versatile," explains Christophe Detrembleur, a chemist at the University of Liège. However, the fact that they are difficult to recycle, or even impossible to recycle in the case of thermosets, has serious consequences." This impossibility of recycling not only leads to the depletion of the fossil resources used to manufacture them, but also to their very long - term accumulation in nature and the oceans.

It is therefore imperative for our society to quickly design and manufacture plastics that can be easily recycled at the end of their life.

In this context, a study led by researchers at the University of Liège and carried out in collaboration with the University of Mons and the University of the Basque Country, reports on a new technique for producing easily recyclable polyurethane plastics.

The special feature of this approach is the use of carbon dioxide (CO2) -- a major emblematic waste of our society -- as a raw material for the production of the building blocks, or monomers, needed to manufacture these new products," explains Thomas Habets, PhD student at ULiège and first author of the article. The structure of the monomers can be easily modified, making it possible to produce plastics with a wide range of properties, from highly malleable elastomers such as silicones to more rigid materials such as polystyrene." These plastics have a chemical structure that resembles a three - dimensional network rather than long linear chains.

This structure, which is generally associated with thermosets that are very difficult to recycle, makes them more resistant than plastics made from long molecular chains.

The polyurethanes created here have new 'dynamic' chemical bonds, which means that despite their thermoset structure, they can be reshaped by exchanges of chemical bonds under relatively mild reaction conditions.

The greatest advantage of this new technology lies in its ability to vary the range of properties accessible while offering multiple ways of recycling materials at their end-of - life.

“These new plastics can be recycled in multiple ways, either by simply reshaping them by heating them, or by mixing different types of plastic to create hybrid materials with new properties, or by breaking them down into their constituent monomers, which is ideal for eliminating additives such as dyes or recycling composites," continues Thomas Habets.

With a view to the future industrialization of CO2 valorization, this study demonstrates that waste Co2 can be directly used as a chemical resource. "This is the first initial study using our new building blocks and plastics," enthuses Christophe Detrembleur, "but it is quite remarkable to see that our materials can already reach properties similar to those of some conventional petro-sourced plastics." This new technol.

Masterbatch for Ideal Black Plastic Coloring

Blending elegance and coolness, black is a premium choice color for an array of plastic products ranging from consumer goods and luxury items to cosmetics and industrial products. Grafe, as a seasoned specialist in standard plastics' black coloring, has an expansive portfolio of corresponding masterbatches that has powered the creation of high-quality solutions for an increasing number of technical plastics and their respective applications.

An innovative addition to the company's offerings is the Base Black masterbatch for polypropylene (PP). It brings to the table an efficient alternative to most common automotive black shades, offering superior availability, a reasonable price point, and flexibility in adjustments. It stands out in meeting OEM tolerance in production processes while only slightly deviating from the direct colors.

For the production of staple fibers and in film extrusion, Grafe Group, Blankenhain / Germany, offers a masterbatch that is suitable for black coloring of polyethylene terephthalate (PET). Very good carbon black and fiber quality are special features of the product. It has the usual market carbon black content of 30% with very good dispersion. This is necessary in order to be able to color fibers reliably.

For more information contact on email: grafe@grafe.com

New Additive for Matte Finish In Plastic Parts From CAI Performance Additives

CAI Performance Additives announces the launch of ST-B50T™ to provide the customers with a new and effective way to achieve a matte finish or lower the gloss of their plastic parts.

ST-B50T™ is an effective way to achieve a matte finish or lower the gloss of plastic parts made from ABS, PC/ABS, PC/ASA, and PC/PBT alloy.

Ability to Achieve Extremely Low Glossiness

It offers a number of advantages over other matte additives, including its ability to achieve extremely low glossiness, its mild impact on mechanical properties, and its broad range of applications.

Customers enjoy ST-B50T™ with:

- Automotive interior and exterior parts
- Home appliance parts
- Electronic devices
- Medical devices
- Consumer goods

Our commitment to providing innovative solutions for the plastics industry, and the introduction of ST-B50T™ is just one example of our dedication to delivering superior products that meet the evolving needs of our customers. ST-B50T™ is available now in commercial quantities.

Ampacet Launches ProVital + GermsClean, Medical - Grade Antimicrobial Masterbatch

Ampacet, a global masterbatch leader, has introduced ProVital+ GermsClean, an additive developed to protect plastic components in healthcare facilities against the proliferation of microrganisms by blocking the growth of bacteria and slowing down fungi multiplication, preventing the formation of harmful biological layers.

Cut Loading Time Through Direct Charge Blending

Direct charge blender loading, a vacuum - powered automation process, can dramatically improve loading time and reduce material costs. In this article, we address ten common questions to help you determine if the systems are right for your facility.

While pneumatic conveying manufacturers are experts at moving powders and bulk solids, and blender manufacturers are experts at homogenizing powders and bulk solids, **direct charge blender loading** systems unite these two technologies while automating the process. Direct charge blender loading eliminates manual lifting of heavy bags, stair - climbing, and messy dumping of product into and out of tumbler blenders, while reducing the overall loading time of tumble blenders.

By incorporating dilute phase vacuum conveying technology in your process, powders and other bulk materials are conveyed to tumble blenders at rates up to 6,000 pounds per hour – safer and more efficiently with no spills or waste.

While pneumatic conveying manufacturers are experts at moving powders and bulk solids, and blender manufacturers are experts at homogenizing powders and bulk solids, **direct charge blender loading** systems unite these two technologies while automating the process. Direct charge blender loading eliminates manual lifting of heavy bags, stair-climbing, and messy dumping of product into and out of tumbler blenders, while reducing the overall loading time of tumble blenders.

For process engineers interested in the most efficient, consistent, and scalable powder and bulk material mixing solution, **tumble blenders and dryers** are statistically proven to provide the lowest standard deviation of all options. Today's modern technological advances in vacuum conveying allow for safer and more efficient operations for applications requiring homogenized mixing while maximizing plant safety and OSHA compliance.

1. What is “Direct Charge Blender Loading” ?

This unique adaptation of **vacuum transfer**, “direct charge blender loading,” uses a vacuum - tolerant process vessel like a tumble blender as the primary receiver of the powdered material charged to it. Material is vacuum - conveyed into and out of the process vessel automatically. This automated system loads and unloads pre - and post - blend bulk materials. Direct charge blender loading eliminates the vacuum receiver's conventional loading and discharge cycle, transferring material into the blending process without spills and fugitive dust, keeping housekeeping at a minimum. With material transfer being completely automatic, there is no manual handling of the material, no operator exposure to dust or harmful materials, no ingredient loss or waste, and no product contamination. Material can be drawn from floor level via wand, from bulk bags, or up high from mezzanines. The system is packaged with timing controls and automatic pulse filter cleaning.

2. What are the Loading and Unloading Options?

Direct charge loading technology allows for the vacuum conveying of powders and other bulk solids from various sources, whether a drum or bulk bag, and vacuum conveys the bulk materials to the blending vessel. Material can be conveyed from floor to mezzanine, and to upstream process equipment such as screeners or sieves. Once ingredients are blended, material is then vacuum conveyed out of the tumble blending vessel and conveyed to the preferred post-blend container. This vacuum transfer process is fast, secure, and simple. It reduces any chance of batch contamination, waste, loading time issues, or operator exposure to fugitive dust.

3. What Types of Materials Can be Vacuum Transferred to a Tumble Blender?

The principal of vacuum transfer has been proven as a "better way" to move a wide range of powders and bulk materials, maximizing process efficiency by eliminating manual material handling. Considerations include material consistencies, moisture content, and/or particle size, but direct charge blender loading technology conveys virtually any dry powder or granular bulk material that can be vacuum conveyed through a hose or tube.

4. How are Powders Moved Into and Out of Containers Or Into a Process Vessel?

The tumble vessel is the center of the mixing project, acting as the vacuum discharge receiver. Powders can be conveyed from any ingredient container such as a drum or tote box, using a hand - held vacuum wand, or a bulk material device like a bulk bag unloader or bag dump station, with material transferred through vacuum hose lines and discharged into the blender vessel. In reverse, the same material transfer vacuum lines can empty post - mix ingredients from the vessel and discharge them directly into the container(s) of choice. Inline filters on the direct charge blender loading system guarantee zero loss of material transfer between drum and vessel and prevent powder from collecting on the pump.

5. Are There any Industry Standards Applied to Direct Charge Blender Loading Technology?

Process vessel sizes and shapes should be designed and manufactured per USDA - sanitary design standards suitable for the food, beverage, pharmaceutical, nutraceutical and chemical industries. Blenders should be Mill - Certified, inspected, and American Society of Mechanical Engineers (ASME)-certified. Vacuum conveyors should be designed for cleaning and sanitation requirements for the industry being served.

All documentation and testing is consistent with standard cGMP (Current Good Manufacturing Practices) quality controls. Calibration and Material Certification(s) are also available.

Safety standards for combustible dusts (NFPA 652) and control of static electricity (NFPA 77) are also applied.

6. What Seal Options are Available On Vacuum Tumble Dryers?

There are two (2) seal options available, standard packing and/or a mechanical seal design.

The standard packing options are easy to install, with a lapped tolerance of less than one micron (0.00039 inches). Vacuum dryer systems have extremely low RPMs, making them better for packing.

The mechanical seal design is sensitive to installation errors so measurements must be precise. Any vibration or shaft deflection can cause catastrophic results. When cleaning and servicing the units, fluid can solidify, crystallize, or become viscous when the mixer / dryer is not running.

The mechanical seal design does not generate much heat and seldom requires cooling. Newer face materials and the latest elastomers are chemically compatible with a wide cross-section of chemicals and cleaners. Mechanical seals are better than packing when designing a high - speed shaft application.

Packing is best for slow - speed or high - temperature applications. Packing seals and mechanical seals will hold the same vacuum and maintain the same transfer leakage rate.

For more information about vacuum conveying and direct charge tumble blender loading visit www.vac-u-max.com or www.okgemco.com

Source: Plastic Technology Insider

How to Effectively Reduce Costs with Smart Auxiliaries Technology

As drying, blending and conveying technologies grow more sophisticated, they offer processors great opportunities to reduce cost through better energy efficiency, smaller equipment footprints, reduced scrap and quicker changeovers. Increased throughput and better utilization of primary processing equipment and manpower are the results. Plastics processors have experienced an array of challenges over the last few years. Materials shortages, rising energy prices, the lack of skilled labor – they've all converged to pinch margins in ways we've never experienced before. This perfect storm is forcing companies to reexamine their production processes to find new efficiencies to reduce costs while increasing throughput. Today, there are pathways to running a more profitable plant by implementing more advanced auxiliaries that allow better utilization of primary processing equipment, more consistent quality, quicker changeovers, and best of all, reduced cost of operations.

In general, while the cost of resins finally stabilized this year, though at historically high prices, there are still supply chain issues in some resin grades, while future expectations come into question with the growing cost of polymer feedstocks. And, then there's the rising cost of energy which is real concern when it comes to the bottom line. According to Statista, the average retail cost of electricity rose from 7.18 cents per kilowatt hour in 2021 to 8.45 last year with, and with dramatic differences in rates from state to state. So, for many plants, the most obvious cost reduction target will be ***reducing energy consumption***. But there are many other sources of waste in most processing plants that also contribute significantly to shrinking the bottom line.

Moretto is a well - known and established provider of a wide range of auxiliary equipment with a global reputation for advanced technology in auxiliaries and overall processing systems. Here are some of their suggestions on how to run a more efficient plastics processing plant by choosing the right drying, blending and conveying technologies.

Reducing Energy Costs

Moisture Meter works by passing electromagnetic waves through the resin and reading the exit wave patterns which precisely indicate the true moisture content of the material.

For many processors, the elephant in the room is their electricity bill. For auxiliary equipment that points directly at resin dryers as a good place to begin assessing cost reduction opportunities. That cost will certainly not go away, but newer drying technologies can go a very long way in bringing energy costs under much better control.

A primary challenge of drying is ***understanding the moisture content of the incoming resin pellets.*** This will vary based on resin storage methods, ambient plant conditions, and even the season of the year. Supplier drying recommendations often can't account for that variability so the best - guess method is frequently used to determine drying time, which can often can lead to under - or over - drying. The former can cause quality problems. The latter can too, and it absolutely wastes energy.

Today, most dryers have the ability to measure the moisture content of the dryer air, which is a major improvement. But a more efficient and accurate solution is to ***measure the moisture content of the resin itself.***

Moretto has a product that does that, called ***Moisture Meter***, that works by passing electromagnetic waves through the resin and reading the exit wave patterns which precisely indicate the true moisture content of the resin. The main benefits to this process is ***automatic early warning detection*** so you are aware of potential issues ***before they happen***; and process verification so you can actually track back in time what occurred hours ago, days ago, even months ago in the event you are challenged to prove your drying process was accurate for that specific batch.

Consistency in the drying hopper is also important for the sake of quality, which means all material must have the same access to dry air and resonance time. With many traditional designs, uneven pockets of material can form due to poor flow through the hopper which results in variability of exposure to dry air and stagnant material accumulation. Moretto has an advanced technology called ***OTX (Original Thermal eXchanger)*** in their drying hoppers that is designed to deliver optimized mass flow of materials for highly predictable resin drying. More compact than traditional dryers (think space utilization), the design uses a center core that smooths resin movement with air delivery located low in the vessel for improved cone drying. Because the material comes out of the dryer uniformly "pre-heated," it is often possible to ***run injection molding and extrusion processes at lower temperatures on the press, further saving on energy costs.***

For more information please visit Moretto.com.

Coperion Optimises ZSK 18 MEGAlab Extruder Design for Greater Flexibility

- Coperion has upgraded its ZSK 18 MEGAlab laboratory extruder with new features, including pluggable cartridge heaters for rapid barrel reconfiguration, an electrically securable maintenance door for increased operational safety, and a patent - pending feeding platform for flexible arrangement of up to four feeders.

- These improvements aim to enhance flexibility, simplify maintenance, and reduce downtime, making the extruder suitable for research and development projects as well as small - scale production.

- The newly developed feeding platform attached to the ZSK 18 MEGAlab allows for flexible positioning of up to four feeders, simplifying ingredient addition and facilitating cleaning.

- Coperion has equipped its ZSK 18 MEGAlab laboratory extruder with numerous new functions that provide significantly greater flexibility and safety in handling.

- Pluggable cartridge heaters instead of hard wired ones now allow for rapid barrel reconfiguration as well as straightforward cartridge heater exchange. An electrically securable maintenance door on the gearbox lantern increases operational safety and at the same time provides quick access, reducing downtimes for screw changes and system maintenance. Moreover, feeders for this laboratory machine can now be placed on a newly developed patent - pending feeding platform which allows up to four feeders to be arranged with maximum flexibility for adding ingredients in myriad ways.

- The ZSK 18 MEGAlab, with a screw diameter of 18 mm, has a specific torque of 11.3 Nm/cm^3 and achieves a maximum rotation speed of 1,200 min-1. It is ideally suited for use in research and development projects as well as for production of minimum quantities.

- The new , patent - pending feeding platform makes adding ingredients noticeably easier. It is firmly attached to the ZSK 18 MEGAlab extruder, allowing for flexible positioning of up to four feeders on all barrels of the process section as well as on the ZS-B side feeders. Moreover, the new feeding platform, which can be moved laterally along the machine, allows the feeders to be rotated and raised or lowered as needed. This feature creates enormous advantages particularly in the areas of research or recipe development, since feeding can be located flexibly at various points, in accordance with the process requirements.

- Elaborate, costly reconfiguration tasks and cumbersome additional frames for feeders are a thing of the past. Moreover, cleaning is simplified since the feeder can simply be pivoted away from the process section, thanks to the new platform. Where the previous model required a separate frame for each feeder, now up to four feeders can be mounted on the new platform. Time - consuming solution for mounting additional feeders, or reconfigurations, have like wise become a thing of the past. This improvement significantly increases flexibility as well as efficiency in the production process.

CIRCULAR ECONOMY/ BIO-PLASTICS/ RECYCLING

ALPLA Operates State - of -the - Art Plants Worldwide Under the Brand ALPLArecycling for the Production of rPET (recycled PET) and rHDPE (recycled HDPE)

ALPLA is focusing on the circular economy: the global packaging specialist invests more than 50 million euros annually in recycling and uses state - of - the - art technologies to produce recycled material. With an installed and projected output capacity of 350,000 tonnes per year, the company is one of the world's leading plastics recyclers. Analyses performed by the life cycle assessment specialist c7-consult now confirm efficient production at a total of four additional sites in Mexico and Germany. There, ALPLArecycling produces rPET and rHDPE, which produces up to 87 per cent fewer carbon emissions than virgin materials

'The figures confirm our path. We produce climate-friendly recycling solutions with a regional focus and convert the material into new packaging, thereby promoting the bottle-to-bottle loop. In this way, we ensure there are safe, affordable and sustainable packaging solutions all over the world,' emphasises Georg Lässer, Director of Business Development, Procurement and Sales, Recycling, at ALPLA.

Circular economy pioneers in Mexico ALPLArecycling produces 30,000 tonnes of rHDPE per year at its Toluca recycling plant in Mexico. Production in Toluca causes 0.69 kg of Co2e per kilogram. This is 70 per cent fewer emissions than with HDPE virgin material (2.32 kg of CO2e per 2/3 kilogram1). ALPLA has been operating what was the first PET recycling plant in Latin America at the time in Toluca since 2005 within the joint venture IMER (Industria Mexicana de Reciclaje S.A. de C.V.) together with Coca-Cola FEMSA and The Coca-Cola Company. It has an annual production capacity of 16,000 tonnes of rPET. According to the analysis, production causes only 0.38 kg of CO2e per kilogram, which is 87 per cent less than virgin PET (2.90 kg of CO2e per kilogram2).

The rPET production capacity in Mexico will be increased to 51,000 tonnes next year. The PLANETA plant (Planta Nueva Ecología de Tabasco) in Cunduacán is currently being built in cooperation with Coca-Cola FEMSA. The joint venture partners are setting new collection priorities with the model of paying for the receipt of used PET bottles and with social cooperations. 'Recycling is a key element in packaging solutions of the future. We want to convince people of the benefits and are drawing on substantiated data to do so. Exact analysis of our plants also enables us to improve our ecological footprint in a targeted manner,' explains Carlos Torres Ballesteros, ALPLA Managing Director, Mexico, Central America and the Caribbean.

Germany: household recyclables collection

With an annual production capacity of 43,000 tonnes of rPET, ALPLArecycling is one of the largest PET recycling companies in Germany. Materials sourced from household recyclables collection are processed at the site in Bitterfeld-Wolfen, Saxony-Anhalt. Unique sorting and processing plants were built worldwide for this

purpose in 2019. Recycling PET bottles from household collection leads to a slightly higher energy requirement for washing. For example, Bitterfeld-Wolfen causes 0.93 kg of CO2e per kilogram of rPET. This means the recycled material produces 68 per cent fewer emissions than virgin material. At the PET recycling site in Bad Salzuflen, North Rhine - Westphalia, it is just 0.68 kg of CO2e per kilogram, which corresponds to a reduction of 77 per cent.

ALPLArecycling's recycling plants in Austria and Poland, for which the PCF was likewise calculated in recent years, prove that there is still potential for optimisation. Through the additional use of renewable energy, rPET can produce a footprint of up to 0.21 kg of CO2e per kilogram, which corresponds to a reduction of up to 93 per cent. Switching to renewable energy is currently also being considered for plants in other countries.

About the ALPLA Group ALPLA is one of the world's leading companies in the manufacture and recycling of plastic packaging. Around 23,300 employees worldwide produce custom-made packaging systems, bottles, caps and moulded parts at 190 sites across 46 countries. The high-quality packaging is used in a wide range of areas, including for food and drinks, cosmetics and care products, household cleaning products, detergents and cleaning agents, pharmaceutical products, engine oils and lubricants. ALPLA operates recycling plants for PET and HDPE in Austria, Germany, Poland, Mexico, Italy, Spain, Romania and Thailand. Other projects are being realised elsewhere around the world.

About ALPLArecycling

With approximately 23,300 employees, 190 sites and annual sales of 5.1 billion euros (2022), the ALPLA Group is one of the world's leading companies in the production and recycling of plastic packaging. In the ALPLArecycling division, the company operates state-of-the-art recycling plants at 13 locations around the world and works with customers to develop sustainable packaging solutions that contain up to 100 per cent PCR. The annual installed and projected output capacity amounts to 266,000 tonnes of recycled PET (rPET) and 84,000 tonnes of recycled HDPE (rHDPE).

Bildtexte

ALPLA - Recycling . jpg: ALPLArecycling operates 13 state-of - the - art recycling plants worldwide for the production of rPET and rHDPE, four of which are joint ventures. ALPLA-PCF.jpg: ALPLA processes used plastic packaging into recyclate. The recycled material produced in Mexico and Germany causes up to 87 percent less CO2 emissions than virgin material.

Berry Launches Breakthrough Technology in Cling Film, Providing a Certified Recyclable Alternative to PVC Films

Berry Global has launched a new version of its Omni® Xtra polyethylene cling film for fresh food applications, which provides a high-performance alternative to traditional polyvinyl chloride (PVC) cling films. While Omni® Xtra is already an established solution

for the packaging of fruit and vegetables, meat and poultry, and deli and bakery products, the new Omni® Xtra+ film has improved elasticity, uniform stretching behaviour, and improved impact resistance. It also offers users significant sustainability benefits, including compliance with the anticipated requirements of the forthcoming EU Packaging and Packaging Waste Regulations (PPWR) and Extended Producer Responsibility (EPR). Omni Xtra+ is recyclable in line with current European recycling guidelines and has received certification of recyclability and compatibility from RecyClass and Interseroh, both leading industrial organizations working to achieve plastics circularity.

As well as being recyclable, the film offers an overall weight reduction of over 25% in density compared to PVC. Both features are a key part of Berry's sustainability goals and BMore Together initiative and support the aims of the Ellen MacArthur Foundation's Global Commitment, to which Berry is a signatory. Equally important, Omni Xtra+ film's improved mechanical properties enable the production of a thinner overall film than PVC versions while maintaining strength and puncture resistance. Berry's new advanced manufacturing process also creates a much higher clarity film than traditional PE films, matching that of PVC. This enables products

to be displayed to full advantage on retail shelves. Other advantages include excellent machinability and high elastic retention power, providing strong sealing properties for a tight pack and excellent product fixation. In addition, the film has superior clarity and strong anti-fog and condensation properties to provide a high level of product visibility. Furthermore, the film's ease of handling allows high through puts on automatic packing machinery. “Our Omni Xtra+ film represents a significant technical advance over previous versions, mirroring the performance of PVC in terms of usability and clarity whilst lowering packaging weights for improved yields,” commented Benjamin Hendriks, R&D Manager, Berry Global Flexible Films. “In addition, its enhanced performance and presentation provide customers with effective product protection and maximum on-shelf appeal while meeting consumer demands for more sustainable pack formats and helping companies achieve their own sustainability goals, particularly by avoiding hard to recycle PVC films.”

Banyan Nation Pioneers Digital Eco-System for Plastic Recycling in India

In the context of the Indian Circular Economy, packaging and particularly the plastic packaging industry, is getting its house in order. The brand owners and plastic packaging material producers, including what are known as converters, are grappling with design of new material structures that can be sorted after consumer use and put into the correct waste stream to yield productive materials, which can be added to new materials for few containers instead of being destined for landfills.

There are numerous companies that come up in Google search of Indian Packaging or plastic recyclers- some of them are new and novel and others that have considerable experience and a track record that is putting them on the path from the good idea to a financial viability, Banyan Nation based in Hyderabad, is one such company.

The latest draft update of the regulations has been issued by the Central pollution Control Board of the Ministry of Forests and Environment via a gazetted document dated 16 October 2023. This follows the significant revisions of February 2022 that established the guidelines for Extended Producer Responsibility to the original rules issued in 2016.

While the regulations are developing and coming into force, companies such as Banyan Nation, which have tackled the difficult issues of collecting and sorting plastic waste and the technical issues of producing useful recyclates for lateral use in similar packaging, have started attracting their second round of investment.

Found in 2013 by two well-educated persons with global business experience, the venture has attracted several rounds of funding since then, adding up to US$ 15 million (approximately Rs120 to 123crore at today's exchange rates). As we spoke to the company's chief business officer, Rashi Agrawal on the phone in the second half of October, we learned that it has just completed a latest round of funding of US$ 30 million (approximately Rs 245 crore) which brings its overall funding to approximately US$ 45 million.

In the past decade, Banyan Nation has established a modern mechanized plast8ic recycling facility in Hyderabad with an annual processing capacity of 12000 tons of post-consumer plastics. The Company, which has now achieved about 50 to 60% of its capital utilization, has become the sole supplier of high-quality blow-grade recycled HDPE resin in India.

Through its fully digitized, traceable and responsible informal supply chain, Banyan Nation collects discarded HDPE and PP and utilizes its proprietary plastics cleaning technology to remove product and packaging contaminants. This has come about because has built up a strong process for waste collection where its 40- member field staff uses digital mapping and tracking tools to essentially collect HDPE and PP waste to engage with the last-mile collectors in the informal sector.

Banyan Nation collects the discarded HDPE and PP mostly in the five Southern states at present. Then by utilizing proprietary plastics cleaning and washing technology, they remove the product and packaging contaminants to produce human-contact - safe recycled plastics that meet US and EU packaging safety standards. In the past years, Banyan Nation mastered the process of sorting, cleaning, and producing high- quality HDPE recycled resins that can be used as inputs for producing premium packaging.

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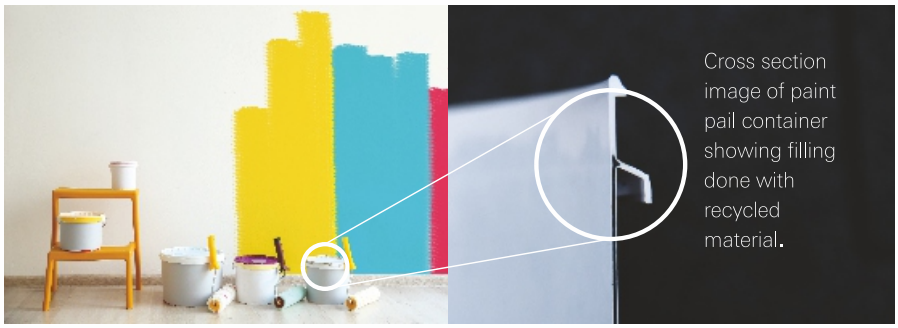

Cross section image of paint pail container showing filling done with recycled material.

SOME MORE APPLICATIONS

CAMERA BODY

HOSPITAL WHEEL

ACOUSTIC APPLICATIONS

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