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PLASTISCOPE

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• April 2023



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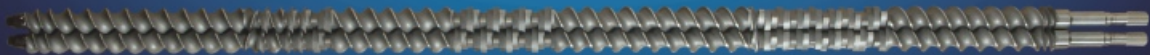
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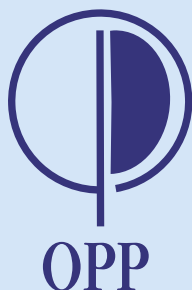
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FROM THE PRESIDENT'S DESK

Mr. Dilip Parekh



Dear Members,

Greetings from Organization of Plastics Processors of India!

At the outset I am happy to inform you that our 39th Annual Meet will be held on Friday 4th August, 2023.

Mr. Sunil Kant Munjal, Chairman, Hero Enterprise will be the Chief Guest. I appeal to all OPPI Members to reserve the evening for this event.

We have started the Financial Year 2023-2024 with positive outcomes of our Representations to the various Ministries.

1. Department of Chemicals and Petrochemicals have extended the implementation of the following Quality Control Orders by 6 months i.e till 3rd October 2023.

i. Ethylene Vinyl Acetate Copolymers.

ii. Polyethylene Material for Moulding and Extrusion.

2. Department of Chemicals and Petrochemicals had convened a meeting to discuss Extended Producers Responsibility (EPR) implementation as per Amendment to PWM Rules, February 16, 2022. In this meeting Organization of Plastics Processors of India represented on various issues faced by the Plastic Processors in relation to EPR. **Ministry of Environment, Forest and Climate Change has accepted most of our suggestions.**

3. A meeting was held under the Chairmanship of Mr. Deepak Mishra, Joint Secretary (Petrochemicals) to deliberate on "Surge in the Import of Petrochemicals during the period – December 2022 – February 2023."

We brought out the following facts to the notice of the Joint Secretary (Petrochemicals):-

a) During the period 2020-21 four HS Codes were newly created. Few HS codes were no longer being used in the HSN code 3901.

b) Period of comparison of the "Surge" is not consistent as two consequent years 2020 to 2022 were under the influence of COVID which had its effect on the demand for Petrochemicals.

Besides the above, we had highlighted external challenges faced by domestic sellers, converters etc., which might have led to increased demand. Our submissions were well received.

With Best Wishes,

Dilip Parekh
President

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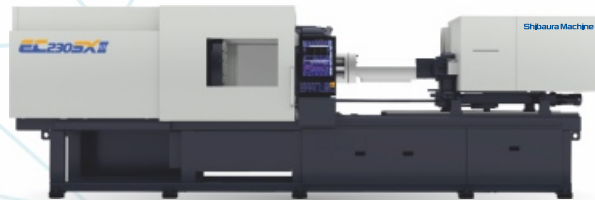
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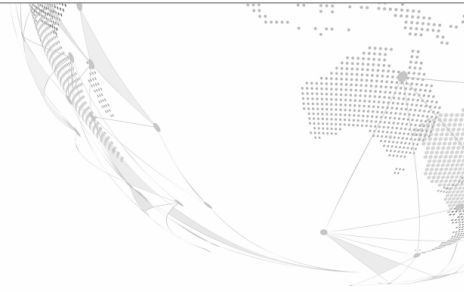
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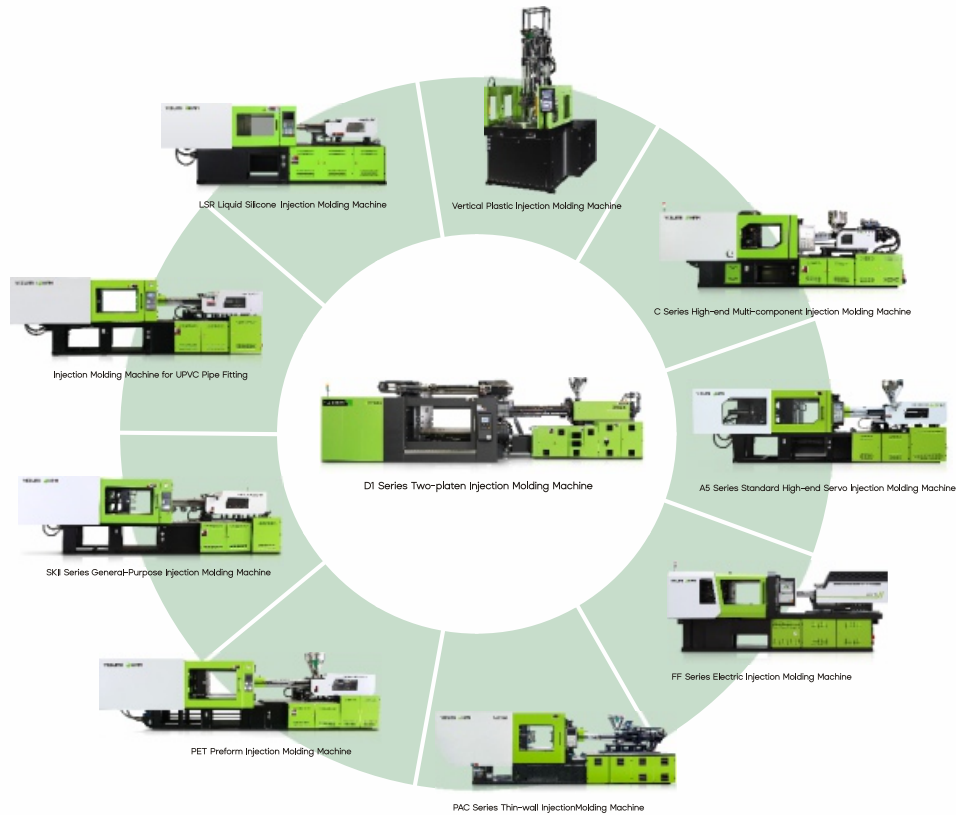
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NEWS FROM INDIA

Foreign Trade Policy Introduces Amnesty Scheme for Default in Export Obligations



The new Foreign Trade Policy will introduce an amnesty scheme for exporters to help them close old pending authorisations and start afresh.

The Amnesty scheme shall be available for a limited period, up to September 30, 2023, as per the FTP which is effective from April 1.

In line with "Vivaad se Vishwaas" initiative, which sought to settle tax disputes amicably, the government is introducing a special one-time Amnesty Scheme under the FTP 2023 to address default on Export Obligations, according to the commerce ministry.

The scheme is intended to provide relief to exporters who have been unable to meet their obligations under Export Promotion Credit

Guarantee (EPCG) and Advance Authorisations, and who are burdened by high duty and interest costs associated with pending cases.

"All pending cases of the default in meeting Export Obligation (EO) of authorisations mentioned can be regularised on payment of all customs duties that were exempted in proportion to unfulfilled EO. "The interest payable is capped at 100 per cent of these exempted duties under this scheme," the ministry said.

However, no interest is payable on the portion of Additional Customs Duty and Special Additional Customs Duty. This is likely to provide relief to exporters as the interest burden will come down substantially.

The FTP also lays emphasis on streamlining the Special Chemicals, Organisms, Materials, Equipment and Technologies (SCOMET) procedure.

India is placing more emphasis on the "export control" regime as its integration with export control regime countries strengthens, the ministry said.

There is a wider outreach and understanding of SCOMET among

stakeholders, and the policy regime is being made more robust to implement international treaties and agreements entered into by India, it added.

The ministry explained that a robust export control system in India would provide access to dual-use high-end goods and technologies to Indian exporters while facilitating exports of controlled items / technologies under SCOMET.

Under the new Foreign Trade Policy, the application fee is being reduced for Advance Authorisation and EPCG schemes. The move will benefit 55-60 per cent of exporters who are MSMEs.

The reduction in fee structures and IT-based schemes will make it easier for MSMEs and others to access export benefits, the ministry said.

Centralized Trade Body to Sharpen Export Focus

The government will soon finalise structure of a single trade body to promote India's exports, with focus on specific products and markets in order to achieve exports of \$2 trillion by 2030.

The body, likely to be called Trade India, could be set up on the lines of Japan External Trade Organisation (JETRO) and Korea Trade - Investment Promotion Agency of South Korea (KOTRA), and will replace the multiple export promotion councils, which would henceforth function under the trade body, a senior government official told ET.

Deliberations have started on the broad contours of the trade body, including its structure and function, and a formal proposal could be made soon.

The need for a centralised body has been felt to help the government identify key products and markets that should be tapped to improve exports, enhance efficiency and take accountability of any slackness in exports going forward. "The centralised body will bridge the gap between the Centre and the industry, and work on a comprehensive roadmap with annual targets set to achieve the \$2 - trillion export mark," the official said. "Besides, it will also be responsible to direct all funds to EPCs, including the market access initiative grant."

"A dedicated trade promotion body will drive strategy, strengthen 'Brand India' and strengthen our negotiations," said another official, adding that its name would be crucial to make it an identifiable brand. The new body will also be expected to explore international trade opportunities in untapped markets.

(Source: Economic Times)

Italian Tech in India Expo Bridges Gap Between Italian and Indian Industries



Italian tech in India was inaugurated by Italy's Deputy Prime Minister and Minister of Foreign Affairs and International Cooperation Mr. Antonio Tajani, and India's Minister of Commerce and Industry Mr. Piyush Goyal along with Ambassador of Italy in India Mr. Vincenzo de Luca, IICCI President Amit Roy and CEO and Secretary General of IICCI Claudio Maffioletti

The Italian Tech in India event was organized by the Embassy of Italy in India and The Indo Italian Chamber of Commerce & Industry.

The event aimed to foster greater collaborations between India and Italy, particularly in the field of manufacturing and skill development.

Italian Manufacturing for India's Growth

The Italian Tech in India event held recently witnessed insightful seminars and panel discussions on the topic of "Italian Manufacturing for India's Growth: towards Green Transition and Circular Economy."

Cosmo Films to Invest Rs.140 Crore in CPP Film Production Line at Aurangabad

Cosmo Films announced expansion by setting up CPP film production line at Aurangabad with annual rated capacity of 25,000 MT. The CPP line will require investment of about Rs 140 crores to be funded through internal accruals and debts and is expected to commence commercial production in 2 years.

Commenting on CPP line project Pankaj Poddar, Group CEO, Cosmo Films said, "Worldwide significant focus is being given on recyclability & sustainability of packaging films. Monolayer structure of CPP and BOPP is most preferred structure to address sustainability requirements. With current CPP capacity running close to 100% utilization, the Company planned capacity expansion with the world's largest width line and lowest cost of production. Other growth plans i.e. Specialized BOPET line, BOPP line, focus towards growing specialty sales, expansion with Cosmo Specialty Chemicals and Zigly are progressing well in line with the plan."

Established in 1981 and founded by Ashok Jaipuria, Cosmo Films today is a global leader in specialty films for packaging, lamination, labeling and synthetic paper. With engineering of innovative products and sustainability solutions, Cosmo Films over the years has been partnering with worlds' leading F&B and personal care brands and packaging & printing converters to enhance the end

consumer experience. Its customer base is spread in more than 100 countries with sales & manufacturing units in India and Korea and additionally sales & distribution base in Japan, USA, Canada and Europe.

The company is strategically expanding beyond Films into Specialty Chemicals & Polymers as well as Pet care business.

Uflex Continues its Focus on Innovation and Sustainability with New Products and Solutions

Uflex limited demonstrated another quarter of path - breaking innovations across business verticals. Continued focus on research - led innovation resulted in a number of new product launches.

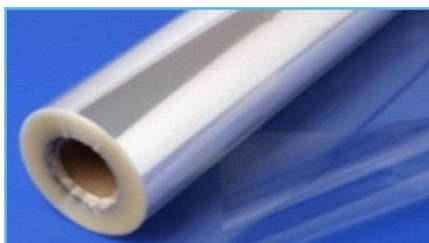
A glimpse of pathbreaking product innovations steered by the company. is given here.

Packaging Films

1. 'F-TFE' Thermoformable BOPET Film:

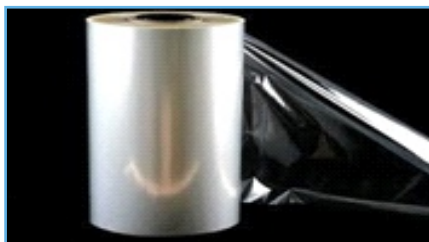
'F-TFE' Mono or Co-extruded transparent Biaxially - Oriented Polyethylene Terephthalate or BOPET film is specially designed for thermoforming applications for depth formation and this film is recommended to be laminated with a sealant layer. Its outstanding properties include high tensile strength, chemical stability, dimensional integrity, and transparency. It is an updated version of their existing grade of F-TFP.

Additionally, this film can be corona treated on both sides or on a single side to enable wettability for ink adhesion while printing. A recent sample was approved by an LLP named Print and Pack of Uzbekistan, and UFlex produced 36 MT quantities of 12 microns, 15 microns and 19 microns for them.



2. 'F-POX' Excellent Oxygen and Moisture Barrier Transparent BOPET Film:

This is an excellent oxygen (0.5 cc / m² / day) and moisture barrier (2.0 gm / m² / day) transparent BOPET film with optical clarity. This is a more superior product than PVDC coated PET film and EVOH PET film. It is also thermally stable and achieves exceptional processability. This film enables see-through packaging while functioning as a high aroma retention barrier. It is apt for storing dry and chilled food.



Chemicals Business

1. Flexseal HSL 1025 (G) and Flexseal HSL 1024 (F):

Adding to the long list of green solutions offered by UFlex's chemical business, UFlex

developed water - based heat sealable coatings in Q3, 2022 for Kraft paper bags for their e-commerce business. With its base being water, the product is environment-friendly. It is a highly advanced product for sealing a formidable bond between coatings of flexible packaging materials. In addition, it is compatible with Gravure and Flexo application processes to produce high - quality e - commerce bags.



2. Flexgreen Sprayable top coat gloss coating:

This LED coating is made for fiberglass - reinforced optical polymer materials, adding to its visual appeal. It is based on radical chemistry wherein the coating instantly cures in UV LED lamps of 385-395 nm wavelengths.



With diverse applications in the construction industry, this considerably flexible coating offers excellent curing capability on high-speed machines. Further, as its curing depends on UV LED light, it leads to energy savings of about 30-70% compared to mercury based UV lamps.

3. Flexcure Super Matt:

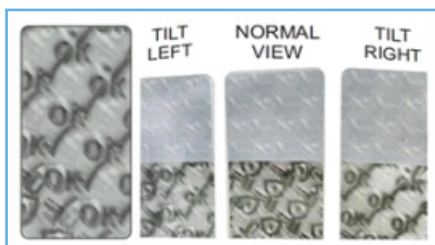
It's been designed as a free radical UV coating for absorbent and non - absorbent under - layers like paper, polythene and polypropylene. This coating has applications in product labels and mono - carton packaging for materials like cosmetics, bottle labelling, pharma, and health and wellness range of products.

4. Flexcote MH 785:

For a durable bond and excellent seal strength, UFlex has developed a solvent-based adhesive with high solids and low viscosity for medium to high performance in flexible packaging applications. It is a cost-effective solution offering excellent bond and seal strength.

Holography Business

1. 3D Optics as a superior security feature for product authentication:



UFlex developed a 3D Flipogram material to authenticate genuine products from counterfeits, protecting consumers from spurious products. Using complex micro - optical technology, the

material creates a unique lenticular visual effect. As a result, a simple glance at the product and its 3D visual imagery effect ensures that consumers are purchasing genuine products. The spectacular visual effect of the 3D Flipogram material makes the product stand out and requires no special lighting or reading device to ensure authenticity.

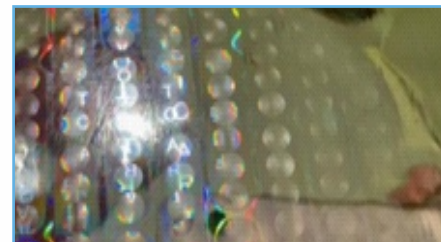
In addition, this technology is unique and cannot be duplicated. This product can find applications in domains such as automobiles, electronics, FMCG, pharma, tobacco, identity cards/certificates, and in the Government excise business. The flexible 3D Flipogram material can be transparent, translucent or opaque as per customer requirements, with the processed film being supplied in 40 and 70 - micron versions.

It is tamper-resistant and malleable for use in strips or sheet form and printing on it is possible with high precision in multiple colours. Some materials can be used on glass, cans, plastic bottles, paper, cardboard, leather and metal. Further, tracking through QR codes or sequential numbering is also possible as per customer requirements.

2. Floating lens film with customized brand logo:

Another great innovation in the quarter ended December 31, 2022 was developing a new and advanced brand protection packaging product consisting of customized emboss film designed for laminates, paper board and UV offset printing on mono cartons. A slight rotation and tilting in

light reveals the brand logo, and this has critical applications in the pharma industry to protect from counterfeit drugs. This product will go a long way in ensuring the safety of patients and healthcare professionals.



Flexible Packaging Business

1. Enhancing consumer engagement via variable data incorporation in packaging:



To enhance consumer engagement, UFlex developed a new packaging solution for Mondelez's Cadbury Choclairs sachet in Q3, 2022 wherein variable data was incorporated using laser coding in white MasterBatch induced PE film. Each pack had a different code which was used by the brand owner to connect with the consumers.

2. 3.2 Litre re-closable stand-up pouch for Surf Excel:

In another demonstration of excellence in providing eco-friendly flexible packaging solutions for storing liquids, Uflex developed a large format re-closable stand-up pouch for Surf Excel. This re-closable pouch can store up to 3.2 litres of liquid laundry. This pack was extremely well received with the rising class of environmentally - conscious consumers. This pouch also consumes less shelf space than its rigid counterpart, making it a clear winner.

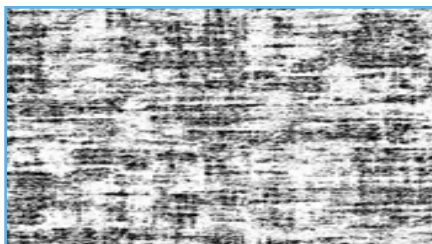


Printing Cylinders Business

1. Embossing Effect on Fabrics:

While embossing has found broad applicability in advertising and marketing industries, it has remained a challenge for the Indian textile businesses. The embossing technique can help create three - dimensional images and patterns on a product's surface through heat and pressure. But when it comes to embossing on fabrics, the challenge for the Indian textile market has been in getting the three - dimensional effect right and the availability of easy - to - use and cost - effective equipment. Addressing this challenge creatively for the first time in India, Uflex

has developed embossed cylinders to produce an embossing effect on fabrics. This revolution in innovation by UFlex is projected to benefit the Indian textile market immensely.



2. Attal Promotional Bags:

The Attal Promotional Bags developed by UFlex are set to benefit many brands. The product packs some unique features like two layers metallic effect in halftone without using metallised film. UFlex has also introduced special security features in this product, like micro text, dot security and line security. These security features will support brands in promoting genuine products and encourage them in their fight against counterfeiting.

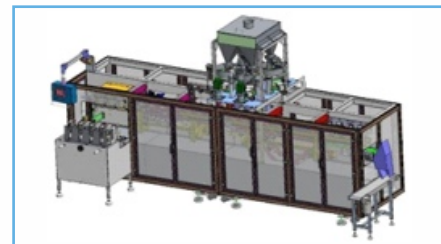


Engineering Business

1. LPFS-4U:

Innovation is part of UFlex's strategic vision and the company continues to make great strides in developing innovative products and solutions. The packaging sector continues to witness new

innovations and it is imperative to strengthen its core and ancillary business process segments. To cater to the fast-growing and significant pouch sealing and filling segment, UFlex launched a machine in Q3, 2022 called LPFS-4U or 4 UP Linear, Pick, Fill, and Seal that guarantees speed, performance, safety, hygiene and caters to environment conscious brands.



This machine is entirely servo driven with an operatorfriendly human interface module and an efficient filling system that can address many applications. This machine can run up to 20 PPM per track and has four channels. LPFS-4U has been well accepted in the market, and UFlex witnessed the first win with a big MNC in Q3, 2022. The developers are confident that this product will have a more-than-normal life cycle and create high value for clients.

2. Quick change over in Rotogravure Printing:

Rotogravure printing involves a rotary press with cylinders typically rotating at high speeds used for printing various substrates for packaging/magazines. However, one of the significant drawbacks that professionals face with this technology is the time taken during job changeovers. To solve this, self-shaft chucking, trolley systems and sleeve - mandrel methodologies came into existence. While the industry has learned to live with the drawbacks, UFlex made some

innovations to make it even more efficient by enabling auto changeover.

Some of the exciting features added to the process by UFlex include the following:

- a) The unique concept of equipping the trolley with a doctor blade
- b) The detachable ink tank with click-in positioning to avoid the ink return mechanism separately
- c) Doctor Blade oscillation through a pneumatic motor with variable speed control, moving over rollers guide for firmness
- d) Precision positioning of the trolley at desired locations
- e) By automation, the trolley becomes an integral part of the mainframe in working, helping in accurate output
- f) Reduction in job change over time as changeover works simultaneously on all desired stations
- g) Reduction in the workforce
- h) Improvement in output
- i) Quality improvement



This new concept is likely to take the industry by storm, especially in price-sensitive markets like India, where success depends on product economics. UFlex's inventions go well with the customers' goals for increased

productivity by approximate 400 to 500 kgs more; considering assumptions like four job changeovers per day, 12 microns PET as substrate, operational speed of 300 mpm and considering the job is 1300 mm wide.

Welspun Buys Water Tank Company Sintex for Rs. 1,251 cr via Bankruptcy Process

Mr. B K Goenka - controlled Welspun Group has acquired Sintex BAPL, widely known as the manufacturer of black plastic water tanks, for Rs 1,251 crore, through the bankruptcy route. The deal strengthens Welspun's play in the business - to - consumer business. Before Sintex BAPL was admitted to insolvency proceedings, it had a double - digit market share in plastic products.

Mr. Goenka has routed the Sintex BAPL acquisition through the arms of his listed company Welspun Corp. He plans to turn around Sintex BAPL, which had a revenue of Rs 761 crore in FY22, leveraging the Sintex name, which still has a strong brand recall among consumers, and its network covering 800 distributors and 13,000 retailers in the country.

In FY19, Sintex BAPL had an operating profit of Rs 270 crore on a turnover of Rs 1,800 crore.

Welspun Group's other consumer-focused businesses include home textiles and flooring tiles. Apart from water storage tanks, Sintex BAPL also manufactures industrial containers, sub-ground structures, factory made doors and plastic moulded components for passenger car, two - wheeler and commercial vehicle manufacturers.

GDP Growth Forecast, 2023.

India	5.9%
China:	5.2%
Indonesia:	5%
Nigeria:	3.2%
Saudi:	3.1%
Turkey:	3%
Mexico:	1.8%
US:	1.6%
Spain:	1.5%
Canada:	1.5%
Japan:	1.3%
Brazil:	0.9%
Russia:	0.7%
France:	0.7%
Italy:	0.7%
South Africa:	0.1%
Germany:	0.1%
UK:	0.3%

International Monetary Fund

ExxonMobil to Invest Rs. 900 Crore in Lubricant Plant

The plant will source a larger part of the base stocks, additives, and all packaging will be done locally. It is expected to create nearly 1,200 jobs during the construction phase.

ExxonMobil said it would invest almost Rs. 900 crore (\$ 110 million) to build a lubricant manufacturing plant at Raigad in Maharashtra. Once operational, the plant will have the capacity to potentially manufacture 1, 59,000 kiloliter of finished lubricants annually to meet the growing domestic demand from industrial sectors such as manufacturing, steel, power, mining, and construction, as well as from passenger and commercial vehicle segments. It is expected to begin operations by the end of 2025, the company said in a statement.



PLASTIC PRODUCTS AND NEW TECHNOLOGIES

PEI Used in Lightweight Augmented Reality Eyeglasses

SABIC's Ultem 1000 molded by Beijing LLVision Technology for the temples of their AR eyeglasses which display voice translations in text on the lenses in real time.



Augmented reality (AR) eyeglasses for hearing loss compensation and spoken language translation from Beijing LLVision Technology Co., Ltd., branded Leion Hey, feature legs (or temples) molded from SABIC's tough, lightweight, and inherently halogen-free flame retardant Ultem 1000 PEI.

The Ultem PEI enables thin-wall molding of the hollow legs, which contain both a lithium-ion battery and a computer chip to enable rapid, multi-language translations. The material helped LLVision minimize the weight of the legs to give users all-day comfort, while providing high strength that enables key

components to be integrated into the legs with maximum functionality.

Said LLVision's CEO Wu Fei, "At the beginning of the design phase, we set a goal to make the lightest AR glasses on the market. Every gram mattered to the comfort of our customers. However, with all the components required for AR glasses, including the optical module, microphone and computer chip, it was a difficult challenge. After comparing and testing materials from more than 20 suppliers globally, we found SABIC's Ultem resin to be the lightest, with additional advantages of strength, resilience and inherent, non-halogenated flame retardance. With the help of Ultem, we lowered the overall weight of our Leion Hey glasses to just 79 grams, or 2.8 ounces."

Parkside Launches New Recyclable Monopolymer Film

Sustainable flexible packaging solutions company Parkside has announced the release of its new mono-polymer laminated film, which can be placed into existing UK recycling streams. Manufactured from polypropylene substrates, the new laminate



aims to replace non-recyclable aluminum foil and PET structures and can be utilized in a wide range of packaging formats, including flow wraps, bags, sachets, stick packs, pillow packs, pouches and more.

The pioneering laminates are available in duplex or triplex formats, in a range of thicknesses, with either matt or gloss finishes, all of which are suitable for full-color printing.

Joshua Swann, head of technical at Parkside, said, "Aluminum foils and PET laminates are very popular in flexible packaging at the minute, but they lack recyclability. Our new mono-polymer laminate eliminates the need for these non-recyclable substrates and can be placed into the existing UK recycling stream once used."

The new film possesses superior gas, mineral oil, water, light and UV barrier performance to extend product shelf-life performance and reduce food waste, as well as

being ideal for a wide range of food applications including coffee, soup and confectionery. The mono-polymer film can also be used in the packaging of products that require more rigorous barrier properties, such as condiments, toiletries, perfumes, medicines and alcohol.

The new mono - polymer PP laminate adds to Parkside's already extensive range of sustainable packaging solutions that enable brands to enhance their green credentials. The launch of the new material comes hot on the heels of the flexible packaging innovator's 'Sustainable 7' campaign, which laid out the seven pillars of sustainability that Parkside uses as a foundation for every project. The company claims that the new film fits perfectly within these pillars, offering a lightweight, recyclable solution that can help reduce food waste.

Toppan to Establish First European Production Site for Transparent Barrier Films in Czech Republic

Toppan (TYO: 7911), a global leader in communication, security, packaging, décor materials, and electronics solutions, will open a new plant in Most, the Czech Republic. Toppan aims to commence mass production at its first transparent barrier film manufacturing site in Europe by the end of 2024. With the launch of the new plant, Toppan will establish a market - leading and global supply capacity for transparent barrier films with production bases in Japan, North America (Georgia, USA), and Europe.



Czech Plant (Image)



GL BARRIER Product Examples

“By taking advantage of the new plant's location, Toppan will bolster its capacity to supply GL BARRIER1 transparent barrier films to packaging manufacturers in Europe, where we see some of the world's most environmentally friendly countries, and accelerate sustainable transformation (SX) business globally by strengthening relationships with top - rated companies in the areas of ESG and the SDGs,” said Masahiko Tatewaki, Managing Executive Officer of Toppan's Global Packaging business. “This plant will also employ the most environmentally friendly technologies, such as heat reuse systems, with an emphasis on maximum energy efficiency.”

“We welcome the establishment of Toppan's barrier film factory in the Czech Republic, which will produce eco - friendly and sustainable packaging materials locally with export to Europe and contribute to the development of the Usti region.” said Eva Jungmannova, Director of Foreign Activities and Investments, Czech Republic.

Evonik and Chemours Team Up to Provide High - Performance, Low - GWP Solutions for the Spray Polyurethane Foam Industry

Evonik, the market and innovation leader in polyurethane additives, has boosted its range of high-performance products for the spray polyurethane foam (SPF) industry with the release of DABCO® PM 301. Used in combination with the latest Opteon™ 1100 and Opteon™ 1150 blowing agents from Chemours, a global chemistry company, DABCO® PM 301 improves thermal performance and increases efficiency in SPF systems.

SPF is one of the most efficient modern insulation materials driving energy savings in buildings due to its low thermal conductivity and its ability to prevent heat leakages that can be further advanced by the new product combination. Additionally, compared to traditional hydrofluorocarbon (HFC) blowing agents, Chemours' Opteon™ hydrofluoroolefin (HFO) blowing agents offer a significant reduction in global warming potential (GWP) to optimize end-of life contribution of SPF. For example, Opteon™ 1150 has an ultra-low GWP of 16, according to the World Meteorological Organization's (WMO), 2018 Scientific Assessment of Ozone Depletion Research and Monitoring Project*, which is 100 times lower than traditional HFC blowing agents.

“The need to reduce the GWP footprint and ozone depleting building emissions, while at the same time maintaining

blowing agent compatibilization for SPF systems, requires innovative tools to help the industry best optimize new HFO blowing agents,” said Christian Eilbracht, head of the polyurethane insulation business at Evonik.

DABCO® PM 301 is nonflammable and offers a reduction in the required use level of the blowing agent while maintaining foam physical properties. Benefits of using DABCO® PM 301 with Opteon™ 1100 and Opteon™ 1150 blowing agents include:

- solubilizes blowing agent and suppresses vapor pressure of the resin
- reduces polyol viscosity
- improves spray yields
- enhances foam thermal performance
- produces fine, uniform cells

ARRIS Unveils Structural Flax Fiber Composites

ARRIS, the advanced manufacturer enabling high - performance thermoplastic composites at scale for mass - market products and industrial applications announced that it has a new sustainable fiber material offering.

Sustainability and innovative material development are at the core of everything ARRIS does as the team scales Additive Molding for a production capacity in the millions to meet demand (recent announcement). Additionally, ARRIS has doubled its in-house material production capacity as of February 2023 to support growing customer programs.

The ARRIS R&D team has been developing natural - fiber composites with high-performance capabilities to complement its already available bio-nylon resin material being used with carbon and glass fiber for products today.

"Since we started, our R&D team has been researching and investigating recycled, recovered, and natural fibers, as well as recycled, bio - based, and bio - synthesized polymers that help brands achieve necessary sustainability initiatives without sacrificing the best - in - class performance their customers have come to expect," said Bert Mannhalter, ARRIS Vice President of Research and Development. "I'm excited to reach this breakthrough in processing flax fibers. Though it's been used for cosmetic parts such as veneers and paneling, we now see a way to use these fibers for true structural applications." Since flax fiber is <5% of the CO2e footprint compared to carbon fiber, these advanced composites have a massive impact on further reducing CO2 emissions.

Jabil and KAV Sports Harness the Power of Engineered Materials to Produce Game - Changing Customized Bike Helmets

Jabil Inc. has teamed with KAV Sports on made - to - order, personalized bicycle helmets that deliver a better fit for superior comfort and protection using custom engineered materials and additive manufacturing. Recognized by Time Magazine as one of the “best inventions of 2022,” the KAV Portola helmet is made from custom nylon

carbon-fiber material engineered by Jabil to meet exacting standards for performance and aesthetics.

“To fulfill our mission of saving lives, we needed to produce a better-fitting helmet that people would want to wear,” said Whitman Kwok, founder and CEO of KAV Sports. “For consumers to experience the benefits of customization, we had to overcome limitations in materials and manufacturing. Jabil knocked it out of the park by engineering a custom material that met stringent criteria and could be manufactured using 3D printing to create something really unique and special for the helmet industry.”

Innovating the Perfect Fit

Traditional bike helmets are made from injection-molded, expanded polystyrene (EPS) foam and come in one to three sizes, which fall short in accommodating various head sizes and shapes. Moreover, typical helmets have limitations in stability, durability, and comfort.

While KAV wanted a novel material that was as light as EPS, the company sought superior performance in temperatures ranging from - 15 degrees to over 60 degrees Celsius. KAV engineers evaluated more than 20 off-the-shelf materials, all of which failed to meet the company's criteria for absorbing high - velocity impacts or providing sufficient stability under extreme environmental conditions.

KAV enlisted the help of Jabil to create a custom material that was stiff and strong yet flexible enough to accommodate both high and low temperatures. In addition to providing excellent

energy absorption, the material needed to increase layer - to - layer adhesion for consistent performance, as well as improved look - and - feel. A team of additive manufacturing engineers, chemists, materials scientists, and production experts at Jabil's Materials Innovation Center in Minnesota created a completely new and customized material — in just nine months — that met all KAV's expectations.

Prioritizing Polymer Science

To achieve that milestone, Jabil applied comprehensive innovations in materials formulation, compound development, materials systems integration, and ISO 9001 Quality Management System certification. “We take a polymer science approach to developing additive materials,” said Matt Torosian, director, product management for additive manufacturing at Jabil. “Jabil engineers materials that work with additive manufacturing processes in a repeatable manner to meet customer requirements and manufacture top-quality products.”

Jabil and KAV developed and tested nearly 30 iterations of custom polymer formulations and compounds before creating the proprietary nylon carbon - fiber composite that embodied all the necessary properties. Jabil's extensive expertise and experience in materials processing, testing, and scaling proved instrumental in formulating the polymer, compounding the final filament and attaining ISO 9001 Quality Management System certification.

KAV then completed the necessary validation testing to achieve certification in accordance

with the U.S. Consumer Product Safety Commission (CPSC). When KAV launched the Portola helmet featuring the new material in April 2022, the company asserted that the product not only met but exceeded U.S. CPSC safety standards for impact resistance by more than 25%.

Improving Customer Experiences

KAV's custom material is available in grey, black and white colors to offer flexible choices while a simple custom - fitting process and the use of 3D printing enable two - to - three - week delivery of made - to - order helmets. Production of these unique, energy - absorbing structures would not be possible via traditional manufacturing. Additive manufacturing also allows KAV Sports to reduce production costs and unnecessary waste.



Jabil teamed with KAV Sports on a custom material, available in different colors, to produce tailor-made, 3D-printed bike helmets.

Tamper - Proof Closure Seals from Schreiner Medipharm for Pharmaceutical Packaging

The volume of the worldwide counterfeit medicines market amounts to about 200 billion U.S. dollars. Every year, it grows

by about 20 percent—twice as fast as the legal medicines market. Counterfeits and tampering pose potential health risks to patients. The consequences for the pharmaceutical industry are major economic losses and reputational damage. Pharmaceutical packaging can be protected by means of specialty Void-Labels from Schreiner MediPharm. They make tampering attempts and first opening clearly and irreversibly visible.



In February 2019, the European Union responded to the growing counterfeit medicines market by issuing the EU Falsified Medicines Directive for pharmaceutical packaging. The global ISO 21976 standard also states how security features can be used on pharmaceutical packaging and how tampering attempts can be verified. In addition, it specifies requirements for protecting the authenticity of pharmaceutical packaging. The tailored Void - Labels from Schreiner MediPharm satisfy all these requirements.

The utilization of MediPharm's Void-Labels makes it clearly more difficult for counterfeiters to reuse original packaging. Peeling off a label with a void effect makes a previously covert message visible. Following extensive tests, Schreiner MediPharm adapts the closure seals specifically to the relevant packaging, material, substrate,

and application. The seals can be custom-designed, offering film material choices in various colors as well as white, and transparent versions. In addition, the void effects can be used for glass and plastic containers. Various void effects can be realized depending on the individual use case:

No Transfer

Peeling off the label leaves no residues on the pharmaceutical packaging. The void effect becomes visible only in the label after it has been opened for the first time. Reclosure of the label with the visible void effect is possible.

Semi Transfer

Peeling off the label leaves partial residues on the pharmaceutical packaging. After first opening, the void effect is visible both in the label and on the packaging. Reclosure of the label with the visible void effect is possible.

Full Transfer

Peeling off the Void-Label leaves a complete coating layer on the packaging. Consequently, the void effect is visible on the pharmaceutical packaging and in the label after first opening but reclosure of the label is not possible.

In addition, a convenient tab may be integrated for particularly easy handling by the final user. Due to the addition of overt or covert authentication features, the Void-Labels can also provide proof of authenticity. Schreiner MediPharm ensures optimal and reliable performance of the seal

that is adapted precisely to the respective packaging and specific threat scenario.

WPC Deck Boards Perfectly in Shape Using The PIXARGUS Inline System

A leading US manufacturer of sustainable decking products made of wood-plastic composites (WPC) uses measuring technology made in Germany for its quality control. The PIXARGUS inline system, ProfilControl 7 DX WoodPlasticComposites, ensures 100% inspection of the entire board profile in a continuous, inline process. As a premiere, the system inspects even highly critical features, such as the grooved edges of the boards, with the highest accuracy – and with minimum handling effort, from quick commissioning and set-up through to automated switch-over from one product variant to another.

Looking for decking that leaves nothing to be desired? Decking that is designed to last, be resistant to fading, has a natural look, and is safe for children and pets, as it resists splintering and is non-slippery? You can get all this from composite decking. Wood - plastic composite decks are the sustainable alternative to traditional wood decks made from exotic hardwoods.

Thorough quality inspection is also essential for these innovative WPC products. A new inline inspection system from PIXARGUS – ProfilControl 7 DX WoodPlasticComposites – is now available to ensure that all of the deck boards leaving a

manufacturing line are of perfect shape. The system is of compact design and based on PIXARGUS' proven and successful PC7 inspection technology. One such system is now successfully in use at a leading decking and cladding boards manufacturer in the USA.

OPC-UA interface is the pathway to fully automatic manufacturing

This renowned US deck board producer has recently made great strides in automating its production processes. In 2022, all process steps, machines and equipment were networked and linked with the higher-level control systems. The company now uses the new smart inspection system from German measuring specialists PIXARGUS to make quality control of its extruded deck boards a fully automatic process.

The camera-based digital inline inspection system ProfilControl 7 DX WPC from PIXARGUS comes with an OPC-UA interface that allows it to smoothly and seamlessly integrate with the manufacturer's process chain and communicate with the various control units and downstream processes in real time.

Automatic product grading and stacking

In addition to providing 100% inspection of the deck boards in a continuous process, the measuring system's smart software is also instrumental in grading the products fully automatically. Boards graded as defect-free are automatically stacked ready for dispatch.

Automated product switching

The link between the PIXARGUS system and the manufacturer's higher - level control systems also enables automatic switching from one product variant to another. Upon a signal received from the line control system, ProfilControl 7 DX WPC automatically adjusts to the inspection parameters of the new product – during running production.

A first in quality control: 100% inspection even of critical features such as deep grooves

After the deck boards have been cut to length, the eight high - resolution cameras of the ProfilControl 7 DX WPC system capture the contours of the boards in an inline process, checking all radii, angles, distances, lengths, heights and widths. For the use case at the US deck board manufacturer, PIXARGUS has positioned the cameras in such a way that also the entire grooved edges of the deck boards can be measured. These grooves will later accommodate the fasteners to install the decking.

While the standard measuring systems the US customer had used in the past were only able to measure either the height or the depth of the groove, ProfilControl 7 DX WPC uses a specially adapted sensor head to measure both parameters of the highly challenging groove geometry simultaneously with just one measurement (IMG 4).

Turnkey solution designed to cope with the most challenging production conditions

ProfilControl 7 DX WPC is supplied calibrated ex works. The process reliability and

measuring accuracy are in compliance with MSA type-1 and type-3 studies. This means the system fulfills even the most exacting internal QM requirements. It is designed for up to 250 mm wide products and stable operation under the most challenging production environments. The sensor unit is protected by an enclosure. This makes the measuring equipment highly resilient to contamination. The new PIXARGUS system has already proved highly successful at the US customer's operations.



IMG 2: ProfilControl 7 DX WPC from PIXARGUS ensures 100% inspection of the entire board profile in a continuous, inline process. As a premiere, the system inspects even critical features, such as the grooved edges of the boards, with high accuracy.

Flexible Production with Faster Neck Changes on The Stretch Blow Molder Courtesy KHS

Whereas in the past, only one category of the product was usually run on aseptic lines, bottlers of sensitive beverages now face an ever - growing demand for flexibility. Beverage producers who process both aseptically filled beverages and juice and carbonated soft drinks need to use 38-millimeter bottle necks for the former and

containers with 28 - millimeter openings for the latter. If the bottle neck is to be changed on a PET line, however, to date, a comparatively large amount of effort was required to convert the stretch blow molder in particular. Machines were often stopped for up to four hours, tying up the often very few operators of the same for a disproportionately long period. With its new, simplified neck changeovers, KHS has now shortened the time needed to convert the InnoPET Blomax stretch blow molder – including the preform infeed.



It is usual to only manufacture and fill bottles with an identical neck on one line. If a water bottler wants to produce a still and a carbonated product alternately, until now, it has had to decide whether to use the higher and heavier neck only necessary for carbonated water for both products or not. The bottler would save time but waste material and money filling the still water.

The alternative would be to live with the long intermittent downtimes caused by a neck changeover. Besides these considerations, marketing often plays a role in this decision, calling for a bottle adapted to suit the various products. Combined lines such as these that require neck changes are very often found in Japan.

Complex process made simple

To gain an idea of just how complex the exchange of parts for the above process is on the stretch blow molder alone, it is worth taking a closer look at the individual steps involved.

First, the preform infeed needs to be adjusted, and what is known as the mandrel heads replaced that are wedged into the preform necks to guide these safely through the heating module. The grippers that transport the preforms by their necks to the blow wheel are then exchanged on the star wheel.

Finally, the molds in the blow stations, the blow nozzles, and often the stretch rods and further grippers downstream that feed the finished containers to the subsequent filler need to be changed over. Here, the number of parts that need replacing depends on the size of the machine.

The mandrels and shields are especially important: the higher the machine output, the longer the heater, as the containers may move faster but always need the same amount of time to heat up. On an InnoPET Blomax 16 stretch blow molder with a capacity of up to 48,000 bottles per hour, around 170 mandrel heads and shields must be changed by hand, for instance. This means that this part of the neck change is particularly relevant when it comes to the amount of time needed – unlike the exchange of just 20 grippers, which is quick in comparison.

Thought through to the end

To considerably speed up the conversion process, KHS has simplified the individual work steps involved and the concept governing the entire procedure.

“We started out by analyzing how the operators work,” says Arne Andersen, stretch blow molding product manager.

“On this basis, we then considered how all tasks could be made easier and organized as perfectly as possible – paying particular attention to the ergonomics. Magazines were thus installed that stop the operator having to repeatedly abandon the machine to fetch and carry change parts, for example. We also replaced the grippers to reduce the number of screws that need to be loosened. At the same time, newly developed mandrel heads are now used that can be simply removed by pressing a release spring. This process used to be much more complex.”

In this case, KHS consciously went for an approach that thought all of the specific processes through to the end based on actual customer requirements, Andersen emphasizes. “We aimed to achieve the best possible improvement within the shortest possible time.”

KHS managed both: thanks to the simple neck change, the time needed for two operators to convert the KHS InnoPET Blomax16 stretch blow molder, for instance, has now been cut by a good two - thirds to approximately just 86 minutes – including the preform infeed.

As the PET bottles in a block like the KHS InnoPET BloFill are held and conveyed by their necks throughout the entire machine, the stretch blow molder and the filler have been developed further in order to shorten conversion times. The capper was one area of focus, where the cone responsible for lifting and closing the bottles needed to be replaced manually. However, no conversion is required regarding the screw cap, as there are two cap feeds – one for each neck diameter in the respective format.

Greater flexibility, less storage space

Andersen is convinced the new neck change option will give beverage producers much greater flexibility. They can now also run much shorter production cycles for bottles with different necks and reduce their warehousing effort accordingly.

Protolabs Unveils Advanced Capabilities and Volume Pricing Through Digital Network of Global Manufacturers

Digital manufacturing leader Protolabs (NYSE: PRLB) has significantly expanded its manufacturing capabilities and pricing options available to designers, engineers, and buyers worldwide. By leveraging the company's digital network of manufacturers at Hubs, customers can access advanced capabilities, reduce part cost, and increase part quantities across CNC machining, injection molding, and 3D printing services. The

expansion complements the low-volume, on-demand manufacturing services already available from Protolabs.

Here's a breakdown of additional options unlocked by the manufacturing network:

- **CNC machining:** Tolerances down to +/- 0.001 in. (0.020mm) are now achievable. Plating (black oxide, nickel), anodizing (Type II, Type III), and chromate coating are available in larger quantities. And parts sizes can range from as large as 40 in. (1,000mm) to as small as 0.02 in. (0.5mm).
- **Injection molding:** High-requirement molding projects in need of larger and deeper parts (47.24 in. x 27.56 in. x 11.81 in.; 1,200mm x 700mm x 300mm) and more complex parts are also possible.
- **3D printing:** Fused deposition modeling (FDM) 3D printing is available via the network for rapid prototyping of cost-efficient parts. This is in addition to Protolabs' six other plastic and metal additive manufacturing technologies offered through its digital factories.

All of the manufacturing capabilities are now live and available to customers, who can access the new CNC machining through protolabs.com, and expanded injection molding and 3D printing FDM options directly through hubs.com.

"Never before has the industry seen a digital manufacturing model quite like this. Protolabs has combined the speed and

quality of a service bureau built from the ground up with a highly vetted distributed network of global manufacturers," said Alex Cappy, Vice President and CEO of Hubs. "We're pushing the envelope further than ever before to provide a truly seamless service at Protolabs."

Craemer TC Plastic Pallets with and without Palgrip Coating

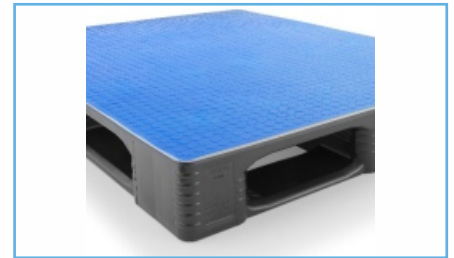
Craemer's TC fully closed hygienic plastic pallets are ideally suited for heavy-duty loads and prove their worth in all areas where permanent protection against moisture is essential. For absolute reliable load securing, our TC3-5 is available with a full-surface Palgrip® anti-slip deck.

The patented Craemer welding seam geometry sets this pallet type apart from the rest of the closed plastic pallets market. Its high-strength welds and innovative honeycomb structure make Craemer TC pallets exceptionally resistant to impact. It is ideal for cleanroom applications in the pharmaceutical or food industries and ideally suited for heavy-duty loads.



- Cost-effective solution - low cost per trip
- Low production downtime
- Hygienic & easy to clean - meet your industry hygiene requirements

- Option to track with RFID tags or "smart labels"
- Lowest damage rates



Features*1

- Dimensions in inches*2: 47.6 x 39.7 x 6.3 (in mm: 1208 x 1008 x 160)
- Manufactured from pure PE, one-piece design
- Flat and solid deck style: permanently completely closed plastic pallet
- Four-way entry, tapered entry and exit edges
 - 3 or 5-runner, unwelded with chamfered openings on both sides of the runners
- Hygienic pallet with high resistance to damage thanks to solid wall thickness
- Rackable and stackable closed pallet
- Full-surface Palgrip® anti-slip deck

All TC pallet models (height 160 mm) are dimensionally stable and can withstand temperatures from -30 to +40 degrees Celsius, briefly up to +90 degrees. The non-welded skids are sloped on both sides for optimal transport with industrial vehicles. TC pallets are suitable for use on rollerconveyors, chain conveyors and in automated high-bay warehouses. An optional equipment with RFID transponder allows traceability.

Sustainable and Efficient – Pure - Line Stand - Up Pouches From Südpack and SN Maschinenbau at Interpack

The film manufacturer SÜDPACK and the packaging machine manufacturer SN Maschinenbau will be coming together at this year's interpack to present an innovative and sustainable concept for the production of practical stand-up pouches at booth A61 in Hall 6. The versatile, PE-based and therefore recyclable packaging material from SÜDPACK will be used on the SN Maschinenbau pouch packaging machine, the FMH 300, for the production of stand-up pouches with zippers. In combination with the pouch packaging machine featuring a special hygienic design, the PE mono-material is particularly suitable for primary packaging, for example for grated cheese, sausages or snacks.



There is a clear trend in pouch packaging that can now be found in many fields of application – a growing number of suppliers want to replace their conventional product packaging with particularly material-efficient and recyclable alternatives. The film manufacturer SÜDPACK offers an unparalleled product and service portfolio for just that. Developed for a broad range of packaging concepts, the material structures meet the current requirements

of processors, retailers and consumers in terms of both sustainability and performance.

The packaging concept

The high-performance films in the Pure-Line product family, which will be used on the FMH 300 pouch packaging machine from SN Maschinenbau at interpack 2023 in Düsseldorf, are based on the polymer polyethylene. The PE composite stands out most particularly due to its recyclability and material efficiency. SÜDPACK customers benefit from the minimal use of resources while enjoying optimal pouch stability and reduced packaging weight, which leads to an improved carbon footprint along the entire process chain. The recyclability of the packaging can be verified with a certificate from independent external institutes.

The PE mono-material can be equipped with different features and barrier properties to ensure that products are aroma proof, airtight and have a longer shelf life when packaged. Easy-to-integrate zipper systems make it convenient to open and close pouch packaging. These PE-based systems are already available on the market, which means these stand-up pouches can be assessed as a true single-material solution and introduced into the appropriate recyclable material cycles.

The FMH 300 pouch packaging machine

The FMH 300 is a horizontally operating pouch packaging machine that features a special hygienic design with a rotary table to form, fill and seal flat

and stand-up pouches from roll stock (FFS). And, of course, sealing systems such as zippers can be integrated. It is possible to process conventional material structures as well as those that are modern, sustainable and recyclable, such as SÜDPACK's PurePE, without any difficulties, reduction in speed or losses of quality. A host of innovative technologies, such as continuous web draw-off and the option of adding continuous ultrasonic zipper sealing or the fully automatic block adjustment of sealing frames, lead to significant processing advantages and potential savings because even thinner and more recyclable films are used, which limits the environmental impact.

Moreover, the hygienic design of the FMH machine range has been consistently developed, making it particularly suitable for packaging products such as grated cheese or air-dried sausages, which are extremely demanding when it comes to the cleanability of the packaging machine. The hygienic structure of the range keeps surfaces, corners and crevices to a minimum to avoid possible product build-up, which reduces potential contamination as well as the amount of effort needed to clean the machine.

Last but not least, the impressive FMH 300 triplex model offers high speed operation and maximum flexibility thanks to its extremely broad format range. Depending on the product properties and the size of the pouch, it is possible to achieve an output quantity of up to 270 pouches per minute. Format changing is nearly fully automatic, requires almost no tools and is performed on the operating panel (HMI) of the machine.



PLASTIC RAW MATERIALS

Heartland Polymers Begins Integrated Production at PDH/PP Complex

The new PDH plant is now providing on-site feedstock for North America's only integrated, single-site commercial PP production.



Heartland Polymers has successfully started-up its propane dehydrogenation (PDH) plant, which is now providing on-site propylene monomer feedstock for North America's only integrated, single-site commercial PP production.

Heartland produced about 200 million lbs of PP in 2022 after the initial PP production began in July, followed by the PDH plant's start-up in October 2022. Located in Alberta, Canada, east of the Rocky Mountains, Heartland is unique to the industry, producing both polymer grade propylene (PGP) feedstock and PP at a single site. Heartland's PP plant and its cogeneration central utilities

block (CUB) were commissioned earlier in 2022. Before the PDH plant entered into service, Heartland was producing PP with PGP feedstock from parent company Inter Pipeline's NGL business, Canada's only PGP producer prior to PDH entering into service. This alternate feed source enabled Heartland to begin PP production in late fall 2022 and remains a key aspect of Heartland's reliability in addition to its optimal geographic location. Heartland is currently producing a range of homopolymers with a plan to add random copolymers to its production schedule later in 2023. Production currently focuses on serving the high demand for film, sheet extrusion, fibers and injection molding.

Said Heartland CEO Todd Karran, "Thanks to the dedication and hard work of our operations team, I am proud to report that our propane dehydrogenation plant has been providing a reliable onsite source of feedstock to our polypropylene production since the end of 2022. Heartland is responsibly producing and shipping polypropylene to customers daily, and we continue to focus on optimizing our service. As the new entrant to the market and one that brings Heartland's promise of reliability,

service and sustainability, there is high interest in our products. We expect it will continue to grow now that we have achieved commercial production."

OQ Chemicals Launches ISCC PLUS Certified Isononanoic Acid



OQ Chemicals has launched an isononanoic acid that is produced from both bio-based and circular feedstocks, and is ISCC PLUS certified. OxBalance isononanoic acid has a bio-based content of over 70%, providing manufacturers with a sustainable and eco-friendly alternative to conventional isononanoic acid. To meet the growing demand for carboxylic acids, OQ Chemicals has recently invested in a capacity expansion project in Germany. Isononanoic acid is widely used in the production of various industrial and consumer goods, such as energy-efficient lubricants, plasticizers, and surfactants.

“The demand for bio-based raw materials is increasing across different industries,” said David Faust, Executive vice president Oxo Performance Chemicals at OQ Chemicals. “Therefore, the introduction of our ISCC PLUS certified OxBalance Isononanoic Acid is a significant milestone in our journey towards sustainable chemical production. With the same specifications and quality, our OxBalance products are a drop-in replacement for traditional carboxylic acids. As consumers demand more environmentally friendly products, we see a great opportunity for our customers to shift from fossil - based to sustainable feedstocks without compromising on quality or performance.”

“At OQ Chemicals, we are proud to be the first to offer bio-based isononanoic acid,” said Oliver Borgmeier, Ph.D., CEO of OQ Chemicals. “For us, this is the logical next step on our journey towards greater sustainability. We aim to make our large-scale production processes more environmentally friendly, efficient, and sustainable while reducing emissions. As we expand our portfolio of bio-based Oxo Performance Chemicals, such as carboxylic acids, we invest in capacity expansions and explore new ways to innovate and improve our chemical production processes.”

Nanocarbon Reinforced Masterbatches and Compounds

Modern Dispersions to highlight latest grades of carbon black, graphite, and nanocarbons to boost properties of thermoplastics compounds.



The latest developmental work with nanocarbons that boost the performance of masterbatches and compounds were highlighted by Modern Dispersions. The company continues to undertake research and development work with new grades of carbon black, graphite, and nanocarbons to improve properties of thermoplastic compounds including color, UV resistance, and electrical and thermal conductivity. Due to the lower filler loadings required with nanocarbons, better physical properties can be achieved with these types of compounds.

According to Jan Kozma, v.p. of sales & marketing for Modern Dispersions, the company has seen significant interest from OEMs and processors in such developments and the company's ongoing project sampling looks promising. One of the developmental grades contains graphene oxide which is undergoing testing to assess certain property enhancement features including electrical and thermal conductivity, increased tensile strength, and improved barrier properties. The developmental grade is targeted for fibers and films.

Modern Dispersions also showcased its extensive product portfolio including black masterbatches, wood-polymer composites (WPC), and color concentrates. The company highlighted its conductive masterbatches which contain

high loadings of carbon black which can be diluted into a variety of polymers to impart electrical conductivity. They masterbatches allow the compounder or processor to easily incorporate the desired level of masterbatch resulting in the targeted finished resistivity level. Typically, they comprise between 30-60% of the overall resin content. In wood-polymer composites, the company offers custom formulating with loadings of PE-based WPC between 40%-50%. These composites can be natural or custom colored. Color concentrate and color compound products are designed to meet market demands and end-use requirements such as electronic packaging, cell phones, fabrics, and household items.

Solvay Introduces New Polymer for High-Heat EV Battery Module Insulation

Solvay, a global market leader in specialty materials, has announced the introduction of a new high-heat and flame retardant grade in the company's Xydar[®] liquid crystal polymers (LCP) portfolio, which is designed to meet critical safety demands in EV battery components. The new Xydar[®] LCP G-330 HH material addresses challenging thermal and insulation requirements and is targeted particularly at battery module plates of EV models operating with higher voltage systems.

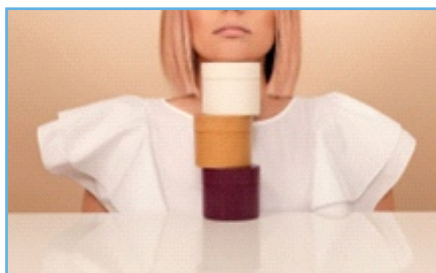
Xydar[®] LCP G-330 HH is a glass-filled LCP for injection molding capable of retaining its electrical insulation upon exposure to 400°C for 30 minutes. Xydar[®] LCP is an inherently flame retardant polymer, without the use of halogen or

bromine additives. In addition, it offers exceptional flowability and helps battery designers achieve thinner parts than possible with incumbent battery module insulation materials, such as polycarbonates or aerogels. It has been successfully tested with plates molded in typical dimensions of 100 x 150 x 0.5 mm.

Xydar® LCP has a proven fit in many electrical and electronic as well as coating applications. Besides automotive lighting components, sensors, solenoids and connectors, advanced examples in e-mobility include thin-wall slot liners used in the rotor design of an electric drive traction motor.

Xydar® LCP G-330 HH extends the portfolio of Solvay's battery solutions, which also includes Solef® PVDF for binders and separators, Ryton® PPS for coolant line connectors and vents, and Amodel® PPA for connectors and busbars.

Two Injection Molding Grades of Biobased Materials Enhance Sulapac's Cosmetics Packaging Portfolio



Sulapac Luxe, ideal for replacing hard plastics such as ABS and its more flexible edition Luxe Flex open up new opportunities.

Finnish eco-startup company Sulapac has been making significant strides with its biobased, biodegradable products, particularly in the luxury cosmetics packaging arena, with leading brands such as Chanel, which was one of its first investors. Sulapac was founded by two female biochemists specializing in biomaterials--Suvi Haimi and Laura Tirkkonen-Rajasalo. Sulapac materials are made of responsibly sourced plant-based biopolymers and sustainable fillers like wood chips from industrial side-streams. The matrix resin varies between recipes and the recipe is always a unique combination of responsibly sourced biobased and biodegradable biopolymers and sustainable fillers. The biobased content in each recipe is maximized.

As noted by Haimi previously, "Sulapac's business model is based on partnerships and factor in as a service concept, meaning we do not own any production facilities but partner with existing production plants. This business model enables localized manufacturing of the end-products, and as our business grows, also the material production can be taken close to the customer."

Recently the company launched two new injection molding materials reportedly ideal for replacing hard plastics such as ABS and specifically developed for conventional plastics converting machinery. Sulapac Luxe, made of sustainably sourced biobased biodegradable biopolymers and wood flour, is said to be ideal for fragrance bottle caps, lids and cosmetic jars. "It's the only material in our cosmetics portfolio with fine, non-visible wood," notes Haimi.

A more flexible edition, Sulapac Luxe Flex, comes without the wood component. This is a more ductile material with exceptionally good flow properties, and is ideal not only for caps and lids but also for compact powder boxes and other complicated designs. Sulapac Luxe Flex has a flexural strain of 10%. Both Sulapac Luxe and Luxe Flex can be used to replace ABS. "They have many similar properties, yet the Sulapac materials leave no permanent microplastics or toxic load behind during the use phase or in the end of life," says Haimi.

High density, resistance to temperature fluctuations, ceramic feel and sound, and a glossy, smooth surface are some of the material's characteristics, which are important for luxury brands. Sulapac Luxe is not only recyclable, but as with all Sulapac materials, it can also be made with recycled content, another feature important for many premium brands. Said Haimi, "Sulapac is a pioneer in recycled bio-based materials and our aim is to use only recycled biopolymers within the next five years." She noted that several high-end beauty brands have already shown interest in utilizing Sulapac Luxe in combination with their existing glass fragrance bottles or jars. The material is commercially available to all manufacturers and slips seamlessly into existing injection molding production lines.

"One major challenge beauty brands face in replacing conventional plastics is the strict performance criteria of the chosen materials," said Sulapac's international sales director Colin Strobant. "With Sulapac Luxe,

we have shown that conventional plastics can be easily replaced without compromising on quality. We have listened to our customers' challenges, and the material has been through an extensive development process to ensure it stands up to the highest demands for luxury performance."

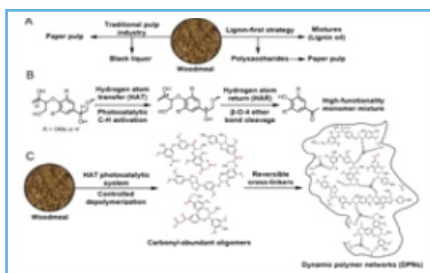


With the expanded portfolio, Sulapac's customers can now create packaging for various product areas, including skincare, makeup, and fragrances. Shiseido's brand Ulé utilizes Sulapac for their lids, while a diverse group of skincare brands from Lumene to Manik package their products in Sulapac jars. The selection of materials and production techniques allows brands to choose between a matt, glossy, or natural appearance complimented by a wide range of color options.

The successful launch of the BetterBarrel by Schwan Cosmetics last year, and Toly's popular Infinity Line of powder compacts made with Sulapac further demonstrate the versatility of Sulapac's offering. Sulapac has also developed premium quality solutions in collaboration with Chanel, including sustainable bottle caps created exclusively for the fragrance range Les Eaux DeChanel and the lid for the N°1 de Chanel Cream.

Besides materials for injection molding and extrusion, Sulapac's portfolio includes solutions for thermoforming, allowing cosmetic companies to create sustainable logistic trays and point-of-sale displays, as well as for 3D printing enabling sustainable prototyping.

Researchers Use Light to Convert Abundant Lignin Into Plastic that can be Continually Recycled



Schematic illustration of different strategies to process lignocellulose. (a) Two industrial routes of processing woodmeal, namely, the pulp industry or the lignin oil industry. (b) Mechanisms of hydrogen-atom transfer to break the β -O-4 motif, which is abundant in native lignin. (c) Overview of our strategy to first depolymerize native lignin and then repolymerize the resulting oligomers using dynamic covalent cross-linkers. Credit: ACS Central Science (2022). DOI: 10.1021/acscentsci.2c01257 Lignin is arguably the most abundant component of biomass that most people have never heard of. That may be about to change.

Many people are familiar with its biochemical cousin cellulose, a byproduct of paper and wood milling. But the same processes produce 50 million tons of lignin

annually, industry experts estimate. Once distilled, 98 percent of the inky liquid is burned to produce electricity.

Scientists have been working to find more efficient and sustainable approaches to transform this naturally occurring polymer for use as a cleaner and greener building block to develop next generation materials.

Boston College chemists have developed an approach that uses light to transform lignin into sustainable plastics, the team reported recently in the journal *ACS Central Science*.

"We developed a catalyst that can selectively break down specific chemical bonds in lignin when it is exposed to light, such that the lignin is converted into intermediate - sized, soluble molecules called oligomers," said Boston College Assistant Professor of Chemistry Jia Niu, a co-author of the study.

The team then converted the oligomers into sustainable plastics by reacting with a molecular glue called crosslinkers, according to the report. Because of the unique chemical structures of the oligomers created by the catalyst, the plastics made in this way can be chemically broken down back into the oligomers, and reformed from the oligomers and the crosslinker.

The findings advance a potential strategy for the waste-free system of polymer manufacture and re-use known as the circular plastic economy, said report co-author Dunwei Wang, Boston College's Margaret A. and Thomas A. Vanderslice Chair in Chemistry.



PLASTIC MACHINERY

The Largest Injection Molding Machine in China, Designed, Developed and Produced by YIZUMI, Delivered to the Customer

The largest injection molding machine in China, which was designed, developed and produced by YIZUMI, is officially delivered to the customer. It marks that the machine is officially put into operation by customers.

The 8500-ton ultra-large high precision injection molding machine has been hailed as one of the noticeable breakthroughs of YIZUMI. It is not only the largest-tonnage machine installed in China, but also could meet the customer requirements in molding process relying on its advanced technologies, such as precision control technology, thick-wall injection molding technology for large transparent parts, synchronous plasticization by two injection units, and injection compression molding technology.

The machine was manufactured by the team of two-platen injection molding machine of YIZUMI. The rated clamping force of the machine is 8500T, and

the maximum clamping force can reach 9000T, which has achieved a breakthrough in the key technology of China ultra-large two-platen injection molding machine, and also set a new record of injection molding machine industry in China.

8500-ton ultra-large injection molding machine, the first injection molding machine with the largest clamping force in China, embodies the wisdom and painstaking efforts of the YIZUMI R&D team, and it is the result of the continuous pursuit of excellence by the experts participating in the research and test in overcoming difficulties.

The project has entered the stage of preliminary technical research and technical demonstration since the middle of 2019. During this period, a large number of technical personnel of YIZUMI have carried out preliminary demonstration, scaling experiment, process test and other work. After that YIZUMI has determined the direction of research and development. Through a large number of project design, data calculation and simulation analysis by the research and development personnel, it has overcome a series of engineering problems such as the

manufacturing, assembly and functional testing of ultra-large parts of the machine.

Through continuous testing, the machine passed the client's scheme review, technical review and process review in the first quarter of 2021, and completed the whole machine assembly and test run in December of the same year. In order to ensure that the production process of the customer's products meets the requirements of mass production, three mold tests were conducted in 2022 to fully verify the performance of the machine. It completed the process validation of the customer's products and the production of the customer's first batch of products at the end of November of the same year. It totally took three and a half years from the early technical demonstration to the successful production, during which more than 30 technicians participated in the development of the machine.

The 8500-ton ultra-large high precision injection molding machine is a key product that YIZUMI has built with great effort in recent years. Its accuracy of mold opening and closing is able to up to $\pm 0.3\text{mm}$ and two

injection units with a maximum shot weight of 140 kg. Meanwhile, it can be used in one - step molding of large - sized transparent plastic parts (or with metal inserts) with high requirement in part shape, light transmittance and accuracy, solving the molding difficulties of large - sized transparent plastic part in China.

Besides, the machine incorporates cutting-edge technologies in the industry, including injection compression molding (ICM) technology, SmartClamp technology, internal circulation two - platen clamping unit and closed - loop pump technology special for optical products. The control system integrates smart control technology, information technology and Internet technology independently developed by YIZUMI. And the machine is three - platen machine.

In February 2023, China Plastic Machinery Industry Association (CPMIA) recognized that the technology of 8500 - ton Injection Molding Machine reached the international advanced level and agreed to pass the appraisal.

With the rapid development of domestic aerospace and automobile industry, the demand for ultra-large injection molding products is gradually increasing. YIZUMI will continually develop new products, new technology and new process, to improve the integrated solution for ultra-large injection parts. One-step molding of large plastic components achieved by integrating different in - mold technologies, replacing the assembling production of small and medium size

plastic parts, will gradually become a new technical trend.

At present, the machine which was completed prototype development and commissioning has been delivered to customer. For this achievement, Deputy Managing Director of YIZUMI Group & General Manager of Injection Molding Machine Division, Zhang Tao introduced:

“The R&D of the 8500-ton ultra-large high precision injection molding machine has taken a leading role in the development of large-scale injection molding machine for the plastic industry. In terms of tonnage and injection weight, this machine is the largest injection molding machine produced in China at present.”

“This machine is not only large, but also we have adopted new technologies such as injection compression molding process and synchronous plasticization by two injection units.” Zhang Tao emphasized, “The development of the machine has increased more possibilities for our application in large plastic parts. It also means that YIZUMI has achieved the leading position in the industry of ultra - large injection molding machines in global.”

As the first product of injection molding machine with the largest clamping force in China, 8500 - ton ultra - large injection molding machine can meet the demand for ultra-large products in aerospace, automotive industry, petrochemical pipeline, transportation facilities and other fields. Meanwhile, it has solved a series of difficulties in the processing, transportation and assembly of ultra - large

equipment, and provided customers with more cost - effective ultra-large transparent plastic molding solutions.

*The Data above were acquired by testing in the factory, only for your reference. As to the specific data, please refer to the actual equipment.

Kiefel Showcased New KMD 90 Smart for the First Time Live at Chinaplas 2023

In line with this year's Chinaplas focus "A Brighter and Shared Future, Powered by Innovation", Kiefel demonstrated the new SPEEDFORMER KMD 90 Smart steel rule cutting machine - engineered in Germany and made in China. The model is equipped with state of the art features and options, processing various materials for the packaging industry. Furthermore, new solutions for the appliance industry - also engineered in Germany and made in China - were on display

Combining innovative strength - a German-Chinese success story

In a live demonstration, visitors can experience the performance capabilities of the brand new SPEEDFORMER KMD 90 Smart. It is the world premiere of this new Kiefel machine and is available for sales in China and many other countries. It is engineered for the efficient production of food and non-food plastic packaging e.g. trays and containers, made from PET, PP, PLA, PS, PE or re-cycled plastics. The machine is 100% made by Kiefel and combines proven

German technology with Chinese local manufacturing benefits, made in the Brueckner Group top - notch factory in Suzhou, China. Of course Kiefel's worldwide engineering standards and quality processes are applied in the SPEEDFORMER KMD 90 Smart, guaranteeing a high level of satisfaction for the customers. It complements the smaller KMD 78 Smart which was shown at Chinaplas 2021.

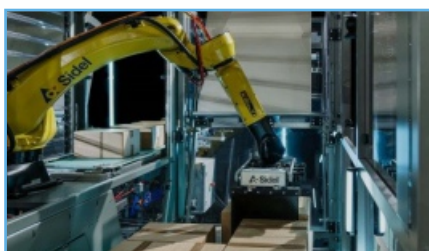
The high degree of automation and the sophisticated, time-saving tool change system are as much part of the mature concept as the steel rule cutting and the integrated stacking station. Additionally the highly productive machine comes with a forming area of 870 x 920 mm, a tool dimension area of 890 x 940 mm and can produce formed parts with a height of up to 160 mm. The machine is efficient and sustainable, e.g. through the film temperature measurement with closed-loop control or drives with energy recovery system.

New: Appliance solutions made in China

Kiefel is also underlining its presence in China with its new machine solutions for the appliance industry. From now on Kiefel is building SHARPFORMER KID 1.250 Smart machines in China: This Inline Thermoforming Machine for the flexible production of HIPS and ABS refrigerator inner-liners and door-liners utilizes vacuum-pressure forming technology for more demanding shapes and higher production speeds. The KID 1.250 Smart can produce side-by-side products with one mold.

Following Kiefel's strategy dedicated to the Chinese market, the KID 1.250 Smart is also engineered in Germany and assembled in China, Suzhou. As the offer is already very well received by Chinese customers, further machine types for the refrigerator industry will be successively offered according to the same concept, engineered in Germany and assembled in China. Chinese and Asian customers in particular therefore benefit from shorter delivery times, even faster spare parts availability, as well as competent and swift local support from the Kiefel team in China.

New Sidel Agile, Compact Palletising Unit Combines Robotics and Cobotics



Sidel is expanding its palletising range with the introduction of the high performing RoboAccess_Pal S. This new palletising unit,

which will be presented at Interpack, combines the best of cobotic and robotic worlds. It provides a uniquely capable solution that delivers improved agility, operability and compactness to the Food, Home, and Personal Care (FHPC) market segments.

With the introduction of cobotics in palletizing, Sidel has been able to answer the growing market demand for very compact and affordable cells, which generally replace manual operations.

For more demanding lines, where robotic arms could offer higher technical performances, Sidel has drawn on its 50-plus years of palletizing expertise to create an all-in-one solution that combines small footprint, fast return on investment and higher case payload and speed.

RoboAccess_Pal S delivers speeds of up to 12 cycles per minute and enables a case payload of up to 25kg while ensuring a fast return on investment, typically of one to two years. The palletising solution offers a new level of compactness with a footprint of less than 12m² for two stations with a significant pallet height of 1700mm.

Available only in ten weeks, RoboAccess_Pal S is embedding three new patented features to provide an even higher level of agility, operability, and compactness. A light-weighted carbon fibre and 3D - printed clamping head helps deliver higher payload capacity and overall machine footprint reduction while handling a wide range of secondary packaging. Additionally, the patented folding guarding system ensures effortless movable Plug & Play capabilities.

Sidel is committed to ensuring a high level of safety standards and a patented mobile physical curtain guarantees the operator's protection during pallet supply and removal in addition to helping reduce the machine footprint further.

Sidel will be premiering the new palletising solution at Interpack, the international packaging trade fair, from 4-10 May in Düsseldorf, Germany. Visitors and journalists are invited to come along to Sidel's stand in Hall 13, Booth B47 to discover more.

HP Debuts The HP Indigo 200k Digital Press Designed to Accelerate Growth for The Flexible Packaging Industry

HP Inc. (NYSE: HPQ) unveiled its new HP Indigo 200K Digital Press, designed to give digital flexible converters the competitive edge with better productivity, on-demand delivery, no minimum orders, unique designs, reduced energy consumption, and minimal waste. The new press is based on the only field-proven digital technology for digital flexible packaging and on a successful install base of over 300 HP Indigo 25K digital presses, series 4, worldwide². The new, series 5, HP Indigo 200K digital press, prints up to 56 m/min (183 ft/min) and dramatically increases the productivity of high-margin, sustainable short runs of digital flexible packaging, to be delivered in days, not weeks.

“The HP Indigo 200K is a mid-web digital press especially designed for converters addressing the needs of brands in flexible

packaging, but it also serves the growing requirements of the label and shrink sleeve industries for higher productivity and wider format,” said Noam Zilbershtain, VP & General manager of HP Indigo & Scitex. “Flexible Packaging is a growing market, and as HP Indigo customers are growing much faster than the market³, I have no doubt that the HP Indigo 200K digital press will open the door for more flexo converters who want to join the success, and reign in industry 4.0.”

Increased speed while maintaining quality

The HP Indigo 200K digital press showcases a 30 percent increase in speed and 45 percent boost in productivity compared to the HP Indigo 25K4. Featuring gravure - matching color quality based on the HP Indigo Liquid Electro Photography (LEP) and One - Shot Color technologies, the new press offers the widest available range of ElectroInks and is designed to print high coverage packages with white on the majority of industrial substrates, both surface and reverse. Additional business opportunities include unique brand protection elements.

Following the announcement of UK-based Sirane Group as one of the press' first beta customers, Peter Ralten, Commercial and Business Development Director said: “At Sirane, we have been looking into digital print for a while now, realizing it is where the future lies. The HP Indigo 200K digital press, with its incredible increase in productivity, opens new business opportunities for us. With the unmatched HP Indigo quality

and versatility, we can't wait to see the results of adding it to our portfolio.”

The HP Indigo 200K digital press achieves efficient production with HP Indigo's PrintOS software automation capabilities for batching, ganging, and variable data, as well as faster, accurate color match and workflow. Automation tools for operator efficiency⁵, coupled with sustainable production, circular packaging and food packaging safety⁶, all amount to an outstanding digital solution.



Features of the HP Indigo 200K Digital Press

- Mid - web press offers on - demand delivery, no minimum orders, fast setup, and minimal waste per job.
- Press print speeds up to 56 m/min (183 ft/min).
- Press print speeds up to 56 m/min (183 ft/min).

Thermal Management for The Plastics Industry – Technotrans to Exhibit at Trade Shows in The USA and Mexico

High - efficiency cooling and temperature control technology for the plastics industry on the American continent – technotrans will showcase its advanced

systems at two trade shows in the USA and Mexico. On the occasion of the Plastics Technology Expo in Rosemont, IL, USA, the thermal management specialist will present the energy-efficient protemp flow 6 ultrasonic eco and the teco cs 90t 9.1 temperature control units. At the Expo Plasticos in Guadalajara, Mexico, technotrans will present a compact high - performance refrigeration machine of the ECOtec product range. Climate protection, energy efficiency and customised solutions are important key topics at both exhibitions.



“Efficient thermal management plays a vital role in reducing the Co2 footprint of the plastics industry. In addition to demonstrating our technological leadership at the exhibitions in this field in the US and Mexico, we are also honing our image as a reliable business partner providing sophisticated and customised solutions on the American continent,” says Tom Carbery, VP Sales at technotrans America. Visitors to the Plastics Technology Expo can explore the protemp flow 6 ultrasonic eco, a temperature control unit with up to six circuits and maintenance - free ultrasonic flow measurement, among other products. When compared to conventional, uncontrolled peripheral pumps, up to 92 percent annual savings in electricity become possible thanks to the high - efficiency

pumps of the unit. Moreover, the compact eco.line series features a loss-free heat transfer system thanks to a “longlife” stainless steel heating cartridge while offering numerous interface and equipment options.

Technotrans will also present the teco cs 90t 9.1, a space - saving and energy - efficient temperature control solution with indirect cooling. The exhibit is configured to manage flow rates of 60 litres per minute at a temperature of 95 degrees Celsius while flow rates of up to 200 litres per minute at a temperature of up to 180 degrees Celsius are possible. A unit version of the base. line product range is available that offers a heating capacity of up to 9 kW along with user-friendly operation via a membrane keypad with a 7 - segment display. The high. line product range features a heating capacity of up to 36 kW and a logotherm display and control unit with a 7-inch multi touch screen.

Compact refrigeration technology with high operational reliability Together with the business partner Gitamsa Koch Tecnologias, technotrans will present service - friendly temperature control solutions and compact refrigeration machines for a wide variety of applications at Expo Plasticos, the Mexican plastics industry exhibition. The air - cooled or water-cooled units feature a high degree of efficiency, high operational reliability and a long service life. The smallest system variant provides a cooling capacity of 1.5 kW at a delivery rate of 0.42 m³/h, whereas the largest variant, xtend 3700 of

the ECOtec product range, has a cooling capacity of 370 kW at a delivery rate of 65 m³/h.

“Our energy efficient technologies provide the answer to a significant increase in the demand for eco-friendly cooling and temperature control solutions,” pointed out Martin Chacon, Area Sales Manager at technotrans America. “Thanks to the vertical range of manufacture, we are offering a unique degree of flexibility on the market – complex, application-specific systems for the plastics processing industry are among our core competencies.”

How Inline Vision Inspection can Minimize Scrap in Molding

Once viewed by injection and blow molders as a necessary evil, machine vision technology today can continuously monitor and improve production while reducing costs.

Machine vision technology is widely used in the plastic packaging industry and throughout manufacturing processes in all markets that have any level of automation. Historical use of the technology was simply to reject defects from the production line, so that nonconforming output does not ship to the customer and lead to return costs.

In this mode of operation, vision systems were often considered to be a “necessary evil,” since they do not add to the production process, but rather reduce output by rejecting not only bad products but some that are borderline or, at times, even good products through false rejects.

In the hands of an inexperienced operator, a natural tendency when a vision system starts to reject a large amount of product is to turn it off so that product can be shipped.

But that was the past. With proper design and application of industry-specific expertise, today's vision systems can be used to continuously monitor and improve production and, ultimately, to reduce costs.

What Causes Scrap?

What are the causes of scrap in plastic product manufacturing? Scrap can be created by material variations, process settings, machinery malfunction, environmental conditions and operator error.

Material variations are only increasing with demands for sustainability and greater use of recycled materials. Material variations occur from batch to batch, and even within a batch. Two major areas where vision technology can help is inspection for color variations (yellowing, graying) and for presence of contamination (black specks).

In the case of scrap caused by process, machinery and environmental issues, the most important function of inline vision technology is early detection. Defects can be discovered almost immediately, preventing the need to re-sort a production batch or scrap a large amount of suspect product.

Personnel challenges have significantly accelerated in recent years. It is a common story for manufacturers to have challenges simply hiring enough workers to

operate their plant. It has become even more challenging to find and keep sufficiently skilled workers for an increasingly technical manufacturing environment.

Reducing Operator Errors

To address personnel challenges, a major area of continuous development for vision systems has been in their ease of use and security. Some vision-system suppliers have become focused on specific markets. With a high level of know-how for the applications, these companies have developed purpose-dedicated systems, designed specifically for the application and ease of use. Furthermore, modern vision systems can be equipped with individual logins and passwords, controlled access to key functions, and full traceability of operator actions.

With regard to personnel issues, another major advantage of dedicated vision suppliers is the customer's ability to rely on the supplier for training and support, so that a manufacturer's vision program does not collapse upon the departure of key users from the company.



FIG 1 Intravis' IntraVisualizer remote monitoring software includes a dashboard and trend analysis with Estimated Time to Failure (ETF).

Digestible and Accessible Data to Prevent Scrap

Today's vision technology can supply a rich depth of statistics to provide data to diagnose production variations. An operator can review graphs of rejects by defect type during specific periods of time and review image history to see what has occurred. To make the data review more intuitive, information can be grouped by functional elements, rather than by specific camera inspections.

Another key feature of modern vision technology is the ability to provide notifications when processes shift. Warning limits can be programmed so that an alert is raised when inspections are nearing reject limits. This allows identification of issues and preventive action to be taken before defects are produced.

To take notifications to another level, information can be provided remotely, to reach decision makers without requiring their review of each individual vision system on the production floor. One modern feature is email or push notifications when warning limits, reject limits or negative machine states are reached. To take capabilities to another level, some vision-system suppliers provide remote monitoring software (Fig. 1), so that trends can be accessed and monitored through any web-based device such as a PC, laptop, tablet or smart phone. Remote monitoring software can allow the creation of production line "dashboards" visualizing key data that are meaningful to the user.

Furthermore, remote monitoring software can provide more detailed feedback on production trends. For particular product attributes, the software will identify an upward or downward trend, heading towards an upper or lower quality limit, and provide an Estimated Time to Failure (ETF). This function gives key information to the production planners that identifies an issue and the time available to take corrective action before defects are produced.

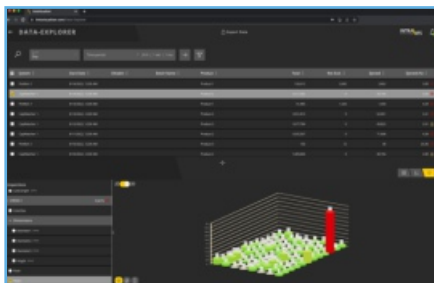


FIG 2 Intravis' "Mold Map" technique for cavity correlation of temperature readings of plastic closures helps isolate potential problem areas.

Pinpointing Issues to Identify Machine - Generated Scrap

Advanced vision systems can be used to closely monitor production processes and pinpoint the specific causes of issues so that scrap created by upstream machinery can be promptly addressed.

A classic example is on the filling line after filling and capping. Vision systems that are inspecting fill height and cap application can pinpoint reject rates to individual heads on the filling and capping machines. This is accomplished by a signal interface and tracking of product movement from the filling / capping machine through the

inspection system. Software can identify problem filler / capper heads immediately so that corrective action can be taken to prevent prolonged production of defects.

A major example of using vision to pinpoint machinery issues in plastics injection and blow molding is to correlate defects to specific molds and/or cavities. This can be a challenge for many applications since the parts are often not controlled between the molding and inspection areas. In the production of plastic closures or preforms, for example, parts are commonly handled in bulk before feeding into the inspection system. A main technique to address this challenge is to use vision to read cavity numbers and to correlate data and statistics to each mold. Cavity number reading has advanced significantly with the onset of deep - learning algorithms.

One basic use of cavity reading is to "blacklist" specific cavities creating defects, so that those parts are automatically rejected to be reprocessed later. This allows the production line to continue running until the issue can be addressed.

Cavity reading and correlation can create value for additional inspections relevant to the production process. One example is inspection of plastic closures. The vision - inspection system incorporates a temperature measurement of every part, in addition to the cavity reading. The supplier's web - based remote monitoring software can produce a "mold map" (Fig. 2), indicating the physical location of the cavities in the injection mold, together with temperature data.

This easy-to-use graphical data is applied to identify and troubleshoot potential temperature-related issues that are causing defects on the molding machine.

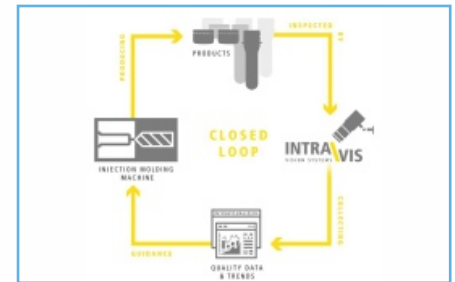


FIG 3 In closed-loop production, the vision system feeds information back to the molding machine to ensure scrap products are never produced.

Using Vision to Close the Loop

The ultimate goal for advanced vision systems is to use the information gathered from every product inspected to "close the loop" — i.e., to provide a feedback loop to the production machine to automatically adjust the machine to prevent defects (Fig. 3). This is a significant step towards achieving "lights out" production as part of an Industry 4.0 program.

One example was implemented with the cooperation of a vision system supplier and a major injection molding machine manufacturer on a plastic closure production line. The vision system provided a highly precise measurement of the closure diameter inline after molding. Diameter values were communicated to the molding machine via an OPC - UA interface, informing the machine that the diameter was moving towards its limit value, and that intervention was necessary. The injection machine automatically

counteracted this trend by making appropriate adjustments to the associated process parameters (e.g., injection pressure, melt temperature). After a very short period, the machine corrected the drift and prevented scrap from occurring.

New Tool Steel Qualified for Additive Manufactured Molds and Dies

Next Chapter Manufacturing says HTC-45 — an optimized H-13 — will offer superior thermal transfer and longer tool life.

Next Chapter Manufacturing has successfully qualified HTC-45 as a new tool steel available for additively manufactured molds and dies, offering a material that it says eliminates the cracking that can be common with H-13 while also increasing thermal conductivity to twice that of maraging steel. The company announced the new offering and brought a sample printed component to the recent PTXPO (March 28-30; Donald E. Stephens Convention Center; Rosemont, Ill.).

Jason Murphy, owner and CEO Next Chapter Manufacturing, said in a release that the new HTC-45 will enable his company to push the limits of additive manufactured molds and dies by providing longer wear and tool life through better thermal transfer, which also leads to faster cycle times. Murphy told Plastics Technology that the newly qualified material behaves like copper beryllium in terms of thermal transfer but is still a steel.

Daido Steel developed DAP - AM HTC 40 and DAP-AM HTC 45 by optimizing the chemical

composition of H13. International Mold Steel is the distributor of DAP-AM HTC powders. Next Chapter notes that H13 powder can be difficult to build without cracking, since the low thermal conductivity of maraging powder leads to higher thermal stress, cracking from water cooling channels and heat checking can occur on the design surface.



This core insert with conformal cooling channels was printed from HTC-45 powder.

X-Ray Vision Inside Parts Gets More Affordable for Processors

Shimadzu's new benchtop x-ray CT scanner provides internal and external metrology and flaw detection at a fraction of the previous cost.



New Shimadzu XSeeker 8000 benchtop x-ray CT scanner costs about 20% as much as the company's main floorstanding model.

Last week, I invoked the theme of x-ray vision in a figurative sense, writing here about MES systems

that use real-time production data to give processors an "inside view" of their operations. Today, I'm talking about actual x-ray vision inside plastic parts and even some metal components.

In recent years, we have published close to a dozen articles about using 3D x-ray computed tomography (aka CT scanning) to look inside plastic parts and assemblies to inspect internal features and identify voids. CT scanners also provide extremely precise external metrology. As we have reported, a growing roster of molders is finding that CT scanning can speed product development and mold qualification – generating, for example 50,000 measurements in 65-85% less time than a conventional CMM. Precision molders and micromolders have come to rely on x-ray CT scanning as an essential technology.

But its growth has been hampered by the high capital cost of CT scanning equipment – often in the \$500,000 to \$750,000 range, though at least one model for around \$200,000 arrived in the last five years. CT scanning service bureaus have emerged to fill the need. (I was gratified to learn from the founders of one of the first of these firms that he got the idea from reading an article in Plastics Technology about the promise of CT scanning.)

Since I have been following this technology for eight years or more, I was encouraged to learn last week that industrial CT scanning machines have crossed a new threshold of affordability and compactness. Shimadzu Scientific Instruments in Columbia, Md., has come out with a benchtop x-ray CT scanner

that costs around 20% as much as the company's primary floor model.

Shimadzu's new XSeeker 8000 unit can hold samples up to 11.8 in. in diam. and 12.6 in. high. A scan can be completed in as little as 12 sec, thanks to proprietary software, which offers both cross-sectional and 3D volume views of scanned objects. The new unit measures approximately 3 ft long × 2.4 ft high and weighs 638 lb. Shimadzu's flagship floor-standing model InspecXio SMX-225CT FPD HR Plus measures around 7.1 ft long × 6.1 ft high and measures samples up to about 15.75 in. diam. × 11.8 in. high.

Shimadzu's news appears to be part of a trend to make industrial CT scanning more widely available. There are at least two other benchtop x-ray CT scanners on the market, from Bruker and Rigaku, though the former appears to be aimed mainly at life - sciences applications and the latter has a smaller sample-size capacity and is aimed at "materials - science imaging centers."

Large Chamber 3D Printer Produces Large Components or Small Industrial Batches

Arburg will present the Freeformer 750-3X at the Rapid+TCT trade show in Chicago

Arburg announced it will premiere the Freeformer 750-3X, its largest industrial 3D printer to date, at the Rapid+TCT show, taking place May 2-4 in Chicago. The printer is designed for speed and economy, and is especially suited to functional components in a hard/soft combination.



Arburg's new large capacity 3D printer, the Freeformer 750-3X.

The new printer has a build chamber of 116 square inches, enabling it to produce larger components or additively manufacture small batches industrially. Controls and data processing have been optimized for process stability, component quality, and build time. At Rapid+TCT, a Freeformer 750-3X will demonstrate the production of an automotive window seal.

X-Rite Unveils Comprehensive Color Measurement Solutions for a Sustainable Packaging Workflow at INFOFLEX 2023



GRAND RAPIDS, Mich., March 20, 2023 – At INFOFLEX 2023, April 17-18, in Columbus, Ohio, X-Rite Incorporated and Pantone LLC, showcased a connected ecosystem of color measurement solutions to transform the flexographic and packaging color workflow process. Attendees will experience firsthand how the next - generation eXact™ 2 handheld spectrophotometer connects to a software ecosystem, including InkFormulation Software

and ColorCert® Suite, to bring the print and packaging workflow together in one device for improved quality control and productivity. In addition, X-Rite will chair a session at INFOFLEX on the value of color measurement with leading flexographic printers.

eXact™ 2 non-contact, handheld spectrophotometer measures color across various substrates, including flexible film and paper, in a single device. With easy-to-use features such as the touch-screen interface, patented Mantis™ video targeting technology, onboard digital color standards, quality control tools, and fleet management, print operators can verify customer requirements two times faster and with more confidence.

ColorCert Suite provides printers an overall view of print quality and color performance in a single number score to confirm compliance with brand specifications.

InkFormulation Software delivers fast, accurate, consistent ink formulation, formula creation, storage, approval, and retrieval for offset, flexo, gravure, and screen-printing inks.

X-Rite Link dashboard allows converters to verify the status of one or a fleet of eXact 2 devices, configure and distribute updates and libraries, and more.

PantoneLIVE™ digital color ecosystem enables brand owners, designers, and printers to feel confident in selecting color standards that are achievable in production.

i1Pro 3 Plus color profiling device reduces color appearance variability allowing printers to create ICC profiles for almost any substrate, including paper, film, textiles, vinyl, and other materials, and calibrate print production devices for the highest level of color accuracy.



CIRCULAR ECONOMY/ BIO-PLASTICS/ RECYCLING

Packaging Sector Leads Plastics Recycling Surge Collaboration to Increase Low-Density Polyethylene Packaging Recyclability Sees Success in Deinking Trials

Siegwerk, one of the leading global providers of printing inks and coatings for packaging applications and labels, has partnered with German startup Wildplastic and the Hamburg University of Technology (TU-Hamburg) aiming to increase the recyclability of plastic waste. One way to achieve this is by successfully deinking the collected waste before entering the recycling extrusion process. The partners conducted initial trials at the end of 2022 with very successful results.

Of the billions of tons of plastic that have been produced worldwide, only about 9% has been recycled, and about 12% ends up in landfills. The rest can end up leaking into the environment, polluting oceans and rivers, and breaking down into microplastics that are hazardous to human health. There is a clear and urgent need to improve recycling processes and ensure that more packaging

enters the recycling stream. Deinking packaging before granulation helps to prevent the packaging inks from contaminating the materials to be recycled and ensures that the packaging stays in the recycling stream.

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

recyclate granules are then sent to a production partner and used as a substitute for virgin LDPE material. This material is then used to create trash bags and mailbags. A broader scope of applications may be possible if the materials could be successfully deinked first.

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

“We started to research deinking of post - consumer plastic waste with Wildplastic about one year ago. As a technical university, it is important to carry out meaningful research relevant to the real - world problem. From our project, we have learned that a successful circular economy only works by motivating all the stakeholders involved. Siegwerk as the producer of printing ink, can play an important role in this context since it brings the producer's perspective to solve the problem in the beginning.” said Jinyang

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

Siegwerk is supporting Wildplastic in this initiative by providing the deinking chemistry and knowledge to enable the creation of clean recyclates. For successful deinking to occur, a precise combination of the right ink chemistry, the right drinking detergent, and the right process need to be applied. Inks on packaging can often be a hindrance to recycling, as the inks degrade during the recycling process and can contaminate the recyclates, leading to unpleasant odors or unsightly colors. Even if the inks are not removed, the opportunities for recycling are increased exponentially.

Nova Institute Highlights Bio - Based Feedstocks' Global Trends 2022 -2027

"Bio - based Building Blocks and Polymers - Global Capacities, Production and Trends 2022-2027" - stating a CAGR growth of 14% for bio - based polymers between 2022 and 2027. In this report, the polymers are grouped into bio - based 'drop - in', 'smart drop - in' and 'dedicated' inputs within the chemical production chain.

The report shows capacities and production data for 17 commercially available bio - based polymers in 2022 and a forecast to 2027. In 2022, the total installed capacity was 4.9 million tons, with an actual production volume of 4.5 million

tons. Unfortunately, this is still only 1% of the total production volume of fossil - based polymers.

I actually wrote a recent profile about the polyethylene (PE) market for Tecnon OrbiChem's Bio - Materials report, and as of 2022, the total global PE capacity is roughly estimated at around 216 million tons, while ethanol - based PE, all produced by Braskem, is only 260 ktpa. Braskem, by the way, is aiming to reach 1 million tons of green PE production capacity by 2030. Production of ethylene sourced from other renewable feedstock (CO₂, pyrolysis oil, bio - naphtha, waste fats / oil) is also starting to increase worldwide.

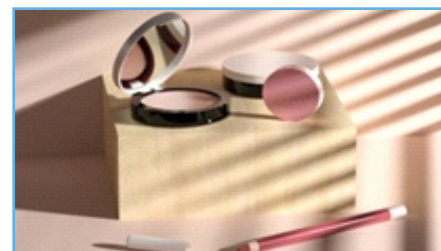
Bio - based polymers capacity is expected to increase to 9.3 million tons in 2027 indicating an average compound annual growth rate (CAGR) of around 14%, which is significantly higher than the average overall growth polymers of 3 - 4%. Biopolymers such as polyhydroxyalkanoates (PHAs) is expected to have a CAGR of 45%, polylactic acid (PLA) with 39%, polyamides (PA) with 37% and polypropylene (PP) with 34%. PE in Europe will reportedly increase by 18% until 2027. Casein polymers (which, unfortunately, I do not follow as much will reportedly increase by 15%.

Asia has the largest bio - based production capacity accounting for 41% of total capacities led by PLA and PA production, followed by Europe, with 27% mainly based on starch - based polymer compounds, PP and PE. North America accounts for 19% because of PLA and polytrimethylene terephthalate

(PTT) production, while South America accounts for 13%, mainly from bio - based PE production.

More interesting information about the report is shared in the press release including feedstock trends and updated market information on bio - based monomers. As for bio - naphtha, I have included a short overview of this market given the sharp increase of mass - balanced - derived polymers coming out of the market, especially from Europe and Asia. The report also provides a comprehensive expert view on Mass Balance and Free Attribution overview as well as on the Packaging and Packaging Waste Regulation. Finally, about 200 detailed company profiles were included in the report from start - ups to multinational corporations.

New Biobased Material For Substituting Plastics Like ABS For Cosmetics And Beauty Packaging



Beauty brands are seeking sustainable alternatives for conventional plastic packaging – but high - end brands have high - end demands.

An award - winning material innovation startup, Sulapac (Helsinki, Finland), has launched Sulapac® Luxe, a new biobased material ideal for substituting hard plastics, including ABS, as part of its expanded portfolio for

cosmetics and beauty packaging. The new material comes in response to demands from the beauty industry's leading brands for more environmentally conscious packaging solutions that still offer high - end luxury feel, function, and aesthetics.

“One major challenge beauty brands face in replacing conventional plastics is the strict performance criteria of the chosen materials”, says Colin Strobant, International Sales Director at Sulapac. “With Sulapac Luxe, we have shown that conventional plastics can be easily replaced without compromising on quality”.

High density, resistance to temperature fluctuations, ceramic feel and sound, and a glossy, smooth surface are some of the material's characteristics, which are important for luxury brands. Sulapac Luxe is not only recyclable, but like all Sulapac materials, it can also be made with recycled content, another feature important for many premium brands. “Sulapac is a pioneer in recycled biobased materials and our aim is to use only recycled biopolymers within the next five years”, says Sulapac's CEO and Co-founder, Suvi Haimi. Sulapac Luxe is made from industrially compostable materials; it leaves no permanent microplastics or toxic load behind.

Several high-end beauty brands have already shown interest in utilizing Sulapac Luxe in combination with their existing glass fragrance bottles or jars. The material is commercially available to all manufacturers and slips seamlessly into existing injection moulding production lines

Sustainable solutions for various applications and manufacturing technologies With the expanded portfolio, Sulapac's customers can now create packaging for various product areas, including skincare, makeup, and fragrances. Shiseido's brand Ulé utilizes Sulapac for their lids, while a diverse group of skincare brands from Lumene to Manik package their products in Sulapac jars. The selection of materials and production techniques allows brands to choose between a matt, glossy, or natural appearance complimented by a wide range of colour options.

Besides materials for injection moulding and extrusion, Sulapac's portfolio includes solutions for thermoforming, allowing cosmetic companies to create sustainable logistic trays and point - of - sale displays, as well as for 3D printing enabling sustainable prototyping.

Regulation and ambitious sustainability targets urge brands to switch to bio - based, circular solutions Demand for sustainable solutions is accelerating rapidly as companies are actively seeking alternatives for certain conventional plastics widely used in cosmetics packaging, including thermoset materials. They are unrecyclable and thus potentially subject to restrictions by European Commission's upcoming Packaging and Packaging Waste Regulation (PPWR). There are also upcoming country-specific restrictions for certain materials, such as ABS, that push companies towards more sustainable solutions. Sulapac's expanded portfolio enables cosmetic brands to replace controversial materials, such as thermosets and ABS,

with truly sustainable alternatives – without compromising quality or aesthetics.

“We are happy to see the positive movement within the cosmetic sector as more and more brands are turning away from conventional plastic. Our job is to make this transition as easy and beneficial as possible - for brands, their customers, and the environment”, says Haimi. AT

SK Chemicals Enters 7.57 Billion Dollars Recycled PET Market to Take the Lead

- **Signed a 98.4 million dollars asset purchase agreement with Shuye of China... Secured the world's first mass production system for recycled raw materials and PET**
- **The abundant supply of recycled plastic raw materials enables SK chemicals to have the highest level of price competitiveness and facilitates the development of disruptive recycling technologies.**
- **Targeting the market for high-value-added special materials such as industrial fibers to meet various customer demands such as climate neutrality and price**

SK chemicals accelerates its entry into the global market and business expansion with the world's first chemically recycled BHET (r-BHET) and chemically recycled PET (CR-PET) production system.

SK chemicals announced that it held a board of directors meeting and signed an asset transfer

agreement related to the chemically recycled BHET and chemically recycled PET business division of Shuye, a Chinese company specializing in green materials. The acquisition price for this deal is approximately 98.4 million dollars.

SK chemicals' acquisition of Shuye's assets includes a depolymerization plant that chemically decomposes waste plastics to produce recycled BHET and a CR-PET production facility that uses the r - BHET produced here to make PET again. As a result, SK chemicals has secured the world's first commercially available polyester chemically recycled raw materials and production facility, which can be sold separately.

Through the acquisition of Shuye's assets, SK chemicals has obtained a commercial production system for chemically recycled BHET and products that utilize depolymerization technology about 1-2 years ahead of other domestic companies. By producing recycled plastic raw materials such as waste PET in China, where there is abundant supply, SK chemicals is expected to gain a high level of price competitiveness.

Through this investment, SK chemicals has completed a recycled plastic value chain that extends to chemically recycled BHET, chemically recycled PET, and chemically recycled copolyester (CR - Copolyester), securing the sustainability of copolyester, which is its core business, and laying the groundwork for new growth.

According to Wood Mackenzie's report, the global recycled PET market in 2022 is approximately 9.7 million tons, with the majority of the market currently being mechanically recycled PET (MR - PET). The chemically recycled PET market, which is yet to be formed due to raw material shortages such as 'r-BHET,' is expected to rapidly grow by 2030 to form a 4.6 million - ton (about 7.57 billion dollars) market due to various factors such as carbon emissions, regulations on plastic use and recycling, and changing consumer preferences for a circular economy. As such, SK chemicals is expected to grow with the aforementioned asset acquisition.

Along with the expansion of its copolyester business, SK chemicals plans to make the chemically recycled BHET and chemically recycled PET businesses with high growth potential as new growth drivers and focus on them starting from the early stage of market formation.

SK chemicals' strategy is to supply chemically recycled PET to the domestic and foreign food and beverage bottle markets, as well as the food packaging film market, highlighting its excellent properties such as transparency, appearance, and stability. In addition, the company plans to enter high - value - added markets, such as industrial specialty fibers, where the use of physically recycled PET is difficult, and take the lead in the global 7.57 billion dollars market. The company also plans to sell the chemically recycled BHET as a standalone product to polyester

manufacturers who want to produce recycled products.

By quickly validating its own technology through operations of the secured production and pilot facility, SK chemicals plans to accelerate domestic depolymerization plant investment and continuously discover business partners to build global production infrastructure in Europe, North America, and beyond.

In addition, SK chemicals plans to accelerate the development of depolymerization technology with 'r - TPA,' which can be a game - changer in the recycled plastic industry. 'r - TPA' is a chemically recycled raw material that allows easy removal of impurities from waste PET and production of high - quality recycled plastic without requiring additional production equipment.



Ahn Jae-hyun, the CEO of SK chemicals, said, "The early securing of chemically recycled BHET will accelerate the enhancement of our corporate value through the recycling business as a part of our financial story expansion," and added, "We will strive to become a leading company in the global recycled plastic market by pursuing global expansion and advanced recycling business models."

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