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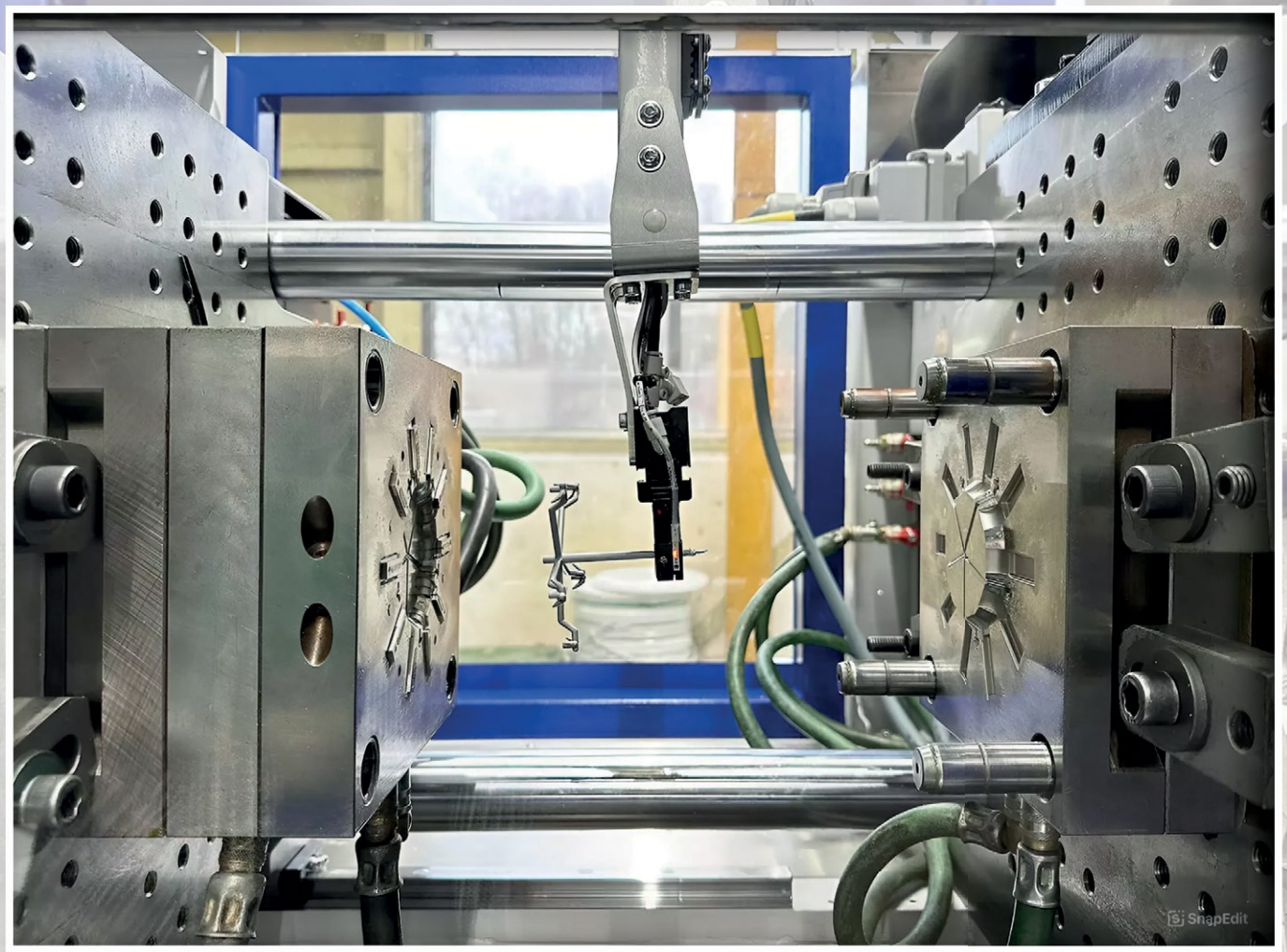

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Front page picture: WITTMANN Group

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Neste, Borealis and Covestro have signed a project agreement to enable the recycling of discarded tires into high-quality plastics for automotive applications. The collaboration aims at driving circularity in plastics value chains and the automotive industry. When no longer fit for use, tires are liquefied by means of chemical recycling and then processed into base chemicals and further into polycarbonates of high purity. These can then be used in various automotive applications, from parts of headlamps to radiator grilles.

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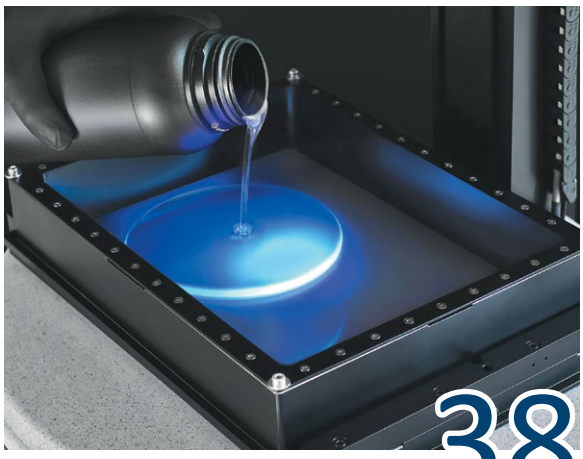
Mold-Masters®, a leading developer and supplier of hot runners , controllers, auxiliary injection, and co-injection systems, has launched the new TempMaster M4 hot runner temperature controller, which features a Mold Direct Mount (MDM) design as well as the company's new HR-Connect Technology. Through this innovative technology, a single cable connects the mold to the controller head unit, which eliminates conventional mold thermocouple and power cables to minimize extra weight, clutter and complexity from the molding cell.

After RCYL, a bicycle made from 50 per cent recycled fishing nets, igus is setting the next milestone for sustainable mobility: the motion plastics specialist has developed the first bicycle frame made from recyclable plastic material for the German e-bike manufacturer Advanced Bikes, which is manufactured using injection moulding. Decades of expertise in plastics manufacturing and experience with the RCYL bike are channelled into the development of both the frame and new bicycle components made from high-performance plastics.

The geometry of a planned injection-moulded component defines the complexity and the amount of work involved in designing and producing the moulding tool. For this reason, it is advisable, back at the design phase, to look closely at the practicability of the moulding tool and the complexity of the demoulding process. As a leading manufacturer of highquality modular standardised mould units and customised hot runner systems, HASCO offers a variety of solutions specifically for the field of multi-stage demoulding.



Digital light processing machines produce high-quality results faster than many other plastic 3D printing technologies and the range of materials available allow a variety of resins to be processed and easily swapped, making DLP ideal for research settings and makerspace environments alike. The Envision One offers academic institutions an approachable opportunity to offer students hands-on experience with design and manufacturing concepts as well as the up- and downstream implications for innovation, product development, and supply chains.

This year, Hexagon’s pioneering SmartScan VR800 structured light scanner has been awarded the prize in the Product Design category reflecting the quality of the user experience, ergonomics and the consistent and attractive application of Hexagon’s design language. The function was equally important – as the manufacturing industry's first optical 3D scanner featuring a motorised zoom lens, the SmartScan VR800 fundamentally changes the user experience so they can obtain high-resolution scans of inspected parts in a matter of seconds.

ENGEL duo 5500 combi M in the technical center for developing new technologies (picture: ENGEL)

ENGEL presents the world's largest technical center IMM

ENGEL AUSTRIA GmbH has expanded its technical center in St. Valentin, Austria, with one of the largest injection molding machines from its standard portfolio: the duo 5500 combi M. With a clamping force of 55,000 kN, it is by far the largest technical center machine in the world, measuring 32 meters long, 13 meters wide, 6.8 meters high, and weighing 545 tons. ENGEL aims to use this machine to enable technologies and components in completely new dimensions in collaboration with its customers and partners. The extra-large mold space accommodates molds weighing up to 150 tons, with possible shot weights up to 42 kg. This state-of-the-art machine was developed to meet the demands of the automotive industry and technical injection molding and is now available for customer trials.

Mega-Trends in Automotive Manufacturing

The automotive industry increasingly uses larger plastic parts to reduce vehicle weight, improve fuel efficiency, and lower production costs. Plastics offer design flexibility, enhance corrosion resistance, and contribute to the longevity and safety of vehicles. They also allow for the integration of functional elements and reduce the number of individual parts needed. ENGEL's new facility supports this trend by enabling the production of larger plastic components.

New Injection Molding Opportunities for the Automotive Industry and Technical Molding

Until now, large plastic parts have often been manufactured using various processes other than injection molding, which have significant limitations. With the availability of an injection molding machine as large as the duo 5500 combi M in a technical center, extensive possibilities for part and technology development and sampling are now available. This offering reinforces ENGEL's role as an enabler of new technologies, allowing customers and partners to actively pursue developments in new dimensions and expand injection molding capabilities.

The sheer size of the machine is impressive, as is the wide range of material combinations and technologies it supports:

- clearmelt - Coating visible parts with PUR
- foammelt - Foam injection molding for lightweight construction and warpage reduction
- organomelt – Processes with long glass fiber or tape reinforcement
- coinmelt - Compression injection molding
- optimelt - High-quality optical parts made from transparent plastics
- combimelt – Multi-color injection molding
- foilmelt – Back-injection of decorative/functional films

The new ENGEL technical center facility covers all application areas for the automotive sector and technical injection molding.

Cutting-Edge Technology and Digital Assistance Systems

The duo 5500 combi M represents the latest technology in injection molding. It features two movable (combined and individually operable) horizontal injection units and a combi M injection unit. It is also equipped with two six-axis ENGEL easix articulated robots for flexible and efficient automation. For PU applications, two Cannon systems are available, one for small-volume applications and one for high-volume applications. Additionally, a corresponding dosing unit allows for coloring the polyurethanes to create exciting designs. All digital assistance systems from ENGEL are integrated into the machine control, enabling energy-efficient, sustainable, and efficient production while optimizing processes.

Extensive Know-How

No other manufacturer has built as many injection molding machines of this size as ENGEL, giving it extensive expertise from which its customers benefit. By proactively installing a machine of this magnitude, ENGEL emphasizes its commitment to technological leadership, innovation, sustainability, and customer orientation, underscored by the motto “be the first”.

ENGEL
www.engelglobal.com

FANUC injects a new dimension into moulding processes at Fakuma 2024

FANUC is celebrating the 40th anniversary of its high-performance ROBOSHOT fully electric injection moulding machine. The enduring appeal of ROBOSHOT, alongside FANUC's long-standing experience and continuous innovation in the field of injection moulding, will receive a full showcase at the Fakuma 2024 exhibition in Friedrichshafen (15-19 October). FANUC is set to present the latest solutions in injection moulding technology and automation, with particular focus on sustainability, energy efficiency, compact design, reliability and the industry's lowest total cost of ownership (TCO).

Among many highlights will be a fully automated production cell demonstrating the efficient and precise processing of sustainable biopolymers. Comprising a ROBOSHOT a-S150iB with a clamping force of 150 tons and an LR-10iA compact 6-axis robot, this example of seamless cell integration will show how moulding shops can increase their output significantly. Longitudinally mounted on an additional linear axis, the complete footprint of the exhibit has been minimised.

Artificial intelligence (AI) is the heart of latest a-iB series ROBOSHOT. The injection unit, for example, includes AI metering that uses torque (rather than speed) control to compensate for changes in materials viscosity such as drying conditions and variations in regrind. In addition, FANUC AI mould and ejector protection avoids mould damage and costly repairs/ downtime if an event occurs during the opening and closing cycle. It even indicates when greasing is necessary or if the mould is showing signs of wear. The same technology also protects the ejector's forward and reverse movement.

A further eye-catching display at Fakuma will be the FANUC ROBOSHOT a-S100iB, presented together with the SEPRO Success 11 robot. This combination demonstrates the flexibility and versatility of FANUC injection moulding solutions, enabling the precise and fast handling of plastic parts with seamless integration of third-party robots.

The market's most competitive TCO, underpinned with a highly sustainable all-electric operating platform, makes FANUC a futureproof technology partner for injection moulding processes. Advanced servo technology and an intelligent energy recovery system, means ROBOSHOT users enjoy reductions in electricity consumption of up to 70% compared with hydraulic injection moulding machines (and 5-10% less than other electric injection moulding machines). Moreover, tasks like oil treatment and disposal become a thing of the past.

To help users maximise the available savings, ROBOSHOT machines feature a power consumption screen as standard. This includes an energy analysis page to identify where energy consumption takes place during the cycle, aiding optimisation. Further features contributing to low TCO include class-leading reliability and machine uptime, while low wear, simple mechanisms with less components, and high spare part availability are among many supporting factors.

Elsewhere on the stand at Fakuma, visitors will discover how quickly they can automate steps in the injection moulding process with FANUC's CRX-iA lightweight collaborative robot (cobot), which is easy to program using a tablet PC and drag-and-drop functionality. The CRX is user-friendly, flexible and safe to operate without the need for guards or barriers, making it perfect for integration into a wide variety of manufacturing environments.

FANUC
www.fanuc.eu

Heinz Zahoransky passed away at the age of 95

ZAHORANSKY mourns the loss of long-time managing director and innovator

The ZAHORANSKY Group is bidding farewell to a mechanical engineering visionary with a unique entrepreneurial flair: Dr. Heinz Zahoransky, son of the company founder and Managing Director for decades, passed away in Freiburg on 25 July at the age of 95. He played a leading role in turning the family business, founded in 1902, into an international business company. Heinz Zahoransky was also responsible for the fact that ZAHORANSKY now has around 700 registered patents, of which he alone developed more than 200. After retiring from management in 2005 after 46 years, Heinz Zahoransky focused mainly on his social commitment. For this and for his entrepreneurial achievements, he was made an honorary citizen of Todtnau and awarded the Cross of Merit of Germany, the Medal of Merit of the La Rioja region in Spain, the Baden-Württemberg Business Medal and the Entrepreneur Prize of the city of Freiburg. "My father was not only a forward-thinking entrepreneur who made us a world-class technology leader. He was also always committed to good causes in the region and beyond," says Ulrich Zahoransky, board member and son of Heinz Zahoransky.

Dr. Heinz Zahoransky (photo: ZAHORANSKY)

Born on 7 September 1928, Dr. Heinz Zahoransky completed his school education at elementary school in Todtnau and Schönau. His attendance at the Kepler-Gymnasium in Freiburg was interrupted by the war and four years of imprisonment in France. He therefore completed his Abitur at an evening school after returning from captivity. There he also met his wife Hanni Galli, whom he married in 1953. He completed his studies in mechanical engineering at the Technical University of Karlsruhe in 1954 with a diploma, followed by his doctorate in 1958.

In 1959, he joined his father's company as an employee and was appointed managing director alongside his stepbrother in the same year. From 1963, he managed the company alone for three decades, laying the foundations for its successful development. Under his leadership, the company experienced an unprecedented period of growth thanks to numerous new designs, most of which were based on his ideas.

Pioneer in social commitment

Heinz Zahoransky placed particular emphasis on global customer contact and consistently invested in the expansion of the production facilities. However, his commitment was not limited to economic success. As early as 1959, he introduced a company improvement system that rewarded employees' suggestions for efficiency and improvement. In 1970, he founded the ZAHORANSKY company charity, which is supported by both employees and the company and promotes social institutions, and also introduced "profit sharing" (employee share ownership).

After stepping down from the Management Board in 2005, Heinz Zahoransky remained on the company's Supervisory Board until 2012. In his well-deserved retirement, he then focused on private interests such as astronomy and painting. He is survived by two children and several grandchildren and great-grandchildren. The funeral took place on August 6 at Freiburg's main cemetery.

ZAHORANSKY
www.zahoransky.com

Andreas Montag named new Director Business Development Medical at Sumitomo (SHI) Demag

Effective 1 July 2024, Andreas Montag joined Sumitomo (SHI) Demag Plastics Machinery GmbH as the company's new Director of Business Development Medical. He replaces Anatol Sattel, who moves into a new function as Group CSO, effective 1 September 2024. Andreas Montag is an internationally experienced medical technology specialist who has spent his entire professional career in the plastics industry, first at Hekuma followed by Barnes Molding Solutions.

Thanks to the continuous and outstanding work of the medical team, Sumitomo (SHI) Demag is already highly successfully positioned in the medical technology market, says Andreas Montag. "As the all-electric world market leader, we have the perfect machine for the medical market with the IntElect. Our IntElect Medical Package is also specifically developed for the production of medical plastic parts. This includes cleanroom compatibility, precise process control, and comprehensive validation options to meet the highest quality and safety standards."

For the new BD Director, commitment to quality and innovation remains the foundation to successfully support further expansion. Characterising the product portfolio as state-of-the-art technology balanced with high reliability, Montag regards both as being equal priorities for medical manufacturers. By maintaining the focus on technological innovation and digitalisation, market and customer orientation, as well as global expansion and market diversification, Montag wants to build upon Anatol Sattel`s strategy of aligning the medical business unit as one global team.

Sumitomo (SHI) Demag
www.sumitomo-shi-demag.eu

f. l. t. r.: Michal Mucha, Technical Sales Manager UK, is supported by Philip Jahn, Technical Sales Manager, and both report directly to Nikolaus Weiss, Head of Sales at KRAIBURG TPE (picture: KRAIBURG TPE)

KRAIBURG TPE UK Ltd official opening and personnel announcement

KRAIBURG TPE, a global competence leader in Thermoplastic Elastomers, has recently announced the official opening of its subsidiary, KRAIBURG TPE UK Ltd. This strategic move underscores the company's commitment to serving the important UK market directly. It marks a pivotal milestone in the company's development to further enhance local customer services.

The United Kingdom has long been a pivotal market for KRAIBURG TPE with numerous well-known clients and successful collaborations. However, evolving dynamics presented challenges in maintaining optimal service standards since 2020. Collaborating closely with the longstanding partner, Abbey Polymers, KRAIBURG TPE diligently addressed these challenges. In January 2024, KRAIBURG TPE UK Ltd. initiated its business and warehousing operations. With a dedicated sales office in Stafford and a strategically located warehouse in Stoke-on-Trent, it is poised to deliver customer-centric solutions and uphold its hallmark service excellence. This strategic expansion reflects KRAIBURG TPE's unwavering commitment to meeting the evolving needs of clients and further expand the company's presence in the UK market.

Appointment of Michal Mucha

KRAIBURG TPE is delighted to announce Michal Mucha as the main UK representative for KRAIBURG TPE UK Ltd. With a wealth of experience spanning over a decade in plastics and automotive sectors, Michal is primed to further extend the company's presence in the UK market. His appointment underscores the company's commitment to delivering exceptional customer experiences and fostering partnerships. Michal Mucha is supported in his role by Philip Jahn, Technical Sales Manager EMEA, who has been in charge of the UK market for KRAIBURG TPE since 2020 and who has extensive experience of the local requirements.

Expanding operations in the UK not only reinforces the company's commitment to the region but also streamlines the purchasing process for customers. By establishing a local presence, lead times and shipping costs are significantly reduced, providing customers with greater convenience and efficiency in their procurement journey. This localization strategy aligns with the growing trend towards regionalization in supply chain management, enabling KRAIBURG TPE to respond swiftly to market demands and expand overall service levels. Moreover, customers benefit from seamless navigation in regulatory frameworks, ensuring compliance with local standards and regulations. By understanding and adhering to UK-specific requirements, KRAIBURG TPE provides customers with products that meet their exact specifications and regulatory needs, further enhancing trust and confidence in our brand.

KRAIBURG TPE
www.kraiburg-tpe.com

HASCO family celebrates its 100th company anniversary

Picture: HASCO

Around the globe, HASCO is this year celebrating its 100th anniversary together with customers, employees and associates. For company boss Christoph Ehrlich, it was a matter close to his heart to adequately celebrate this exceptional event with the employees and former staff at the headquarters in Lüdenscheid. On the company site, at places where components are normally designed, developed, manufactured and packed, a major HASCO family celebration took place on 22 June.

Invited guests included employees and their families as well as former employees with their partners who were presented with a varied program of activities. A time tunnel took the visitors into an eventful past. Large-format screens showed milestones from ten decades of HASCO history. For some of the guests, the tour of the plant with a visit to the administration area and the production facilities was a highlight because, up until then, they had been familiar with the name HASCO and the company's standard mould units only from their family members, but were now given an insight into the heart of the company. They also visited the unique sheet production area and the warehouse/logistics section with its innovative Autostore system. The guests were given an impression of how, on a day-to-day basis, the HASCO formula is brought to life through availability, speed and quality.

Christoph Ehrlich, in the presence of the Hasenclever founder family and the management of Berndorf AG (majority owner), welcomed the guests in the afternoon with the emotional words: "What would HASCO be without you? – You are the stars of the evening." He emphasised that many members of staff had been true to the company for decades, had encouraged young upcoming staff and had passed on their knowledge to them. Standards were set for an entire industry and continuously further developed: "This has made HASCO the pioneer of mouldmaking for 100 years."

Everything was set for an unforgettable employee celebration. Culinary delights with regional specialities and music from one of the best German live bands provided for an exuberant atmosphere. There was also plenty to do for the younger generation, who had a lot of fun on the bouncy castle and climbing wall or could try out their artistic talents with face-painting.

Many stories were exchanged on this day, dealing with technical achievements, pioneering inventions and anecdotes, which were told not least by the many former HASCO members. The riddle of the roly-poly doll was also solved during the evening – the object with which everything started at HASCO and which featured as the main silent actor in the anniversary film.

HASCO
www.hasco.com

Comar celebrates 75 years of innovation

Comar proudly announces its 75th anniversary as a leading contract manufacturer for healthcare companies worldwide and as a leading provider of primary packaging and dispensing products. Founded on the guiding principles of excellence, dedication, and customer-centricity, Comar has established itself as a trusted partner for clients in the Medical, Pharmaceutical, Consumer Healthcare, Personal & Home Care, and Food & Beverage markets.

Established in 1949 as TST Glass Co., Comar's journey began in a New Jersey garage with the production of a snakebite kit. Over the years, the company transitioned into manufacturing glass tubing and vials

before eventually venturing into plastic injection and blow molding. Comar's success is rooted in its unique approach to problem-solving, which combines fresh thinking, engineering expertise, and a relentless focus on client satisfaction.

Brian Larkin, President and CEO of Comar, reflects on the company's journey, stating, "In all its iterations through all the years, Comar has continuously evolved and adapted to meet the changing needs of its clients, providing innovative design solutions and quality-driven manufacturing to drive progress and shape the future of packaging and medical solutions."

Picture: Comar

"Our success today is a testament to the enduring values instilled in our organization, stemming from our rich family heritage and unwavering commitment to our long-standing healthcare clientele. From our beginnings as a family business to our current status as a premier global supplier, Comar's journey reflects the resilience of our core values and the strength of our partnerships." Added Comar Chairman, Mike Ruggieri.

As part of its anniversary celebration, Comar reaffirms its commitment to innovation, progress, and collaboration. "Together, we set progress in motion," emphasizes Larkin. "As we look ahead to the next 75 years, we remain dedicated to driving innovation, exceeding expectations, and making a difference in the lives of our clients and the communities we serve."

Comar
www.comar.com

DuPont has acquired Donatelle Plastics Incorporated

DuPont has completed the previously announced acquisition of Donatelle Plastics, a leading medical device contract manufacturer specializing in medical components and devices. The acquisition of Donatelle brings complementary advanced technologies and capabilities including medical device injection molding, liquid silicone rubber processing, precision machining, device assembly, and tool building.

"Our healthcare strategy is focused on offering a comprehensive suite of solutions for customers in high-growth therapeutic areas," said Jon Kemp, President, DuPont Electronics & Industrial (E&I). "Donatelle Plastics Incorporated will be the second acquisition, following Spectrum last year, that will deepen our expertise in the medical device market segments and enhance our position as a partner of choice for our customers."

DuPont's healthcare exposure within the Industrial Solutions line of business of the E&I segment includes Spectrum, a leader in medical device components, and Liveo™, a leader in silicone solutions for healthcare applications. The acquisition of Donatelle Plastics Incorporated will bring complementary advanced technologies and capabilities including medical device injection molding, liquid silicone rubber processing, precision machining, device assembly, and tool building. Donatelle Plastics Incorporated has a strong financial growth profile aligned to attractive therapeutic areas including electrophysiology, drug delivery, diagnostics, cardiac rhythm management, neurostimulation, and orthopedic extremities.

Picture: DuPont

Founded in 1967 and headquartered in New Brighton, Minnesota, Donatelle Plastics Incorporated has a workforce of more than 400 employees and operates a facility strategically located in a medical technologies hub near leading original equipment manufacturers. Donatelle Plastics Incorporated has established decades-long relationships by providing best-in-class customer service, top-notch quality and injection molding expertise. They are recognized for innovation in medical device and component manufacturing, particularly in complex applications where quality, reliability and technical expertise is required for critical end-use applications.

"We're excited for this next chapter in Donatelle's journey and for our team of highly talented and skilled employees to join DuPont," said Treasa Springett, President of Donatelle Plastics Incorporated. "As a part of a broader healthcare offering, we will have even greater impact on patient outcomes by enabling the innovation and development of next generation devices for patients worldwide."

DuPont
www.dupont.com.

Well positioned for the future

With the appointment of four divisional managers, WITTMANN BATTENFELD Deutschland based in Nuremberg and Meinerzhagen, Germany, consolidates its structures and prepares for future growth. The automation technology sector will be further expanded, and the company's application technology center services will be extended as well.

Ongoing further development in the injection molding markets leads to changes in plastics processors' demands. Counseling and service are becoming more and more significant. WITTMANN BATTENFELD Deutschland has responded precisely to this trend by taking numerous actions. Most recently, four divisional managers have been appointed at the Nuremberg site. Alexander Paech is now the new Sales Manager for Automation and Auxiliary Equipment, Björn Dünfelder is responsible for Project Management, Design and Project Planning in automation technology, Maximilian Töpfl is the new Production Manager, and Jürgen Kreissl is in charge of Service and Infrastructure, which also includes the company's technology center and training facilities.

"We are glad that we have found experts from our own ranks to take charge of these strategically important areas of responsibility, candidates who have already been with the WITTMANN Group for a long time and have contributed substantially to the excellent positioning of our products and services in the market", emphasizes Andreas Schramm, Managing Director of WITTMAN BATTENFELD Deutschland GmbH.

A young management team pooling many years of experience

Alexander Paech has familiarized himself with all relevant corporate departments during his ten years at WITTMANN, including service, project planning, training and sales, and he excels by his close relationship with customers and the market.

Björn Dünfelder has been with the company for more than 20 years and has successfully managed project planning in automation technology for several years. With his interdisciplinary knowledge and extensive experience, he is ideally qualified to solve cross-divisional requirements in a targeted manner. His sphere of responsibility has been extended by the new structure.

From left: Björn Dünfelder, Alexander Paech, Jürgen Kreissl and Maximilian Töpfl (photo: WITTMANN BATTENFELD Deutschland)

Maximilian Töpfl was in charge of project management for large-scale and customized systems during the past four years and possesses an outstanding amount of industry expertise. One main focus in his new sphere of responsibility lies on optimizing the order management with the objective of being able to implement customer requirements even faster and more flexibly.

Jürgen Kreissl has been with the WITTMANN Group for 33 years and was previously head of electrical design, software and assembly. To his new position, he contributes extremely thorough product expertise. One of his primary tasks is to further expand the service network.

Investments at both German facilities

In both Nuremberg and Meinerzhagen, the facilities of the application technology centers are being extended. A wider range of machines, robots, auxiliary equipment and technologies will be made available in future for training programs, presentations, testing and joint developments with customers. Here, the benefits of the Smart Factory can be presented very clearly and tangibly. Investments to install intelligent temperature control have already been made at both locations.

Investments are also taking place in customer support. For example, a second test stand is currently being installed at the Meinerzhagen facility, in order to provide temperature controller servicing at both German facilities in the near future.

"With Nuremberg and Meinerzhagen as permanent locations and a close-knit sales and service network, we are close to our customers everywhere in Germany", says Andreas Schramm. "The processors are benefiting from the short distances."

WITTMANN Group
www.wittmann-group.com

IVW and T.Michel launch cooperation in lightweight construction and composite technology

Two unique partners, Leibniz Institute for Composite Materials (IVW) and T. Michel Formenbau GmbH & Co. KG, have joined forces to create a groundbreaking unit for future product developments in lightweight construction and composite technology for particle foam applications. This collaboration offers industrial customers a seamless development platform – from basic research to the production process. It enables significantly more efficient and practical product creation and industrialization.

From left to right: Prof. Dr-Ing. Thomas Neumeyer, Thorsten Michel, Pascal Sadaune (photo source: IVW)

The cooperation aims to combine the innovative strengths of both companies, setting new standards in the industry. Customers benefit from the combined expertise and comprehensive knowledge of both partners, revolutionizing the development and implementation of new products.

"We look forward to close cooperation and many exciting projects that will emerge from this partnership. This collaboration provides us with the opportunity to combine our strengths and thus elevate product development in lightweight and composite technology to a new level," said Thorsten Michel and Prof. Dr.-Ing. Thomas Neumeyer.

About T. Michel Formenbau GmbH & Co. KG

T. Michel Formenbau is a leading company in lightweight construction and composite technology, with a special focus on particle foam applications. The company is known for its innovative strength and practical solutions.

About IVW

The Leibniz Institute for Composite Materials (IVW) is a renowned research institution specializing in basic research and development in composite material technology. IVW is known for its outstanding research and close collaboration with the industry.

IVW
www.ivw.uni-kl.de

Stork IMM establishes North American operations

Stork Plastic Machinery B.V., Hengelo, Netherlands, has created a U.S. subsidiary – Stork IMM USA LLC – based in Swedesboro (in the Philadelphia area), New Jersey, and led by George Kotzeff and Scott Molnar. Established in the Netherlands in 1968, Stork IMM has sold injection molding machines ranging in clamp force from 200 to 2,000 tons for high-speed packaging applications into the U.S. for 25 years.

Photo: Stork IMM

To support the new North American operation, Stork IMM has named Kotzeff and Molnar as directors of business development. Based in California, Kotzeff has worked in key account manager roles at both Husky and Sidel. Most recently, he worked as a consultant with packaging companies, including Rplanet, Power Hydration and INOSIP. Based in Toronto, Molnar was formerly president of Molding Excellence in Toronto and has held executive and business development roles with injection molding, hot runner, automation and mold cooling companies, including leadership positions at RJG, Mold-Masters and Husky.

Stork IMM has also partnered with industrial services and logistics firm Valley Group Inc., Fishersville, Virginia., to provide machine installation, field service and maintenance support for Stork IMM's existing and new customers. In a release, Gert Boers, Stork IMM CEO, says the establishment of domestic service and spare parts make the company "uniquely positioned to scale up and grow our business."

Stork IMM
www.storkimm.com

From old tires to new car parts: Neste, Borealis and Covestro aim at closing the loop for automotive industry

Strong partnership for a circular economy (from left to right): Jeroen Verhoeven (Neste), Thomas Van De Velde (Borealis), Guido Naberfeld (Covestro) aim to make new car parts from discarded tires

Neste, Borealis and Covestro have signed a project agreement to enable the recycling of discarded tires into high-quality plastics for automotive applications. The collaboration aims at driving circularity in plastics value chains and the automotive industry. When no longer fit for use, tires are liquefied by means of chemical recycling and then processed into base chemicals and further into polycarbonates of high purity. These can then be used in various automotive applications, from parts of headlamps to radiator grilles.

"Circularity requires cooperation, and this cooperation with our partners Neste and Borealis is testament to the possibilities at our disposal," says Guido Naberfeld, Senior Vice President, Head of Sales and Market Development Mobility at Covestro. "We are creating options to turn old tires into new car parts again. With that, we are supporting our automotive customers and addressing an increasingly prominent question discussed across the value chain: How to match high-performance materials with recycled content? Projects like this can be the answer."

As part of the collaboration, Neste turns liquefied discarded tires into a high-quality raw material for polymers and chemicals manufacturing and supplies it to Borealis. Borealis will then process the Neste-produced raw material into base chemicals phenol and acetone, which are supplied to Covestro. Covestro can use these materials to make polycarbonates. The share of recycled content is attributed via the mass balancing approach all the way to the final products using ISCC Plus certification.

The first products based on the collaboration are already available as each party has manufactured the first batch of their respective contribution to the project. Aside from polycarbonates, the project partners may also consider polyurethanes as a possible end product, which could also find its way into parts of the interior of a car. The companies emphasize that the potential to scale-up these types of developments should be considered when setting ambitious targets for future EU regulations, such as the End of Life Vehicles Regulation.

"We are demonstrating the importance of value chain cooperation to give new value to waste," says Thomas Van De Velde, Senior Vice President Base Chemicals at Borealis. "We are proud that Borealis, in collaboration with Neste, is able to play a role in this project, providing more sustainable solutions for polymer applications for Covestro and its customers."

"This project can serve as a blueprint when it comes to establishing circularity in the field of plastics in cars," says Jeroen Verhoeven, Vice President Value Chain Development for polymers and chemicals at Neste. "It shows how low-quality waste materials can be turned into very high-quality plastics. This is good news for the polymers and automotive industries as well as for the environment."

Borealis
www.borealisgroup.com

All photos: Covestro

YIZUMI Thailand's opening marks a great move in global strategy

On June 12th Yizumi Precision Machinery (Thailand) Co., Ltd. (YIZUMI Thailand), held a grand open day to celebrate its opening. Industry experts, customers, partners, and YIZUMI Thailand staff attended the ceremony.

Ms. Karen Yu, Deputy General Manager of YIZUMI Injection Molding Machine Division, delivered a welcome speech at the ceremony. She stated that the establishment of the subsidiary in Thailand marked a strong and significant step in YIZUMI's globalization. This step not only indicates YIZUMI willingness to strengthen international cooperation and expand overseas market, but it is also an important part of YIZUMI development strategy.

She emphasized that YIZUMI will make every effort to support the operation and expansion of the YIZUMI Thailand, including providing top technologies and excellent after-sales service. At the same time, she eagerly anticipated that the YIZUMI Thailand will become a flagship of YIZUMI in Southeast Asia, bringing new growth impetus.

Amidst enthusiastic applause, YIZUMI senior executives and guests mounted the stage and participated in the ribbon-cutting ceremony, officially opening a new chapter in YIZUMI's internationalization development.

At the ceremony, two senior technical experts from YIZUMI shared their ideas on innovative injection molding processes, integrated metal forming, and other subjects related to Thailand's and Southeast Asia's industrial features.

In addition to technology sharing, there were also visits and exchange activities. Guests gained a thorough grasp of YIZUMI's advanced technologies and manufacturing processes, and highly appreciated the company's mature machine processes and strong brand strength.

All photos: YIZUMI

Because of its tariff preferences, developing economy, upgraded infrastructure, and friendly foreign investment policies, Thailand has become one of the favorite overseas investment markets for Chinese companies. YIZUMI actively seized the chance to establish a subsidiary in Thailand to better serve the local and Southeast Asian markets, and achieve continuous business growth.

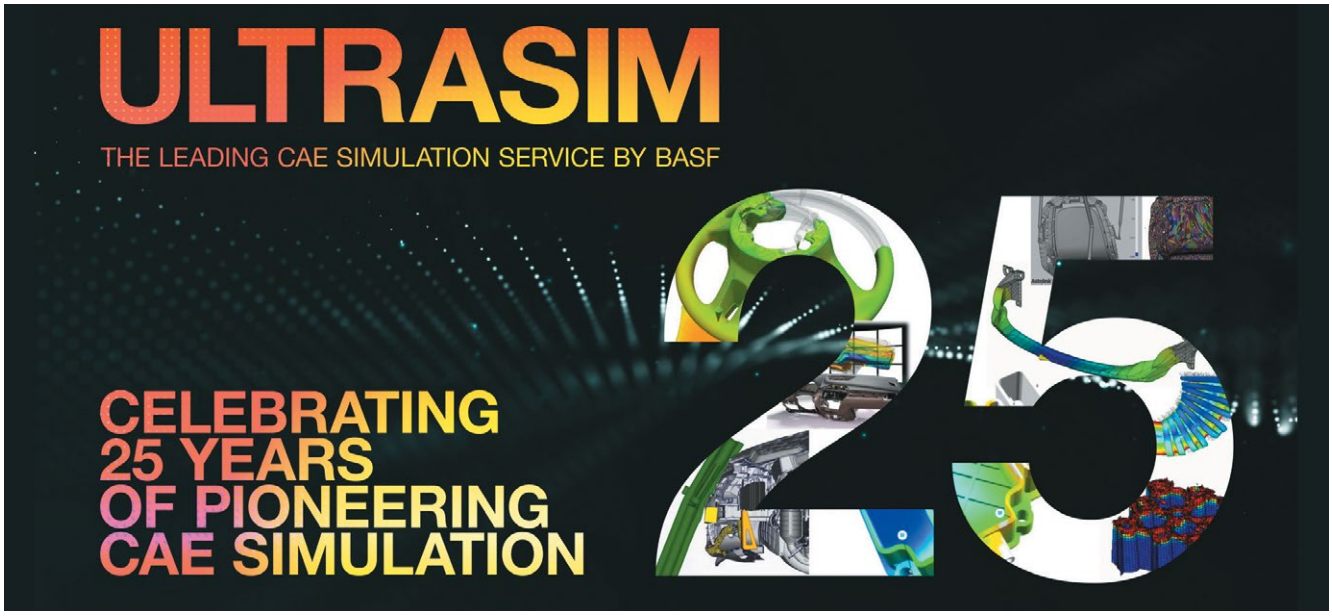
YIZUMI Thailand's main business includes the sale of injection molding machines, die casting machines, and spare parts, as well as product display and technical service. Its establishment not only demonstrates the company's focus on the Southeast Asian market, but it also marks an important step forward in YIZUMI's globalization strategy.

YIZUMI Thailand employs a professional team that includes management, sales, technical services, and administration staff. The facility has got various function areas, such as equipment display areas, mold trial areas, training areas, and spare parts areas to ensure that the business runs smoothly. In addition, the company have introduced advanced systems like CRM and SAP to improve management efficiency and customer service.

In today's globalized world, YIZUMI is actively expanding its international influence and continuously deepening its global layout. The company integrates local and foreign resources to provide all-around support to overseas markets, particularly Thailand, in areas such as market expansion, talent selection and training, supply chain optimization, asset allocation, and brand promotion.

YIZUMI is confident in building YIZUMI Thailand as a key business hub in Southeast Asia to better serve the surrounding areas and contribute to its globalization. The company is excited to collaborate with more Southeast Asian customers to build a better future!

YIZUMI
www.yizumi.com



The leading CAE simulation service Ultrasim® celebrates 25 years of pioneering virtual engineering for customers

Powered by unique and ultra-accurate simulation methods, extensive material data, and easy-to-access web services, the computer-aided engineering (CAE) competence Ultrasim® creates an unparalleled offering for BASF customers. As a pioneer in the field, BASF introduced the first integrative simulation capability for plastics in 1999, laying the foundation for what is today a strong global network of CAE simulation services. In 2024, Ultrasim® celebrates 25 years of helping customers use BASF plastics and foams to develop sustainable innovations in industries ranging from automotive to appliances, footwear, furniture, renewable energies, and more.

Pioneering CAE simulation for plastics and foams since 1999

"The late 1990s were an exciting time", Stefan Glaser, today Vice President Simulation Engineering & Ultrasim®, recalls. He had joined BASF in 1996 to develop BASF's integrative simulation capability and prepare its launch. "It was a completely new way of thinking. The internet opened up new possibilities, Google went live in 1998, and we at BASF already thought about connecting the data of our plastic materials and use them to optimize our customers' products. This was truly pioneering work."

In 1999, BASF launched its integrative simulation capability, which was soon rebranded Ultrasim®. Since then, the Ultrasim® competencies have expanded continuously: "In the last 15 years, we added at least one new simulation capability to our Ultrasim® portfolio per year to address new applications of our plastic materials", Glaser shares. Today, Ultrasim® provides simulation services for process design (filling and foaming simulations) and mechanical design (static and crash analyses). The plastics are described with accurate material models that cover a wide range of phenomena like the dependence of the material response on strain rate, temperature, moisture content and, in particular, its processing.

25 years of helping customers develop sustainable innovations

"The track record of Ultrasim® is impressive", acknowledges Josef R. Wünsch, Senior Vice President Research & Development Performance Materials, "Over the past 25 years, we have helped our customers from a wide range of segments to drive exciting innovations in their fields using our high performance materials – be it energy absorbers and engine mounts in cars, materials for battery packs, photovoltaic connectors, sport shoes, wheelchairs, and many more."

Regardless of the target application, all customers enjoy valuable benefits from using BASF's simulation services: Ultrasim® helps them achieve a more sustainable part development with less waste, time, and energy. This results in lower costs and higher performance of their products. Customers can rely on the global network of Ultrasim® simulation experts who work hand-in-hand with the respective technical development colleagues at BASF to deliver optimum service tailor-made to the customers' specific needs.

The pioneering story of Ultrasim® continues into the future

"Ultrasim® has been a true success story – and it doesn't stop now", shares Wünsch, "We continue to develop our offering and have recently revolutionized the field of CAE material simulation again: with our Ultrasim® Web Services making it a real customer experience."

Ultrasim® has pioneered the world of web-based simulation services to seamlessly integrate BASF's material and part design knowledge with customers' in-house development processes: The Ultrasim® Web Services offer simulation services as easy-to-access and 24/7 available web apps. The apps' interfaces are streamlined for specific industry challenges and come with integrated support, which enables cost-effective collaboration between customers and BASF simulation experts.

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Production of bottle trays from regrind with an ENGEL e-mac 310 slim edition at NPE 2024

Great success for ENGEL with technological innovations and customer focus

After an impressive week at NPE2024 in Orlando, Florida, ENGEL can draw an extremely positive balance. Between May 6 and 10, the company showcased its latest innovations and technologies. ENGEL remains true to its reputation as an innovation leader – not only through the continuous development of its product range, but also through its customer focus and technical support. This emphasised ENGEL's commitment to provide advanced technologies to its customers.

The most important facts

After a 6-year break, the trade fair attracted over 55,000 visitors. Many of them were particularly interested in ENGEL's innovative machines and technologies. These products were developed not only to demonstrate technical progress, but also to respond specifically to customer requirements and challenges. The injection moulding machines on show therefore proved to be a crowd magnet:

The new e-mac slim edition offers maximum mould installation space with a reduced and very compact footprint.

The hybrid e-speed 610/90 enables particularly high injection pressures and speeds for the production of thin-walled packaging with the highest performance requirements.

The hydraulic, tie-bar-less victory 330/85 enables quick and easy mould changes, which minimises downtimes and increases productivity.

The e-motion 440H/160TWP combi M optimises the production of two-component products in the tightest of spaces under cleanroom conditions using cube mould technology.

ENGEL also promoted fast available stock machines and the new digital assistance systems. These software solutions were also designed as a response to the shortage of skilled labour and provide support in part design, mould testing, production, maintenance and service.

Innovative highlights and exhibits in detail

The e-mac slim edition impressed with its compact design. It demonstrated to the participants the advantages of space saving and high efficiency at the same time. Of particular note was ENGEL's recycling package used on the e-mac 1565/310

ENGEL e-speed 610 for high-performance applications at NPE 2024 (all photos: ENGEL)

slim edition, which produced bottle trays from regrind – a first in the industry that closes the loop on plastic materials and minimises CO_2 emissions. This machine is proof of ENGEL's ability to combine precision and environmental awareness. This machine demonstrated its strength in producing high-precision technical parts, emphasising the modularity and adaptability of ENGEL's electric machines.

With the e-speed 610/90, ENGEL presented an injection moulding machine for packaging that demonstrated its capabilities at high injection rates and pressures. This makes it ideal for high-performance applications. Its hybrid drive concept combines the advantages of electric and hydraulic drives. This enables high productivity and energy efficiency at the same time. Equipped with a 4+4-cavity family stack mould, the e-speed produces tamper-proof food containers and lids with in-mould labelling (IML). Thanks to its unique hybrid drive technology, it is ideally suited for applications that place the highest demands on injection performance.

Another highlight for the visitors was the tie-bar-less victory 330/85 with its quick mould change system. With this system, ENGEL emphasises its commitment to cost efficiency in production. The exhibit also featured an integrated RFID system, which enables automatic recognition and adjustment of machine settings without the need for manual intervention. This drastically reduces changeover times and minimises human error. The tie-bar-less design maximises the space for moulds and facilitates access, which further shortens changeover times and improves operating efficiency. ENGEL is making a clear statement in favour of high user-friendliness.

Another very remarkable exhibit was the e-motion 440H/160TWP combi M. It attracted attention with its innovative cube mould, which makes it possible to produce highly complex two-component products in the smallest of spaces. This high-performance, all-electric machine with a horizontal rotary table produced diagnostic cartridges under cleanroom conditions. The combi M design, which divides the clamping area of the machine, enables the parallel operation of two mould halves, efficiently doubling the output and illustrating ENGEL's advanced two-component injection moulding technology. It is a prime example of ENGEL's leading role in the development and manufacture of solutions for cleanroom applications, particularly in the medical and diagnostic industries.

Future-orientated technologies and circular economy

In addition to the exhibits, ENGEL also sent out a strong signal in favour of sustainability and solutions for the circular economy. The company presented several initiatives to reduce its ecological footprint through improved recycling technologies and the use of bio-based materials in production. ENGEL is committed to environmentally friendly manufacturing practices and supports customers in achieving their own sustainability goals in order to strengthen their competitiveness. The award of Ecovadis Platinum status underlines ENGEL's leading role in sustainable plastics processing.

Answer to the shortage of skilled labour

The digital assistance systems and advanced automation solutions on show at the NPE focus on increasing efficiency in plastics processing and minimising human error. These technologies make it possible to handle even complex tasks with

Quick mould change system with a tie-bar-less ENGEL victory 330/85 at NPE 2024

fewer personnel. They help ENGEL's customers to work more productively and at the same time reduce their dependence on qualified labour.

Local presence and customer proximity

ENGEL's investments in local production and service centres were also highlighted at the trade fair. With assembly plants and service centres in North America, ENGEL is demonstrating its proximity to its customers. These centres play a crucial role in providing fast and efficient responses to customer needs. The location in York, Pennsylvania, serves as a key point for the assembly of customer-specific solutions. The office and technology centre in Corona, California, have been modernised and a new plant is being built in Queretaro, Mexico, whose capacity will benefit not only North American but also South American customers.

Customer-focused portfolio of fast delivery stock machines

Many of ENGEL's pre-configured machines and robots are immediately available, emphasising ENGEL's commitment to fast and efficient solutions. This comprehensive offer of stock machines covers a wide range of applications and enables ENGEL's customers to respond quickly to their own customers' demands.

ENGEL's commitment to innovation and quality is unrivalled. With a tradition of almost 80 years in the plastics industry and an extensive patent portfolio, ENGEL remains a reliable partner for its global customers. Continuous investment in research and development secures ENGEL's position at the forefront of technology development in the plastics processing industry. The trade fair success at NPE2024 has impressively confirmed this.

About ENGEL AUSTRIA GmbH

ENGEL is one of the world's leading manufacturers of plastics processing machinery. Today, as a single-source provider, the ENGEL Group offers a full range of technology modules for plastics processing as a single source supplier: injection moulding machines for thermoplastics and elastomers together with automation, but also individual components which are competitive and successful in the market. With ten production plants in Europe, North America and Asia (China and Korea) as well as subsidiaries and representatives in more than 85 countries, ENGEL offers its customers worldwide the optimum support which they need to compete and succeed with new technologies and leading-edge production systems. ***smi***

ENGEL
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Jomar and Baumüller redefine injection blow molding machinery

In the ongoing battle against environmental degradation, pioneers emerge in every industry. In the Pharmaceuticals sector, Jomar Corp. and Baumüller stand out as leaders, reshaping the future of manufacturing with a green ethos.

The evolution of Pharmaceutical products isn't solely about their composition but also the methods employed in their creation. Jomar Corp. and Baumüller are spearheading this change with an emphasis on innovation, laying the groundwork for a sustainable tomorrow. Together, they're not just crafting medical containers; they're sculpting the landscape of Pharmaceuticals through their eco-conscious approach.

Jomar's legacy as a premier injection blow molding machine manufacturer speaks volumes. Machines installed over four decades ago continue to operate flawlessly today, a testament to the company's unwavering commitment to excellence. Renowned for its intuitive design and energy-efficient technologies like the Vertical Plastifier, Jomar sets the standard for sustainability and productivity. Its relentless pursuit of customer satisfaction ensures optimal performance for renowned manufacturing brands worldwide.

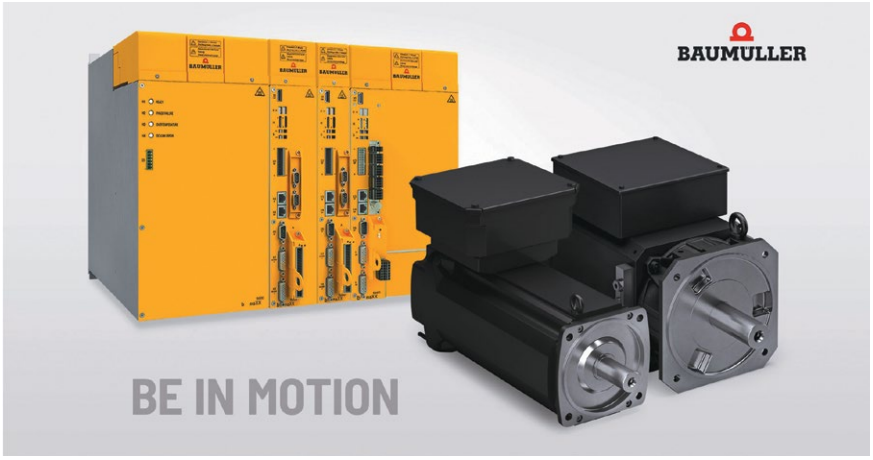
Complementing Jomar's endeavors, Baumüller specializes in delivering intelligent servo-drive solutions for intelligent injection blow molding machines. Its focus on maximizing efficiency and performance and conserving energy aligns seamlessly with Jomar's vision for eco-friendly manufacturing. Together, they signify a significant stride towards infusing green principles into the injection blow molding industry.

Through the integration of Baumüller's digital motion control technologies, Jomar aims to achieve several pivotal objectives:

• Environmental Impact & Sustainability: Leveraging Baumüller's expertise, Jomar strives to enhance its machines' eco-friendliness by incorporating more recycled materials and minimizing energy consumption.

• Cost Efficiency: By harnessing digital innovations from Baumüller, Jomar's machinery will optimize throughput while reducing operational costs, delivering enhanced economic benefits to end-users.

• Supply Chain Resilience: Predictive maintenance solutions utilizing machine learning and data intelligence will bolster the reliability and performance of Jomar's machinery, ensuring smoother operations and minimizing downtime.



Picture: Baumüller

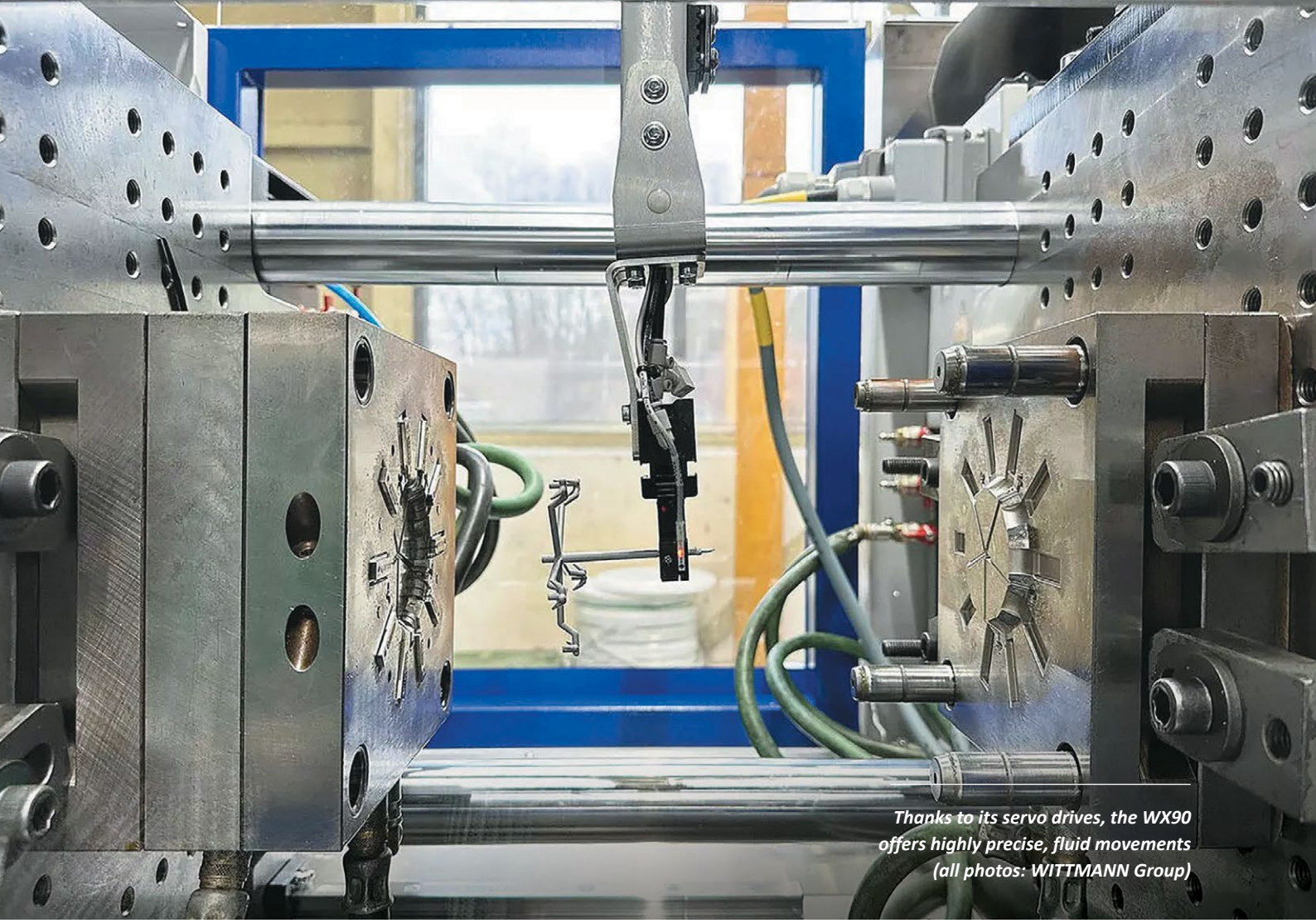
"We are delighted to partner with Baumüller to bring servo-drive digital technologies to

injection blow molding machines manufacturing Pharmaceutical products. Jomar aims to design and manufacture long-lasting, high throughput, efficient, greener machines, which we are achieving with Baumüller's solutions and expertise", says Ron Gabriele, Jomar Corp's Global Sales and Marketing Manager.

Diego Areces, the CEO at Baumüller-Nuermont Corp., is equally excited about the partnership's potential. "We are excited to collaborate with Jomar to integrate our servo drives and automation technology into their machines. Together, we aim to continue bringing sustainability to the Pharmaceuticals market through digital technologies and Industry 4.0. Jomar has demonstrated to have the same corporate values as we do; therefore, our common purpose drives our exciting relationship".

The collaboration between Jomar Corp. and Baumüller Group heralds a new era of innovation and sustainability. Together, they bring their expertise and enthusiasm to the forefront, aiming to introduce revolutionary solutions that elevate customer experiences and foster a greener future. This partnership signifies a significant milestone, driven by a shared commitment to positively impacting industry practices and the environment. ***smi***

Jomar
www.jomarcorp.com



Thanks to its servo drives, the WX90 offers highly precise, fluid movements (all photos: WITTMANN Group)

KB Kunststofftechnik boosts its efficiency with production cells from WITTMANN

More efficiency and sustainability – this is the target KB Kunststofftechnik has set itself for investing in new injection molding technology. Its most recent project – three automated production cells from WITTMANN to produce highly complex technical components – is a prime example.

Author: Susanne ZINCKGRAF,
Head of Strategic Marketing, WITTMANN Group

"Efficiency and reproducibility were the decisive criteria in making our choice", reports Iris Langenberg, CSR Manager at KB Kunststofftechnik in Gummersbach, Germany, during our visit. We are standing in front of three brand-new production cells from WITTMANN with precisely these attributes to strengthen the contract manufacturer's competitiveness.

At the heart of each of the three units are servo-hydraulic SmartPower injection molding machines, two with 38 tons and one with 60 tons clamping force. Moreover, two of the machines are equipped with the new WX90 sprue removal system fitted with rotary servo axis. The third cell operates with a Primus 16 pick-and-place robot – here in telescopic design, as the production hall offers only limited space for upward movements.

High-precision machine movements for premium-quality parts

KB Kunststofftechnik supplies a wide range of different components to numerous industries. The customer base for its products includes door and window manufacturers, as well as laboratory and dental technology, mechanical engineering and automotive industries.

Iris Langenberg is holding a particularly complex component in her hands. To be precise, a complete assembly consists of 68 individual components. With few exceptions – such as circuit boards and switching elements – these are all thermoplastic parts, which are injection-molded in Gummersbach and

As integrated complete solutions, the production cells have only a small footprint

subsequently assembled manually, together with the electronic components supplied by the customer. As a central part of winch drives in crane systems, this assembly is an important safety feature. These devices known as geared limit switches control the positioning of the crane hook. Depending on the type and size of the crane, the crane hook must be able to carry loads of up to 120 tons reliably. Therefore, every geared limit switch is examined on a test stand for correct functioning and then provided with a code via which the test documentation and all subsequent servicing activities can be traced.

Accordingly, the demands on injection molding processes for the individual components of the assembly are particularly stringent. “Drive systems only function if the cogwheels are kept strictly within tolerance limits”, says Langenberg. Multi-stage planetary gears, small axes and mounting elements for circuit boards and switches are molded mostly from two materials – ASA and POM.

Inside the SmartPower machines, the main elements providing high process stability and reproducibility for even extremely delicate part geometries are high-precision injection units and a combination of fast-response servo-hydraulic motors with high-performance constant displacement pumps. Consequently, there is no more production scrap.

The machines’ “Drive-on-Demand-2.0” technology also minimizes their energy requirements. During cooling and handling phases, the motor is shut off and consumes no energy. “Depending on the application, Drive-on-Demand 2.0 reduces energy consumption by up to 35 per cent compared to machines with modern variable displacement pump systems”, explains Daniel Müller, Regional Sales Manager at WITTMANN BATTENFELD in Germany.

A further contribution to the high level of energy efficiency is made by the kinetic energy recovery system, abbreviated KERS, patented by WITTMANN. It transforms the deceleration energy of the moving mold platen into electric energy and transfers it to other consumers – for example the barrel heater.

Plastic version tougher than hybrid part

The KB Kunststofftechnik team members are particularly proud of their geared limit switches, since before the crane manufacturer placed the order in Gummersbach, this assembly was a hybrid object made of plastic and metal. “Jointly with our customer, we developed the thermoplastic variant further in order to exploit the advantages of the plastic material more fully”, reports Langenberg. “This proved a major success, since the parts’ unit costs were reduced and the drive systems now reach a longer service life.”

For some other customers, too, KB Kunststofftechnik functions not only as a contract injection-molding business, but also as a co-designer of the products. “These are often companies thoroughly familiar with metalworking, knowing that we have a particularly thorough in-depth plastics processing expertise combined with extensive experience. Our strength is to recommend the most suitable materials for a given application and to design the part to suit these materials”, Langenberg continues. On its own premises, KB Kunststofftechnik carries out simulations, strength analyses and FMEA, designs and produces the molds, makes prototypes and subjects these to endurance tests.

The Production Manager Christian Cassierer appreciates the many practical features of the WITTMANN machines, which simplify processes and make them more efficient

Servo-driven sprue removal for more flexibility

One special feature of the new WITTMANN production cells only becomes obvious when taking a closer look. The two WX90 sprue removal systems bear the serial numbers 0001 and 0002. WITTMANN first presented this novelty at the Fakuma trade fair in October 2023. For KB Kunststofftechnik, this innovation was precisely what they had been waiting for. “We deliberately chose the servo-controlled sprue removal device, because it features very smooth, precise movements and yet responds faster than a pneumatic sprue picker,” says Daniel Kaufmann, responsible for initial sampling and maintenance work at KB Kunststofftechnik. “With its fluid movements, this parts removal device is also suitable for simple parts handling tasks.”

A great additional advantage is its control system. Similar to linear robots from WITTMANN, WX90 sprue removal systems also come with an R9 control system. Consequently, the data from the sprue removal process are fully integrated into the production cell. This means that the injection molding machine and the robot have an ultra-fast data exchange system at their disposal to co-ordinate their movements with optimal efficiency. What is more, with the import of the mold data set, not only the parameters for the machine are set automatically, but also the process sequence of the sprue removal device. This accelerates the set-up process.

Minimizing changeover times

“We produce just in time and have many tool changes”, Kaufmann explains, which is why set-up efficiency plays an important part. Eight changeovers per day are normal practice, sometimes there are even significantly more. Added to this are frequent barrel changes. Thanks to the new B8X generation of control systems, the SmartPower injection molding machines still reach very high uptimes. “The injection unit is coded via a sum plug, so that the machine’s control system knows immediately which screw model it is working with”, explains Daniel Müller. “This enables us to plug and produce. The maximum time needed for a barrel change is 20 minutes.” With the introduction of the B8X control system, WITTMANN has included the sum plug in the standard equipment package of the SmartPower series.

“The WITTMANN machines offer many practical features especially for machine setters and re-toolers to make processes simpler and more efficient”, Daniel Kaufmann emphasizes. “People at WITTMANN always have an open ear for us users, and we notice that they really listen to our feedback”.

“We always seek ways to analyze and evaluate processes”, Iris Langenberg adds. Transparency is the key to continuously optimizing the processes in the interest of higher and higher overall efficiency. Here, the main focus lies on energy demand and material consumption, which both make up a large proportion of the unit costs. “Whenever we accept an order, we must always know where the real cost levers can be found”, says Langenberg. “After all, we want to continue our competitive production in Germany in future as well.”

The new WX90 sprue removal systems with rotary servo axes are equipped with an R9 control system and thus completely integrated in the production cell

Saving resources, however, not only has a noticeable effect on unit costs. Just as important is the fact that production efficiency also supports the sustainability targets which KB Kunststofftechnik has set itself. The newly installed photovoltaic system on the factory roof supplies about 13 per cent of its total energy consumption. “This is already a step in the direction of CO_2 neutrality”, says Langenberg.

In all actions taken, the company manager makes a special point of combining economy with ecology. “We have already pursued ecology for a long time, because we have always pursued economy”, Langenberg emphasizes. “With our investments as well as technical and organizational measures we have, for example, reduced our reject rate. Every kilogram of raw material not processed saves energy and machine service life. We can use the time saved in this way to produce something else and thus generate additional turnover, and simultaneously reduce our product-specific CO_2 footprint.”

About the WITTMANN Group

The WITTMANN Group is a globally leading manufacturer of injection molding machines, robots and auxiliary equipment for processing a great variety of plasticizable materials – both plastic and non-plastic. The group of companies has its headquarters in Vienna, Austria and consists of two main divisions: WITTMANN BATTENFELD and WITTMANN. Following the principles of environmental protection, conservation of resources and circular economy, the WITTMANN Group engages in state-of-the-art process technology for maximum energy efficiency in injection molding, and in processing standard materials and materials with a high content of recyclates and renewable raw materials. The products of the WITTMANN Group are designed for horizontal and vertical integration into a Smart Factory and can be interlinked to form an intelligent production cell.

The companies of the group jointly operate ten production plants in six countries, and the additional sales companies at their 37 different locations are present in all major industrial markets around the world.

WITTMANN BATTENFELD pursues the continued strengthening of its market position as a manufacturer of injection molding machines and supplier of comprehensive modern machine technology in modular design. The product range of WITTMANN includes robots and automation systems, material handling systems, dryers, gravimetric and volumetric blenders, granulators, temperature controllers and chillers. The combination of the individual areas under the umbrella of the WITTMANN Group enables perfect integration – to the advantage of injection molding processors with an increasing demand for seamless interlocking of processing machines, automation and auxiliaries. ***smi***

WITTMANN Group
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In order to drive forward the transformation to a circular economy, e-bike manufacturer Advanced Bikes is relying on igus for future frame production (left: Helge von Fugler, founder and Managing Director of Advanced; right: Jan Philipp Hollmann, Head of Bike Components at igus)

igus develops first recyclable plastic bicycle frame

igus continues to expand its bicycle component business and presents the first injection-moulded polymer bicycle frame for advanced bikes.

After RCYL, a bicycle made from 50 per cent recycled fishing nets, igus is setting the next milestone for sustainable mobility: the motion plastics specialist has developed the first bicycle frame made from recyclable plastic material for the German e-bike manufacturer Advanced Bikes, which is manufactured using injection moulding. Decades of expertise in plastics manufacturing and experience with the RCYL bike are channelled into the development of both the frame and new bicycle components made from high-performance plastics.

In 2023, more e-bikes than traditional bikes were sold in Germany for the first time. One reason for this is the growing awareness of environmental concerns. The problem: 90 percent of today's bicycle frames are made of steel, aluminium or carbon-fibre and are produced using very energy-intensive processes, only to end up in huge bicycle landfills at the end of their service life. In order to drive forward the transformation to a circular economy, e-bike manufacturer Advanced Bikes is relying on igus for their future frame production. Together, the companies have now developed a sustainable composite plastic bicycle frame, which is to be used in the new Reco Urban trekking e-bike. “Advanced's aim was to produce an injection moulded composite frame with 100 per cent recyclable plastic,” recalls Jan Philipp Hollmann, Head of Bike Components at igus. “As we have been developing and producing components such as plain bearings, rod ends, gears and spherical bearings for the bicycle industry for over 30 years, we immediately accepted the challenge of supporting Advanced with the design of the bicycle frame and taking on the development, tool making and production.”

New frame protects the environment

To ensure that the frame has sufficient strength, rigidity and low weight, igus uses a composite material in granulate form, consisting of high-performance plastics and carbon fibres. In addition, igus produced a multi-part injection moulding tool for the complex geometry of the bicycle frame within weeks. The

result: a 3.3 kg lightweight, single piece injection-moulded bicycle frame – without weld seams, corrosion-resistant, durable and externally tested. Production in Germany also enables short logistic distances and just-in-time production aligned with demand. igus is able to regranulate end-of-life frames via its own "chainge" recycling programme in order to re-use the material. "In future, we also want to have other recyclable bicycle components such as pannier racks, rims, handlebars and seat posts manufactured using injection moulding," explains Helge von Fugler, founder and Managing Director of Advanced. "This is the only way to make a fully recyclable e-bike a reality."

Components made from lubrication-free high-performance plastics

igus currently produces bicycle frames in two different processes at its headquarters in Cologne. In injection moulding, both modular and single-piece frames are produced. There are also frames that are manufactured using the rotomoulding process – for example for the company's own RCYL bike. But even for igus, it's not just about bicycle frames. The in-depth expertise in plastics processing and the new development experience are now also being channelled into new bicycle components – from wheels, cranks and handlebars to planetary gears. Large and small volume cost effective production is the reality – and "made in Cologne". The high-performance plastic components are also lighter, and free from all lubrication and corrosion. Users can therefore reach for the high-pressure washer without any problems: no lubricant can be rinsed out and nothing can rust.

Maximum safety due to many test trials

Before they are used, all components are extensively tested. 135 trillion test cycles and 15,000 tests take place annually in the 4,000 square metre igus test laboratory in Cologne. 250 square metres of this is for the bicycle test rigs alone, on which all components such as wheels, handlebars and cranks are tested. This also applies to the new Reco frame. Hollmann: "We will use computer tomography (high-tech imaging) to check the first injection-moulded bicycle frames for potential problems such as air pockets in the composite material and carry out all relevant frame tests in our test laboratory." Customers receive a 30-year guarantee from Advanced. For maximum safety, igus therefore relies on a large number of test procedures. "These are based on standardised tests, for example from the EFBE and TÜV," emphasises Hollmann. "We also carry out our own test procedures – for example in our climate chamber." With the data obtained, precise statements can be made about the service life of igus materials under different environmental conditions.

Everything from a single source: from design to the finished product

"With our bicycle components made of high-performance plastic, we are offering the bicycle industry access to a completely new technology," says Hollmann. "In this way, we also appeal to OEM manufacturers who want to bring their own ideas into reality with us." By using plastic, developers can completely rethink design and geometry. And with igus, you also get everything from a single source: from design to research and development, mould making, compounding, testing and production, right through to recycling. The just-in-time production line means that igus is able to deliver quickly and customers' storage capacities can be reduced. This makes the business more predictable and profitable as everything is produced to order.

About igus:

igus GmbH develops and produces motion plastics. These lubrication-free, high-performance polymers improve technology and reduce costs wherever things move. In energy supplies, highly flexible cables, plain and linear bearings as well as lead screw technology made of tribo-polymers, igus is the worldwide market leader. The family-run company based in Cologne, Germany, is represented in 31 countries and employs around 5,000 people across the globe.

In 2023, igus generated a turnover of €1,136 billion. Research in the industry's largest test laboratories constantly yields innovations and more security for users. 243,000 articles are available from stock and the service life can be calculated online. In recent years, the company has expanded by creating internal startups, e.g. for ball bearings, robot drives, 3D printing, the RBTX platform for Lean Robotics and intelligent "smart plastics" for Industry 4.0. Among the most important environmental investments are the "chainge" programme – recycling of used e-chains – and the participation in an enterprise that produces oil from plastic waste. *smi*

igus
www.igus.eu

The new bike frame is 3.3 kg, recyclable and moulded in a single piece (all pictures source: igus)

Photo: Husky

Husky launched HyPET®6e platform at NPE2024

This ideal combination of proven technology and innovation was engineered to work together to deliver new, unprecedented standards in sustainable molding.

Husky Technologies™, a pioneering technology provider enabling the delivery of essential needs to the global community, has recently announced the launch of its next generation HyPET®6e platform. Building upon the industry-leading technology of the company's flagship PET preform injection molding system, HyPET®6e is the ideal combination of proven technology and innovation engineered to work together to deliver new, unprecedented standards in sustainable molding.

"The plastics industry is at a pivotal moment and as industry leaders we must deliver by proactively developing circular solutions to address plastic waste management," said Robert Domodossola, Husky's President of Systems and Tooling. "Our new HyPET®6e platform meets this need as it's designed so that all system components are integrated to work together to deliver on the unique requirements of sustainable molding, including superior rPET capability, enhanced energy efficiency, and closed-loop quality control, while simplifying operation and still delivering the lowest total production cost."

The evolution of sustainable molding

Visitors to Husky's booth at NPE2024, were the first to see the company's new HyPET®6e technology in action. Engineered to be the market's fastest system with unprecedented integration of machine, mold, auxiliary, and real-time remote monitoring, HyPET®6e achieves the ideal balance between high throughputs and quality without compromise.

Running at the show all week, a HyPET®HPP6e 400 system was producing a lightweight 5.89 gram, 100 percent rPET preform at a 4.5 second cycle time on a 144-cavity, 45-pitch mold – a configuration designed to enable up to double the production output. The system's industry-leading performance and integration enables this preform to be blown into the market's lightest, functional, industrializable 20oz (591ml) Factor 101 bottle, which is the evolution of the 2016 lab scale Factor 100 concept.

Superior rPET capability

A number of improvements have been made to enable the new HyPET®6e platform to optimize processing of lightweight preforms made from up to 100% rPET. An integrated drying solution enables accurate material blending, metal contaminant removal, and consistent material preparation when running up to 100% rPET. A high throughput screw design is optimized to deliver superior rPET melt quality while optimized melt delivery enables uniform melt flow for lightweight applications. To reduce rPET color variability, an integrated, self-adjusting, real-time inspection system enables closed-loop color correction and automatic color adjustments.

Industry-leading energy consumption

HyPET®6e has been designed with regenerative, system level energy management that delivers on demand performance. This enables the system to intuitively reduce energy consumption, resulting in a considerable decrease in operating costs for producers. At the heart of the platform is intelligent, adaptive technology that uses feedback from pressure and actuator sensors to determine the optimum pressure required to effectively and efficiently mold every application. This adaptive system monitors and automatically adjusts for optimal energy consumption without impacting system capability, cycle time or part quality. ***smi***

Husky
www.husky.co

Mold making and automation expertise from a single source

The Medical Unit of ZAHORANSKY AG was once again represented at MedtecLIVE in Stuttgart. In the field of medical technology, ZAHORANSKY offers comprehensive solutions to produce complex plastic, hybrid and glass replacement products.

The Medical Unit of ZAHORANSKY AG was once again represented at MedtecLIVE in Stuttgart at the joint stand of the VDMA Medical Technology Working Group, where it presented its extensive solution expertise in the field of mold making and injection molding-related automation. ZAHORANSKY is clearly focusing on the topic of "plastic instead of glass". After all, manufacturing pharmaceutical primary packaging from COC/COP-based materials offers significant advantages when it comes to filling and storing sensitive pharmaceuticals. The production of plastic-based containers is much more reliable than the production of glass containers. This is particularly the case with staked needle pre-filled syringes (staked needle PFS), as the needle can be positioned more flexibly before overmolding and is not melted or glued in. In addition, there is a reduced risk of breakage, which requires less care during handling, transportation and storage. Finally, the durability of highly sensitive medicines is significantly extended thanks to the advantageous barrier properties of plastic-based containers. Depending on the product and customer requirements, ZAHORANSKY systems can also be equipped with any number of camera and other inspection systems for quality assurance, such as 100% inspection via an integrated X-ray system. With pioneering state-of-the-art technologies and highly developed injection molding and automation solutions, ZAHORANSKY thus covers the entire manufacturing cycle for pharmaceutical primary packaging, consumables for laboratory analysis and in-vitro diagnostics as well as drug delivery systems. "MedtecLIVE is the ideal platform for us to present our high-performance solution portfolio for the requirements of the pharmaceutical industry and its CMOs and CDMOs from a single source," commented Marc Schmidt, Account Development Manager at ZAHORANSKY.

In the field of medical technology, ZAHORANSKY offers comprehensive solutions to produce complex plastic, hybrid and glass replacement products. The company also has extensive expertise and experience with injection molds – including upstream and downstream automation and quality control as well as the integration of injection molding machines and system components.

This offers manufacturers of pharmaceutical primary packaging various advantages in terms of risk minimization and time savings, such as fewer interfaces, less engineering effort, reduced complexity, detailed simulations using so-called digital twins and intuitive cross-system human-machine communication. All of this ensures the greatest possible implementation and process reliability, a predictable time-to-market, optimized overall system effectiveness, reduced unit costs and finally, efficient use of personnel and resources. "We have been thinking, developing and implementing mold making and automation under one roof for over 15 years. In doing so, we build on our extensive and long-standing expertise in industrial plastics production, particularly in the areas of oral hygiene and brush production," explained Marc Schmidt. ***smi***

ZAHORANSKY
www.zahoransky.com

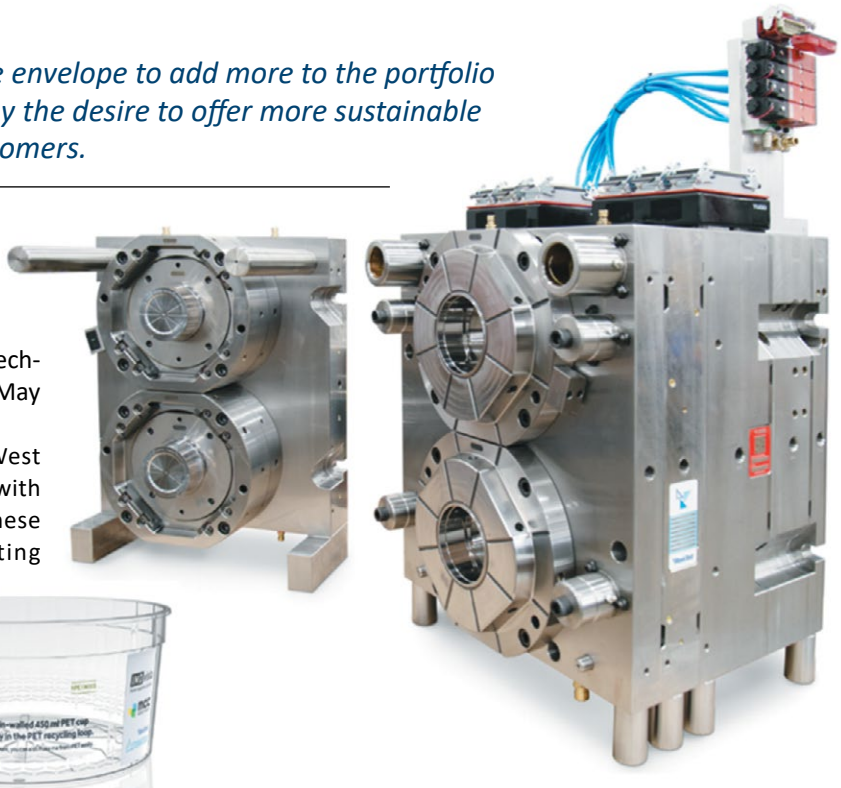
Picture: ZAHORANSKY

StackTeck displayed sustainability technologies and intelligent automation at NPE2024

StackTeck team is constantly pushing the envelope to add more to the portfolio of mold technologies, which are driven by the desire to offer more sustainable options and real advantages for the customers.

StackTeck Systems Ltd., a global manufacturer of high volume injection molding solutions for thinwall packaging, closures, PET preforms, personal care and medical products, was showcasing their latest innovations in technology at the show that was taking place from May 6th to 10th in Orlando, Florida.

Static displays in StackTeck's booth in the West Building were featuring the latest technologies with plastic parts and steel components. Some of these included PET Preform applications highlighting cooling and post mold cooling technologies, co-injection, multi-material, specialty coatings, KoolTrack™, TRIM™ (Thin Recess Injection Molding), IML and closures technologies. Show attendees were able to learn about the latest patent pending 5 piece collapsing core technology which was developed recently to for parts that require large undercuts.



A new approach to molding ultra-thin 450 ml PET food tubs with a StackTeck Automation IML system

An active display in the StackTeck booth was a Cobot-based plastic part inspection system that uses intelligent vision capability to recognize randomly placed plastic parts in a bin. It will identify, choose, and pick up a part to transfer it to a vision inspection station that will measure external dimensions and develop a real time visual image of the part profile. This technology is one example of the custom automation capabilities that the StackTeck Automation team offers as part of their complete automation systems up to stacking and boxing.

StackTeck had two show molds and one IML automation system running at NPE2024. These two show molds included TRIM and sequential multi-gating features, stack mold technology, and optimized cooling for maximum productivity.

StackTeck Demonstrated Ultra-Thin PET Round IML Container Capab

StackTeck exhibited a new approach to molding ultra-thin 450 ml PET food tubs that were running with a StackTeck Automation IML system in the NETSTAL MACHINERY booth.

The mold technology delivers an unprecedented level of thinwalling technology that combines StackTeck's Thin Recess Injection Molding (TRIM™) with a set of 7 sequentially controlled valve gates to yield the lightest part of this type ever molded. According to StackTeck's CEO, Vincent Travaglini, "We set out to establish a new standard in molding PET containers using at least 30% content of hard-to-fill PET with a high IV level mixed with a high volume, easier filling low IV PET resin with the intention that customers would be able to run the same part using 30% rPET. Some of our customers on the PET preform side of the business are running 100% rPET for beverage applications, and so we're pointing the way towards being able to add PCR capability for thinwall containers, while adding advantages in material strength and clarity."

The hot runner used for this mold incorporates YUDO's ISO™ technology to enable tightly spaced valve gated drops on the bottom of the container, while incorporating independent control of valve gate timing to suit optimal filling of this ultra-thin part. The hot runner is custom designed to be suitable

for high pressure injection, with thermal profiled nozzles and incorporating a balanced thermal management approach.

The IML automation system had also been supplied by StackTeck for this show system, including high speed side entry robotics, in addition to downstream 100% vision system inspection by IMDVISTA, and downstream stacking.

The IML automation for this show system was limited to part stacking only, due to limited floor space at the tradeshow. Wil Meevis, StackTeck's VP Sales commented, "Almost everything we quote now has to include automated loading of stacked parts into a box or tote. We see an increasing demand for customized part inspection using vision systems, as well as special steps in handling of parts before they are ultimately stacked and loaded into the final shipping unit. For many of our projects, we are setting up the automation with the customer's machine and mold at StackTeck to do the final FAT with hot parts before shipping."

StackTeck was pleased to have NETSTAL MACHINERY as a partner for this show system, as both companies have experience working together in both thinwall packaging, as well as PET applications.

The IML labels for this part had been supplied by MCC VERSTRAETE, using a PET substrate to achieve 100% PET content in this show part.

PET resin had been supplied by EASTMAN, including Eastar EN001 resin that has an Intrinsic Viscosity (IV) level of 0.80 dL/g as well as EN058 that has an easier filling IV level of 0.58 dL/g.

At the StackTeck booth, part samples were on display that had been molded using a blend with 30% rPET supplied by VERDECO using material with an IV level of 0.72 dL/g.

StackTeck Showcased its Unique Stack Mold and TRIM Technologies

At the NPE2024, StackTeck was also displaying a thinwall 2X8 stack mold with TRIM™ design running in the BMB booth.

Thinwall parts were being molded with StackTeck's proprietary TRIM™ ultra-thin panels covering a large proportion of the bottom panel of this round 16 oz. container. Pushed to the limit, TRIM™ technology was demonstrated to lightweight conventional thinwall designs by 10-40% of part weight by applying the TRIM panels all over the part, however container strength can be adversely affected. An alternative approach is to apply bottom TRIM™ panels only, while the sidewall and bottom corner wall thicknesses are not affected, and hence 5% light weighting can be achieved without affecting top load and some other key performance criteria.

This mold combines the advantages of using the stack mold technology for increased productivity, while offering a sustainable solution bringing weight savings with the use of the TRIM™ technology.

According to Jordan Robertson, StackTeck's VP Business Development and Marketing "The TRIM technology is a unique approach to lightweighting that has been gaining acceptance over time. We have now built large stack molds with this technology for thinwall containers, as well as expanding the range of applications to include rectangular, tamper evident, and ice cream applications. As compared to other lightweighting approaches, it has proven to be simple and reliable, while also working well with other technologies such as multi-gating."

This high-volume system was running in BMB's booth with a high speed side entry robot supplied by MULLER Technology.

Jordan Robertson stated: "We are very pleased to have the opportunity to be back at the NPE Show and continue a dialogue with our customers about our latest developments. We are constantly pushing the envelope to add more to our portfolio of mold technologies, which are driven by our desire to offer more sustainable options and real advantages for our customers."

About StackTeck Systems Limited

StackTeck, with over five decades of mold building innovation, is a leading source of high productivity system solutions for the injection molding industry. StackTeck supplies a wide range of injection molds and IML automation used to produce plastic parts in applications such as caps, closures, medical, PET preforms, and thinwall packaging; as well as complete system integrations including IML. StackTeck has dedicated R&D, testing, and part sampling facilities, in addition to plastic part design, prototyping, engineering, and manufacturing capabilities. StackTeck Systems Ltd. is located 8 km north of Toronto's Pearson International Airport. *smi*

StackTeck
www.stackteck.com

16 ounce round container with bottom TRIM panels (all pictures source: StackTeck)

HASCO's product diversity supports a variety of demoulding processes

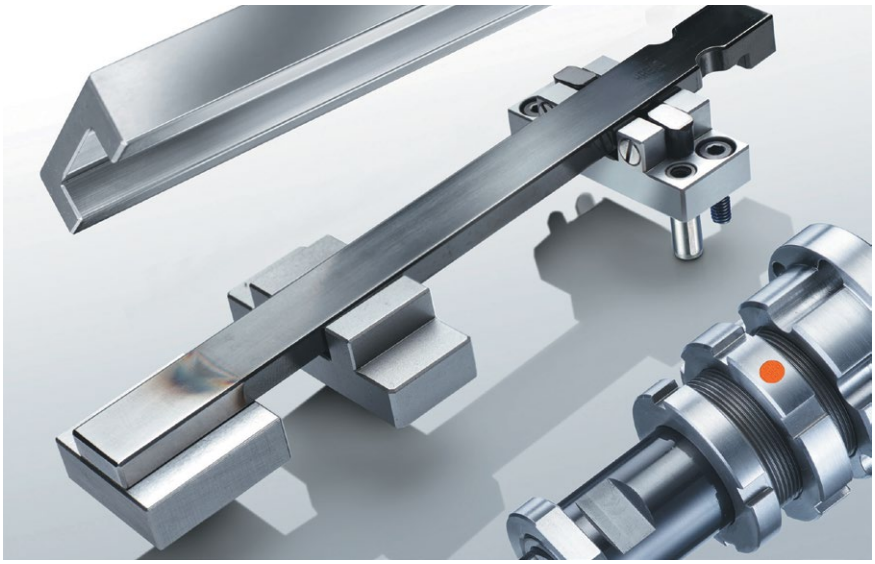
In contrast to latch locking units, which precisely control the movements of the mould plates by opening up the mould, two-stage ejectors control the sequence of the ejection by splitting up the output movement into separate stages.

The geometry of a planned injection-moulded component defines the complexity and the amount of work involved in designing and producing the moulding tool. For this reason, it is advisable, back at the design phase, to look closely at the practicability of the moulding tool and the complexity of the demoulding process.

As a leading manufacturer of high-quality modular standardised mould units and customised hot runner systems, HASCO, with its comprehensive range of latch locking units and two-stage ejectors, offers a variety of solutions specifically for the field of multi-stage demoulding. In contrast to latch locking units, which precisely control the movements of the mould plates by opening up the mould, two-stage ejectors control the sequence of the ejection by splitting up the output movement into separate stages.

To simplify selection for users and provide help with the design, to make demoulding easier, a brochure entitled "Multi-stage demoulding" has been published, which is now available both online and as a printed version.

When choosing the right demoulding element, the main focus is on the desired movements and the respective mounting position. Four different movements were selected as examples: forward and backward movements, single stroke and the use of stripper plates. The product selection can then be narrowed down according to the requirement of how the plates should move in relation to each other.



Precision standard components for reliable, multi-stage movement guarantee HASCO customers consistent component quality without compromise.

Picture: HASCO

The mounting position – a further criterion – necessitates renewed filtering of the selection. A distinction is made between central and non central mounting and between internal and external mounting of the standard units. Subsequently, the right standard unit can be ordered, depending on the mould size and the desired length of the stroke movements.

All products can be easily and reliably mounted and adjusted. The precisely manufactured standard units for multi-stage cycles are coated on the functional surfaces with HASCO's well-established DLC coating, and thus have hard sliding surfaces and an extremely low coefficient of friction. This creates the basis for consistent component quality, even when used in clean rooms. The standard units generally have double-sided locking.

For unconventional applications with a special cycle or mounting position, HASCO's technical customer support is on hand to advise the clients.

About HASCO

As a leading manufacturer of modular high-quality standard mould units and individually designed hot runner systems, HASCO offers innovative and economical solutions for designers, mouldmakers and injection moulders from a single source. **smi**

HASCO
www.hasco.com

Unleash efficiency, conserve energy: New I-shield HRS to redefine hot runner insulation

While transitioning from room temperature to the desired set temperature, precious resources are preserved, ensuring a prompter production start.

Oerlikon HRSflow presents its latest innovation, the I-Shield HRS Insulating Cover, meant to further optimize the sustainable approach in hot runner systems. Engineered with a focus on reducing heat dissipation, this solution aims to significantly lower energy consumption while enhancing the efficiency during the production at moulding plant.

One of the most important advantage lies in time and energy savings during the warm-up phase. While transitioning from room temperature to the desired set temperature, precious resources are preserved thanks to I-Shield HRS cover, ensuring a prompter production start.

Furthermore, the insulating cover reduces the energy consumption required to keep the hot runner at set temperatures, contributing to overall energy efficiency. Finally, it reduces the thermal interaction with the surrounding environment, isolating the tool regulation from any heat developed by the hot runner.

The I-Shield HRS Insulating Cover has recently been utilized on a 7 Valve Gated drop system, injecting 1340 grams of Polypropylene on a 4mm cross section. The power consumption achieved thanks to the I-Shield HRS was 26% lower compared to the same configuration without insulation. In particular, the I-Shield HRS was applied onto the FLEXflow HRS, which highlights its versatility on multiple molding scenarios.

Interesting Features of the I-Shield HRS insulating cover:

- The new I-Shield Insulating Cover is easily applicable to any new hot runner system upon customer request or as a retrofit option for existing systems (subject to evaluation for each specific application).
- Replaceable directly at the End User plant, ensuring ease of maintenance and flexibility.
- The cover has been manufactured with particular care to the environmental impact and sourced from recycled materials.
- Exceptional durability, capable of withstanding high-temperature environments for extended periods without deterioration, even in the face of accidental impacts.

Picture: Oerlikon HRSflow

Advancing Sustainability:

The I-Shield HRS Insulating Cover stands as a testament to Oerlikon HRSflow's commitment to sustainability. By significantly reducing energy consumption at the End User plant, not only it contributes to cost savings but also promotes a greener manufacturing ecosystem. Furthermore, its compatibility with recycled materials underscores its role in fostering environmental responsibility within the industry.

About Oerlikon HRSflow

Oerlikon HRSflow is part of the Swiss technology group Oerlikon and its Polymer Processing Solutions Division. The company designs and manufactures hot runner systems for a wide range of applications in the plastic injection molding industry.

Oerlikon is a global innovation powerhouse for surface engineering, polymer processing and additive manufacturing. Its solutions and comprehensive services, together with its advanced materials, improve and maximize performance, function, design and sustainability of its customers' products and manufacturing processes in key industries. Pioneering technology for decades, everything the company invents and does is guided by its passion to support its customers' goals and foster a sustainable world. ***smi***

Oerlikon HRSflow
www.hrsflow.com

New hot runner technology updates

Mold-Masters® releases TempMaster M4 hot runner temperature controller and also releases Fusion Series® G3 optimization enhancements that improve overall productivity by minimizing downtime and enhancing overall performance.

I. New TempMaster M4

Mold-Masters®, a leading developer and supplier of hot runners, controllers, auxiliary injection, and co-injection systems, has launched the new TempMaster M4 hot runner temperature controller, which features the company's new HR-Connect Technology. Through this technology, a single cable connects the mold to the controller head unit, which eliminates conventional mold thermocouple and power cables to minimize extra weight, clutter and complexity from the molding cell.

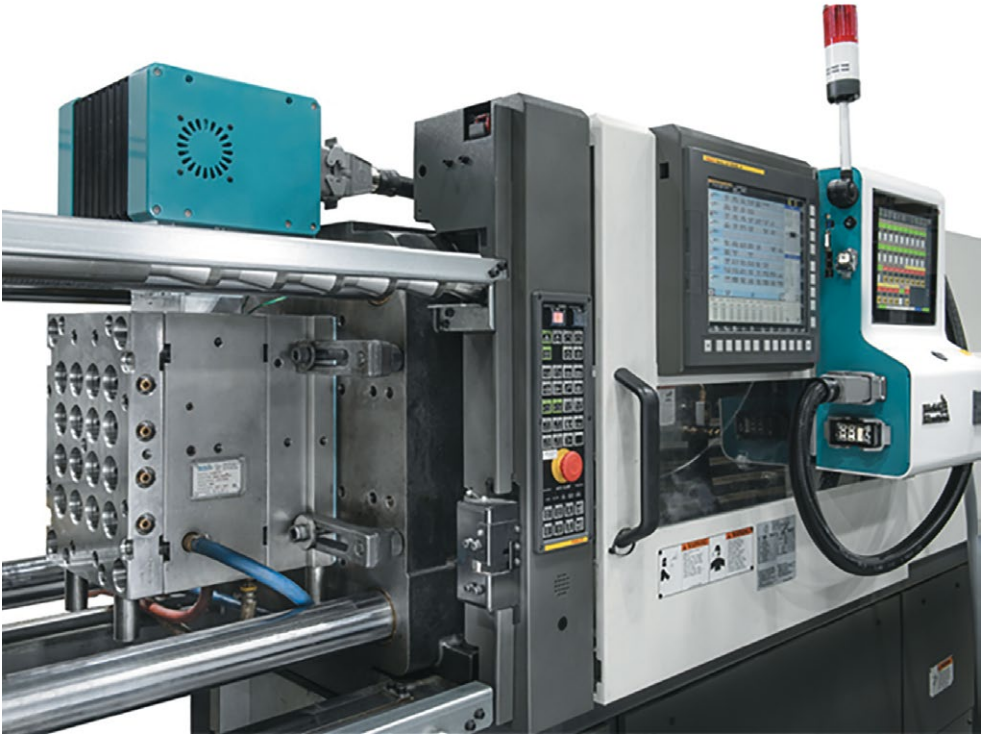
The TempMaster M4 features a Mold Direct Mount (MDM) design, with a standalone control display head unit and incorporates a wide range of advanced processing and protection features similar to our previous flagship controller platforms.

The TempMaster M4 compact control display head unit can be attached directly to the injection machine to eliminate the controller footprint or kept mobile by placing it on a lightweight compact trolley base. The head unit incorporates a 12 in. full-color touch screen, providing an intuitive interface for all control functions. The screen angle can also be adjusted to optimize viewing. Optional step-down transformers are also available.

The TempMaster M4 uses a new modular 3z-15A control card with on-board TC fuses for quick and easy serviceability. M4 has the capacity to control up to 72 temperature zones. The control cards are installed directly on the mold in the M4 control box(es) which replace conventional e-boxes and stay with the mold. Wiring the hot runner system remains unchanged. This technology is compatible with new and existing hot runner systems (retrofit). Retrofits are quick and easy as an adapter is available that plugs the M4 control box directly onto the plugs of the existing e-box.

The controller, covered by a 5-year warranty, also comes Industry 4.0 Ready (OPC-UA) and has SmartMOLD built-in. This allows users to collect valuable real-time process data. Molders have the option to feed the data directly into their existing local ERP/MES systems and into the SmartMOLD cloud software (optional). Both configurations offer the ability to receive a variety of text and email alerts.

New TempMaster M4 (all pictures: Mold-Masters)



II. New Fusion Series G3 Hot Runner Updates

Mold-Masters® has enhanced its latest generation of drop-in ready Fusion Series hot runner systems. The Fusion Series G3 system's improvements from the previous G2 system optimize mold design to simplify installation, minimize downtime, and enhance overall performance. The new enhancements include:

- Quick Valve Pin Stroke and Height Adjustment
- Quick Release Actuators
- Compound Nozzles
- Heated Nozzle Flange
- Waterless Actuators featuring PACT

Quick Valve Pin Stroke and Height Adjustment

In addition to offering more compact actuator dimensions, all units now offer quick and easy adjustment of valve pin height and stroke. The valve pin height can be adjusted without the need to remove the actuator from the mold. This enhancement makes adjustments during the system installation process much quicker and easier without the need for machining.

Quick Release Actuators

Fusion Series G3 actuators can now be detached from the hot runner system, without having to remove the valve pin with it, to make servicing the actuator much quicker and easier.

For comparison, hot runner system designs that need to pull the valve pin to remove the actuator require that the system be heated to release the valve pin from the cold resin which takes extra time to complete. In addition, on systems incorporating long valve pin lengths, it would be necessary for hydraulic lines to be fully disconnected which adds to service times and risks creating a mess from leaks when having to disconnect the hydraulic lines. This extra complexity and hassle are eliminated with the new G3 quick release actuators.

Compound Nozzles

Compound G3 nozzles are also available which feature a tapered nozzle body to maintain gate access in areas with limited clearance. These nozzles feature a larger runner channel at the base of the nozzle to reduce pressure drop and improve melt flow performance. Compound nozzles are a durable one-piece design without any split line connection in transition and are available in standard lengths up to 800mm.

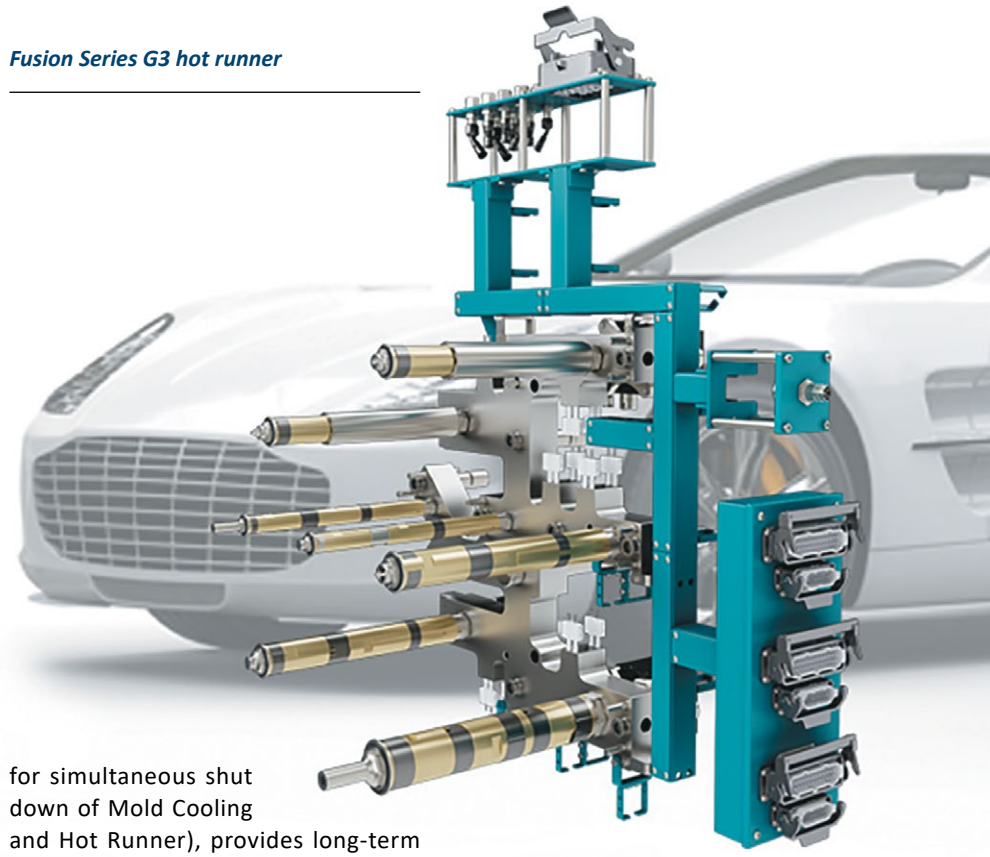
Heated Nozzle Flange

For high pitch systems, a heated nozzle flange is now available for enhanced leak protection from the effects of thermal expansion. These minimize the core deflection effect to ensure proper hot runner alignment is maintained and are recommended when drop length (N) to pitch ratio (MP) is not satisfied. Heated nozzle flanges are available for F5-F8 nozzle sizes.

Waterless Actuators

Waterless actuators feature an advanced design incorporating PACT (Passive Actuator Cooling Technology) which maintains operating temperature by transferring heat to the top clamp plate. As such, they can eliminate conventional hose-plumbed cooling circuits to actuators. Benefits to the molder include faster mold changes (less components to manage, allows for simultaneous shut down of Mold Cooling and Hot Runner), provides long-term performance reliability (eliminates issues associated with clogged cooling circuits) and enhances safety when the hot runner is used at Pre-Heat stations. Valve pin height adjustment is also a standard feature.

Fusion Series G3 hot runner



Fusion Series G3 systems are now engineered to be installed and uninstalled at room temperature. It can be pulled directly from the shipping box and placed into the mold. This helps to significantly reduce installation time, eliminate extra equipment such as a temperature controller and improve safety conditions during installation, assembly, and removal.

Fusion Series G3 nozzles are available in customizable lengths up to 1,000 mm and feature more compact nozzle bore cut-outs. Fusion nozzles incorporate field replaceable heater bands and gate seals to ensure molders can respond and fix issues quickly on-site to minimize downtime. Most gate seals are interchangeable between G2 and G3, so customers can convert to the new system, in many cases, without any special retooling.

Mold-Masters Fusion Series G3 hot runner systems are shipped pre-assembled, pre-wired, plumbed, and tested for fast, one-step installation. They are also available with our industry-leading 5-year warranty.

Fusion Series hot runner systems are also compatible with our advanced Servo Electric Valve Gate (SeVG+) actuation control system. SeVG+ offers absolute control and precision of actuation profiles over each individual valve pin and is well suited to your most challenging applications.

About Mold-Masters®

Mold-Masters® is a leading global supplier of hot runners, controllers, auxiliary injection and co-injection systems. We design, manufacture, distribute, sell and service highly engineered and customized plastic processing equipment that caters to every market. Mold-Masters is credited for patenting the first commercially viable hot runner system in 1965. Today, Mold-Masters conducts business in more than 100 countries and employs a diverse workforce that exceeds 2,150 professionals. Mold-Masters Global Headquarters is located in Georgetown, ON Canada. Mold-Masters is an operating company of Hillenbrand (NYSE: HI). *smi*

Mold-Masters
www.moldmasters.com

Picture: Kimya

Introducing Kimya PEI Support: Simplifying your 3D printing process

We are happy to unveil Kimya PEI Support, a new high-performance breakaway support filament meticulously designed to elevate your 3D printing experience. Tailored for use with Kimya PEI-9085 and Kimya PEI-1010 filaments, both based on ULTEM by SABIC, this innovative support material brings a new level of functionality to your printing of Ultra material parts.

Perfect Synergy with ULTEM-based PEI 3D printed parts

Crafted with precision, Kimya PEI Support establishes a perfect synergy with Kimya PEI-9085 and Kimya PEI-1010 filaments. The synergy ensures an optimal 3D printing experience, with the support material exhibiting excellent adhesion to the model material. This seamless integration guarantees a hassle-free printing process with consistent and reliable results.

The challenge of printing intricate parts with complex geometries and internal features has met its match with Kimya PEI Support. This innovative support material opens up a new realm of design possibilities, enabling the creation of high-performance material parts that were once deemed impossible through traditional manufacturing methods. By providing essential structural support during the printing process, Kimya PEI Support prevents the collapse of model material before hardening. This not only ensures the integrity of the final product but also facilitates the fabrication of intricate designs that push the boundaries of what can be achieved through 3D printing. Embrace the freedom to implement complex geometries and internal features, knowing that using Kimya PEI Support is reliable, making the realization of once-considered unattainable designs a tangible and exciting prospect in the world of 3D printing.

High Temperature Resistance and post-processing ease

Engineered with high-temperature resistance, Kimya PEI Support seamlessly complements our Ultra range of PEI filaments. This feature ensures the durability of your prints, even in the most challenging conditions, opening possibilities for a broader range of applications.

Bid farewell to cumbersome post-processing routines. Kimya PEI Support eliminates the need for chemical dissolution of the final part, allowing for effortless removal at room temperature. The breakaway support not only saves valuable time but it also peels away from the rest of your final printed part with a pristine, smooth finish, leaving you with an accurate model and enhancing the overall aesthetics of your creations.

The natural transparent color of Kimya PEI Support serves a practical purpose beyond aesthetics. It creates a distinct contrast with the amber color of PEI filaments, facilitating the easy identification of support zones that require removal. This transparency enhances overall printing precision, allowing you to achieve meticulous and accurate prints with confidence

Empowering Your 3D Printing Process

Kimya PEI Support goes beyond being just a support filament; it empowers you to achieve outstanding parts without unnecessary complexity. With its reliable high-temperature resistance, user-friendly breakaway support, and seamless integration with ULTEM-based PEI filaments, Kimya PEI Support welcomes you to explore enhanced possibilities in 3D printing. Elevate your creations, streamline your workflow, and enjoy a more efficient and effective printing experience.

The filament can be used on all major high-performance industrial 3D printers following these printing condition recommendations:

- Extrusion temperature: 375-385°C
- Bed temperature: 175-190°C
- Chamber temperature: 170-180°C
- Printing speed: 50-70mm/s smi

By Bertrand Pesneau

Kimya
www.kimya.fr

An increase in overnight production capabilities

Carbon introduces AO Stack, enhancing 3D printing capabilities with increased unattended model throughput for M2 and M3 printers.

Carbon, a leader in product development and additive manufacturing technology, proudly announces the launch of AO Stack, the newest addition to its Automatic Operation suite of solutions. Specifically designed for the Carbon M2 and M3 printers, AO Stack is another software tool designed to increase printing capabilities, allowing dental labs to print multiple builds worth of DPR10 models in one print run without supervision.

AO Stack allows Carbon users to produce up to three times more models in a single unattended print cycle, perfect for the last print of the day. This underscores Carbon's commitment to pushing the boundaries of dental lab technology and continuing the innovation within the Automatic Operation suite of solutions launched earlier this year.

"The introduction of AO Stack is a milestone in our ongoing quest to innovate and provide transformative solutions to our customers," said Brice Harkey, Senior Product Manager of Oral Health at Carbon. "By allowing up to three builds worth of models on a single unattended print, AO Stack offers the opportunity for an increase in overnight production capabilities without additional hardware or oversight."

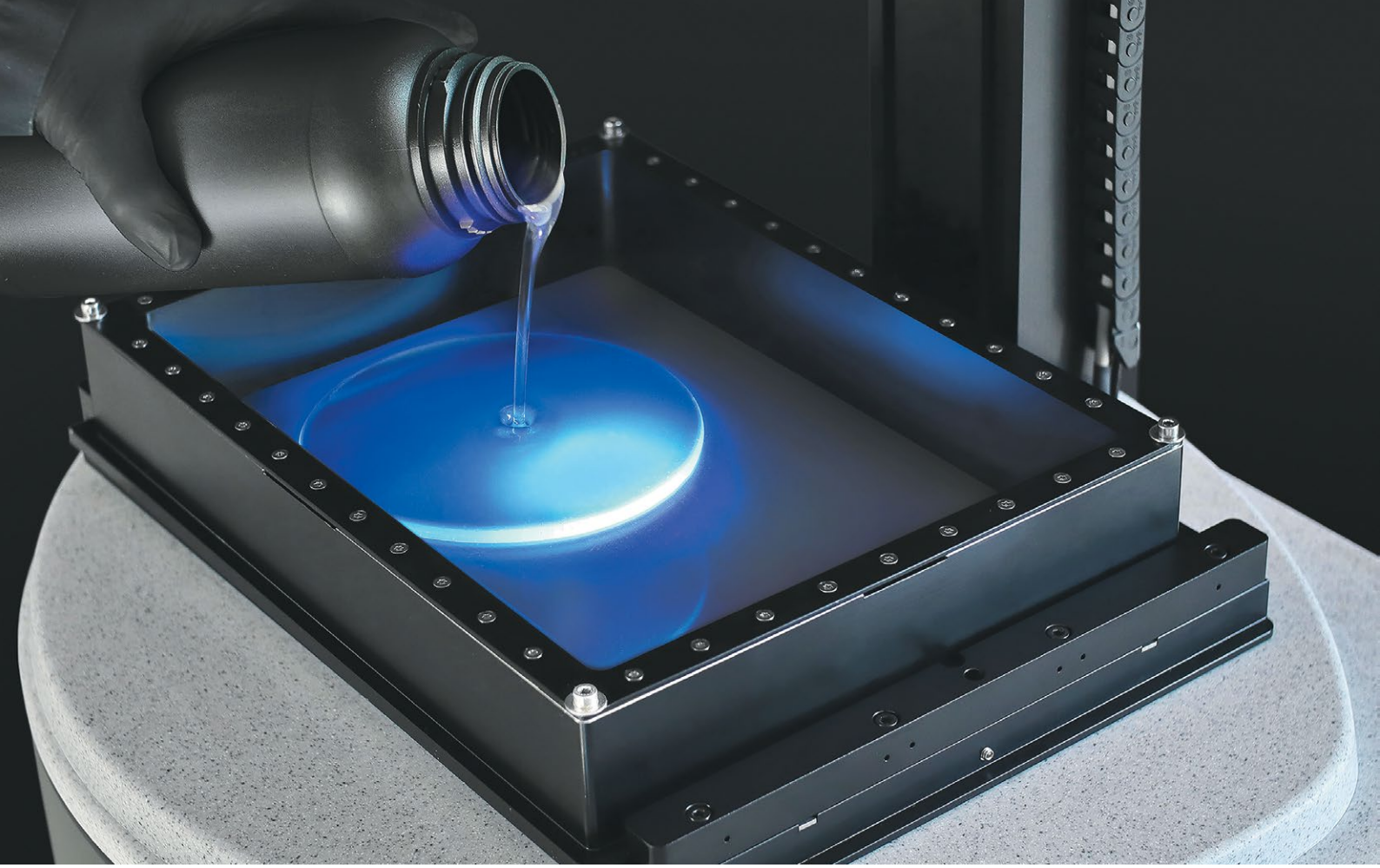
Key Features of AO Stack Include:

• Increased Unattended Throughput: Capable of producing up to three times more models in a single print run than traditional single-layer printing, while unattended.

• Ease of Integration: AO Stack is designed for seamless incorporation into daily operations, supported by comprehensive resources from Carbon Academy.

AO Stack Availability and Integration: Since May 17, 2024, AO Stack is accessible to Carbon M2 and M3 customers utilizing DPR10 as part of their subscription. *smi*

Carbon
www.carbon3d.com.



Five reasons why universities are investing in DLP 3D printers

Investing in DLP technology from ETEC increases the quality of education by allowing students the opportunity to gain invaluable hands-on experience directly producing the parts they design.

Additive manufacturing is one of the most versatile forms of production and is revolutionizing a variety of industries. Also known as 3D printing, it enables the creation of complex parts with intricate geometries that were once impossible to produce using traditional methods.

Digital light processing (DLP) 3D printers have a vat full of resin with a projector that lights the areas of the vat that are needed for the current layer of the 3D model. Stereolithography (SLA) is a closely related technology but slower technology that uses lasers to trace out geometries instead of light projectors to cure the entire layer of resin one flash at a time. Fused Deposition Modeling (FDM) printers extrude thermoplastic filaments through a nozzle to melt material designs layer-by-layer. Because FDM also traces out the geometry, it is significantly slower than DLP and the individual layers are most often visible while DLP prints tend to be smoother, more detailed, and more organic looking.

Investing in DLP technology from ETEC increases the quality of education by allowing students the opportunity to gain invaluable hands-on experience directly producing the parts they design. As 3D printing continues to emerge as a key creative force and manufacturing technology, it is critical academic organizations include it in their curricula to inspire the next-generation of professionals and avoid leaving students at a disadvantage as they enter the workforce. Here are five reasons educational institutions are printing knowledge by investing in digital light processing.

Hands-On Industry 4.0 Engagement

Education 4.0 calls for embracing and adopting technologies in education. Additive manufacturing helps transform classroom theories into applicable skills. Hands-on learning environments with disruptive technologies help prepare students to be successful in the evolving workforce. 3D printing is also a key part of all levels of academic and industry research.

Digital light processing machines produce high-quality results faster than many other plastic 3D printing technologies and the range of materials available allow a variety of resins to be processed and easily swapped, making DLP ideal for research settings and makerspace environments alike. The Envision One offers academic institutions an approachable opportunity to offer students hands-on experience with design and manufacturing concepts as well as the up- and downstream implications for innovation, product development, and supply chains.

Across the Board Investment

3D printing is disruptive across a broad range of industries. While 3D printers may be looked at as a commodity, industries from automotive to aerospace and from machine design to consumer products, build intricate shapes with digital light processing – touching nearly any industry students may enter as future professionals.

Regardless of academic discipline, 3D printing applications are diverse, and the impact far reaching. From classroom projects to engineering innovations and makerspace services to research labs, incorporating additive manufacturing on campus is an investment in technology, processes, and people. Offering hands-on experience with a game-changing technology in a reliable system that rapidly produces high-quality parts relevant to a wide range of disciplines and subject areas within the university environment is an all-inclusive investment.

Jumpstarting Student Projects

From race teams to art shows, on-campus 3D printing allows students to put their creative designs and innovations on display.

The design freedom of 3D printing gives student engineering teams a competitive advantage to develop solutions for challenges of lightweighting, performance efficiency, and cost-effective production. The high-quality results and surface finish of DLP prints deliver parts with precise tolerances in less time. The on-demand, tooling-free nature of 3D printing allows teams to iterate as needed.

DLP printers, known for smoother, more organic surface finishes, are also used to create art pieces with precise details or molds for larger installations. Empower creativity and innovation on campus and let students reach their highest creative and technical potential with ETEC digital light processing.

Incubating the Business Community

Institutions of higher education serve as reference points to incubate disruptive technologies and implement road-to-adoption strategies for the local business community. Developing 3D printing expertise allows knowledge transfer to foster innovation partnerships and provide opportunities for the businesses in your area to benefit, especially small and medium-sized enterprises (SMEs).

The increasing adoption of 3D printers in industry will continue to drive demand for 3D design and process skill sets. Graduates with experience with additive technologies are increasingly sought after by a wide range of employers. Offer the expertise of your institution with market-ready solutions that incubate local innovations and nurture the job market for your future graduates.

Easy to Get Started

Students learn to solve problems with hands-on experience, and ETEC offers systems that perform with industrial reliability but are easy-to-operate without complicated installation requirements. Bringing in accessible additive manufacturing technologies spreads an innovation mindset that has even led to on-campus improvements, like printing replacement residence hall lamp knobs or electronics boxes for the IT department.

The software-controlled process offers an easy-to-adopt approach, allowing the machine to be operated like a tool without hours of training or adjustments needed. Design files are uploaded into Desktop Metal software for auto orientation, support generation, and printing parameter assignment. And switching materials for flexible production is as simple as pouring resin into a clean material tray.

DLP 3D printers like the Envision One perform at speeds and qualities that create an exciting environment for students to relate to their projects and learn with direct experience.

The Envision One features patented Continuous Digital Light Manufacturing Technology, which enables the ability for continuous printing (all pictures: ETEC)

About ETEC

ETEC is a leading global provider of professional-grade 3D printing solutions. As the original inventor of digital light processing (DLP) 3D printing technology, ETEC has one of the most advanced portfolios of precision polymer printers and materials in the market today.

Supported by more than 130 issued and pending patents, ETEC also has extensive range of resins for its platforms. In all thousands of customers across a broad range of industries, including automotive, aerospace, medical devices, and jewelry have relied on ETEC solutions for more than two decades. The company's solutions are used for prototypes, tooling and low-volume to mass production. **smi**

ETEC
https://etec.desktopmetal.com

TRUMPF presented live showcases of cutting-edge VCSEL solutions for optical sensing

Compact VCSEL lasers with many benefits to support optical sensors in industrial environments.

TRUMPF Photonic Components, a global leader in VCSEL (Vertical-Cavity Surface-Emitting Laser) solutions for industrial and consumer sensing was showcasing two live demonstrations to show the performance of the single-mode VCSEL solutions at the Measurement Fair Sensor+Test in Nuremberg, Germany that was held in June. The sensing components based on VCSEL technology are compact and robust laser sources, supporting industrial optical sensing systems.

One showcase illustrated the measurement principle "Time-of-Flight" (ToF). ToF measurement relies on emitting a short pulse of light from the VCSEL. By measuring the time taken for the light to travel to the object and back, the distance can be accurately calculated using the speed of light, enabling precise distance measurements for applications like depth sensing with smartphones or gesture recognition systems.

Another live demonstration will highlight the capabilities for gas sensing in the 760nm to 766nm wavelength range.

VCSEL in TO packaging for industrial environments (all pictures: TRUMPF)

Real-time analysis with contactless measurement based on VCSEL technology, for fast-response and accurate measurement

A benefit of optical measurement is highly accurate, real-time information. The VCSEL packages with integrated temperature control allow for easy handling and precise wavelength tunability.

Benefits of optical sensing with VCSEL technology

Optical sensing with VCSEL (Vertical-Cavity Surface-Emitting Laser) technology offers highly precise measurements due to its narrow spectral linewidth, enabling accurate detection of small changes. VCSELs are inherently compact and energy-efficient, making them ideal for integration into portable devices and reducing power consumption in larger systems. Their fast modulation capabilities allow for rapid data acquisition, enhancing real-time monitoring and response in a number of applications. Additionally, VCSEL-based sensors exhibit excellent reliability and service life, contributing to cost-effectiveness and minimal maintenance requirements over time.

New VCSEL for higher illumination quality

Single-mode VCSEL light sources offer excellent and reliable performance and are available with wavelengths ranging from 760 nm to 940 nm. For even higher illumination quality, TRUMPF offers solutions with polarization control. Later in 2024, TRUMPF will expand its portfolio of polarized VCSELs and release polarization-controlled, single-emitter, single-mode VCSEL components with 2 mW output power. This will serve applications like industrial optical encoding and spectroscopy. Evaluation samples will be available from September onwards and mass production is scheduled for the end of 2024. ***smi***

TRUMPF
www.trumpf.com

Hexagon's innovative scanner wins Red Dot Design Award for outstanding product design

Hexagon's Manufacturing Intelligence division has been awarded the renowned Red Dot Design Award, recognising outstanding product design quality. Established in 1955, the Red Dot Design Award is one of the world's most sought-after distinctions for excellence in design. Its international jury of experts assesses products on criteria such as aesthetics, degree of innovation, functionality, ergonomics and sustainability.

Picture: Hexagon

This year, Hexagon's pioneering SmartScan VR800 structured light scanner has been awarded the prize in the Product Design category reflecting the quality of the user experience, ergonomics and the consistent and attractive application of Hexagon's design language. The function was equally important – as the manufacturing industry's first optical 3D scanner featuring a motorised zoom lens, the SmartScan VR800 fundamentally changes the user experience so they can obtain high-resolution scans of inspected parts in a matter of seconds.

Hexagon is at the forefront of innovation in digital reality solutions that combine sensor, software and autonomous technologies. With 15% of net sales invested in R&D, more than 5,500 active patents and more than 6,500 R&D employees supported by dedicated innovation centres across the globe, the company leverages innovation processes to create groundbreaking solutions. The SmartScan VR800 is one such example of innovation that benefits global manufacturers.

Focus on R&D

Traditional structured light scanners require manual recalibration with every lens change, compromising efficiency. By contrast, the SmartScan VR800 remains calibrated as the scanner zooms in on the desired area without sacrificing precision, delivering a resolution range from 238 to 49 microns. Integrating a zoom lens into a 3D scanner's design presents significant technical challenges, which is why such a solution had not been developed before. Many factors needed to be taken into account in order to accommodate a zoom lens, including a robust frame and calibration capabilities, all while maintaining portability and performance.

Developed in collaboration with colleagues from Hexagon's Swiss Innovation Hub, the scanner's unique closed zoom lens design replaces the need for multiple lenses, streamlining scanning into a single process and simplifying operation for expert and new users. A custom-built carbon fibre frame was developed to accommodate the cameras and lenses, ensuring the thermal stability of the scanner and allowing customers to use the equipment to perform accurate measurements for longer intervals between calibrations.

Ergonomic design for people, or cobots

Ergonomic design was a crucial consideration during the design process, particularly considering the role that truly portable scanners will have in highly automated manufacturing processes. Hexagon's design team prioritised usability for industrial professionals, investing significant effort into understanding user needs and solving their pain points.

Setting the SmartScan VR800 apart from many of its predecessors is its integrated controller unit, which provides fast on-device processing and optimisation of scan data. Traditional scanners have a separate control box that must be set up alongside the scanner, occupying additional space on the shop floor. The VR800's embedded control unit requires just two cables, enhancing portability and freedom of movement. This is complemented by the scanner's universal quick-mounting interface, which provides stability when mounted onto any robotic arm or tripod.

By addressing hands-on user challenges with future-looking design and engineering, the SmartScan VR800 exemplifies Hexagon's commitment to pushing technical boundaries to improve how people work in manufacturing and quality inspection. ***smi***

Hexagon
www.hexagon.com

New unit enhances the efficiency of closure inspection

The new closure inspector from Krones enables bottles to be efficiently inspected for the correct placement of tethered caps as well.

Picture: Krones

In beverage bottling plants, the process of closing the containers constitutes a point of crucial importance for the product's overall quality. Until now, quality-assurance solutions have used a combination of the reflected- and transmitted-light methods, but that requires quite an elaborate set-up. In order to meet more stringent quality standards and keep pace with innovative improvements like tethered caps and lightweighting while simultaneously upgrading the existing methods, Krones has developed the 360° closure inspection unit.

This new unit marries a precisely defined lighting system to a very high camera resolution. It measures the positions of the bottle's closure and neck finish in three-dimensional space. Based on that, it can determine their relative position to each other. As its accuracy is ten times higher than that of its predecessor model, it is possible to take ultra-precise measurements down to 20 micrometres or smaller, even with customary container height tolerances or slightly angled bottle necks. In this way, the process ensures leakproof integrity for all containers, thus saving time and effort for manual testing in the lab where only random checks on individual specimens are performed. Thanks to its full-coverage all-round inspection, the unit checks the closures for presence, correct colour and placement (neither skewed nor too high), damage, jammed breakaway bands and torn perforations. "In contrast to previous solutions, sizeable beads of water don't pose any problems for the 360° inspector. Therefore, bottlers can use a modular blower, which takes up much less space and is also more hygienic and more economical," explains Stefan Piana, Head of Inspection and Monitoring Technology at Krones, and adds: "The unit's selectivity is sufficiently high to ensure that as good as no faultless containers ("false positives") are tagged as defective." And even though its overall dimensions have once again been significantly reduced, the inspector also includes the TopCheck feature for inspecting the closure's logo.

A true multitasker

The new technology enables bottles to be efficiently inspected for the correct placement of tethered caps as well. This new type of closure, which is intended to reduce plastic littering, became mandatory in Germany as from July 2024 and is subject to stringent requirements. The integrated twist-and-clip mechanism keeps the lid out of the way while consumers are drinking from the bottle. Independently of the cap's orientation, the inspection unit now also checks that both the perforation at the breakaway band and the twist-and-clip mechanism are in perfect condition and the latter has been correctly placed.

The new unit can be used for checking the correct position not only of plastic closures but of crowns as well. With the latter, it is important to detect typical errors like skewed crowns or drawn-in skirts. Besides, the 360° closure inspector offers full-coverage in-process monitoring by precisely measuring each crown's diameter. That enables the bottler to do without manual reference-gauge tests in the lab that used to be required once every shift. What is more, the unit reliably detects any leaks or hairline cracks in the bottle's neck finish by evaluating any foam that may be leaking out.

Excellent ratings in every respect

Not only does the new inspector reduce the manual work required in the lab, it offers the additional benefit of testing and assessing the closures' leakproof integrity, which upgrades product quality. As it is easy to handle, the users' feedback has been positive throughout. That is why it will gradually replace the presently used NeckCheck-based variant.

And here is some good news for older generations of our Checkmat inspectors: Depending on the specific circumstances in each case, the 360° closure inspector can be retrofitted in machines featuring DART 4.0 or higher. ***smi***

KRONES AG
www.krones.com

SIGMASOFT® at DKT 2024

At DKT 2024, SIGMA Engineering introduced the new version of SIGMASOFT® Virtual Molding. The spotlight was on new features specifically for elastomers, such as a new generic elastomer database: SIGMA Rubber Designer.

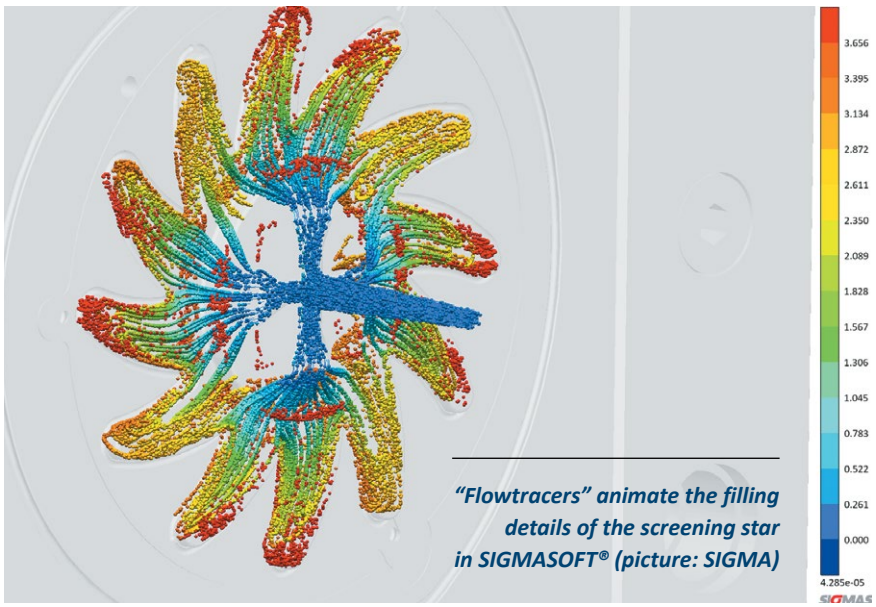
At DKT 2024 in Nuremberg (July 1-4), SIGMA Engineering GmbH was showcasing the advancements of SIGMASOFT®. With the new version 6.1.1, new features for elastomer processing became available.

The measurement of elastomers is time-consuming and cost-intensive, which is why the material data of the compounds based on measurements is only available for the simulation in a few cases. This is where the SIGMA Rubber Designer comes in: This generic database allows approximation of the own elastomer compound without measurement, for use in simulation, thereby obtaining realistic results swiftly and efficiently.

In the continuous development of SIGMASOFT® Virtual Molding, research is always at the forefront. The pursuit of improvements and the development or adaptation of new models continuously expands the software's capabilities, especially in elastomer processing, where these extended approaches are required. At the conference, Timo Gebauer, CTO of SIGMA, was presenting the contribution "Viscoelastic constitutive modeling for flow simulation in injection and compression molding based on log-conformation methods." Although the first rheological models for viscoelastic constitutive modeling were published over 70 years ago, their application in industrial process simulation is still limited. Approaches with state-of-the-art numerical methods based on the log-conformation approach have been developed and implemented in SIGMASOFT® to address further challenges in material characterization and model selection or adaptation.

Together with industry partners, SIGMA presented practical examples of ongoing processes developed with SIGMASOFT®. At the ENGEL stand, the production of a screening star made of NBR and the large-scale production of slit valves made of LSR was presented. At the SIGMASOFT® booth, explanatory simulation results were available.

"Our focus is not on our software itself, but on what can be achieved with it," said Thomas Klein, CEO of SIGMA. "We guide our customers, train dozens of simulation experts every year, and are available every day to provide engineering assistance. Especially in the elastomer world, this is of central importance, and we are proud to have been a sought-after partner in this industry network for many years."



"Flowtracers" animate the filling details of the screening star in SIGMASOFT® (picture: SIGMA)

About SIGMA

Since 1998, SIGMA Engineering GmbH has been driving the development of the injection molding process with its simulation solution SIGMASOFT® Virtual Molding. This virtual injection molding machine enables the optimization and development of polymer components and molds as well as the mapping of the entire production process. The SIGMASOFT® Virtual Molding technology combines the parts 3D geometries with its tooling and temperature control system and integrates the parameters of the production process. This ensures a cost-efficient and resource-saving production as well as high-performance products – from the first shot.

SIGMASOFT® Virtual Molding integrates a multitude of process-specific models including 3D simulation technologies that have been developed and validated over decades and are being continuously optimized. The SIGMA Solution Service and Development team support customers' specific goals with application solutions. The software company SIGMA offers application engineering, training, direct sales, and support. A software straight from its developers and designers to be a solution service to polymer engineering all over Europe.

SIGMA Engineering GmbH, headed by Managing Director Thomas Klein, has subsidiaries in the USA, Brazil, Singapore, China, India, Korea, and Turkey. In addition, SIGMA supports its users worldwide in a variety of international companies and research institutions with its Virtual Molding technology. ***smi***

SIGMA
www.sigmasoft.de

All photos: DOMO Chemicals

DOMO Chemicals presents a new optimized workflow simulation tool

• THERMOFIP is a joint initiative focused on expediting the introduction of innovative lightweight components in the fields of mobility cooling and water management.
• THERMOFIP offers unparalleled opportunities for optimizing parts, leading to a substantial weight reduction of approximately 20% for the targeted components.
• THERMOFIP provides predictive simulation which reduces the number of design cycles of complex parts and limits waste generation during the prototyping phase.

As part of a collaborative project with Toyota (TME), Renault, SOGEFI, Hexagon Manufacturing Intelligence, and AROBAS Technologies, among others, DOMO Chemicals introduces a brand-new workflow simulation tool for polyamide parts in contact with water and coolant. This THERMOFIP workflow enables the prediction of parts resistance evolution after aging, supporting designers in shaping the right geometries for their new parts without the need for numerous tests.

Along with automotive applications, the THERMOFIP project also delivers prediction capabilities for heating and sanitary applications, which routinely come into contact with water and coolant as well.

Key application examples for polyamide 66 glass fiber compounds in the automotive space are under the hood parts in contact with coolant. Not only is this the case for internal combustion engine vehicles, but also battery electric and hybrid vehicles, and even fuel cell vehicles.

In response to the need to reduce CO2 emissions and the resulting changes in engine architecture, accurate predictive simulation technology is becoming a must-have in the plastics industry.

The interactions between the compound's main ingredients (polyamide and filler) and the main components of the coolant, water and ethylene glycol, are complex. They include plasticization, which significantly decreases the compound's glass transition temperature and hence mechanical properties in standard operating conditions. They also include chemical degradation, through hydrolysis of the polyamide chains, and the coolant concentration, which can vary from one side of the part to another. This results in different mechanical performance levels of the material in different points of the part geometry and in time.

Additionally, the consequences of fiber orientation also need to be considered. Due to all these variables, it has been very difficult to predict local levels of performance of such parts through simulation – until now.

By optimizing the simulation and use of fiber-reinforced plastic parts exposed to water and glycol-based coolants, THERMOFIP provides a true game changer for players in the automotive cooling segment and plumbing industry. This outcome is just as important for material suppliers as it is for the companies designing the parts and the carmakers using them. On top of being able to simulate the behavior of static parts, THERMOFIP opens the way for simulating active components in their different positions with the related local stress effects.

"When calculating the final mechanical properties of a part made of glass fiber-reinforced polyamide resin, integrative simulation offers the advantage of also taking the forming process into account. This opens new possibilities for parts optimization with a significant weight reduction of around 20% for the targeted parts," said Gilles Robert, Senior Materials Expert at DOMO.

"Within the THERMOFIP project, we have created a kinetic model to simulate how coolants influence the progressive embrittlement of materials, in order to find new ways of making even lighter parts," Robert added.

The new prototype simulation chain, designed in collaboration with Hexagon and Arobas Technologies, allows the local degradation of parts to be predicted. Several models are now enabling the prediction of material degradation levels caused by aging, which can then be used to anticipate the mechanical performance of coolant-exposed polymers. The study also includes the evolution with aging of material mechanical behavior for different fiber orientations.

The simulations have been validated by empirical testing. One example is the test run on the Localized Strain Demonstrator, designed and molded by DOMO Chemicals. The target pursued was to exclude failures in proximity of the metallic inserts. Results show a high correlation between experiments and simulations.

THERMOFIP is the last addition to DOMO's established MMI simulation offering, which already combines high quality **M**echanical - **M**aterial modelling and **I**njection molding simulation.

SOGEFI Filtration module case study

A first case study was performed on a SOGEFI Filtration oil module made of a glass fiber reinforced TECHNYL® solution.

Simulation results reveal a few interesting trends and a good level of correlation between test and simulation. A key point is that failure does not happen on the oil module where hydrolysis is the most intense. It happens where an unfavorable combination of local stress concentrations, fiber orientation and hydrolysis can be found. This illustrates why a complex workflow taking several parameters into account is needed to predict failure in such complex parts.

The results obtained in this first phase of the project are very encouraging, showing good correlations between experiments and simulations.*

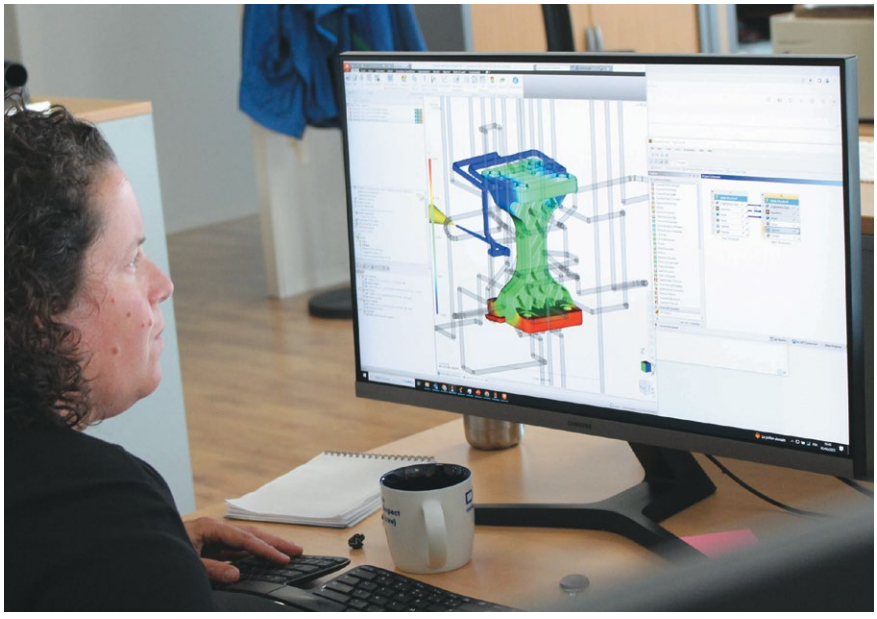
The next steps of the project are to extend the model to other commercial coolants. The material database will be expanded to include new materials and, more importantly, more case studies must be undertaken to prove that this new technology can change the way polyamide parts in contact with coolant are designed.

*Data are based on researches conducted during the THERMOFIP project in collaboration between all partners and are available upon request.

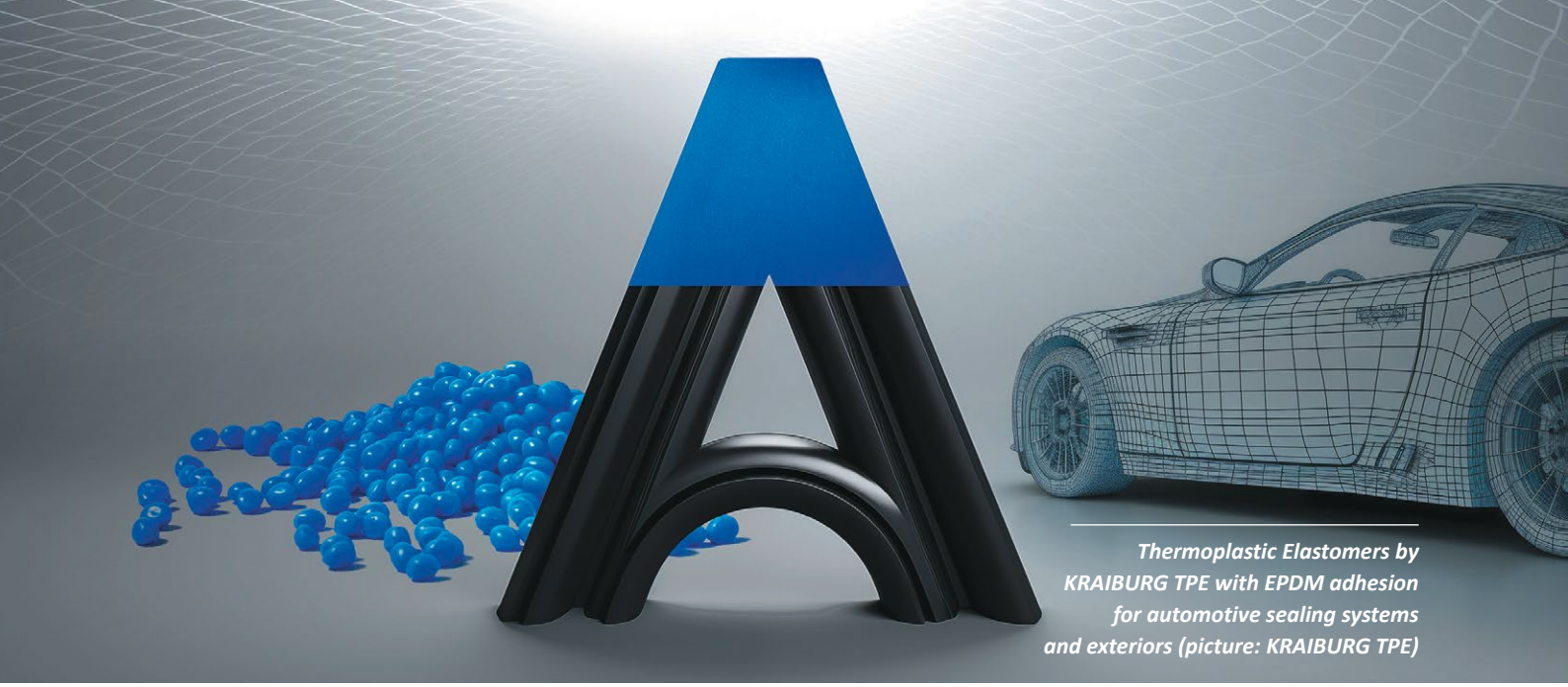
About THERMOFIP

The project team includes the OEMs, Renault and TOYOTA; the tier one supplier, SOGEFI Filtration; two French academic labs, CEMEF Mines Paris and LEM3; ADI, a toolmaker; NOVITOM, specialized in analytical techniques involving synchrotron X-ray beams; Promold, expert consultants in Moldflow simulation; AROBAS Technologies, specialized in simulation and software development; Hexagon Manufacturing Intelligence, maker of the Digimat™ software; and DOMO Chemicals as material supplier and project coordinator. The project was funded by Banque Publique d'Investissement, and local communities, Grand Lyon and Auvergne Rhône Alpes. *smi*

DOMO Chemicals
www.domochemicals.com



DOMO Chemicals presents a new optimized workflow simulation tool for predicting the effects of water and glycol-based coolants on heating, sanitary and automotive parts for their entire lifespan



Thermoplastic Elastomers by KRAIBURG TPE with EPDM adhesion for automotive sealing systems and exteriors (picture: KRAIBURG TPE)

KRAIBURG TPE introduces new EPDM adhesion compounds for automotive industry

KRAIBURG TPE unveils its latest innovation: Thermoplastic Elastomers (TPE) with EPDM adhesion for automotive sealing systems and exteriors. These compounds set a new standard in material technology, offering adhesion, durability and processability. Available globally with comprehensive technical support on parts and processing, KRAIBURG TPE reaffirms its commitment to excellence in automotive solutions.

KRAIBURG TPE is launching new EPDM adhesion compounds designed for the automotive sealing and exterior sector, addressing global requirements and needs with particular focus on the markets in Europe, North, South and Central America. These compounds epitomize a remarkable leap in material technology, delivering adhesion, durability, and processability essential for demanding applications. Specifically formulated for automotive exterior parts with UV resistance, they find application in glass run channels and sealing profiles featuring molded corner joints and end caps. In close cooperation with one of the most important Tier 1 in automotive sealing businesses worldwide there have successful tests of the compounds in comprehensive trials since 2023. This release emphasizes the importance of the automotive sealing segment for KRAIBURG TPE and the company's commitment to deliver high-quality solutions for OEMs and Tiers.

KRAIBURG TPE's latest market introduction features constant EPDM adhesion quality proven at 23°C and 90°C heat aging, with dry surface appearance. The optimized flow properties provide a broad processing window and increased design flexibility in part and tool design while maintaining high performance standards. Additionally, the compounds offer weathering resistance, color stability, low surface friction behavior and wear and tear resistance. The homogeneous surface quality enhances aesthetics and functionality, meeting the stringent requirements of automotive applications. Compared to full EPDM sealing solutions, TPE-EPDM hybrid technology meets market trends by supporting the transition to TPE for sealing systems due to process efficiency. A lower product carbon footprint as well as weight reduction support efforts towards sustainability.

Global Support and Supply

The new compounds address the needs of original equipment manufacturers (OEM), Tier 1 and Tier 2 in the automotive sealing and exterior industry as well as tool makers. Products are available worldwide, ensuring accessibility and support for manufacturers across the globe. The KRAIBURG TPE service package offers unparalleled support, including assistance with the TPE approval processes at global OEMs, technical guidance, and global supply security with constant quality.

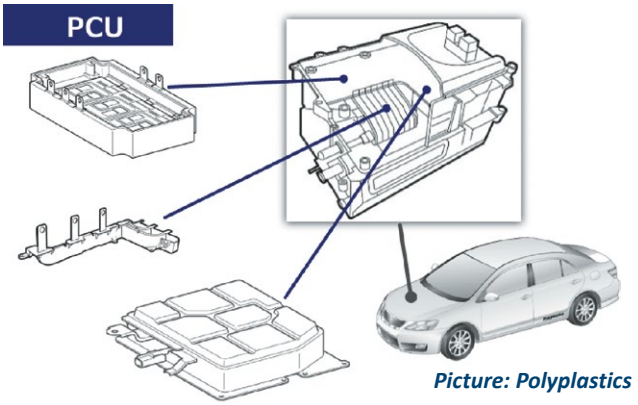
With the introduction of the enhanced EPDM adhesion compounds, KRAIBURG TPE continues to lead the industry in providing innovative solutions for automotive sealing and exterior applications. The company's commitment to quality, performance, and customer support remains unwavering to empower manufacturers to achieve excellence in their products.

To highlight the significance of this technology, KRAIBURG TPE also holds various patents for this new series in Europe and North America. **smi**

KRAIBURG TPE
www.kraiburg-tpe.com

Polyplastics launches new glass-filled PPS grade with improved thermal shock resistance

DURAFIDE® PPS 1140HS6, a 40% glass-filled grade, meets the requirements for metal insert molding, particularly busbars for electric vehicles (xEVs).



Picture: Polyplastics

Polyplastics, a global leader in engineering plastics, has announced the launch of a next-generation polyphenylene sulfide (PPS) grade that boasts significantly improved thermal shock resistance and can be easily recycled during post-consumer recycling (PCR) without sorting. DURAFIDE® PPS 1140HS6, a 40% glass-filled grade, meets the requirements for metal insert molding, particularly busbars for electric vehicles (xEVs).

DURAFIDE® PPS 1140HS6 can be easily collected without being separated from other PPS components during recycling. Polyplastics has employed a material design technique to ensure thermal shock resistance by minimizing residual strain during molding and homogenizing linear expansion to mitigate internal stress. As a result, thermal shock resistance has been improved while retaining mechanical and other essential properties.

DURAFIDE® PPS 1140HS6 eliminates molding imperfections and enhances performance without the need for impact modifiers in xEV busbar applications. Insert molded xEV components conduct high-voltage currents in various electrical parts and their complex shapes make them susceptible to cracking. They are usually made up of a metal that conducts electric power and PPS resin that functions as a coating for insulation. This cracking problem is caused by repeated heating and cooling and subsequent rapid temperature changes. This is a significant issue, leading to insulation failure, particularly in the critical parts of xEVs that conduct high-voltage currents.

The typical solution is to add impact modifiers to PPS. Still, this approach has drawbacks, such as a reduction in material strength and the tendency for gases and mold deposits to emerge during molding. Additionally, materials containing impact modifiers are incompatible with the growing trend of material recycling.

The newly developed DURAFIDE® 1140HS6 PPS is a promising next-generation PPS resin that offers better flowability during injection molding than standard materials. This makes it an ideal choice for molding both thin-walled and large products. It is also environmentally friendly and suitable for use as insulation material in metal insert parts, including peripheral components in xEVs.

Developing high-performance materials that meet environmental needs is a continuous effort, and Polyplastics team remains committed to this goal. **smi**

Polyplastics
www.polyplastics-global.com

The 2024 Gold Edison Award winner LNP™ ELCRES™ SLX1271SR resin provides excellent paint-free aesthetics and weatherability (all pictures: SABIC)

SABIC spotlighted at PIAE 2024 material solutions for automotive innovation and safety

• SABIC was showcasing its specialty material solutions for automotive innovation and safety at PIAE 2024.
• Applications on display included wheel inserts for aerodynamics, a front grille with paint-free color, a rearview mirror with EMI shielding for integrated ADAS radar, a service flap for EV charging ports and insulation film for EV battery modules.
• SABIC's materials enable longer useful life of automotive parts, incorporating recycled content and avoiding volatile emissions from coating application.

SABIC, a global leader in the chemical industry, was highlighting at the 2024 Plastics in Automotive Engineering (PIAE) congress a selection of specialty material solutions that can enhance automotive innovation and safety. The parts and samples at SABIC's exhibited attest to the company's continuing research, development and investment to promote the benefits of advanced thermoplastics. This strategy encompasses recycled and upcycled content for circularity, molded-in color for volatile emissions reduction, durability for longer useful life, and enhancement of driver assistance systems and electric vehicle battery packs.

"Improving automotive efficiency and safety involves many different aspects of a vehicle's design, production, and operation," said Maureen MacDonald-Stein, director, Portfolio Strategy & Marketing, SABIC Polymers, Specialties business. "Our broad and growing array of specialty resins, compounds and copolymers offers customers multiple options for addressing specific challenges related to these two areas. But our solutions also deliver additional benefits, including potential system cost savings and more-efficient processing compared to traditional materials. As regulatory requirements and megatrends like electrification and environmental

protection accelerate the pace of change, SABIC continues to diversify and add value to our portfolio."

Solutions for Sustainability

Aerodynamics plays a role in extending range in electric vehicles (EVs) and reducing fuel consumption in internal combustion vehicles. Wheel inserts can improve aerodynamics by reducing drag, while adding visual excitement and differentiation to a vehicle's design. At its exhibit, SABIC was displaying wheel inserts molded from NORYL™ GTX resin, a high-heat, impact-resistant material that can be painted to enhance aesthetics and also improve the durability of the application. It also features very low specific gravity for weight-out and optimized moment of inertia.

Weatherable SLX

SABIC helps customers achieve sustainability goals and lower system costs with paint-free LNP™ ELCRES SLX resins. These resins help manufacturers avoid volatile organic compounds (VOCs) with a molded in color, high gloss and weatherable solution featured in various automotive exterior applications. Beyond the market leading SLX2271T and 2291T resins, SABIC continues to innovate with solutions that help extend useful life with advancements in scratch resistance, and incorporate recycled content derived by renewable or post-consumer recycled content.

SABIC's LNP ELCRES SLX1271SR resin is another material in this family that provides excellent paint-free aesthetics and weatherability. This product won the 2024 Gold Edison Award in the Materials Science/Advanced Materials category. Besides avoiding volatile emissions from painting, the molded-in color capability of this resin can reduce system costs and accelerate throughput.

SABIC was showcasing an illuminated front grille for an EV that can withstand harsh weather, automotive fluids and impact without the need for hard coating. This is another example of reduction of VOCs from paint and coatings to protect air quality and health. This part is molded from LNP™ SLX1271D copolymer resin, which provides a more sustainable alternative to hard-coated polymer substrates weathers at the similar rate as painted components, maintaining its desirable aesthetics for 10 years or more. One reason is that the resin forms a self-protecting layer that absorbs UV light on a continuous basis to help retain color and gloss. It also offers automotive OEMs a cost-effective route to designing and producing intricate, illuminated, instantly recognizable signature features as part of their exterior branding strategy.

New conductive NORYL™ GTX™ LMX310 resin offers inline paintability for perfect color consistency with adjacent body parts and meets more stringent dimension control requirements in a wider temperature and humidity range for components such as large EV service flaps

To amplify the sustainability benefits of EVs, SABIC has developed a service flap assembly for charging ports that features new NORYL GTX™ LMX310 resin. This conductive grade with very low moisture absorption can reduce global warming potential (GWP) by 30 percent compared to incumbent conductive polyamide-based materials.

Solutions for Safety

At PIAE, SABIC was displaying an interior rearview mirror with an integrated driver and passenger monitoring system for improved safety. To provide electromagnetic interference (EMI) shielding, the mirror housing is molded from new LNP™ FARADEX™ 9X23246 compound, a blend of PC and acrylonitrile-styrene-acrylate (ASA) formulated with electrically conductive stainless steel fibers. This application features a custom molded-in dark gray color.

LNP™ THERMOCOMP™ compounds, which won the 2024 Silver Edison Award in the Materials Science/Advanced Materials category, are another family of LNP materials that can be used in automotive safety systems. They offer highly stable and broad dielectric properties for satellite navigation and communication antennas, helping to advance self-driving technology.

Battery safety is a crucial factor in consumer adoption of EVs. SABIC's NORYL™ NHP8000VT3 resin is well suited for insulation film used in EV battery modules to help protect against short circuits and fire propagation. It achieves the highest comparative tracking index performance level category (CTI PLC0) and meets the UL94 V0 standard at 0.25 mm. Samples of insulation film were on display at the SABIC booth.

PIAE 2024 was being held in Mannheim, Germany, June 19-20.

About SABIC

SABIC is a global diversified chemicals company, headquartered in Riyadh, Saudi Arabia. It manufactures on a global scale in the Americas, Europe, Middle East and Asia Pacific, making distinctly different kinds of products: chemicals, commodity and high performance plastics, and agri-nutrients.

SABIC supports its customers by identifying and developing opportunities in key end-use applications such as Automotive, Hygiene & Healthcare, Electrical & Electronics, Packaging, Agriculture, Consumer Products, and Building & Construction.

The company has close to 29,000 employees worldwide, serving customers in more than 140 countries. Fostering innovation and a spirit of ingenuity, SABIC has 11,070 patents and pending applications, and has significant research resources with innovation hubs in five key geographies – USA, Europe, Middle East, South Asia and North Asia. **smi**

SABIC
www.sabic.com

Henkel introduced Loctite 3D MED3394, a novel solution for post-sterilization durability

Following up to 25 autoclave cycles, Loctite 3D MED3394 preserves mechanical properties and dimensional stability, alongside high feature accuracy and low solvent absorption. This resin ensures reliable performance in demanding medical applications.

With the introduction of Loctite 3D MED3394 Henkel has launched a further innovation within its growing portfolio of medical-grade resins for 3D printing. The novel resin represents a significant advancement, notable for its robust resistance against sterilization methods that commonly challenge other photopolymers in the market. Following up to 25 autoclave cycles, Loctite 3D MED3394 preserves mechanical properties and dimensional stability, alongside high feature accuracy and low solvent absorption. This resin ensures reliable performance in demanding medical applications.

In addition to its sterilization resilience, Loctite 3D MED3394 is compliant with stringent ISO 10993 standards for biocompatibility, meeting the highest safety and quality requirements. Furthermore, the product is formulated without CMR (Carcinogenic, Mutagenic, or Reproductively hazardous) ingredients. Its dimensional accuracy and stability make it ideal for applications requiring sterilization or chemical resistance, including surgical tools, hospital devices, and clean room environments. Available in both white and sheer black, Loctite 3D MED3394 features impressive Heat Deflection Temperature (HDT) and tensile properties, setting a new benchmark for precision and durability in medical applications.

Loctite 3D MED3394 benefits:

- Ability to withstand multiple methods and rounds of sterilization while maintaining performance.
- Capable of meeting ISO 10993-5, -10, -11 & -23 biocompatibility standards for medical applications
- USP Class VI Certified
- Excellent chemical resistance
- High Dimensional Accuracy
- Good balance of HDT and toughness.

Henkel has introduced Loctite 3D MED3394, a novel solution for post-sterilization durability (picture: Henkel)

"We are proud of this advancement in the field of medical 3D printing," said Dr. Daniel Adams, Vice President at Henkel for Loctite 3D Printing. "With our new sterilizable material, Loctite 3D MED3394, we are addressing a clear customer need and show our dedication to providing innovative solutions that support healthcare professionals to deliver quality patient care."

The Loctite 3D Printing team was showcasing Loctite 3D MED3394 at Rapid+TCT 2024 (June 25-27, 2024), providing attendees with the opportunity to experience its performance and versatility firsthand.

About Henkel

With its brands, innovations and technologies, Henkel holds leading market positions worldwide in the industrial and consumer businesses. The business unit Adhesive Technologies is the global leader in the market of adhesives, sealants and functional coatings. The company's three strongest brands are Loctite, Persil and Schwarzkopf. Henkel's preferred shares are listed in the German stock index DAX. Sustainability has a long tradition at Henkel, and the company has a clear sustainability strategy with concrete targets. Henkel was founded in 1876 and today employs a diverse team of more than 50,000 people worldwide – united by a strong corporate culture, shared values and a common purpose: "Pioneers at heart for the good of generations." ***smi***

Henkel
www.henkel.com

exhibitions calendar

Taipei Plas
24-28 September 2024
Taipei, Taiwan
www.taipeiplas.com.tw

Taipei Plas is a biennal international exhibition for plastics and rubber technology. You can see every facet of production, meet company representatives and industry professionals from across Asia and check out the vast array of breakthrough processing machinery, parts, finished products and materials.

Fakuma
15-19 October 2024
Friedrichshafen, Germany
www.fakuma-messe.de

Fakuma is a prominent meeting place for the industry, with international charisma. It holds second place in the overall ranking of international trade fairs for plastics. Fakuma offers a top-class, comprehensive range covering all aspects of injection moulding technology as well as extrusion and thermoforming, in which it holds a leading position. The range of provision at Fakuma is rounded off by forward-looking forums, workshops and special shows.

Formnext
19-22 November 2024
Frankfurt am Main, Germany
www.formnext.com

Formnext is the leading exhibition and conference dedicated to additive manufacturing and all of its upstream and downstream processes. It is where experts from a wide range of industry sectors, such as automotive, aerospace, mechanical engineering, medical technology, electrical engineering, and many more, come together to discover additive manufacturing, industrial 3D printing, and innovative production technologies for themselves.

Plast Eurasia
4-7 December 2024
Istanbul, Turkey
www.plasteurasia.com

The exhibition areas of the Plast Eurasia include plastic, machinery and equipment, mold making, plastic products, raw materials, packaging technology, hydraulics and pneumatics, as well as related industries and trade journals. International exhibitors can present their latest trends, products and developments to an interested audience here.

Arabplast
7-9 January 2025
Dubai, UAE
www.arabplast.info

The Arabplast has become one of the biggest events in the plastics and rubber industries in the United Arab Emirates developed. International exhibitors are represented at this exhibition and present their latest innovations, technologies and machinery in the industry.

Asiamold Select
25-27 February 2025
Guangzhou, China
www.asiamold-china.cn.messefrankfurt.com/guangzhou/en.html

Asiamold Select is a leading trading platform for China's mould and die industry. The fair is dedicated to assisting industry players around the globe by offering an array of the latest mould making, 3D printing and die casting technologies and solutions to help participants to enhance their business results. The fair will once again be held concurrently with SPS – Industrial Automation Fair Guangzhou (SIAF) to provide a total smart manufacturing sourcing ground for industry players.

KOPLAS
11-14 March 2025
Goyang, Korea
www.koplas.com

KOPLAS – Korea's No.1 Plastics and Rubber Industry Exhibition – offers a wide variety of attractions ranging from raw materials of plastic to molds, processing machines, ancillary equipment, automation solutions, printing, packaging, semi-finished goods, finished goods and a "plastics and rubber industry" marketplace where one can witness the present and future of the industry at a glance.

PLASTIMAGEN
11-14 March 2025
Mexico city, Mexico
https://www.plastimagen.com.mx

PLASTIMAGEN represents Latin America's plastics sector's most important forum for the exchange of ideas and networking. It is the industry's premier expo in the region, where the world's leading suppliers gather in a single forum to provide key decision makers with state-of-the-art solutions for machinery and equipment, raw materials, transformation of plastics and plastic products, services for the plastics industry.

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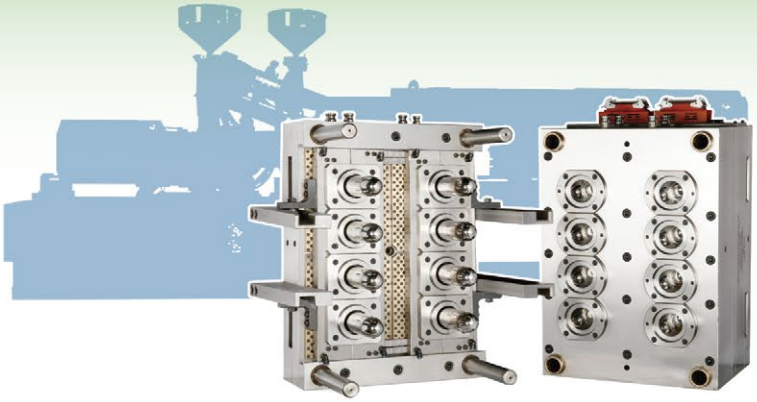

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