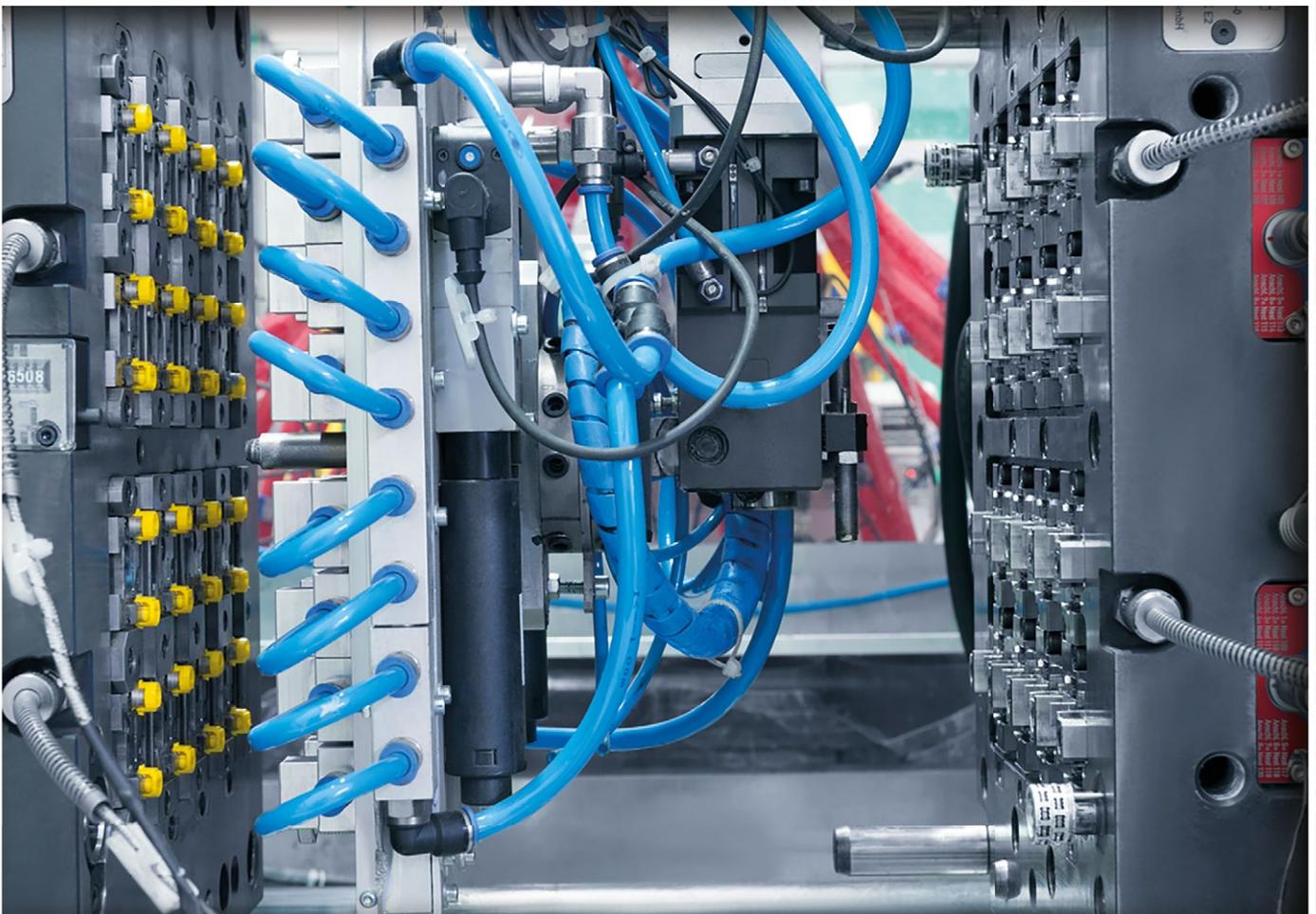


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Thin-walled cups made of r-PET can now also be produced using injection molding technology

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Cavity pressure measurement facilitates GMP-compliant injection molding

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newsfeed

**Both, BOY XS and BOY XXS offer 50% more plasticizing volume**

Up to now the maximum plasticizing volume for the machine types mentioned has been 10.2 cm<sup>3</sup>, but from the middle of this year the two injection moulding machines will have a maximum stroke volume of 15.3 cm<sup>3</sup> as standard.

An extended screw stroke at a screw diameter of 18 mm and an injection force increased by 25 % makes this possible. Thus, the compact BOY XS (100 kN clamping force / 0.77 m<sup>2</sup> footprint) and the BOY XXS (63 kN / 0.69 m<sup>2</sup> footprint) have a significantly wider range of injection volumes in comparison to other

machines in this clamping force class. These two BOY injection moulding machines do not use the piston plasticizing that is customary for this machine size, but instead rely on a screw plasticizing from 8 to 18 mm according to the "first in first out" principle. Maximum specific injection pressures of up to 3128 bar are available.

The proven design is ideally tailored to the industrial requirements of micro injection moulding. In order to achieve a maximum consumption of resources, BOY is pushing for an almost sprueless part production



with cost-effective single-cavity moulds.

The diversity of the plasticizing units allows the processing of bio-based compounds in addition to the common plastics such as thermoplastic (screw diameter 8mm to 18mm), elastomers (screw diameter 16mm) and silicone/LSR.

Dr. Boy  
 www.di-boy.de

**To focus entirely on hot runner business**

Inglis announces the sale of 100% of INEVO to Luigi Covei, owner of CST Stampal and Roberto Paparazzo, Sales Director of the Inglass mould division, since 2015.

INEVO is the new name of the Inglass mould division that started as INCOS in 1987. INCOS, focused since the beginning on injection moulds manufacturing for the car lighting market and the glazing technology.

Maurizio Bazzo, President and founder of Inglass, states: "The sale of INEVO will allow Inglass to entirely focus on the HRSflow hot runner business, a market that requires continuous innovation and investments in order to satisfy the increasingly demanding needs of the injection moulding industry".

inglass  
 www.inglass.it

Luigi Covei, CEO of INEVO states: "We are proud of this acquisition. INEVO has been chosen due to its deep knowledge of the lighting mould market and its high innovation skills in the production of new components for the car mobility. At the same time the synergies with CST Stampal, both in design and manufacturing, will allow us to be a perfect partner for all the markets that require cutting edge technology".

The just signed company transfer represents the completion of the process of total separation between the hot runner systems HRSflow division and the lighting mould division.

**WITTMANN and FarragTech now under one roof**

For more than 25 years, FarragTech GmbH has been active in plant engineering for plastics processing



in the auxiliary equipment sector, with one main focus within its product range on compressed air granulate

From left to right: Ethard Fas, WITTMANN Material Handling Department Manager, Aenne Goring, Product Manager Compressed Air Drying and Mold Cooling, Michael Wittmann, WITTMANN Managing Director.

newsfeed

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drying. As the inventor of the compressed air granulate dryer as well as internal compressed air mold cooling for blow molding processes, FarragTech has invariably been setting benchmarks when it comes to adding the benefits inherent in these technologies. Another main focus of the company's product development line on protection against condensation water for cooled molds, in which area FarragTech has created an exceptionally

energy-efficient and low-cost solution.

Now the product range and the team of FarragTech are being integrated into the structures of the WITTMANN Group, thus providing them with direct access from their headquarters in Wollurt to the entire development know-how and the international sales network of the WITTMANN Group. Further development of the FarragTech products from all three sectors will be driven forward,

and it is planned to have the appliances seamlessly integrated into the open concept of WITTMANN 4.0 technology.

The company's previous owner Aenne Farrag is taking over the compressed air drying and cooling segment as Product Manager, and will incorporate this product line into the WITTMANN Group. WITTMANN's Managing Director Michael Wittmann is looking forward to the future cooperation: "We extend a very

cordial welcome to the FarragTech team in our group of companies. With the small quantity dryers from FarragTech, we are closing a gap in our product portfolio. Our international outreach – combined with the advantages of these technically outstanding products – promises an enormous growth potential for our new product segment."

WITTMANN  
 Kunststoffgeräte  
 www.wittmann-group.com

**New products for hot runner and control systems**

Meusburger presents innovations in the field of hot runner and control systems. Under the PSG product brand, the number of versions of the smartFILL nozzle series has been expanded with a new focus. The range is perfectly complemented by the pneumatic and hydraulic operating unit for valve gate nozzles. In control systems, the combination of a VCON controller with the smartFILL nozzle series has been made possible. The newly developed series focuses on melt guidance and ease of maintenance. With the very large variety of nozzle lengths, melt channel diameters and gate geometries, the smartFILL nozzle series is now also available in the large 4527 and the small 4019 versions. The nozzles are available in the variations smartFILL (slide wall), smartFILL SHOT (screwed in) or smartFILL Shot Single

(single application). They are not only suitable for processing technical and filled plastic types, but also for direct gating or gating to a cold runner. The new concept of heating right up to the injection point ensures a homogeneous temperature profile, which in turn guarantees highest component quality.

Compact redevelopment Compatible with the smartFILL nozzle series, the pneumatic (DP 3x4x3) and hydraulic (MH 24x33) operating units for valve gate nozzles are new in the range. With the pneumatic operating unit, the pin is opened and closed via the clamping plate using compressed air. Even with individual actuation of each nozzle, tight inside dimensions are possible for both units. This makes these operating units particularly suitable for use in conjunction with the 19 and



Redevelopment of operating units for valve gate nozzles

27 nozzle sizes in the smartFILL series.

All options in one cabinet Active optimum injection moulding results through sequential control of the melt flow. During the opening or closing of the valve pin, it is possible to control the various pin positions hydraulically in staggered modes. For cascaded filling of injection moulded parts with several injection points, visible defects on moulded parts can be avoided this way.

Meusburger  
 www.meusburger.com



# smart-molding international \_\_\_\_\_ 2/2023

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Kistler



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The possibility to obtain machines, automation and auxiliaries all from a single source from WITTMANN is also becoming more and more important for MESTO. Johannes Stuber, Production Manager at MESTO, particularly appreciates the good cooperation right from the concept planning stage. He comments: "What gives WITTMANN BATTENFELD a competitive edge is above all its excellent service. In combination with its energy efficient, compact, complete solutions, this is a decisive factor for us."

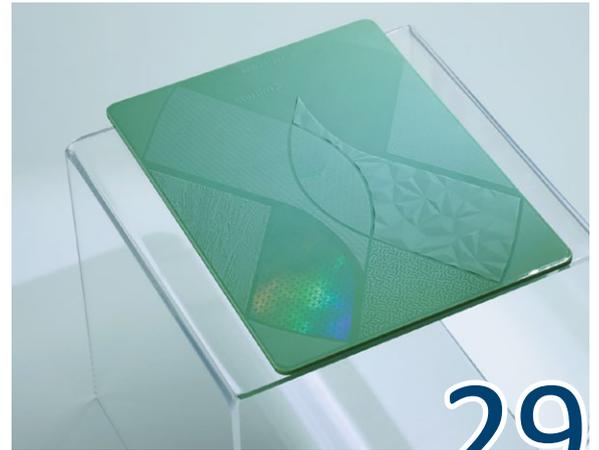


While ENGEL duo injection moulding machines have been available with clamping forces of up to 5500 tonnes as standard machines for a long time, ENGEL has now extended the series upwards for new applications in the mobility sector and other industries. Besides parts with a particularly large surface area and volume, these new mega machines with their extremely large mould mounting spaces enable even more extensive process integration – for example in the glazing sector.



26

For those looking to modernize their single stage PET bottle production. Mold-Masters® has created the AXIOM TG (Thermal Gate) hot runner system, which is designed to meet the needs of single-stage PET molders. This hot runner system brings the latest processing technology to enhance molded part quality, increase productivity and lower cost per part. AXIOM TG is an economical direct replacement for many existing outdated hot runner systems and is compatible with all leading ISBM machines and molds.



29

Highlights of the sample plate 2.0 are the hologram and the lowfriction structure at the corners. The advantage of silicone is that fingerprints do not adhere to the surface, or at least only to a very limited degree. Holograms remain a fascinating feature, despite any contact with human skin. The corners of the sample plate 2.0 are particularly interesting, as their surface is imbued with properties that reduce friction. Use of special surface textures enhances the gliding properties of silicone.



48

ELIX Polymers has developed a range of speciality grades of ABS and PC/ABS to reduce the squeaking and rattling sounds that are generated by plastic parts making contact with other plastic parts, leather, PVC-foil or other products. Especially with the increase in popularity of electric and hybrid vehicles whose powertrains make less noise, anti-squeak materials are more often required by Automotive OEMs to produce critical interior parts like door handles, armrests, seating parts, sunroofs, cupholders and air vents.



50

The recycled injection-molded granulate already saves up to 40 percent CO2 compared to virgin material, is suitable for the production of stable and durable plastic products, and can also be decorated to a high quality. Thanks to optimized processes, RECO SYS® 2.0 now not only enables even more KURZ products to be reclaimed, but also expands the application possibilities of the recycled material. Surplus carrier materials from the graphic industry can now be processed into recycled PET for the first time.



## BASF breaks ground on polyethylene plant at Zhanjiang Verbund site in China

BASF has broken ground on a polyethylene (PE) plant at its Verbund site in Zhanjiang, China. The new plant with a capacity of 500,000 metric tons of PE annually will serve the fast-growing demand in China. The plant is scheduled to start up in 2025.

“China’s demand for PE has experienced rapid growth and is going to outpace the rest of the world,” said Bir Darbar Mehta, Senior Vice President of Petrochemicals Asia Pacific at BASF. “With the groundbreaking ceremony, BASF will enter the PE market in China via a competitive production footprint in its fully integrated production site in Zhanjiang, catering to our customers in the consumer goods, packaging, construction and transportation industries.”

“Strategically located close to our customers, the Zhanjiang Verbund site is fully backward integrated to provide them with high quality and reliable PE products for a wide range of durable applications, including pipes, specialty films and blow molded parts for household and industrial chemical containers, especially in the South China market,” said Bejoy

Chandran, Vice President of Basic Business Management & China Sales Management, Petrochemicals Asia Pacific at BASF.

Polyethylene is a light, versatile thermoplastic polymer produced from ethylene. It is used in a wide range of applications from heavy-duty storage tanks and pipelines to flexible packaging and films.

About BASF’s Petrochemicals division The Petrochemicals division is the starting point for BASF’s petrochemical-based value chains globally. We operate a highly competitive asset base with best-in-class technologies and set the benchmark in safety, sustainability, operational excellence and cost competitiveness. With six Verbund sites and several major production sites, we are close to our customers and present in the largest chemical markets worldwide. The division supplies various value chains across the company and a broad range of customer industries with high-quality chemicals, putting our customers in the center of everything we do and contributing to the organic volume growth of BASF. Our portfolio includes

*BASF has broken ground on a polyethylene (PE) plant at its Verbund site in Zhanjiang, China (picture: BASF)*

cracker products, industrial gases, acrylics, superabsorbent polymers, styrenic foams, alkylene oxides, glycols, alcohols, solvents and plasticizers. In 2022, the Petrochemicals division generated sales to third parties of about €10.6 billion.

### About BASF

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. More than 111,000 employees in the BASF Group contribute to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio comprises six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF generated sales of €87.3 billion in 2022. BASF shares are traded on the stock exchange in Frankfurt (BAS) and as American Depositary Receipts (BASFY) in the United States.

**BASF**  
[www.basf.com](http://www.basf.com)

## Expansion of global manufacturing strength: Haitian International invests in Mexico

Haitian International officially inaugurates its state-of-the-art manufacturing facility in Mexico. The strategic goal: strengthen local production capacity, shorten delivery times and provide even better solutions for the technical requirements of customers in North and South America. With a total investment of around 50 million US dollars, Haitian International is setting a further milestone in its growth strategy.

Official representatives of the state of Jalisco, the municipality of Acatlan de Juarez, the top management of Haitian Group and 400 invited guests, including local customers, dealers, partners and the employees of Haitian Mexico, took part in a formal ceremony.

### Regional headquarters and production center for the American market

The new plant is located in Mexico's Centro Logistico Jalisco, an industrial park in Acatlan de Juarez, a municipality in the Guadalajara metropolitan area. The location was chosen with care because it offers both rapid access to the fast-growing industrial areas in central Mexico and efficient transportation options to the rest of the country. In addition, Mexico is a central transportation hub for the main axes of important logistics links in the Americas and is close to the seaport of Manzanillo.

The area of the new site covers a total of 92,000 m<sup>2</sup> for manufacturing, sales and administration. Around 27,000 m<sup>2</sup> is production space with functions such as metalworking, assembly, application and service



center, customer service. The remaining area is reserved for strategic developments. To date, more than 100 machines have been produced and delivered to regional customers after trial operation.

In his opening speech, Zhang Jianming, CEO of Haitian Group, thanked the local government, business partners and employees for their great support during the construction phase up to the day of the inauguration ceremony. He emphasized the strategic importance of this manufacturing facility in Jalisco, which will serve as both a regional headquarters and a production center for the entire Americas region. "With this plant, we will provide turnkey solutions and actively fulfill our social responsibility to actively promote the region with the expansion of local supply chains and fair jobs," Mr. Zhang explained.

Haitian has been present in the Mexican market since 1999, and over the past 20 years, its reliable quality has successfully established itself with companies in the automotive, electronics, medical and agricultural industries. With the new plant, Haitian is not only setting an outstanding milestone, but is also making an important contribution

All pictures: Haitian

to promoting economic growth in Jalisco.

Margarita Alcantara, Director General of Global Economic Stimulus of the Jalisco Department of Foreign Affairs, emphasized in her speech, "I am sure that with this investment we will promote the creation of highly skilled jobs, strengthen local talent and enhance Mexico."

Roberto Arechederra, Secretary of Economic Development of Jalisco, on behalf of Governor Enrique Alfaro, highlighted that China is Jalisco's second most important trading partner and now with the right infrastructure is ready for more settlements.

As a traditional symbol of sustainable development, the company management and local government representatives planted trees at the new plant. A plant tour with interesting live applications in the showroom rounded off the program in a harmonious way.



## Husky executes successful startup in India



Husky Technologies™, a pioneering technology provider enabling the delivery of essential needs to the global community, announced the installation of the first integrated injection molding system for blood collection tube (BCT) production in India in June. This new installation is at the facilities of CML Biotech Limited, one of the largest BCT manufacturers in the country.

Based on the manufacturing challenges identified by CML Biotech, Husky recommended the ICHOR™ injection molding system. With its world-renowned PET technology expertise, having delivered over 3,000 high cavitation, fully integrated PET systems to the global market, and Schöttli™ High Precision Medical Molds, the ICHOR system will enable CML Biotech to improve part quality, weight variations, cycle times, and overall efficiency of the BCT production process.

The ICHOR™ system is the first of its kind in the medical injection molding industry in India. It will be monitored in real-time through Advantage+Elite™, Husky's proactive, predictive, and transparent monitoring solution. This will ensure that the performance of the system is fully optimized, and any potential issues are detected before they impact production.

"We sought a trusted supplier, who understood our business and our challenges. We found this in working together with Husky", said Mr. Paul

Jacob, Managing Director of CML Group. "It's not just about producing a BCT for the local market, it is about producing the highest quality BCT in India for the global market".

"Husky is honored to work with CML Biotech on this significant project," said Thomas Bontempi, Head of Medical Business Development at Husky. "Our goal was to enable them to grow their business by offering an integrated medical injection molding system that provides end-to-end visibility on the manufacturing process combined with proactive, predictive and transparent monitoring that assures consistent performance and optimal production. ICHOR™ offers new levels of performance and efficiencies in part quality and cost, weight variations and cycle time".

This collaboration signifies Husky's ongoing commitment to transforming the manufacturing process of blood collection tubes, and other medical devices, while making a positive impact on healthcare globally.

Earlier in May, Husky commemorated the next phase of expansion of the company's India facilities with ceremonies at their new offices and existing Chennai campus. The events were hosted by local leaders in the region, as well as senior executive, Robert Domodossola, President of Husky's Rigid Packaging business.

*Picture source: Husky*

### About Husky

Since 1953, Husky Technologies™ has been pioneering technologies that enable the delivery of essential needs to the global community with industry-leading expertise and service. A global leader, Husky is powered by teams of exceptional people in more than 40 locations with valued customers who operate in over 140 countries. By focusing on sustainably sourced feedstocks, material reuse and the exclusive use of medical-grade polymers, Husky continues to be committed to enabling the circular economy now and into the future.

### About CML Biotech

Established in 2000, CML Biotech is a leading manufacturer of medical diagnostic and laboratory consumables based in Kerala, India. They specialize in producing blood collection tubes and accessories, pipette tips, petri dishes, and plates. CML Biotech is one of the largest companies in India that produce vacuum blood collection tubes, with an annual output of 120 million vacuum blood collection tubes and 100 million non-vacuum blood collection tubes, catering to both the local market and exports to over 50 countries.

**Husky**

[www.husky.co](http://www.husky.co)

## NETZSCH Analyzing and Testing opens a new production site in China

It is common knowledge that the NETZSCH Group – with a history of 150 years – is a world-renowned manufacturer of thermal analysis, rheology and fire testing instruments. The company has been committed to providing first-class devices to the international market. And NETZSCH goes on further settling itself for the future.

One of the strategic goals of NETZSCH Analyzing & Testing is to further expand their position in the Chinese market and establish additional production capacities, thus being able to deliver customers with high-class analysis instruments at short notice. NETZSCH is therefore very proud to inform their customers that they have recently opened a new production site in China: NIS – NETZSCH Instruments (Suzhou) Co., Ltd. in Taicang, Suzhou.

NETZSCH's Taicang plant, which covers an area of approximately 2,393 square meters, is engaged in the production of various types of analytical test equipment and is designed to meet the growing demand for high-quality analytical instruments in China and Asia.

*Bernd Hauenstein in front of the signature wall (all photos: NETZSCH)*



Bernd Hauenstein, General Manager of NETZSCH Instruments (Suzhou) Co., Ltd.: "We chose Taicang as production site because firstly, it is very close to Shanghai and convenient for transportation and secondly, it is strongly supported by the government. NETZSCH believes the company has better development opportunities in Taicang."

Bernd Hauenstein studied in Erlangen, Germany, and holds a degree in electrical engineering. He has been living in Shanghai, China, since 2005. Prior to joining NETZSCH, he established production facilities

*Opening Ceremony June 25, 2023*

in China for two German industrial suppliers. Since January 2023, Bernd Hauenstein has been General Manager of NIS - NETZSCH Instruments (Suzhou) Co., Ltd. in Taicang, Suzhou. NETZSCH is pleased to have a manager with extensive experience in China on board.

### Quality, Education and Training First!

In recent months, employees from NETZSCH Analyzing & Testing in Selb, Germany, have continuously trained new employees on site in China to provide the best possible support for the training process - because "Quality First" has always taken centerstage at NETZSCH.

In addition to qualified employees and suppliers, an optimal process landscape is also an important quality component. Therefore, NIS relies on the proven standard processes that have been developed in Germany in recent years and are now being rolled out in the new plant. NETZSCH. Proven Excellence.



NETZSCH

[www.analyzing-testing.netzsch.com](http://www.analyzing-testing.netzsch.com)

## Arkema broadens its range of high performance polymers with the acquisition of PIAM

With more than 30% global market share, PI Advanced Materials (PIAM), based in South Korea, is the global leader of polyimide films for flexible printed circuit boards and graphite sheets used in the high growth and high margin markets of mobile devices and electric vehicles.

PIAM's ultra-high performance polyimides are cutting-edge materials offering exceptionally high temperature resistance, dimensional stability, flexibility and electric insulation. They are increasingly used in attractive markets such as electric vehicles, consumer electronics, semiconductor manufacturing and other advanced industrial applications. They benefit from the growing need for miniaturization, higher thermal management and increased safety and durability.

With two state-of-the-art industrial production sites and two R&D centers in South Korea, this highly innovative company employs approximately 320 people. PIAM enjoyed strong sales growth of 12% per year on average in the 2012-2021 period, focusing on top quality and high value added products, and reaching an EBITDA margin of 30%. Sales amounted to around €200 million in 2022, temporarily impacted by the large destocking observed in the global consumer electronics market.

PIAM sales are expected to grow by around 13% per year in the coming years, supported by its robust innovation pipeline and successful customer qualifications in 5G antennas and high-resolution OLED displays, as well as by strong growth in applications such as flexible screens. In the electric vehicle market, growth will be driven by high demand for tapes for battery cell insulation, flexible printed circuit boards for battery management systems and varnishes for high-voltage motor coils. Besides, PIAM will benefit from the recently finalized capital expenditure program of around €100 million that will cover most of the planned mid term developments.

The acquisition of Glenwood Private Equity's 54% controlling stake will allow the full consolidation of PIAM in Arkema's accounts. The remaining 46% of the shares will continue to be listed on the Korean stock exchange.

PIAM's portfolio fits perfectly with the Advanced Materials segment, strengthening the high performance polymer range in attractive markets linked to megatrends, and enabling to accelerate the segment's organic sales growth and expand its EBITDA margin.

"PIAM is an outstanding company with a unique technological positioning, state of the art manufacturing facilities and invaluable customer relationships. This acquisition is fully aligned with our strategy to be at the forefront of high performance materials for high growth end markets supported by megatrends such as electric vehicles and advanced electronics.

After the divestment of PMMA, the acquisition of Ashland adhesives and the current start-up of our bio PA11 plant in Singapore, Arkema is delivering another significant



*Thierry Le Hénaff, Arkema's Chairman and Chief Executive Officer (photo: Arkema)*

milestone of its strategy focused on innovative materials for a sustainable world." - Thierry Le Hénaff, Arkema's Chairman and Chief Executive Officer.

Given PIAM's best-in-class innovation, ultra-high performance product portfolio and leading position, this project is perfectly aligned with the Group's ambition to be a pure player in Specialty Materials and to pursue its development in fast-growing applications supported by megatrends.

The project offers significant pre-tax synergies estimated at around €30 million at the EBITDA level, which should be progressively achieved within the next five years, with a limited requirement for additional capital expenditure. These synergies are driven by the perfect complementarities of product ranges, Arkema's geographic reach and PIAM's strong customer intimacy in Asia.

The deal, which is subject to the approval of Chinese and Korean anti-trust authorities, should be finalized end-2023.

**Arkema**  
[www.arkema.com](http://www.arkema.com)

## SOLVAY and SYENSQO revealed as new company names

In the context of the proposed split, the SOLVAY name will be maintained for EssentialCo, a leader in essential chemistry while SYENSQO will become the new name of SpecialtyCo, which will explore the future of science.

Solvay announces the new names of the future independent publicly traded companies that will result from its planned separation into two industry leaders: SOLVAY and SYENSQO. The new names will be effective upon completion of the planned separation of Solvay, which is on track to be completed in December 2023, following the satisfaction of customary conditions.

"Solvay has a 160-year legacy that will be passed on for generations to come and the names of our new companies reflect this perfectly. SOLVAY will create and deliver essential solutions in housing, health, nutrition and mobility, which fulfill the basic needs of humanity. It will enable vital solutions that are at the heart of people's everyday lives. SYENSQO will be a company of explorers who will usher in breakthroughs that will advance humanity. I am so proud of our teams who have made this possible and excited about the bright future of both SOLVAY and SYENSQO." Dr. Ilham Kadri, CEO of Solvay

### SOLVAY

SOLVAY, the new name for EssentialCo, will carry on the legacy of mastering the elements that are essential for a sustainable world. It links back to its founders who mastered the soda ash process by achieving a technological breakthrough, which has enabled many other disruptive innovations and was a major step forward in terms of sustainability.

SOLVAY will focus on providing society and generations to come with sustainable solutions meeting their most essential needs such as purifying the air we breathe and the water we drink, preserving our food supplies, protecting our health and well-being, creating eco-friendly clothing, making the tires of our cars more sustainable and cleaning and protecting our homes.

It will comprise leading mono-technology businesses including Soda Ash, Peroxides, Silica, Coatis and Special Chem, which generated approximately €5.6 bn in net sales in 2022. The company will provide technologies that are proven to be essential across a number of attractive and resilient end markets and will benefit from its number one leadership position.

### SYENSQO

SYENSQO, the new name for SpecialtyCo, will be a science company of explorers who seek unexpected perspectives, enable breakthrough innovations and explore the future of science. It has a strong connection to Solvay's history of science at the service of mankind, like the Solvay Conferences for Physics and Chemistry. The breakdown of the name is as follows:

- SY links back to the first and last letters in Solvay.
- EN is a nod to Ernest Solvay's name.
- SYENS refers to Solvay's scientific heritage, which goes back to 1911, when its founder Ernest Solvay brought 24



*Dr. Ilham Kadri, CEO of Solvay (photo: Solvay)*

of the world's most brilliant scientific minds together - including Albert Einstein and Marie Curie - for the first Solvay Conference. In fact, the impact was so profound that the Unesco World Heritage Committee decided to inscribe the archives of the Solvay Conferences for Physics and Chemistry in its Memory of the World Register.

- Q points to this same 1911 conference, which laid the foundations for Quantum Physics, and launched one of the greatest scientific journeys ever, still feeding cutting-edge innovation today.

- And QO is for company.

SYENSQO will play a key role in the future of clean mobility, by making the next generation of EV batteries possible and by advancing green hydrogen and thermoplastic composites. It will bring about breakthroughs in bio-based solutions, natural ingredients, circular solutions, and more.

SYENSQO will include the highly innovative businesses Specialty Polymers, Composites, Novecare, Aroma, Technology Solutions, Oil & Gas, as well as the four growth platforms in batteries, green hydrogen, thermoplastic composites, and renewable materials and biotechnology. The businesses within SYENSQO generated approximately €7.9 bn in net sales in 2022.

**SOLVAY**

[www.solvay.com](http://www.solvay.com)

## ENGEL: recent changes in top-management

### New Vice President Business Unit Technical Moulding & Teletronics

The Austrian injection moulding machine manufacturer and system provider ENGEL is entrusting Anders Nybäck, who has been with the company for many years, with the lead of the Technical Moulding & Teletronics business unit. As of July 1st, 2023, Mr. Nybäck, previously Sales Director in the same business unit, has taken over his new role.

"We are delighted that Mr. Nybäck, a manager with international experience, who has been part of the ENGEL team for a long time, is now responsible for the business unit Technical Moulding & Teletronics," said Stefan Engleder, CEO of the ENGEL Group.

Nybäck has been with the injection moulding machine manufacturer for over 25 years. He started his career at an ENGEL agency in Finland, where he was employed from 1997 to 2002. Then he took over the management of the newly founded subsidiary ENGEL Finland. In 2012, Anders Nybäck moved to China, where he worked as a Sales Manager for ENGEL Shanghai. Since autumn 2018, he has been working at the ENGEL headquarters in Schwertberg (Austria) as Sales Director in the business unit Technical Moulding & Teletronics.

Technical moulding and teletronics are two of the five industry segments for which ENGEL provides state-of-the-art injection moulding machines and automation solutions. Specialised business units can respond best to the requirements of the respective industry. Customers benefit globally from market-specific expertise, a broad product and service portfolio, and solutions that fit their individual



*Anders Nybäck is managing the Business Unit Technical Moulding & Teletronics*

needs. "The focus of the business unit Technical Moulding & Teletronics is on strategic development to guarantee that we can always provide our customers with cutting-edge technology wherever they are located," said Anders Nybäck.

### Gerhard Stangl becomes Chief Production Officer as of July 1st, 2023 (all photos: ENGEL)



### ENGEL Group announced new CPO

After 17 years with the company, Joachim Metzmacher, Chief Production Officer, retired. Under his leadership, the company conducted its most significant investment program. More than 375 million Euros were invested in the expansion and modernization of the global production plants. "We would like to thank Mr. Metzmacher for his outstanding and very successful work over the past years. We wish him all the best for the new phase in his life", commented Stefan Engleder, CEO of the ENGEL Group.

On July 1st, 2023, Gerhard Stangl, previously Vice President Production large-tonnage Machines in St. Valentin, succeed Mr. Metzmacher as CPO on the management board. "Mr. Stangl has been with ENGEL for a long time and has extensive management experience in production. We are pleased to have him join the management board," said Stefan Engleder.

Gerhard Stangl studied Mechanical Engineering at the Vienna University of Technology. In 2006 he started as Vice President Production Small and Medium-sized Machines at the plant in Schwertberg (Austria). He then moved on to managing the large machine plant in St. Valentin, and he is now – after ten years – returning to the headquarters in Schwertberg.

**ENGEL**  
[www.engelglobal.com](http://www.engelglobal.com)

## New sales management at WITTMANN BATTENFELD

Effective July 1, 2023, Mr. Jochen Pernsteiner has become the new Sales Director at WITTMANN BATTENFELD in Kottlingbrunn. In his capacity as Head of Sales, he succeeds Ms. Valentina Faloci, who held this position during the last four years.

Following his technical training and subsequent study of sales engineering at the Mittweida University of Applied Sciences, Jochen Pernsteiner worked in sales management positions for various well-known Austrian industrial companies. In October 2018, he started his career at WITTMANN BATTENFELD, where he was entrusted with the management of a large European sales region. His specialized education and training plus extensive professional experience in sales, in particular in his previous function at WITTMANN BATTENFELD, are optimal prerequisites for his new function as the company's Head of Sales.

Rainer Weingraber, Managing Director and CEO of WITTMANN BATTENFELD, is pleased that he has been able to win Jochen Pernsteiner for this task: "In his previous positions, Mr. Pernsteiner clearly demonstrated his professional expertise as well as his leadership qualities. I am glad that Mr. Pernsteiner has decided to accept the challenging task of managing our company's sales, and I wish him the very best of luck and success."

Rainer Weingraber also took this opportunity to thank Ms. Valentina Faloci for managing the company's sales activities



*Jochen Pernsteiner, new Sales Director in Kottlingbrunn (photo: WITTMANN)*

very successfully as Head of Sales over the last four years, and to extend to her his best wishes for her future career.

**WITTMANN BATTENFELD**  
[www.wittmann-group.com](http://www.wittmann-group.com)

## Sumitomo (SHI) Demag expands Executive Board

Sumitomo (SHI) Demag Plastics Machinery GmbH announced the expansion of its Executive Board with the appointment of Christian Maget as Chief Financial Officer, effective July 1, 2023.

Taking this step to strengthen the Executive Board will enable CEO Gerd Liebig to dedicate more of his time and focus on developing and advancing the Group's strategic, technological and corporate positioning.

Joining Sumitomo (SHI) Demag in 2013 as Head of Controlling, Christian Maget was appointed Group General Manager Finance in 2018. Alongside his finance responsibilities, he oversees human resources, auditing and information technology. His strong involvement in the strategic development and internationalisation of the Group has helped to significantly boost company efficiencies. The introduction of functional KPIs, in particular, has been an enormous support to measuring



*Christian Maget, Sumitomo (SHI) Demag new CFO (photo: Sumitomo (SHI) Demag)*

performance and improving corporate decision-making.

Describing the rationale for having an Executive Board that is aligned

to the strategically crucial areas of Sumitomo (SHI) Demag's business, Mr Liebig commented: "We are delighted to announce the appointment of Christian Maget to the Board. His strong analytical skills combined with his versatile experience, financial acumen and ability to implement ideas have been and will continue to be a real asset to the Group's future strategic direction. This new structure ensures a team of proven experts aligned to specific business operations."

Commenting on his CFO appointment, Christian Maget said: "Our modern energy-saving technology and a corporate culture underpinned by sustainability are a driving force as well as a duty in today's world. I look forward to continuing to build and expand this in my new role as CFO together with our international business teams and local service partners."

**Sumitomo (SHI) Demag**  
[www.sumitomo-shi-demag.eu](http://www.sumitomo-shi-demag.eu)

## Nexa3D and Wilson Sporting Goods join forces to expand access to digital tooling



Nexa3D, the ultrafast polymer 3D printing leader, announced at Rapid + TCT 2023 a new project with Wilson Sporting Goods Co.'s Acceleration Center that will expand access to digital tooling solutions through combining the Freeform Injection Molding (FIM) process and specialized xMOLD resin which can create functional molding tools compatible with thousands of injection molding materials.

In a deal finalized in March 2023, Nexa3D acquired its long-time partner Addifab, along with its Freeform

Injection Molding process, which couples the design freedom of 3D printing with mechanical characteristics and performance of injection molding. The patented digital tooling process uses xMOLD resin to print injection molding tools that are compatible with thousands of off-the-shelf injection molding materials, unlocking the ability to design, iterate, and validate using final grade production materials.

“Because we can iterate so much quicker, our R&D team can afford to fail fast and innovate, bringing a higher level

of creativity to the process,” said Glen Mason, Advanced Innovation Leader at Wilson Advanced Manufacturing. “On top of that, these tools are compatible with final production materials; the value of prototyping quickly and cost-effectively in final grade materials is a real game-changer here. We couldn’t be more excited to strengthen our working relationship with Nexa3D by expanding access to FIM within the product development and manufacturing community so they can take advantage of this revolutionary digital tooling process.”

The new capabilities give Nexa3D’s current and prospective customers the ability to benchmark and qualify the FIM digital tooling process before making any capital investments.

“We are pleased to see the benefits of FIM realized by the R&D team at Wilson and look forward to enabling other customers looking to qualify and integrate the process into their own product design and manufacturing workflow,” said Kevin McAlea, Chief Operating Officer at Nexa3D.

**Nexa3D**

[www.nexa3d.com](http://www.nexa3d.com)

## Fortify secured \$12.5 million in funding from investors

Fortify, a leading full-stack materials science and additive manufacturing company, has raised \$12.5 million in a funding round from investors, including Lockheed Martin Ventures and RTX Ventures, the venture capital arms of Lockheed and Raytheon Technologies, respectively. This strategic investment will enable Fortify to expand its capabilities and accelerate the development of its groundbreaking Digital Composite Manufacturing (DCM) platform.

Fortify’s DCM platform revolutionizes the manufacturing of complex structures by offering unique mechanical, electrical, thermal, and electromagnetic properties. The platform has garnered significant interest across more than 50 Fortify

partners and customers in digital tooling, medical devices, electronics, aerospace, and defense. Key customers in the A&D space beyond Lockheed and Raytheon Technologies include: In-Q-Tel, US Department of Energy, Rogers Corporation, Lawrence Livermore National Labs, TTM Technologies, and Ierus Technologies.

“We are thrilled to have Lockheed Martin Ventures and RTX Ventures as strategic investors in this funding round,” said Lawrence Ganti, CEO of Fortify. “Their expertise and global reach in the aerospace and defense industries will be invaluable in helping us to continue to innovate and scale our Digital Composite Manufacturing platform. We are excited to work together to drive the next generation

of advanced materials and additive manufacturing.”

Fortify has raised funding from Accel, Cota Capital, Neotribe, Prelude, Mainspring, and Ocean Azul. These investors continue to support the growth of Fortify through follow-on investments. With this latest funding round, Fortify is poised to strengthen its position as a leading innovator in materials science and additive manufacturing and has the potential to unlock new possibilities in advanced materials and manufacturing technologies, and transform industries across the globe.

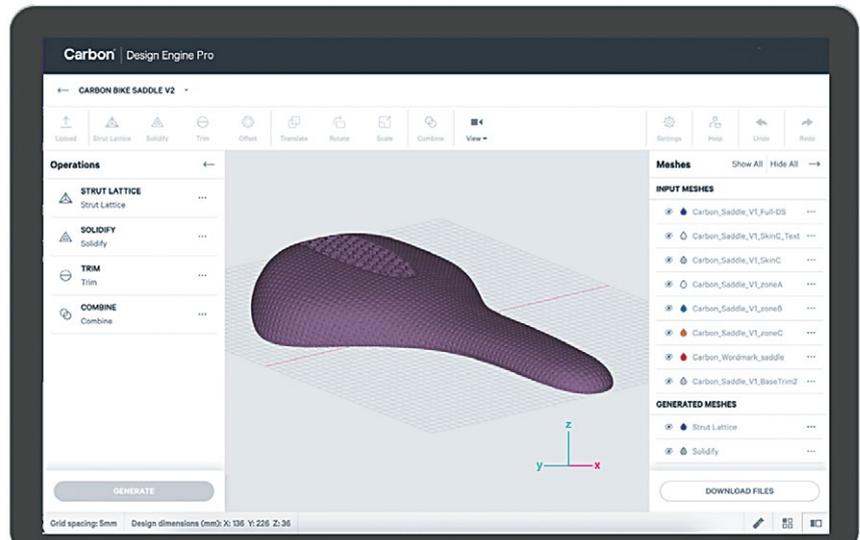
**Fortify**

[www.3dfortify.com](http://www.3dfortify.com)

## Carbon and LKT announce the opening of a joint Advanced Design and Development center

Carbon, a world-leading digital manufacturing platform and the Institute of Polymer Technology (LKT) at Friedrich-Alexander-University Erlangen-Nürnberg (FAU) are proud to announce the opening of their joint Advanced Design and Development center in Bavaria. This collaborative effort aims to harness the innovation and expertise of both entities, offering increased support for Carbon's Production Network and key European customers across industries such as; consumer goods, automotive, industrial, medical, and oral health. The Advanced Design and Development Center will feature all of Carbon's latest production technologies as well as Carbon's award-winning materials.

This unique partnership stems from LKT's dedication to industry collaboration and Carbon's focus on facilitating the production of breakthrough products with best-in-class design and manufacturing technology combined with expert application development capabilities. In addition to serving industry, the Carbon and LKT partnership will foster and support a wide-range of groundbreaking research opportunities in additive manufacturing and materials development.



"We're extremely excited to provide the European market, where so many of the world's best products are designed and manufactured, with a way to experience Carbon's tools and processes first-hand." said Phil DeSimone, Office of the CEOs at Carbon. "This center will enable fast collaboration with Carbon customers in the region, as well as new tools and technologies for the future of product development."

The newly established center will provide a hub for Carbon's European customers and prospects to experience the development of their products and

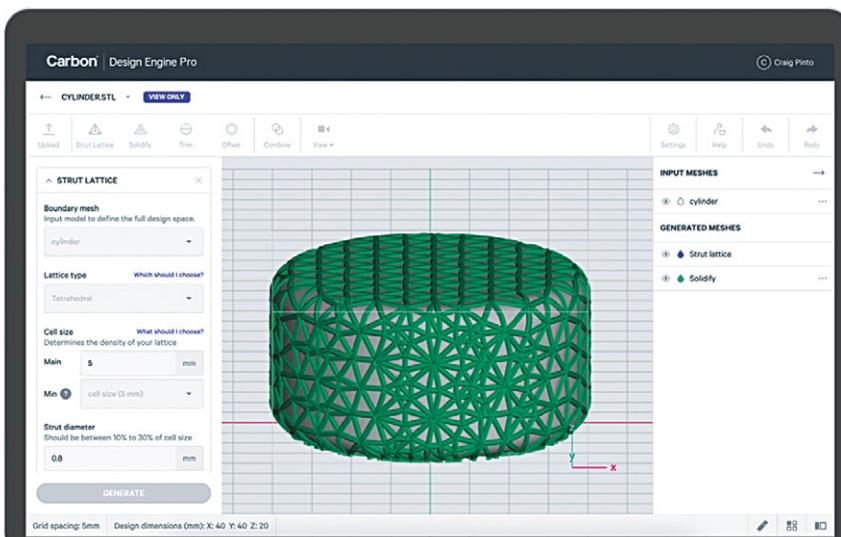
*All pictures: Carbon*

the Carbon processes first-hand, while significantly reducing turnaround times for customers in the region. The center will also serve as a hub for research and development efforts. Carbon and LKT will work closely with PhD students on new research and development initiatives, providing an extended workspace to explore innovative applications and advances in platform processes from material developments to recycling capabilities.

LKT and FAU have outstanding expertise in additive manufacturing with basic and industrial oriented research projects from polymer chemistry, to polymer engineering. "The new common center with Carbon will offer students a perfect learning, working, and research platform on the highest technological level. We are really looking forward to further strengthen our research profile in fluid based additive manufacturing." says Prof. Dr.-Ing. Dietmar Drummer, Head of the Institute of Polymer Technology. "We are thrilled to open this new chapter of collaboration, driving the future of advanced design and development."

**Carbon**

[www.carbon3d.com](http://www.carbon3d.com)



## Two injection moulding machines at Plast Milan: A small giant and a big dwarf

From 5th to 8th September 2023, the internationally important plastics trade fair Plast Milan is going to open its doors. The German machine manufacturer BOY will present two of its injection moulding machines on the booth of its Italian representative ST.A.TE. Technologies srl: The BOY XS E and the BOY 100 E hybrid - the smallest and one of the largest models in BOY's product portfolio.

A BOY 100 E hybrid produces Polypropylene (PP) gift boxes in combination with the BOY-Handling LR 5. The "hybrid" in the machine name characterizes the option servo-electric injection unit. In this specially developed injection unit with the international size SP170, the injection and metering movements are driven electro-mechanically via two servo motors. The rotational and axial movements of the injection unit are performed by two servomotors, which are completely detached from the machine hydraulics.

The independent operation of the injection unit is particularly advantageous for short cycle times and high metering volumes. The BOY 100 E hybrid with a clamping force of 1000 kN and a compact footprint of 4 m<sup>2</sup> demonstrates the visitors to

### BOY 100 E hybrid



Plast Milan how space-saving the BOY LR 5 linear handling system can be positioned on the injection moulding machine. In combination with the required protective housing, BOY will present a fully automated production unit on a footprint of barely 9 m<sup>2</sup>.

### On the new BOY XS E, baby bottle nipples are made of silicone.

The new injection moulding machine – designated successor of the highly successful BOY XS – has now the proven servo drive of the BOY E series. Energy efficiency, high dynamics and extremely smooth running characterize the compact injection moulding machine with 100 kN clamping force. The BOY XS E demonstrates its strengths mainly in micro injection moulding and sprueless production in single-cavity moulding. The new BOY machine model is optionally available with two different clamping platen configurations. In the standard version for conventional mould sizes up to 160 mm (diagonally up to 205 mm clear width

### BOY XS E (all photos: BOY)

between the tie bars) as well as with a special mould holder 75 x 75 mm for micro moulds of many well-known standard manufacturers. Even in the standard version, the BOY XS E offers the advantage of an injection unit that can be adjusted in height by up to 25 mm, thus enabling decentralised gating.

### Company profile

Dr. Boy GmbH & Co. KG is one of the leading worldwide manufacturers of injection moulding machines with clamping forces up to 1,250 kN. The very compact, durable machines work precisely, energy-saving and thus highly economically. With innovative concepts and solutions, BOY has proved itself again and again as a trendsetter. Automation, digitalisation as well as sustainability and CO<sub>2</sub> savings are particularly in focus. Since the company was founded in 1968 more than 50,000 Injection Moulding Machines have been delivered worldwide. The privately-owned company continues to put special emphasis on engineered performance and high-class "Made in Germany" workmanship.

**BOY**  
[www.dr-boy.de](http://www.dr-boy.de)

## HASCO innovations at Fakuma

As a full-service provider for mouldmaking, HASCO offers innovative and economical solutions for designers, mouldmakers and injection moulders. Under the motto "Digitalisation meets standardisation", the company will present at Fakuma and the subsequent trade shows a number of interesting new and further developments from the fields of Mould Base and Hot Runner.

### HASCO Digital

User-friendly tools on the modern homepage, the new HASCO app, CAD updates and further digital services are available to simplify the day-to-day work.

### Mould Track

The innovative Mould Track System from HASCO is an intelligent solution with precise indoor localisation technology for the injection moulding sector. The system enables the exact tracking and localisation of injection moulding tools in real time as well as the digital interlinking of processes. HASCO offers with the new Mould Track an intelligent and pioneering solution, and thus once again defines the standard with the increasing digitalisation in the world of mouldmaking.

### Mould Base Technology

The further development of HASCO's plate range offers mouldmakers maximum flexibility in the production of injection moulding tools. The portfolio of undrilled and drilled plates has been extended with new mould sizes and thicknesses by well over 1,500 new dimensions.

*Fakuma will take place in Friedrichshafen from 17 through 21 of October, 2023. At the world's leading trade event for industrial plastics processing, almost 1,500 exhibitors will present their international range of products and services. Fakuma offers a comprehensive overview of all plastics technologies.*



Picture: HASCO

In the field of demoulding, further sizes have been added to the extensive ejector portfolio. The focus is on the quality material HSS, which has a higher temperature resistance and strength. The service life can thus be extended and mould maintenance costs significantly reduced. New guide pillars with a snug fit for even easier installation and a firmer fit in the mould plates increase process reliability. The new chemical working substances with NSF certification can be used very sparingly because of their high level of effectiveness and are very environmentally friendly because of their all-synthetic content.

### Hot Runner Technology

As the world's first producer of additively manufactured hot runner technology, HASCO hot runner will again this year present a number of new 3D-printed hot runner components. The new Shadowfree

technology eliminates the spider lines with needle valve systems and enables up to 40% faster colour changes in the hot runner. Additions have been made to the Single Shot portfolio with hardened nozzle tips and one-hole and Hot Tip torpedoes, which increase the application possibilities of the nozzle range several times. Innovative plug inserts allow fast and space-saving wiring of power/signal plugs to the mould, while state-of-the-art control technology simplifies the control of the hot runners.

With its extensive expertise in standard mould units and hot runners, HASCO provides its customers with individual solutions to all challenges that arise in the field of modern mouldmaking.

**HASCO**

[www.hasco.com](http://www.hasco.com)



Bottom parts of 3-bar sprayers  
(photo source: WITTMANN)

## Saving space and energy

*The sprayer manufacturer MESTO based in Freiberg / Neckar relies on injection molding machines from the WITTMANN Group to modernize its machinery. Apart from reliability and quality of service, the most attractive features of WITTMANN BATTENFELD machines are their low energy consumption and compactness.*

**M**ESTO, a family-owned company in the third generation, was established in 1919 by Karl and Ernst Stockburger as a metal workshop. Its initial business consisted of repairs and locksmith work. In 1925, it started its production of spraying equipment. Today, the company with a workforce of 120 employees ranks among the leading manufacturers worldwide in the spraying equipment sector, making one million sprayers annually on 9,000 m<sup>2</sup> of production floor.

In the 1970s, MESTO started the production of plastic parts for

its appliances, which was further extended with the construction of a new production hall in 2012. Its high vertical range of manufacture is one of the company's vital success factors. Plastics injection molding, metalworking and assembly are all located in-house, to enable the production of steel and stainless steel containers as well as all necessary plastic parts, including appliances completely made of plastic.

The appliances from MESTO stand out in particular by features which give the customers added value. These are, for example, the ergonomic

design of the sprayers for fatigue-free working, long service life of the appliances due to their robustness, as well as guaranteed availability of spare parts for 20 years. The products are marketed partly as catalog goods and partly developed and manufactured for OEMs. Typical customer segments are industry and tradespeople, home and garden, the food industry, fruit growing and viticulture, agriculture and forestry, the automotive sector and cleaning services. A product line of special interest to MESTO is sprayers for disease control, and here in particular for fighting malaria. MESTO's range includes an appliance

certified by the WHO which was specially developed for this purpose. With this appliance, MESTO is one of the mere handful of manufacturers worldwide which cater to this segment.

The aspect of sustainability is also given a high priority at MESTO. For instance, recycled material is used for producing non-pressurized parts. A photovoltaic system is currently being installed, and the waste heat from the injection molding machines is used for heating. Élise Sellmayr, Manager of Production Technology and Process Optimization at MESTO, points out that a significant amount of energy savings has also been achieved by replacing old injection molding machines with new ones. Élise Sellmayr explains: "The decision to replace the first old machine models was made in order to improve quality standards and reliability. After a substantial reduction of electricity consumption was measured with the new equipment, this aspect was another decisive motive for replacing more old machines. In this way, electricity consumption has been reduced by 30% since 2017 by exchanging eight of a total of 16 existing machines for new ones from WITTMANN BATTENFELD."

Currently, a total of 15 injection molding machines are operating at MESTO, ranging from 250 to 5,000 kN in clamping force, 11 of which have come from WITTMANN BATTENFELD. The machines delivered since 2017 are models from the servo-hydraulic SmartPower series with clamping forces from 600 to 3,500 kN, as well as one MacroPower with 5,000 kN clamping force. The machines from the SmartPower series stand out by their high level of stability, energy efficiency and compactness. Most of the machines come equipped with linear robots from WITTMANN. One SmartPower 350 is designed as an Insider cell, which means that

the W831 robot from WITTMANN, a conveyor belt and the protective housing are all integrated in the production cell – a solution greatly appreciated at MESTO due to the amount of space saved by the system's compactness, and one which will also be considered for the acquisition of future production cells.

On the most recently delivered SmartPower 350, an automation system designed by WITTMANN BATTENFELD Germany based in Nuremberg has been implemented, which includes a separation and feeding device for insert parts and a stacking unit.

An additional SmartPower 180 equipped with a robot and automation will be delivered in late summer this year. The object of this project is to feed various metal inserts to the machine for overmolding. In addition to the machines with automation, MESTO has also ordered a printing station for plastic parts from WITTMANN BATTENFELD Germany.

Apart from their high energy efficiency, the injection molding machines are appreciated at MESTO primarily for their compactness and reliability. The possibility to obtain machines, automation and auxiliaries all from a single source from WITTMANN is also becoming more and more important for MESTO. Johannes Stuber, Production Manager at MESTO, particularly appreciates the good cooperation right from the concept planning stage. Johannes Stuber comments: "What gives WITTMANN BATTENFELD a competitive edge is above all its excellent service. In combination with its energy-efficient, compact, complete solutions, this is a decisive factor for us in the joint implementation of any projects." *smi*

**WITTMANN Group**  
[www.wittmann-group.com](http://www.wittmann-group.com)



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# LS Mtron expands production in China

- LS Mtron established a second factory in China with the objective of securing a stable supply of electric injection molding machines
- Playing a pivotal role as a cornerstone in LS Mtron's lead in the injection molding business for a century

## Second factory in China: expanding Chinese domestic sales and entering East Asian markets

LS Mtron Co., Ltd. (LS Mtron) recently celebrated the completion of its second plant and held a new product presentation event at its Wuxi subsidiary in China on June 15th.

This event, attended by over 200 people including government representatives from Wuxi New District, China, as well as customers and partner companies, aimed to boost sales in the Chinese domestic market and serve as a catalyst for future expansion. LS Mtron announced that the opening of its second plant will serve as a stepping stone to expand sales channels in China and East Asia.

The Wuxi subsidiary in China serves as LS Mtron's primary overseas production base for injection molding machines. These locally produced injection molding products are distributed domestically in China, and worldwide through LS Mtron's global network.



All pictures: LS Mtron

The completion of the second factory in LS Mtron's Wuxi subsidiary ensures a stable supply capacity for the growing electric injection molding machines. Additionally, it is anticipated that the lead time for products manufactured in the Wuxi subsidiary will significantly decrease.

During the ceremony for the completion of the second plant, Park Chan-sung, Executive Director

of LS Mtron's injection molding business division, expressed, "With the establishment of our second plant in Wuxi, China, we have set the foundation to lead LS Mtron's injection molding business for the next 100 years. We seek the active support of the Wuxi New District government and the attending customers."

In particular, during the completion ceremony, LS Mtron showcased CSI4.0 (Connected and Smart Injection) solution functions along with new domestic and special injection molding machines, which drew significant interest from the attending customers.

LS Mtron stated that it aims to expand the sales of customized special injection molding machines, which are in high demand due to the rapid growth of the electric vehicle market. They are actively promoting this in China and plan to further advance as a leading injection system solution provider in China





by actively implementing the locally tailored smart factory solution, CS14.0.

Meanwhile, Wuxi City, China, where LS Mtron's second factory is located, is a dynamic city in the southeastern part of Jiangsu Province. It ranks among China's top 10 economically vibrant cities and is known for its contributions to national industrial origin, advanced international manufacturing bases, mechatronics and automotive parts commercial bases, biotech industrial bases, electronic information bases, high-end textile production bases, new material industrial bases, and key development complexes.

#### LS Mtron leads the 100-year history of injection molding business as a smart injection system solution company!

CS14.0 empowers customers to swiftly adapt to the challenges posed by the 4th Industrial Revolution and Digital Transformation. It encompasses the initial stage of data collection, transforming it into meaningful information, and the intelligence stage that leverages big data processing technology and AI.

LS Mtron's CS14.0 encompasses smart production, smart machine, artificial intelligence (AI), and smart service. Smart Production includes a range of features to enhance productivity and streamline operations. The Smart Monitoring feature allows users to effortlessly manage their production processes from the convenience of their mobile

devices anytime, anywhere. Real-time process monitoring and control capabilities are also accessible.

Smart Mold Recognition enables the transfer of production information across all machines, facilitated by a simple QR code. Moreover, the Smart Peripheral Control gives users access to oversee and control peripheral devices, further streamlining the production process. Finally, the Smart Production experience is completed by the Smart Data Interface that processes all data, generating valuable insight regarding production and machine performance.

#### LS Mtron provides Smart Weight Control and Smart Remote Service as part of its smart machine and smart service offerings

Smart Weight Control identifies factors causing weight fluctuations in the molded product, and the machine autonomously adjusts conditions to

partially correct the weight, thereby enhancing user convenience. On the other hand, Smart Remote Service enables LS Mtron experts to remotely share their screens on the injection molding machines in real-time. This allows them to identify issues three-dimensionally and provides customers with prompt problem resolution, reducing downtime and offering significant advantages.

Lastly, LS Mtron introduced their groundbreaking AI injection system that integrates artificial intelligence into the optimization process of injection machines, marking the first-ever application of AI in injection molding technology. The system comprises two key components: AI Weight Control and AI Molding Assistant. AI Weight Control utilizes a weight meter linked to the injection machine to detect variations in the weight of molded products. On the other hand, AI Molding Assistant is an advanced system that effectively reduces the time required for initial process stabilization.

By learning and emulating the process conditions derived by highly skilled molding experts, it adjusts the process conditions in an efficient manner. This innovative AI injection system brings enhanced precision and efficiency to the injection molding process. **smi**

LS Mtron

[www.lsinjection.com](http://www.lsinjection.com)



# AURORA: The way to digitalization and intelligent manufacturing

*Aurora Precision Plastic Co., LTD. was established in 2006 in Dongguan, Guangdong, China. AURORA specializes in mold design and manufacturing, as well as precision injection molding. In addition, it primarily engages in mold making, injection molding, and post-processing of plastic accessories such as consumer electronics and medical products.*

## Being realistic and innovative to enhance AURORA's core competitiveness

Many people get impressed when they walk into AURORA by its artistic office design. It is a multi-functional and creative space with simple colors and rich art elements, making it a bright and relaxed office.

The display area in AURORA's office building showcases its independently developed Bluetooth headsets, audio products, and various qualification and patent certificates from previous years, recording its development footprints and inspiring all its employees.

All of these are tightly tied to the efforts and insight of AURORA's general manager, Mr. Zhang Wei, a businessman who has a good taste of art. He believes that strengthening aesthetic sensibility while fostering innovation and creativity result in good products. Therefore, he works hard to achieve this goal.

After 17 years of technical and management experience, AURORA has created considerable advantages in the design, development, and manufacture of high-precision dual-component molds and the application of dual-component precision injection molding and material. Especially, the independently developed one-piece dual component injection mold with alternate core structures of two-color screw and bearing solves several technical difficulties in the field of dual-component molds.

## The cool appearance brings users a pleasant experience

AURORA applies the luxury minimalist design style to its products. Thanks to



the appearance design and exquisite craftsmanship, products have smooth contours. Mini size makes AURORA products ideal for taking out.

For consumer electronics, having a cool appearance can lead to higher purchase intention. Therefore, the molding of product appearance is crucial. Mr. Zhang Wei introduced: "Bluetooth headset components are tiny and have strict assembly requirements. And the product's surface should be fine and have a smooth texture, thus necessitating a machine with high precision and stability."

To this end, AURORA has introduced YIZUMI C series multi-component and A5 series injection molding machines. The clamping unit of multi-component machine is reliable and stable, featuring accurate turntable positioning. The BFC (balanced force clamping) technology can adjust the clamping force transmission direction so that the force is applied to the mold

*All pictures: AURORA and YIZUMI*

more evenly and injection molding is more stable. The DCPC (digital closed-loop positioning control) technology ensures the accuracy and high repeatability of turntable positioning.

Mr. Zhang Wei added, "So far, YIZUMI machines can fit the production requirements well. The molding of parts with high-gloss appearance is free of defects like black spots, flow marks, bubbles, and silver streak. The dimensional accuracy of the products is 0.02mm, and the qualified rate of products is above 98%, ensuring the quality of our products."

Moreover, to meet the increasing demand for customization and personalization of consumer electronics, AURORA has conducted thorough research on consumers' lifestyles and changes in needs, focusing on the exploration of customer

experience and to bring users pleasant life experiences.

### Empowering advanced manufacturing with digitalization

AURORA has achieved major highlights of "personality + intelligence" on Bluetooth headsets and speakers and earns a significant reputation in the industry. Simultaneously, it has been developing and expanding with the spirit of "honesty and trustworthiness, proactive progress, pursuit of innovation and excellence".

However, AURORA still faces a number of pain points and obstacles that hinder its future development in its digital and intelligent transformation. For example, the production switch of orders from a single category production of earphones to multi-category, complex production of Bluetooth speakers and household appliances, etc. Those factors stop the forming of effective production management, like the extension of production lines and the increase in the types of purchased materials, are the top priority for Mr. Zhang Wei.

For this, he explained: "Today's market competition is fierce, customers have too many choices, and cross-category competition is getting sharper. The profit margins will be further squeezed if we don't reform. Especially since the manufacturing industry was transformed by the advent of the 'Industry 4.0', manufacturers have focused on the capabilities to control costs. Therefore, empowering advanced manufacturing with digitalization is the



key to achieve transformation of quality, efficiency and motivation."

To address all kinds of problems in the digital transformation at source, AURORA finally decided to further cooperate with YIZUMI after a detailed research. YIZUMI's technical team researched in depth at AURORA workshops and provided a turnkey solution for every essential and process in the production, helping AURORA better realize its digitalization.

### Intelligent manufacturing boosts AURORA's transformation and upgrade

With the help of YIZUMI Manufactory Execution System (YIMES), AURORA realizes production visualization, monitors equipment information, and improves delivery

rate. In addition, users can directly monitor the production situation through the embedded system in the cloud platform. ERP, CRM and other production management systems can be tightly integrated into the platform simultaneously to connect the production with the five major elements like man, machine, material, method and environment, helping AURORA achieve digital production management.

And now, a series of information such as real-time order status, inspection status, production schedule, and the percent of pass is accessible conveniently via phone and computer, and the data accuracy reaches 99%. The systematization and visualization of the production, in addition to real-time monitoring of process progress, enable production efficiency to reach 90%. Furthermore, breaking down the isolated islands of information and handling abnormal production timely raise the on-time delivery rate of orders to 93%. With the further development of informatization, and the in-depth integration of the automation and informatization, AURORA moves a further step toward becoming an industry benchmark.

In other words, YIZUMI has helped AURORA realize digital transformation and provided a strong support to its industry extension strategy. **smi**



*NEO·Mv Multi-Component  
Injection Molding Machine  
with Vertical Rotary Turntable*



# The powerful combination of Tederic and Li Auto

*EVs are the main direction of the transformation and upgrading of the global automobile industry and green development, and they are also the strategic choice for the high-quality development of China's automobile industry.*

As a well-known EV manufacturer in China, only in May 2023, Li Auto sales far exceeded traditional luxury brands and other new power brands. With 25,400 sales, it ranked first in the sales list of SUVs with a price of more than 300,000 yuan in the Chinese market, and the sales of EVs with a price of more than 200,000 yuan ranked top three in the list. (Data from Li Auto)

It is understood that the current peak capacity of Li Auto is 7,500 units/week, and Q4 will sprint to 10,000 units per week. It can be said that, whether from the sales or production point of view, in the field of the EV industry, Li Auto has shown its strong momentum of development.

If a worker wants to do a good job, he must first sharpen his tools. The stability of the equipment is an important condition to ensure production capacity, and it is also a weapon to ensure that Li Auto occupies the market. In 2021, in line with their respective advantages, so that green/energy-saving/high-tech EV products benefit more consumers, Li Auto and Tederic started their successful cooperation.

At present, Tederic has several NEO·M series Multi-Component Injection Molding Machine with Vertical Rotary Turntables and NEO·T Toggle System Injection Molding Machine serving the injection molding production of Li Auto's automotive headlights and interior parts.

## How does Tederic help users core "out of the loop"?

The NEO·M series large multi-material injection molding machine runs smoothly and is equipped with SpinSure®V - vertical turntable technology, which allows the turntable servo control accuracy up to 0.01°, making it easy to handle high-quality injection molding of headlights. The modular shooting platform structure is freely arranged and flexibly forms more than 30 combinations to meet the possibility of a variety of colors for a machine and provide diversified solutions for users.

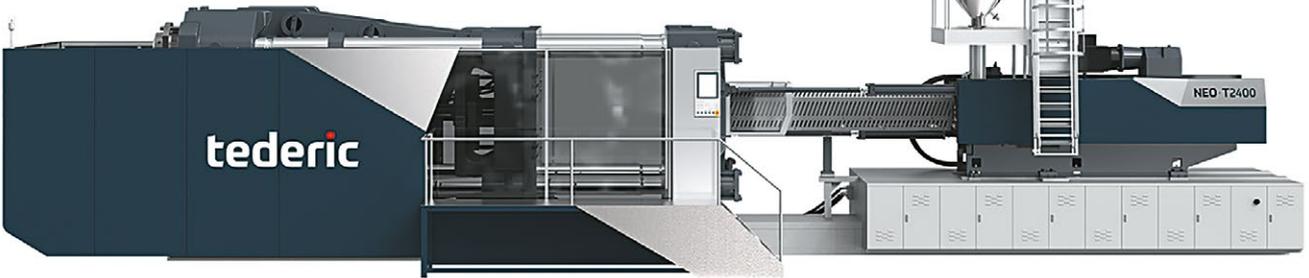
Compared with the traditional hydraulic system, NEO·T series elbow injection molding machine saves 30%~80% of energy. The new generation servo power system is an ultra-high response, 28ms can reach

the highest pressure and can run continuously for more than 10min at full pressure and full speed, which can effectively shorten the injection molding cycle of automotive interior parts and improve production efficiency. The repeating accuracy of the opening and closing mold is within  $\pm 1\text{mm}$ , and the repeating accuracy of the interior decoration products is within 0.3%.

As one of the earliest injection molding machine enterprises in the field of EV in China, Tederic focuses on product research and development and process innovation and converts accumulated years of technical advantages into product advantages, and its NEO series injection molding machine has been recognized and praised by the majority of users with its precision, flexible and stable characteristics.

At present, Tederic fully supports many kinds of intelligent injection molding solutions such as EV headlight vision systems, automotive interior and exterior trim, such as headlight masks, through-line taillights, and automotive front door trim.

NEO-T Toggle System Injection Molding Machine (all pictures: Tederic)



Strong independent casting, precision machining strength, and a complete industrial chain make Tederic different. Under the integration of the whole industry chain resources, Tederic is rising as a new force of intelligent injection molding turnkey solutions for the EV industry, and looks forward to joining hands with more users around the world in the future!

About Tederic

Tederic Machinery is an intelligent injection molding machine

manufacturer with world-leading technology (a world-renowned injection molding solution provider). As a company listed on the main board of Shanghai, China (603289-SH), we have rich industry experience, good performance and professional knowledge. Focusing on creating real value for our customers and pursuing excellence, we uphold flexible methods and continuous innovation to create high-quality, durable, efficient and value-added products for you.

Tederic has 4 overseas subsidiaries in Portugal, South Korea, Brazil and Mexico. More than 1000 employees of Tederic are serving customers from all over the world. So far, Tederic is operating in more than 130 countries and regions, and provide a solution for automotive parts, packaging, medical, electronics, household appliances, construction and other industries. smi

Tederic

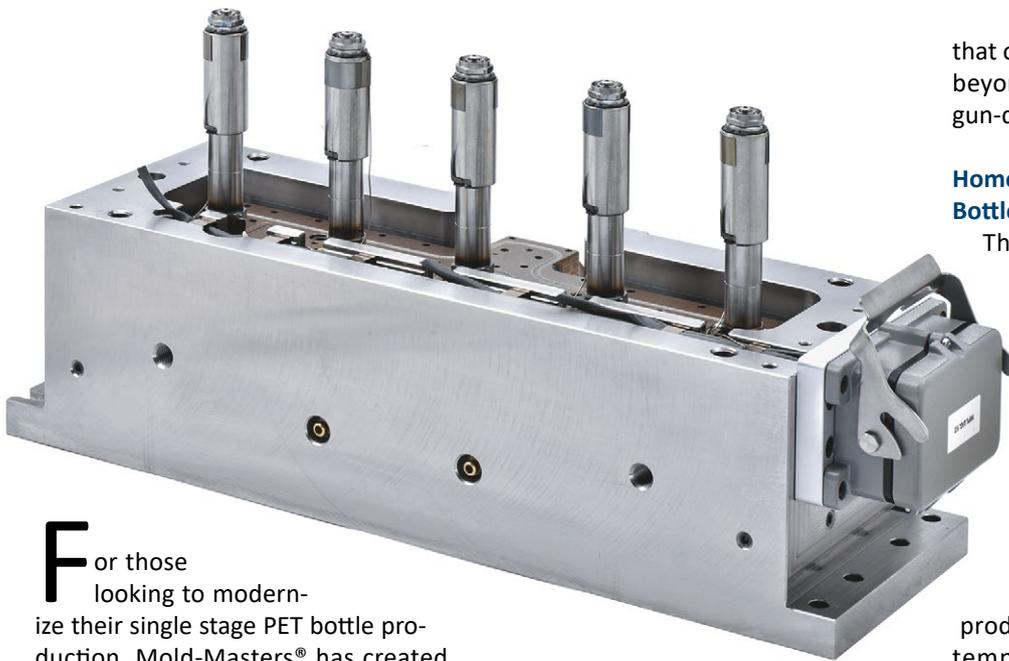
www.tedericglobal.com

Get news updates and magazine alerts  
Submit your e-mail to subscribe free  
**www.smart-molding.com**

The graphic shows three devices displaying the smart-molding.com website. The desktop monitor shows a news article titled 'Both, BOYXS and BOYXS offer 50% more plasticizing volume'. The smartphone shows a navigation menu with categories like 'COMPANIES', 'PRODUCTS', and 'CONTACT'. The tablet shows a magazine cover for 'smart-molding international' dated 1/2020.

# New AXIOM TG single-stage pet hot runner system

Modernize your production of single-stage pet bottles to enhance quality and increase productivity with Mold-Masters® new AXIOM TG (Thermal Gate) hot runner system.



that optimize processing performance beyond the limitations of traditional gun-drilled manifolds.

## Homogenous Melt Delivery Provides Bottle-to-Bottle Consistency

The greatest obstacle preventing bottle-to-bottle consistency is non-uniform melt delivery. Most single-stage hot runners rely on outdated technology that cause differences in residence time, shear history and melt temperature, resulting in non-uniform melt delivery. Non-uniform melt delivery through outdated manifolds produce preforms with inconsistent temperature profiles that stretch-blow into bottles with greater wall-thickness variation, such as side-to-side and top-to-bottom variability. The one-stage ISBM process requires the delivery of near perfect melt homogeneity to all cavities.

iFLOW Manifold Technology achieves greater bottle-to-bottle consistency through optimized melt delivery technology:

- Best in-class melt management provides critical processing capabilities for consistent high-quality part production
- Industry-leading mold-fill balance from improved shear management
- Smooth transitions minimize hang-up spots and dead spots, which allows for rapid color-change performance
- Optimized runner diameters address pressure loss, residence time and shear rate
- Enhanced temperature uniformity

## New AXIOM TG nozzles

The new AXIOM TG nozzle offers an excellent thermal profile to

For those looking to modernize their single stage PET bottle production. Mold-Masters® has created the AXIOM TG (Thermal Gate) hot runner system, which is designed to meet the needs of single-stage PET molders. This hot runner system brings the latest processing technology to enhance molded part quality, increase productivity and lower cost per part. AXIOM TG is an economical direct replacement for many existing outdated hot runner systems and is compatible with all leading ISBM machines and molds.

### Features include:

- Incorporation of Mold-Masters proven iFLOW manifold technology
- A new optimized, purpose-built nozzle design
- Industry-standard gate-seal design

### Benefits include:

- Enhanced bottle quality and reduced scrap rate
- Homogeneous melt delivery and rapid color change
- Increased uptime and reduced maintenance costs
- Retrofittable to existing molds

## Mold-Masters AXIOM TG (Thermal Gated) Single Stage PET Hot Runner System

### Proven iFLOW Manifold Technology

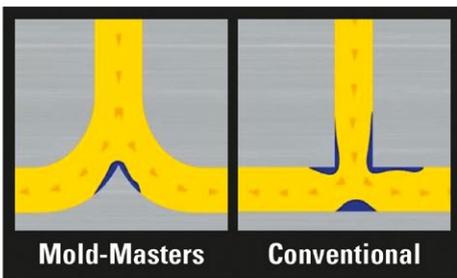
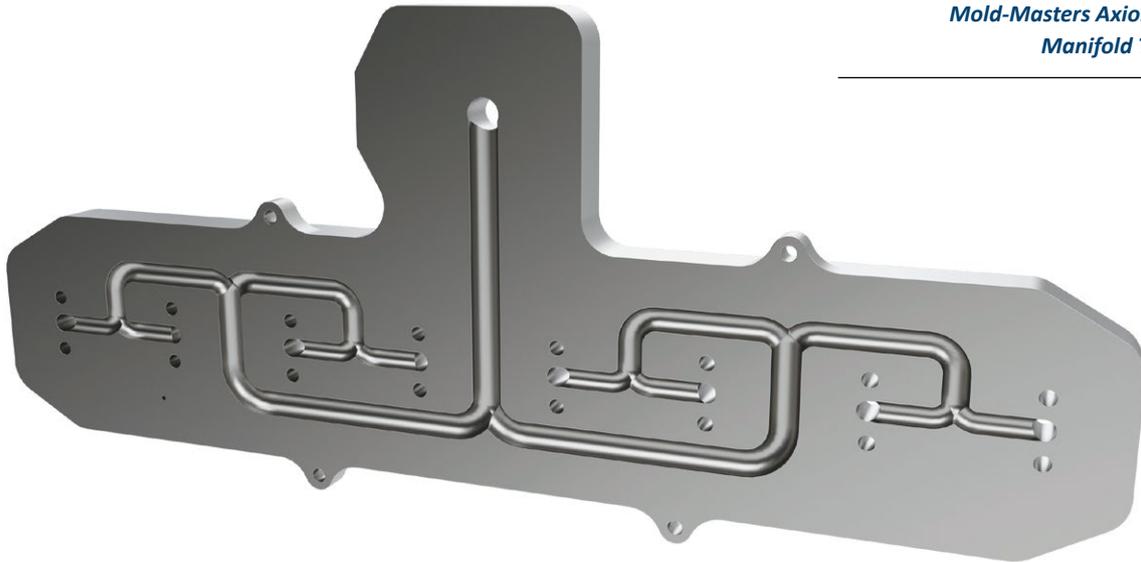
The processing advantages of Mold-Masters iFLOW manifolds have been proven in thousands of applications. iFLOW manifolds are

manufactured from two separate pieces of steel with the runner channels carefully milled from each half of the manifold. This allows Mold-Masters to incorporate melt-flow geometries, flow-path options and runner shapes

Mold-Masters® breathes new life into the single-stage PET market by introducing a new optimized hot runner design integrated with proven technology.

– Leo Devellian, Single-Stage PET Product Manager

*Mold-Masters Axiom TG iFlow  
Manifold Technology*



▲ **Enhanced Shear Control** ▲

deliver precise and repeatable processing capabilities that enhance part quality. The nozzles incorporate individual nozzle heaters for individual temperature control. The nozzle heaters are also field-replaceable for quick and easy maintenance.

The threaded nozzle base provides integrated leak protection. AXIOM's independent temperature control provides a wider processing window, faster start-up time and superior reliability compared to the outdated heater-less heat-pipe nozzles that are common in the industry.

thermal-gate performance over the limited options available on the market today. AXIOM VG has been a proven solution in single-stage applications for more than ten years.

**Single Stage PET Packaging**  
(all pictures: Mold-Masters)



**New Industry Standard Gate Seals**

The gate-seal design seals on the face of the cavity and is compatible with industry standard cut-outs. This allows the AXIOM TG to easily retrofit into many existing molds. The new gate seal features an easy-to-replace slip-fit insert liner and threaded gate-seal tip. The advanced thermal gate design reduces crystallinity in the gate and prevents stringing over a wide processing-temperature range.

AXIOM TG (Thermal Gate) has been created to compliment Mold-Masters' existing AXIOM VG (Valve Gate) system by offering a new economic option for molders who prefer the simplicity of thermal gates over valve gates and desire a higher level of

**About Mold-Masters**

Mold-Masters is a leading global supplier of hot runners, controllers, auxiliary injection and co-injection systems. The company designs, manufactures, distributes, sells and services 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](http://www.moldmasters.com)



Picture: HASCO

# Efficient single nozzle with excellent price-to-performance ratio

*The efficient Single Shot offers the best price-to-performance ratio in the field of single nozzles and boasts optimum temperature control.*

The Single Shot H6300/... offers the best price-to-performance ratio in the field of single nozzles and boasts optimum temperature control. The extension to the range with hardened nozzle tips and Single-hole and Hot Tip Torpedo – as are also used with the Vario Shot – increases the application possibilities of this nozzle many times over.

The Single Shot comes in two sizes and is suitable for the production of small and medium-sized injection mouldings with a shot weight of up to 800 g and immersion depths of over 170 mm.

## Maximum flexibility

The interchangeability of the relevant wear parts, including tips and melt chambers and also the thermocouple, facilitates servicing and maintenance. The heating unit, which is connected to the body of the nozzle with just one control circuit, guarantees a uniform temperature over the full length of the nozzle.

Because of the suitably adapted heating-capacity distribution and the gentle conveyance of the melt through generously-dimensioned flow channels, a homogeneous temperature profile and low-shear mould filling are ensured. Through the optimised position of the thermocouple and the efficient insulation from the mould, plastics with a more limited temperature range can also be reliably processed.

## Compact design

The aims pursued when developing the nozzle were to achieve the largest possible melt throughput plus a compact design and maximum stability. The construction with only one control circuit reduces the time required for design. In connection with the focus on good insulation from the mould, the energy requirement for the Single Shot during use is particularly low.

## Best price-to-performance ratio

The Single Shot nozzle offers the best price-to-performance ratio in the field

of single nozzles, but users do not have to dispense with a variety of injection options. A range of torpedoes and screw-on melt chamber variants are, for example, available. In addition to the classical pin gate, these also permit the nozzle geometry to be readily introduced into the cavity plate and, in the event of wear, allow rapid restoration of the gate quality. Extended melt chambers are available for gates to free-form surfaces or sub-runners with a sprue.

## 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](http://www.hasco.com)

# Innovation in focus – Highlights of sample plate 2.0

*The advantage of silicone is that fingerprints do not adhere to the surface, or at least only to a very limited degree. Holograms remain a fascinating feature, despite any contact with human skin. The corners of the sample plate 2.0 are particularly interesting, as their surface is imbued with properties that reduce friction.*

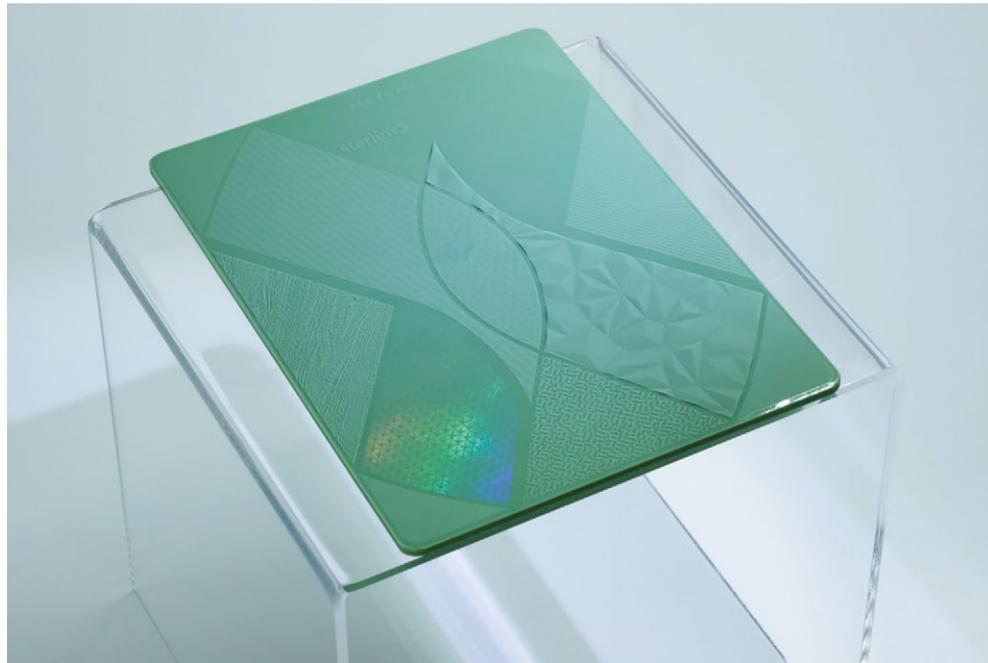
## New design with indiscernible added value

Through femto laser technology, Reichle Technologiezentrum GmbH enables its customers to create moulds with holograms, colour effects, engravings without depth and particularly high surface qualities. An ideal example of the application area of this innovative laser technology is the new silicone sample plate 2.0 in pale green, brown and black with dimensions of 120 x 160 mm and a thickness of 2.7 mm. Together with starlim, the liquid silicone specialist from Marchtrenk in Austria, Reichle has, for the first time anywhere, now even succeeded in engineering a silicone mould so that more than concealed information can be incorporated in a component.

Highlights of the sample plate 2.0 are the hologram and the low-friction structure at the corners. The advantage of silicone is that fingerprints do not adhere to the surface, or at least only to a very limited degree. Holograms remain a fascinating feature, despite any contact with human skin. The corners of the sample plate 2.0 are particularly interesting, as their surface is imbued with properties that reduce friction. Use of special surface textures enhances the gliding properties of silicone. Friction between objects made of silicone and, indeed, silicone objects and other materials is reduced as a result.

## What smells so good?

A further fascinating feature of starlim's silicone plate 2.0 is the integration of micro-encapsulated Alpine timber fragrance. The pleasantly soothing properties of



this wood scent are widely known and now combined with silicone in starlim's plate. Micro-encapsulation captures this Alpine timber fragrance in tiny capsules in the silicone. This scent is emitted continuously and repeatedly replenished through contact with water. The combination of a variety of surfaces and micro-encapsulated wood scent make starlim's sample plate 2.0 a unique product that combines innovation and design.

## starlim x Reichle

starlim is proud to have established an exclusive partnership with Reichle. Together, the companies want to demonstrate to the world just how much can be achieved when processing silicone. This creative cooperation enables them to achieve unique features such as invisible digital watermarks on silicone parts.

Picture source: starlim

This opens up new windows of opportunity and expands the limits of that which was previously thought to be possible.

## About starlim

starlim is the world's largest processor of liquid silicone and specializes in the injection molding production of small parts made of silicone using one-component and multi-component technology. starlim's silicone parts can be found, for example, in cars, in baby pacifiers, but also in the kitchen drawer – often visible, but sometimes also installed invisibly. starlim's clear focus is on mass production. **smi**

starlim

[www.starlim-sterner.com](http://www.starlim-sterner.com)

# Injection molded r-PET cups

After an intensive development phase, Greiner Packaging has achieved a breakthrough in cooperation with Engel – manufacturer of injection molding machines – and mold maker Brink B.V.

Thin-walled cups made of (r-) PET can now also be produced using injection molding technology. They are suitable for filling lines, sealable and have considerable CO<sub>2</sub>e savings potential. Thus, the cooperation opens up new opportunities for packaging designed for a circular economy.

- Thin-walled injection molding cups, which were previously realized using PP, can now be produced from r-PET.

- The use of 100% r-PET results in up to a 4-fold reduction in CO<sub>2</sub>e emissions compared to virgin PP material (based on the Ecoinvent v.3.9 database).

- The thin cups have an even wall thickness distribution, are designed to both filling line compatible and sealable.

- The development collaboration underlines the potential of cross-industry cooperation for a circular economy.

Lightweight, made of recycled material and optimally recyclable - this is what the ideal packaging should look like. For the sake of the environment, but also for conformity with legal requirements. Together with Brink and Engel, Greiner Packaging has now reached a milestone on this path with the development of a thin-walled, injection-molded plastic cup made of r-PET that is ideally suited to industrial requirements.

## Recycled PET realizes great CO<sub>2</sub>e savings potential

Strong availability, food-grade status and high quality - these properties



Picture source: Greiner Packaging

make r-PET the material of choice when it comes to sustainable packaging. Until now, however, PET has mostly only been used for thermoforming applications and for injection-molded bottles and cans. Injection-molded cups with thin walls have been realized mainly with polypropylene (PP), which to date has – mechanically recycled - not received a positive EFSA opinion. Therefore, use of recycled PET in injection molding opens up new possibilities, especially for food applications. Injection-molded cups that were thus far made out of PP can now also be offered in up to 100% r-PET – an advantage of which being up to 4 times less CO<sub>2</sub>e emissions compared to other materials.

## Innovation with a reality check

Manufacturing the cups using the injection molding process ensures that the thickness of the walls of the cups

is especially uniform, as the plastic is distributed evenly in the mold during injection - an essential aspect in terms of top load, quality and appearance. The injection-molded cups can be decorated by means of IML (in-mold labeling).

## Moving towards the tray-to-tray cycle together

Greiner Packaging has proven its innovative strength by creating a new way to produce PET cups with up to 100 % recycled material in injection molding. Furthermore, this development proves the potential that cross-industry cooperation has for the realization of a circular economy. In the future, it won't only be bottles made of PET that will serve as source material for new packaging. Packaging of all kinds should find its way back into the cycle (tray-to-tray recycling). For example, a plastic cup should become a plastic cup again in the future. **smi**

*“When developing the thin-walled, injection-molded cups made of PET, it was particularly important for us to develop a solution that was not only innovative but also able to withstand our customers’ industrial requirements. The cups we developed together with Brink and Engel are designed in such a way that a transition to the new generation of cups is possible, both in filling and sealing”*

Sebastian Diensthuber, Global Product Group Manager

**Greiner Packaging**  
www.greiner-gpi.com

# A light platform that advances illumination performance

*TactoTek® announced IMSE® LightChannels, a light platform that advances the illumination performance for function, styling, and Human Machine Interfaces.*

**A**t the beginning of the year, Finnish In-Mold Structural Electronics (IMSE) pioneer TactoTek introduced IMSE LightChannels, a new light platform that revolutionizes lighting performance. With its advanced programmable light structures, IMSE LightChannels is a transformative solution for illumination features that inform, delight, and guide interaction.

IMSE LightChannels is built using sources of injected light. It controls light along injection molded channels to create stunning light zones with superior light output, uniformity, and color mixing while eliminating unwanted light bleed. Like all IMSE solutions, IMSE LightChannels structures are extremely thin, eliminate air gaps, and simplify construction.

In addition to its superior light performance, IMSE LightChannels also offers significant cost advantages over traditional electronics and smart surface construction techniques by optimizing BoM and eliminating separate illumination structures. It's a versatile platform that can scale to different market segments that require dense, clear light-based HMIs.

"What TactoTek has achieved with IMSE LightChannels is already resonating with many automotive OEMs," said Michael Höfgen, CEO of Lightworks GmbH "achieving bright, even illumination while controlling unwanted light travel is often very difficult and can require very complex structures. IMSE LightChannels achieves these results in a solution that's elegant in its simplicity and economy."

"IMSE LightChannels is part of our Let Light Live™ strategy. We are bringing our newer platforms that can create programmable interfaces with light features that indicate, inform, and interact, exploring new ways of connecting with the users. With



IMSE technology, these structures can be thin and simple, and because it enhances sustainability, the technology enables designers to freely create surfaces that are both smart and sustainable," stated Karthikesh Raju, SVP Product Management and Marketing at TactoTek.

IMSE LightChannels platform supports up to seven different types of dynamic and static illumination features, including closely-spaced illuminated icons, text and emblems, light lines, and illuminated surfaces, along with durable, application-specific mounting features.

The IMSE LightChannels platform was included in the February 2023 release of IMSE Designer, which is part of TactoTek's offering to its licensees. This platform will be continuously updated to enable a wide range of applications using innovations for user interfaces differentiated with light.

## About TactoTek

TactoTek is the leading provider of Injection Molded Structural Electronics (IMSE®) solutions that integrate printed

*The backside of the IMSE LightChannels demonstrator after second shot of injection-molding (picture source: TactoTek)*

circuitry and electronic components into 3D injection molded smart surfaces. Leading IMSE use cases include human-machine interfaces (HMI), connectivity, and electronic styling features for automotive, smart homes, appliances, and other markets. IMSE outperforms conventional electronics manufacturing methods by reducing Greenhouse gas emissions significantly. Benefiting from simulated design processes and reduced material use, IMSE Designed smart surfaces are considerably lighter in mass, leading to substantial lifetime greenhouse gas reductions. TactoTek develops and industrializes IMSE technology, creates mass production-ready IMSE prototypes, and licenses IMSE technology for 3rd party IMSE part design and global mass production. **smi**

**TactoTek**  
[www.tactotek.com](http://www.tactotek.com)

# The common goal: more sustainability



*From automotive through aviation to urban mobility, industry experts and visionaries were discussing challenges and trends, new market opportunities and technological possibilities at the ENGEL Mobility Days 2023 – supported by KTM Technologies – in Austria in mid-June. The two-day event with top ranking keynote speakers and future-oriented machine exhibits combined and expanded the previous ENGEL conferences trend.scaut and Lightweight Future Day to create a new networking event.*

“Let's spend two days completely rethinking mobility,” said host Dr. Stefan Engleder, CEO of the ENGEL Group, welcoming the more than 500 guests to the Design Center in Linz at the start of the ENGEL Mobility Days 2023. Mobility is becoming increasingly diverse and this is not only reflected in the list of participants but also in the conference programme. The keynotes covered individual transport by car, (motor)bike or e-scooter, but also public transport by bus, train, people mover or air cab, as well as aerospace and logistics mobility solutions from the classic truck to drones. There is one thing which unites all sectors of mobility, and that is making mobility more sustainable.

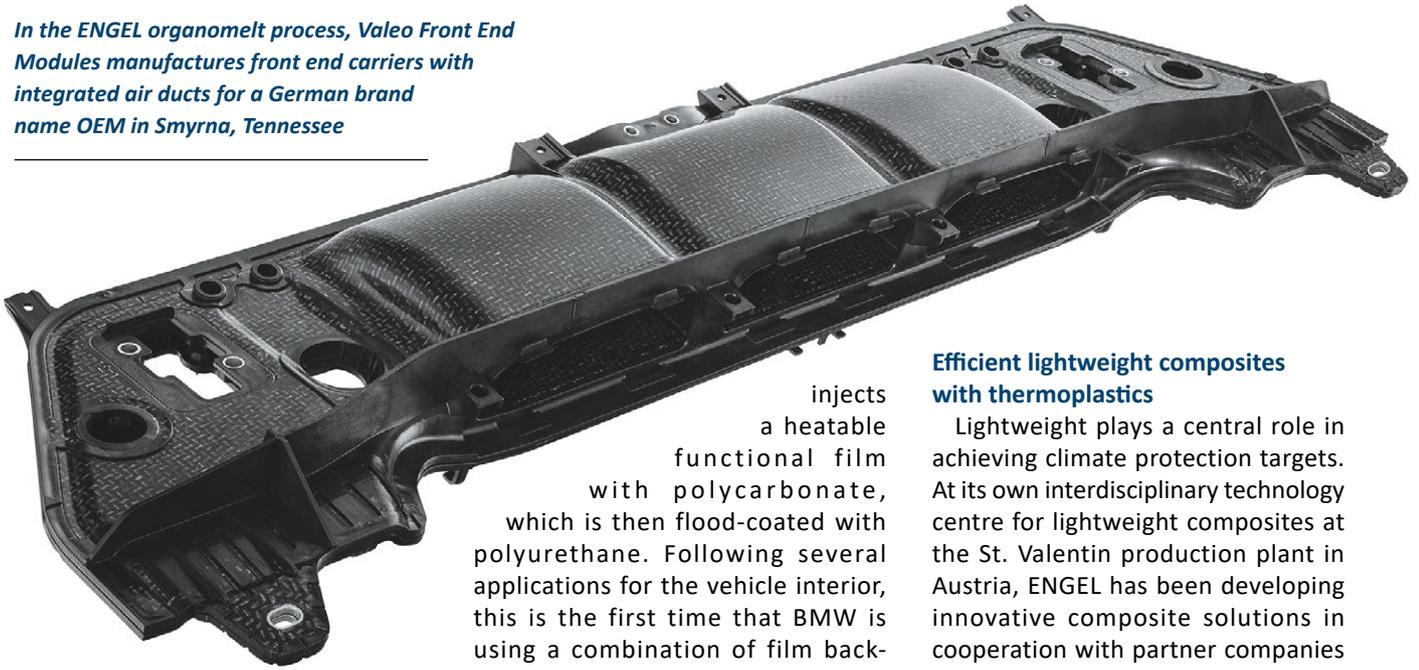
Whether new drivetrain solutions or autonomous driving, these trends are

fundamentally changing the demands on mobility, requiring completely novel material and manufacturing solutions in some cases. This gives rise to huge opportunities for the injection moulding industry. “Plastics will play an even more significant role in future mobility than they do today”, as Franz Füreder, Business Unit Vice President Automotive & Mobility at ENGEL was quick to point out. “Polymer materials are lightweight materials in themselves, and they allow for conservative use of energy and raw materials. They can be processed in a very efficient way in injection moulding, and this makes innovative technologies accessible to the mass market.” The ENGEL Mobility Days 2023 showcased numerous examples of this.

## **Autonomous driving promotes the use of plastics**

Michael Fischer, Head of Business Development Technology at ENGEL, highlighted another advantage of the material group: “Plastics are permeable to sound waves and electromagnetic radiation, and this makes them indispensable for autonomous driving.” Autonomous driving is all about connectivity, communication between the vehicles themselves, and with other public and private transport users and the environment. The sensors used for this purpose rely on electromagnetic and acoustic approaches. Distance sensors, for example, work with ultrasound, while adaptive cruise control works with radar, and night vision assistance systems with infrared.

*In the ENGEL organomelt process, Valeo Front End Modules manufactures front end carriers with integrated air ducts for a German brand name OEM in Smyrna, Tennessee*



"Plastics let all of these waves through, which is why they have already replaced aluminium and steel in automotive front and rear ends," said Fischer. "Autonomous driving is a massive opportunity for plastic injection moulding. More efficient than any other method of plastics processing, injection moulding helps to combine sensor systems and electronic features with a visually appealing design."

Among other processes, ENGEL developed its clearmelt technology for this purpose; clearmelt is a two-component process that combines in-mould decoration (IMD) with polyurethane flood-coating. "Flood-coating with polyurethane in the mould allows for a perfectly repeatable, smooth surface with a uniform wall thickness," says Fischer: "This predestines the technology for integrating optical sensors."

BMW in Landshut uses this technological basis to produce the "kidney" panels for the BMW iX electric vehicle in a cleanroom setup. Once the radiator grille, this characteristic design feature of all BMW models has taken on a new role following electrification of the drivetrains. The kidney-shaped panels protect a series of sensors for assisted and, in the future, autonomous driving. To make sure that the sensors also work reliably in the winter, BMW back-

injects a heatable functional film with polycarbonate, which is then flood-coated with polyurethane. Following several applications for the vehicle interior, this is the first time that BMW is using a combination of film back-injection and flood-coating in the series production of functional parts on the exterior, where they are exposed to particularly high stress. The sensitive electronics are well protected under the scratch-resistant polyurethane surface. The high gloss level and depth effect, which even a thin coating of polyurethane achieves, convey a very elegant impression. ENGEL is the system supplier for this demanding project. The production cell integrates an ENGEL duo combi M injection moulding machine with a horizontal rotary table, two large articulated robots for handling the films and moulded parts, a film cleaning system, an inline quality-control station and peripheral units including the polyurethane feed.

ENGEL is collaborating with development partners in the field of combined back-injection and PUR flood-coating, including Leonhard Kurz Stiftung, Schöfer and Votteler Lackfabrik. In the scope of a project study, the partner companies were able to demonstrate that flood-coating with polyurethane, which is equivalent to in-mould painting in terms of the process, accounts for only 20 percent of the total energy consumed in the production process. This means that the integrated process offers significantly improved energy-efficiency compared with painting the parts outside of the injection moulding process.

### Efficient lightweight composites with thermoplastics

Lightweight plays a central role in achieving climate protection targets. At its own interdisciplinary technology centre for lightweight composites at the St. Valentin production plant in Austria, ENGEL has been developing innovative composite solutions in cooperation with partner companies for more than ten years. The primary development goal is integrated and automated processes for cost-efficient high-volume production.

One focus of the development work is on the use of thermoplastic fibre composite materials. "The reasons for this are the highly efficient processes for processing thermoplastics on the one hand, and greater sustainability on the other", said Füreder. An approach which consistently relies on thermoplastic material paves the way for recycling the parts later on.

In the ENGEL organomelt process, thermoplastic fibre composite prepreps – for example, thermoplastic sheets and UD-Tapes – are shaped and functionalised in a single integrated step. To achieve this functionalisation, reinforcing ribs or assembly elements are moulded immediately in the same mould after thermoforming using a thermoplastic from the same matrix material group as the thermoplastic sheet.

The first high-volume production application of this technology went live in 2018 at Valeo Front End Modules in Smyrna, Tennessee, USA. Starting with thermoplastic sheets, Valeo Front End Modules manufactures front end carriers with integrated air ducts for a German brand name OEM at its plant. The systems solution supplied by ENGEL for automated high volume production consists of an ENGEL duo 1700 injection moulding machine,



three ENGEL easix articulated robots for preparing large quantities of metal inserts and for handling the thermoplastic sheet, an ENGEL viper 90 linear robot and an ENGEL IR oven.

The double-shell structure made it possible to integrate the air ducts directly into the carrier structure. The two half-shells are produced in a one-shot process. To do this, the two thermoplastic sheets are simultaneously heated in the IR oven, and then inserted into the mould, where they are formed and functionalised.

#### **Innovative recycling for fibre composite parts**

Recycling fibre-reinforced composite parts is another development focus at the ENGEL Technology Centre for Lightweight Composites. "In the future, we expect automotive recycling to play a role in returning many fibre-reinforced parts made of polyamide and polypropylene to the material cycles in a single grade process. However, the glass fibres are shortened

when the parts are shredded. To again produce high-quality fibre composite parts from the returned materials, new fibre material does need to be admixed during processing of the recycled materials," as Fischer explained. "We are working on a solution here that lets us tune the material properties in a very efficient way."

The basis is the new Two-stage process which ENGEL presented at the K show 2022. To be able to integrate a melt filter and a degassing unit, the production cell breaks down plasticising and injection into two independent, but mutually tuned, process steps. Thanks to this strategy, plastic waste can be processed as flakes in injection moulding directly after grinding to achieve excellent quality. Since a complete processing step, repelletising, is eliminated, the Two-stage process saves a huge amount of energy and work compared to legacy recycling. In order to be able to reprocess shredded fibre-reinforced plastic composite parts to create vehicle parts capable of withstanding high mechanical loads,

***New mobility applications sometimes require particularly large injection moulding machines. ENGEL builds mega machines with clamping forces of more than 10,000 tonnes***

ENGEL is now integrating a glass fibre feed into the production cell solution in addition to the melt filter. The fresh long glass fibres are admixed before injecting the melt. "We are in the trial phase here," said Fischer. "Initial trials are very promising."

#### **Fuel cells drive innovation**

Alternative drive technologies are also opening up new potential for the injection moulding industry. "Hydrogen technology is currently being promoted particularly strongly in Europe, especially in the truck sector," as Fischer reported. "The Cellcentric joint venture sees Daimler Truck and the Volvo Group bundle their experience in the development and production of fuel cell systems, and they have chosen ENGEL as one of their technology suppliers."



In particular, the expertise which ENGEL has in processing elastomers and liquid silicone rubber (LSR) is crucial here. Fuel cells require many seals, some of which are moulded directly onto metal or plastic components. On top of this, there are cable lead-throughs, which are made of LSR.

The bipolar plates, of which several hundred are needed for each fuel cell, are made of metal, but Fischer is convinced that this could change in the long term. "We are already developing injection moulding solutions for thermoplastic-based bipolar plates. The challenge is the sheet thickness of only a few tenths of a millimetre; we are combining thin-wall technologies with injection compression moulding for this."

Thermoplastics are also increasingly replacing steel and aluminium sheet for battery housings and trays in electric, hybrid and fuel cell vehicles. For example, Envalior – which emerged from DSM Engineering Materials and the High Performance Materials business unit of Lanxess – is

developing an innovative battery tray made of polyamide with a high glass fibre content. The wall thickness is less than 7 mm with a single shot weight of 60 kg. "The challenge is for the plastic design to be able to reliably absorb the high loads," as Fischer explained. "On top of this, the large-volume part and the very high shot weight require a particularly large injection moulding machine. We are planning on an ENGEL duo machine with a clamping force of 8000 tonnes."

#### **Injection moulding machines of 10,000 tonnes and more**

While ENGEL duo injection moulding machines have been available with clamping forces of up to 5500 tonnes as standard machines for a long time, ENGEL has now extended the series upwards for new applications in the mobility sector and other industries. Besides parts with a particularly large surface area and volume, these new mega machines with their extremely large mould mounting spaces enable even more extensive process

*The large mould installation space – shown on an injection moulding machine with a clamping force of 8000 tonnes here – opens up new opportunities for very large parts on the one hand and highly integrated processes on the other (all pictures: ENGEL)*

integration – for example in the glazing sector.

"Clamping forces of more than 10,000 tonnes and shot weights of several hundred kilograms are already technically feasible today," said Stefan Engleder providing an outlook and underlining the commitment which ENGEL has to building a new dimension of large machines. "We have created assembly capacity for this at both the large machine plant in St. Valentin, Austria, and in Shanghai, China. Around the world, we are helping our customers to solve the new mobility challenges." *smi*

**ENGEL**

[www.engelglobal.com](http://www.engelglobal.com)

# Introducing the BCN3D Omega I60: a high-speed industrial 3D printer built for the factory floor

- *The BCN3D Omega I60 is an all-in-one industrial 3D printer built to deliver large and strong tooling, jigs, and fixtures at high-speed.*
- *It features BCN3D's signature IDEX technology, a massive print volume of 60L, a heated chamber of 70°C, a temperature and humidity-controlled material operations system, and a direct-drive high-speed extruder that reaches up to 300 mm/s.*
- *BCN3D has also revealed the material portfolio for BCN3D Omega I60 with custom formulations carefully selected to cater to specific verticals. Additionally, BCN3D has introduced a flexible build plate and Stratos 2.0 for all Epsilon users.*

One of the leading 3D printing solutions manufacturers – BCN3D – has recently introduced the brand new BCN3D Omega I60 at a special event held at its Barcelona headquarters. BCN3D Omega I60 is an all-in-one industrial FFF 3D Printer designed to produce big, strong prototypes and end-use parts, particularly tooling, jigs, and fixtures. The BCN3D Omega I60 features a modernized version of BCN3D's signature IDEX technology, which doubles productivity by using both toolheads simultaneously. It boasts a massive print volume of 60L and a heated chamber that can reach temperatures up to 70°C, allowing for the production of large-scale, robust pieces in engineering-grade materials. The printer is equipped with a temperature and humidity-controlled material operations system that prepares filaments for printing. Additionally, it utilizes a 1.75mm direct-drive high-speed extruder capable of speeds up to 300 mm/s, enabling faster production of parts than ever before.

This momentous occasion coincides with BCN3D's 11-year anniversary, a testament to their unwavering commitment to innovation. Over the course of this remarkable journey,



All pictures: BCN3D



**1. POWERFUL EXTRUSION SYSTEM**

- IDEX
- Direct Drive Bondtech extruders
- Custom E3D Revo hotends
- Quick-swap nozzles
- Ø 1,75mm Filaments

**2. ACTIVE HEATED CHAMBER**

- Chamber up to 70°C
- Heated bed up to 120°C

**3. XYZ AUTOCALIBRATION**

- Piezoelectric sensors
- Dedicated XY calibration area

**4. MASSIVE PRINT VOLUME**

- 450x300x450 mm (17.7x11.8x17.7 in)
- 60 Liters

**5. MATERIAL OPERATIONS SYSTEM**

- Material recovery (75°C)
- Low humidity (< 10% RH)
- Automatic switching
- Pre-loading filament system

**6. HIGH SPEED READY**

- Speed 300 mm/s
- Acceleration 10 m/s<sup>2</sup>
- Built-in Accelerometer
- Electronics 32 bits ATSAME51

**7. PRINTER ARCHITECTURE**

- HAQ-XY Kinematics
- 2 Z axis

**8. USER EXPERIENCE**

- Flexible build plate
- Built-in Camera
- 7" capacitive touchscreen
- Barcode sensors
- Connectivity via WiFi or Ethernet

**9. SAFETY**

- Emergency stop button
- Hepa and Carbon filter
- Light tower signal
- Uninterruptible power supply (UPS)
- Safety pause

BCN3D has successfully distributed more than 10,000 units worldwide across more than 100 points of sales. Notable success stories include the partnership with automotive powerhouse Nissan and French multinational Saint Gobain, leveraging the power of 3D printing to produce tailored tools, jigs, and fixtures for immense time and cost savings, and Prodrive, which develops 3D printing end-use parts for cross-country cars. During this decade BCN3D's pioneering spirit also led to the introduction of the revolutionary IDEX technology in 2015 and the groundbreaking VLM™ technology, unveiled just last year.

### A glimpse into BCN3D Omega I60's specifications

BCN3D Omega I60 has been designed from the ground up and features:

- **Modernized BCN3D's signature Independent Dual Extrusion (IDEX) technology:** IDEX stands out as the sole extrusion system with the unique capability of printing using two independent heads. Users can double productivity with duplication and mirror modes or produce parts with support without cross-contamination. BCN3D Omega I60 is equipped with

a refined IDEX technology, where the X motors remain stationary during the printing process. This design feature minimizes inertia, resulting in accelerated print speeds.

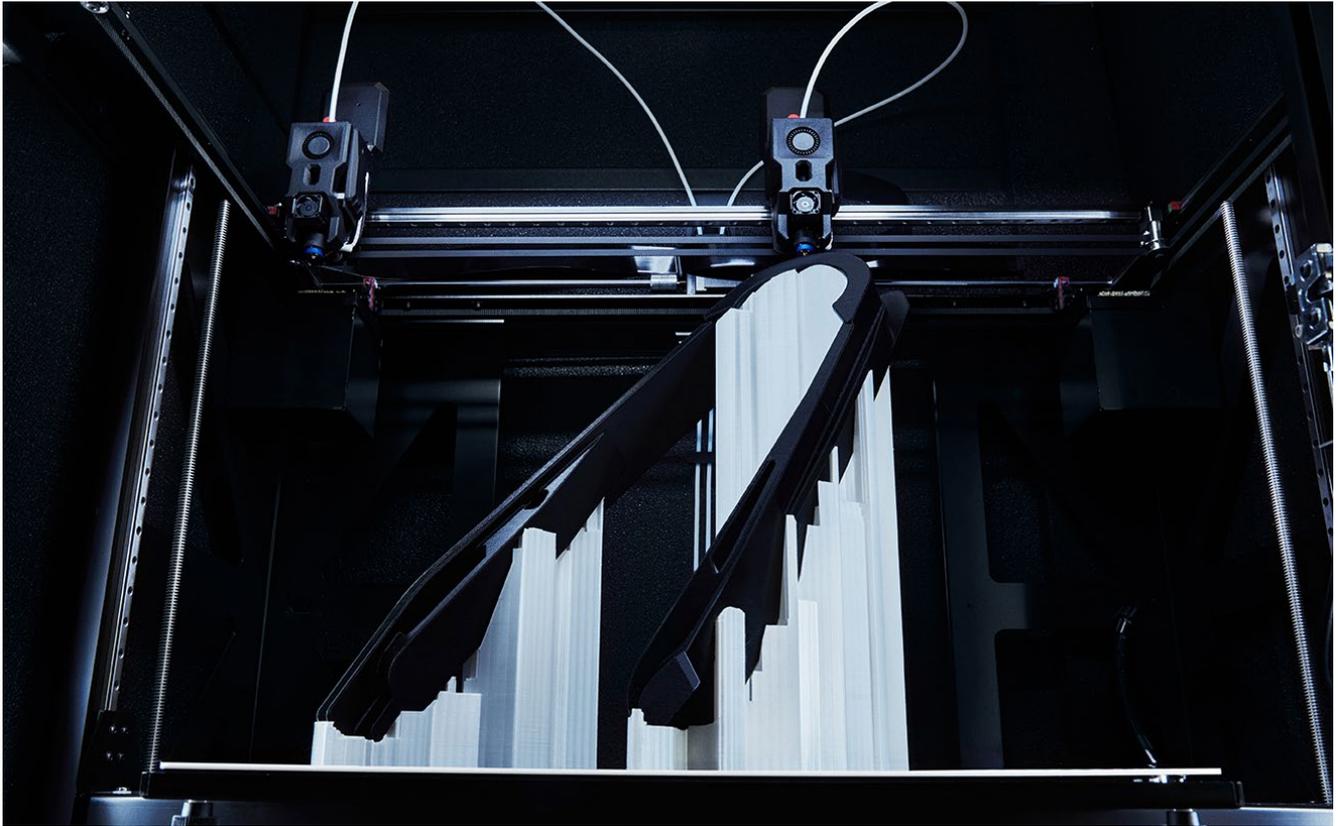
- **HAQ-XY Kinematics:** This motion architecture is considered one of the best systems for dual 3D printers and CNC machines, as it provides a lightweight, robust and precise approach. BCN3D Omega I60 utilizes an improved version of this kinematic system by placing the pulleys in a more optimal position. As a result, the system experiences a significant reduction in torsional moments along the X axis during the printing process. These torsional moments are highly undesirable as they can have detrimental effects on the system's performance and potentially lead to undesired deformations in the X axis, thereby directly impacting the quality of the printed parts.

- **Extrusion system:** BCN3D Omega I60 equips a powerful extrusion system with industry-leading components, including 1.75 mm direct drive Bondtech LGX Pro extruders. This system provides more control and precision. It also includes custom E3D Revo hotends, which offer best-in-class

extrusion reliability, as well as an easy-swap nozzle change.

- **High speed ready:** BCN3D Omega I60 is equipped with built-in accelerometers and 32-bit electronics, together with a custom version of Marlin 2.1. This combination enhances the capabilities of the BCN3D Omega I60, enabling it to efficiently manufacture parts at an impressive speed of 300 mm/s and achieve accelerations of 10 m/s<sup>2</sup>. With this state-of-the-art platform, BCN3D Omega I60 is the only high-speed and IDEX 3D printer on the market, providing users with exceptional productivity.

- **Active Heated Chamber:** A heated chamber facilitates the manufacturing of engineering polymers by maintaining an ideal temperature for the printable part throughout the printing process. This temperature control ensures the uniform construction of the part, minimizing the formation of internal stresses. By heating the chamber close to the material's glass transition temperature, it promotes relaxation and eliminates internal tensions during manufacturing, effectively preventing issues like warping and cracking. After completion, the part undergoes a



gradual cooling process. All of this ensures the best dimensional accuracy and mechanical durability for the printed part. The BCN3D Omega I60 heated chamber can reach temperatures of up to 70°C, making it ideal for printing materials such as ASA, PA, ABS and reinforced PA, among others.

- **Massive print volume:** The printing volume available in the BCN3DOmega I60 is 450 x 300 x 450 mm (17.7 x 11.8 x 17.7 in), offering up to 60 liters. This, combined with the heated chamber, gives BCN3D Omega I60 the ability to produce large technical parts.

- **Material Operations System (MOS):** This integrated material module offers a complete all-in-one experience. The MOS allows you to control not only the humidity, but also the temperature. It provides two key advantages: the ability to recover compromised material and the ability to preheat your filament before starting a print. This is especially important for engineering materials with higher heat deflection temperatures. Furthermore, the material operating system enables automatic filament loading and unloading. So, if your print job runs out of filament halfway through, the

machine will automatically change the filament for you. BCN3D's Omega I60 MOS can reach up to 75°C and provides an RH below 10%.

- **XYZ Autocalibration:** This technology, that uses piezoelectric sensors, eliminates human dependence and guarantees correct first layer adhesion. It calibrates by measuring multiple points to adjust printing surface height (Z) and (XY) offset between nozzles. For BCN3D Omega I60 with Independent Dual Extrusion System (IDEX), precise XY alignment is crucial. A dedicated calibration zone outside the printing surface is used for toolhead alignment. The toolheads make contact with the machined calibration zone in order to calculate positioning and automatically calibrates offsets to avoid crossovers or shifting layers in duplication mode.

Last but not least, BCN3D Omega I60 is equipped with a vast array of other important features such as a built-in camera, a flexible build plate, an Uninterruptible power supply (UPS), a Filament Runout Sensor (FRS), a barcode sensors for spool and components recognition, a andon

light, a 7" capacitive touchscreen, an HEPA and Carbon filter, a Safety Pause function, an emergency stop button and WiFi or Ethernet connectivity functions.

#### Applications and materials

The portfolio of materials offered for BCN3D Omega I60 has been carefully selected to cater to specific verticals such as tooling, jigs and fixtures, short run production, masking, large prototyping, production line replacements, and end-use parts. The materials include:

- **Omega Proto:** A custom formulation developed for BCN3D Omega I60 and ideal for prototyping, jigs and fixtures, low load bearing alignment guides, and drill guides. It offers a smooth matte black surface finish and isotropic properties, making it suitable for both basic and functional prototyping.

- **Omega Impact ASA:** This material excels in UV resistance, making it ideal for outdoor end-use parts. It is highly durable, making it suitable for tooling subjected to repetitive loading.

- **Omega Resistant Nylon:** Ideal for the factory floor environment,

this material is chemical, wear and solvent resistant. It serves as a drop-in replacement for materials like Acetal commonly found across production lines.

- **Omega Tooling CF:** Specifically formulated for maximum strength, this material is well-suited for producing metal replacement parts, metal forming dies, bend tooling and end-use parts that require exceptional strength.

- **Omega Support:** A breakaway support material that works with all the aforementioned materials. This allows for easy removal of supports without the need for dissolving, enabling the immediate use of printed parts.

Customers have three pathways to choose from when selecting a filament for their BCN3D Omega I60. The first option is BCN3D Filaments, which encompasses all previously mentioned materials as well as upcoming materials currently in development and scheduled for future release. The second option is the Open Filament Network, where BCN3D collaborates with material manufacturers to create specialized printing profiles. These materials cater to niche applications with materials that offer unique properties like ESD, flame retardant, or food-safe. Lastly, since the BCN3D Omega I60 is an open material platform with no limitations, customers can use custom materials and create their own printing profiles at no additional cost.

### The Omega Launchpad Program

To let customers experience BCN3D Omega I60, BCN3D has devised the Omega Launchpad Program, aimed at businesses of all shapes and sizes. By participating in this program, individuals can anticipate being among the first to explore the capabilities of the new BCN3D Omega I60, witnessing its true potential through the creation of tangible, 3D printed parts. Moreover, participants will have the opportunity to collaborate closely with a dedicated Additive Manufacturing applications engineer who will provide personalized assistance in analyzing and developing custom solutions specifically designed for the integration of the BCN3D Omega I60 within their respective organizations.



### The BCN3D Epsilon Series gets an update

Earlier this year, BCN3D unveiled the latest generation of their Epsilon Series, characterized by a sturdier structure, enhanced electronics, and XYZ autocalibration. Additionally, during 2023 BCN3D announced firmware 2.0, equipped with first-layer live adjustment, new calibration routines, and improved duplication and mirror printing capabilities, among others. On the software front, BCN3D elevated the performance of their Stratos software by improving 16 print profiles, resulting in a remarkable 35% increase in printing speed and 25% reduction in material consumption. Additionally, BCN3D extended their support for the Open Filament Network (OFN) by introducing 25 new print profiles. This collaboration with leading material manufacturers ensures that customers gain access to top-tier filament profiles, delivering exceptional print results.

During the recent live streaming event, BCN3D made two major announcements for their Epsilon Series 3D printers. Firstly, a flexible build platform that allows users to

remove prints with even greater ease. This innovation will be compatible with all Epsilon and Sigma D25 3D printers. Secondly, BCN3D announced their upcoming release of Stratos 2.0, which is built on the powerful Cura v.5 engine. This upgrade will bring a wealth of new features, an improved user interface, and an overall smoother experience. Starting from September of this year, users will have access to both the flexible build platform and Stratos 2.0, enhancing their 3D printing capabilities.

### About BCN3D

BCN3D is one of the leading developers and manufacturers of 3D printing solutions worldwide with clients including Nissan, Saint-Gobain, NASA, Haribo, and Louis Vuitton. It made a name for itself as a pioneer in FFF with its signature IDEX technology and recently released Viscous Lithography Manufacturing™ (VLM™), a brand new additive manufacturing technology that leverages high viscosity resins to unlock manufacturing autonomy. *smi*

BCN3D

[www.bcn3d.com](http://www.bcn3d.com)



# Decentral manufacturing and digital inventory startup Replique spins off from BASF incubator and closes financing round

- Replique provides a secure digital platform for on-demand industrial parts serving the OEM market
- A seed round was successfully closed led by early-stage investor STS Ventures
- BASF confirms their support by additional funding through Chemovator for this round

**R**eplique, a digital manufacturing startup, spins off from Chemovator, the business incubator of BASF, and successfully closes a late seed round to further build its business. The funding round was led by STS Ventures, a leading digital technology investor. Replique provides the first fully encrypted 3D printing platform that makes spare part management and the production of small series more sustainable.

Replique secures seed funding round with strategic experts and accelerators

STS Ventures led the funding round as experienced early-stage investor. However, with their managing partner Stephan Schubert – former founder and managing director of Onvista until its spin-off in 2007 – STS Ventures also brings valuable entrepreneurial mindset and experience to the table and will be a great support for Replique's path to a strong profitable business.

"We see a lot of startups with promising ideas, but Replique stood out to us as a game-changer in the manufacturing industry. Their innovative industrial 3D printing platform has the

potential to disrupt the industry and we are excited to support their growth and expansion in the future. Besides the right solution, Replique also brings the right mind-set and an excellent team to the table", says Oliver Kaul, partner at STS Ventures.

Angel investors chameleon GmbH and R3 consulting & investment GmbH round up the late seed funding, with great experience in machinery and data business.

"We're thrilled to have successfully spun off from Chemovator and to have secured ourselves the support

of such prominent investors, who have a strong experience in scaling startups and bring the strategic expertise to internationalize our business in an efficient way," says Dr. Henrike Wonneberger, co-founder of Replique. "We look forward to working closely together to achieve our goal of becoming the world's greatest digital inventory for on-demand parts."

Replique is already the fifth startup to spin off from Chemovator. Despite becoming an independent company, Replique maintains a close relationship with BASF as a customer as well as its subsidiary BASF 3D Printing Solutions, one of Replique's trusted material partners, and the whole BASF network. Markus Bold, Managing Director of Chemovator concludes: "We look forward to working together to continue Replique's path to success."

#### Replique as the one-stop shop for on-demand parts

The team around co-founders Dr. Henrike Wonneberger and Dr. Max Siebert offers an industrial 3D printing platform that enables OEMs to store parts digitally. Those parts are provided on demand to customers via a network of more than 80 trusted and certified print farms around the globe.

*Replique co-founders  
(all photos source: BASF)*

The secure platform is easily integrable into existing business landscapes such as ERP systems and webshops. This enables B2B businesses such as Alstom to leverage 3D printing in a smooth seamless supply chain process and B2C businesses like Miele and Siena Garden to offer 3D-printed parts to their customers.

Max Siebert, co-founder of Replique comments: "Our platform is designed to bring part management into the 21st century, and our approach has already proven its worth. We're excited to build on this momentum with the support of our new investors and partners."

Replique is now focused on expanding its reach and acquire new customers in various industries. With the proceeds, Replique plans to enhance the platform's development with new features, as well as invest in human resources.

#### About Replique GmbH

Replique GmbH provides a secure digital manufacturing platform that enables OEMs to provide parts on-demand to their customers through a global and decentralized 3D printing network of more than 75 facilities. As an end-to-end solution, Replique supports its customers along the entire value chain, including design,

technology and material selection, as well as digital warehousing. The solution easily integrates into the existing system landscape (e.g. ERP systems, e-commerce), and is already used by several OEM, such as Alstom and Miele. Replique was founded by BASF employees from the fields of material science and digitization.

#### About Chemovator GmbH

Chemovator is the business incubator of BASF. Complementary to the existing innovation landscape of BASF, Chemovator offers a protected space to test new business ideas, products or innovative services and turn them into investable and scalable business models.

The wholly-owned group company within BASF SE was founded in 2018 and is located in Mannheim. Here, Chemovator offers an unconventional startup environment with plenty of space for creativity. From early validation to successful commercialization, all Venture Teams receive support from experienced entrepreneurs and investors, who have built startups and new businesses from scratch. Their support ranks from coaching over mentoring to providing extended network opportunities. *smi*

**BASF**  
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# SACMI PVS10L: even more accurate controls and greater user-friendliness thanks to AI

*The offline system completes the SACMI PVS preform inspection range. Significantly, it incorporates the AI-based self-guided D.R.I.V.A. system that streamlines workers' tasks by minimizing format changeover times.*



**W**ith the PVS10L, SACMI renews its mission to achieve total quality control of the product by using both in-line and stand-alone inspection solutions. More specifically, the PVS10L enhances the SACMI machine family for in-line and sample inspection by incorporating computer vision systems with new AI tools.

## **Even more precise, more accurate quality control**

Providing maximum inspection accuracy and precision for preforms of different sizes and colors, this system includes patented polarized light inspection, one of the most evident outcomes of applying Artificial Intelligence. The result is maximum inspection precision, even when it comes to those defects that are invisible to the human eye yet can still cause major problems at the bottle blowing stage.

## **AI delivers the «self-guided» advantage**

One of the key features of the SACMI PVS10L is on-machine integration of

## ***PVS10L: off-line machine for Quality Control of PET preforms (all pictures: SACMI)***

the self-guided SACMI D.R.I.V.A. (Drive and Recognize through Intelligent Vision Algorithms) system. The system consists of Artificial Intelligence algorithms capable of:

- identifying each type of preform via its basic characteristics (diameter, length, color)
- autonomously performing the relative format changeover
- loading the right inspection recipe.

D.R.I.V.A. thus provides operators with close support, eliminating any possibility of error. What's more, autonomous systems slash changeover times from over an hour to about a minute, ensuring maximum sorting line availability.

## **Speeds as high as 36,000 preforms/hour**

The PVS10L line lets manufacturers handle and inspect up to 36,000

preforms per hour. It consists of six main machines: a tipper that picks preforms from the octabin and places them in a hopper with an elevator, and the PLO030 roller-type orientator, which features automatic format changeover in synch with the PVS10 inspection recipe. Then comes the heart of the system, the PVS10L inspection system with autonomous format changeover: after this step, faulty preforms are separated, via an elevator, and placed in a separate octabin. Good-quality preforms, instead, are gently placed in the final octabin, where each individual preform is counted and catalogued before packaging.

## **Software interoperability, always-available data**

Like the rest of the SACMI Computer Vision family, the PVS10L features CVs software, ensuring maximum usability and interoperability between machines. The software uses AI tools to read the cavity number printed on the finish with the utmost precision and repeatability, generating a comprehensive set of cavity-specific statistics. This data can then be shared on the web with the aid of OPC/UA, MODBUS and http protocols, making it simple to transfer production data from the vision system to ERP or MES systems.

This approach delivers improvements to product and process quality control by providing accurate, real-time statistical reports that allow retroactive action to be taken, correcting - and often anticipating - potential drifts in the process itself.



**Classy AI**

The PVS range implements the new Classy AI tool. While it does not change the control process itself - which already provides the highest accuracy - Classy AI immediately classifies defects by type on a user-friendly dashboard.

How does it do this? The left-hand side of the state-of-the-art Classy AI dashboard shows the detectable defect types, grouped into 'families' (accidental, technological, decoration-OCR, measures, specific). In the middle, an image highlights the area of the object with the defect. On the right of the screen, quality statistics let users identify any process trends/drifts concerning the specific defect.

Each defect family is, in turn, divided into subcategories. In the event of a problem, the operator is alerted by an icon that identifies not only its type but

its most likely source, allowing corrective action to be taken more quickly.

Classy AI thus implements a different approach to control, one that makes these systems easy to use, even for operators who are not necessarily Computer Vision experts.

**PVS: the complete range**

The PVS10L belongs to the broad SACMI PVS range of preform quality control systems: these differ according to application (in-line, as an aid for Quality Control labs, or offline for high-speed sorting of potentially defective preform batches). The ability to perform a comprehensive set of checks – including dimensional checks, weight checks and reading of cavity numbers – means that these systems play a pivotal role in keeping production ultra-efficient at all times. Other outstanding innovations include SACMI's recently launched PVS156, the first system for the intensive quality control of 100% of output to be integrated on the press.

**Classy-AI: CVS22 Artificial Intelligence platform**

**About SACMI**

SACMI is an international group, world leader in the supply of advanced technologies for the Ceramics, Plastics, Food & Beverage, Metals, Packaging and Advanced Materials sectors, thanks to the application of innovative technologies, its strong positioning on the world markets, and its continuous search for high quality standards and customer service.

Continuous investments in Research & Development - over 150 million euros invested in 3 years - allow SACMI to offer the market the best state of the art technologies, working alongside the customer to develop increasingly efficient, competitive and sustainable products and processes. *smi*

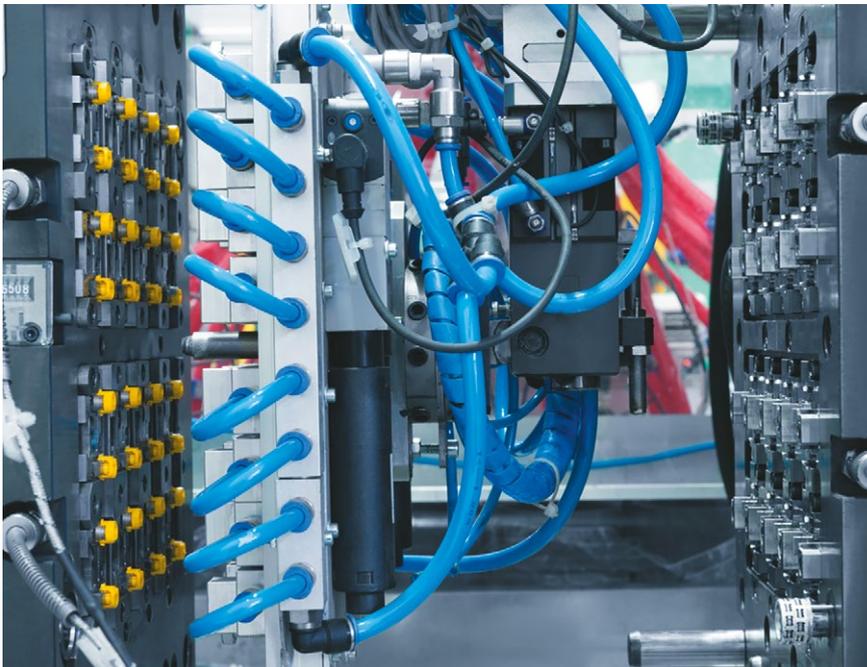
*Even more accurate controls and greater user-friendliness thanks to AI*

**SACMI**  
[www.sacmi.it](http://www.sacmi.it)



# Medtech: cavity pressure measurement facilitates GMP-compliant injection molding

*Kistler's sensors and systems play a pivotal part in quality assurance and injection-molding process optimization.*



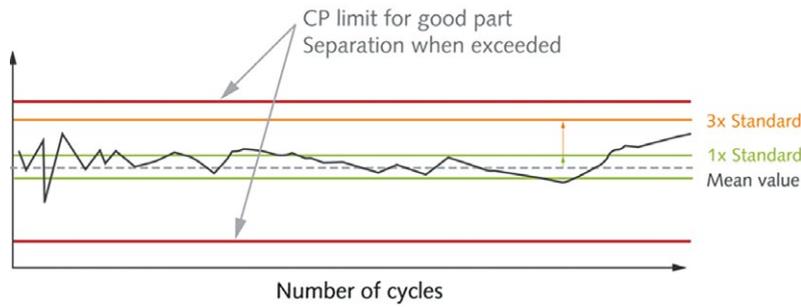
**P**roduct quality is the overriding priority when it comes to manufacturing injection-molded items for the medtech sector. Compliance with statutory requirements and standardization systems such as Good Manufacturing Practice (GMP) is also a fundamental requirement for every market player. But at the same time, global competition is pushing up expectations for production efficiency. The result? Manufacturers are striving not only to achieve reliable, reproducible and documented quality – but also to keep control of the costs involved. Cavity pressure measurement integrated into the production process gives injection molders an effective instrument that helps them to overcome this dual challenge.

*The ComoNeo process monitoring system is integrated directly in the injection molding machine to ensure higher product quality and process efficiency*

Good Manufacturing Practice (or GMP) comprises guidelines on quality assurance that govern the manufacturing processes and environments for a vast range of goods including medicinal products and medical devices. The goal is a high-quality production process all the way from material procurement through to warehouse logistics: the key to high product quality. But above and beyond this, quality management compliant with GMP and ISO 13485

should ensure that the regulatory requirements for marketing the products are met. In other words: validated high product quality is actually an essential condition in the medtech industry, rather than mainly a competitive advantage or differentiating feature as is the case in other industries.

The two core elements of GMP are qualification of machinery and plant, and validation of processes and methods. The first element requires a planned and documented multi-stage process to show that plant and equipment are basically suitable for the purpose, and that they do actually function reliably under the conditions prevailing on site. Process and method validation also calls for documentation and proof that the processes and methods used will generate reliable and reproducible results, and that the manufactured product will conform to the requirements. To achieve these high standards – especially as regards documentation – process monitoring based on cavity pressure has repeatedly proven its effectiveness in injection molding practice. This parameter is the most informative process value in injection molding, because it gives users a completely transparent view of the process to create a molded part. It goes without saying that this helps users to meet their documentation obligations. And as added benefits, cavity pressure monitoring simplifies process validation during machine setup and makes it easier to optimize production processes – with zero-



**Figure 1.** With the help of cavity pressure measurement, good and bad parts can be automatically differentiated and separated during production

defect production based on quality prediction models as the ultimate goal.

**Relevant correlation with part quality**

What makes cavity pressure such an informative and highly relevant value? As a process parameter, it is captured directly in the cavities with the help of pressure sensors. It precisely describes the processes taking place in the cavities, thus providing a transparent view of the conditions under which the part is being created throughout the injection molding process. Essential advantages: specific quality-related features of the part such as dimensional accuracy, surface characteristics, weight and degree of molding can be attributed to the cavity pressure profile during the injection, compression and holding phases. It follows that the cavity pressure profile can be considered as a fingerprint of the quality of the specific part that is currently being produced – it provides the basis for precise statements about optimal process parameters all through the production process. Good parts (OK) can already be differentiated from bad ones (NOK) while production is still in progress. For this purpose, the upper and lower limits of the key values are determined for validation of the respective process parameters. If the value determined from the curve then goes beyond the defined process window during production, the part

concerned is classified as NOK and will be separated automatically. The result is that only good parts continue further into the value chain. But this is not the only benefit: the characteristic values obtained can also be used as input for statistical process control (SPC) (see Figure 1).

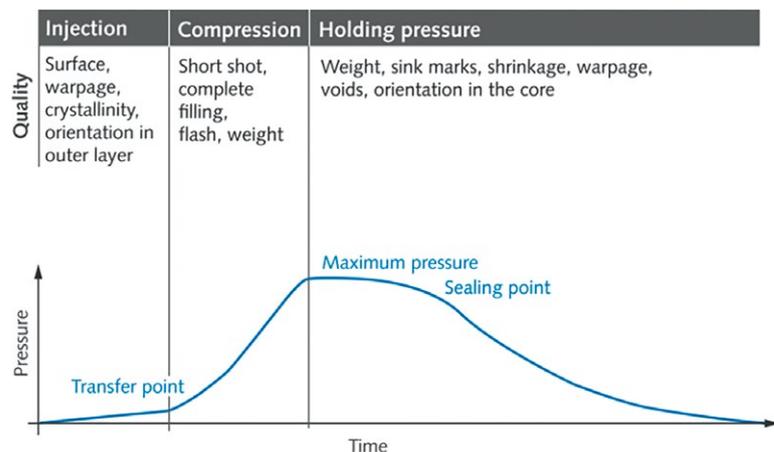
Validation based on cavity pressure measurement yields even more advantages: for example, significantly less effort is required as compared to methods that exclusively take account of machine process parameters. This is because the processes in the machine cannot adequately describe the formation of the molded part in the cavity, so correlation with part quality is difficult. To achieve consistent part quality, the machine parameters then have to be adapted to new conditions – such as changes in material behavior when batches of

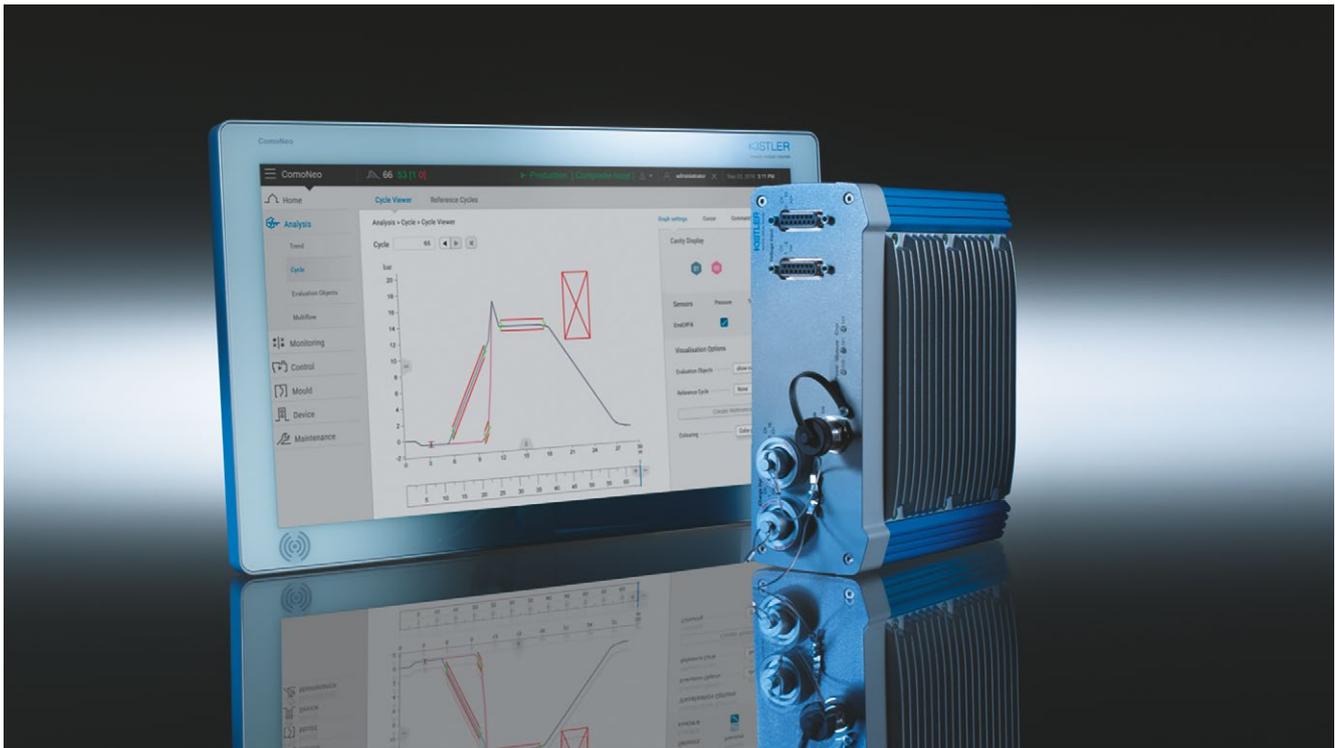
different materials are processed. If the fluctuations are so pronounced that the tracked settings are outside the previously validated process window, the process needs to be validated again – which involves a series of time-consuming trials. This can all be made far easier by using cavity pressure measurement, so the correlation between measured values and quality characteristics is known (Figure 2).

**Smart combination of measurements and statistics**

A process monitoring solution based on cavity pressure measurement consists of sensors that are highly precise but also robust, together with a process monitoring system such as ComoNeo from Kistler. In this case, the ComoNeoPREDICT functionality combined with the STASA QC software enables the system to provide efficient, automated documentation of the test plans (Design of Experiments, or DoEs), and also to perform the corresponding process analyses. This user-friendly functionality can be implemented efficiently on the shop floor, so operators can take a decisive step towards zero-defect production: ComoNeoPREDICT makes it possible to determine the expected quality characteristics from the measured values, with no need to expend effort on measuring the parts. Thanks to this solution, a part's quality can be predicted even before it is manufactured – including the necessary documentation.

**Figure 2.** The cavity pressure values measured during injection molding phases correlate to the parts' quality characteristics





**Preventive quality assurance**

Operating ComoNeoPREDICT in combination with the STASA QC software also reduces the effort required during process analysis and development. To find a stable process window on a qualified machine in the final phase of process development, coordinated DoEs need to be created and executed. The purpose of the DoE with varying machine parameters is to achieve variance of the process conditions represented by the cavity pressure so as to cover the process window.

Mathematical correlation of the measurement values with the continuous, attributive quality characteristics that are measured afterwards supplies a model for ongoing prediction of the quality of each part produced. The model attains a very high degree of accuracy thanks to special algorithms and the use of machine learning in the STASA QC software. This makes it possible to predict part quality during production, and also to separate parts that are out of tolerance. In practice, this function is

*The ComoNeo 2.1 process monitoring system visualizes and evaluates cavity pressure (all pictures: Kistler)*

performed on a fully automated basis by the ComoNeo process monitoring system and the embedded function of ComoNeoPREDICT. The benefits: the required quality can be guaranteed, and testing costs can be drastically reduced – giving injection molders ideal conditions to safeguard their competitive edge.

**About the Kistler Group**

Kistler is the global market leader for dynamic pressure, force, torque and acceleration measurement technology. Cutting-edge technologies provide the basis for Kistler's modular solutions. Customers in industry and scientific research benefit from Kistler's experience as a development partner, enabling them to optimize their products and processes so as to secure sustainable competitive edge. Unique sensor technology from this

owner-managed Swiss corporation helps to shape future innovations not only in automotive development and industrial automation but also in many newly emerging sectors. Drawing on our extensive application expertise, and always with an absolute commitment to quality, Kistler plays a key part in the ongoing development of the latest megatrends. The focus is on issues such as electrified drive technology, autonomous driving, emission reduction and Industry 4.0. Some 2,000 employees at more than 60 facilities across the globe are dedicated to the development of new solutions, and they offer application-specific services at the local level. Ever since it was founded in 1959, the Kistler Group has grown hand-in-hand with its customers and in 2021, it posted sales of mCHF 411. About 7% of this figure is reinvested in research and technology – with the aim of delivering better results for every customer. *smi*

**Kistler**  
[www.kistler.com](http://www.kistler.com)

# Optimized mold tempering: Simulation provides insight and reliable improvement

At the Moulding Expo, SIGMA Engineering presents the simulation-based design of tempering systems using SIGMASOFT®.



At the Moulding Expo 2023 in Stuttgart (June 13-16, 2023), SIGMA Engineering GmbH presented insights into mold simulation and the simulative design of tempering systems using SIGMASOFT®. Simulation is critical to project success in plastics processing, including tooling, where geometries, gating position, and process design can already be optimized. /H&B/ELECTRONIC relies on SIGMASOFT® for the design and dimensioning of temperature control channels.

Cooling is critical to the quality of thermoplastic components. Temperature differences lead to different cooling rates and create residual stresses and warpage in the finished component. This becomes problematic when there are differences in wall thickness within the component, as the cooling requirements are highly variable locally. Conformal cooling, meanwhile, is an established concept in tooling that is increasingly being used. Simulation allows the cost of conformal cooling to be evaluated in advance against the advantages of the conventional concept (improved component quality, shorter cycle times, etc.).

3D printing has revolutionized the possibilities for component production. It is now possible to produce completely arbitrary channels (regardless of feasibility using milling, drilling, assembly, and sealing). /H&B/ELECTRONIC and SIGMASOFT® have carefully examined the simulation-

*Mold temperature control on the left using conformal cooling, on the right using conventional cooling (all pictures: SIGMA)*

based design of a novel temperature control system made using 3D printing. The results will be shown at both exhibitors' stands at the trade fair.

«Analysis and fluidic design of cooling channels are just one of dozens of successful applications of SIGMASOFT®,» explained Timo Gebauer, CTO of SIGMA. «What they all have in common is the ability to understand what is happening before money and time are invested. This was an exciting project where we were able to accompany this successful innovation.» Jan Bayerbach, Head of

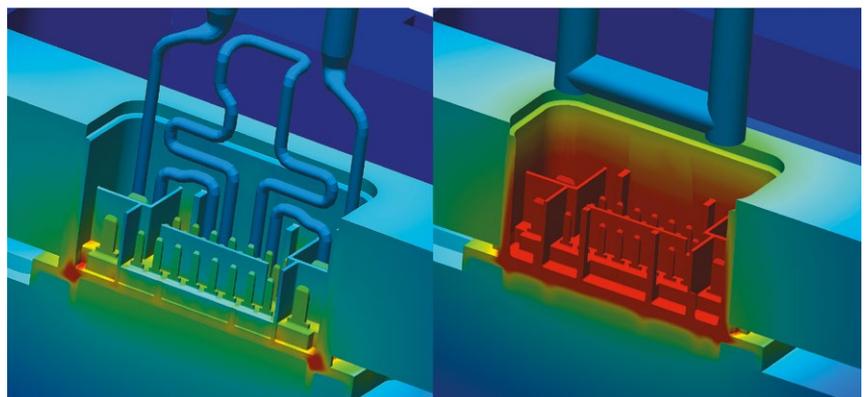
*Temperature distribution just before demolding, with conformal cooling from 3D printing on the left (only visible halfway trough), and conventional cooling on the right*

Development & Construction at /H&B/ELECTRONIC, added: «We have been relying on SIGMASOFT® for many years to develop and optimize our products before they are even manufactured. The good correlation between simulation and reality has always impressed us. We are particularly proud of the mold inserts we developed using 3D printing.»

## 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. **smi**

SIGMA  
[www.sigmasoft.de](http://www.sigmasoft.de)





# ELIX Polymers received approval from premium Automotive OEM for anti-squeak materials

- *New grades reduce undesirable noises*
- *New possibilities have been offered to significantly cut down costs*
- *They are in line with ELIX's focus on specialty added value products*

Picture source: ELIX Polymers

**E**LIX Polymers has developed a range of speciality grades of ABS and PC/ABS to reduce the squeaking and rattling sounds that are generated by plastic parts making contact with other plastic parts, leather, PVC-foil or other products. These undesirable noises can negatively affect the driver's comfort as well as their perception of the quality of a car. Especially with the increase in popularity of electric and hybrid vehicles whose powertrains make less noise, anti-squeak materials are more often required by Automotive OEMs to produce critical interior parts like door handles, armrests, seating parts, sun-roofs, cupholders and air vents. Several ELIX products have received approvals from a German premium Automotive OEM and will be used in future cars.

The materials were subjected to stick-slip tests according to VDA230-206 at testing machines from Ziegler Instruments with very positive test results: a 10-point scale was used, where 10 is the highest risk level. The newly developed ELIX grades managed

to score 1 – the lowest risk level. Tests were conducted with different forces (10 N, 40 N) and speeds (1 mm/s and 4 mm/s) at several temperatures. Especially relevant successful results were obtained after the heat aging of materials where the risk normally increases in standard non-modified materials.

The new grades use ELIX Polymers' base polymers: standard ABS, high heat ABS, ABS/PC or PC/ABS - and because their key properties remain the same, this does not affect existing OEM approvals of ELIX grades. Furthermore, as the shrinkage of the materials remains the same, current moulds can be used without further need for modifications. Significant cost savings are possible using these products, as no felts, tapes or grease need to be added after the injection and assembly of parts to reduce squeaking and rattling sounds. This new development is the result of ELIX Polymers close partnership with leading Automotive OEMs and its strategy directed at focusing on specialised added-value

materials and the development of tailor-made solutions.

## About ELIX Polymers

ELIX Polymers, a member of Sinochem International, is a leading manufacturer of ABS (Acrylonitrile-Butadiene-Styrene) resins and derivatives in Europe.

Operating from its head office in Tarragona, Spain, and with Sales support teams in all key markets, the company is a specialist provider of tailor-made solutions for high quality thermoplastics applications. With more than 45 of track record, ELIX Polymers is an expert in ABS polymers, and it has the resources, the expertise and the experience to create value for its customers through highly individual solutions.

ELIX Polymers offers a broad range of material solutions for a variety of industries and applications, meeting the stringent requirements of the Healthcare, Automotive, Appliances, Electronic, Toys and other industries.

**smi**

**ELIX Polymers**  
[www.elix-polymers.com](http://www.elix-polymers.com)

# Teknor Apex creates color masterbatch solutions for UBQ Materials' thermoplastic

*The new coloring capability makes UBQ™ a perfect sustainable material swap for applications such as point of purchase displays, pallets and more and has already been in use with major brands in both beverage and industrial industries.*

**T**eknor Apex announced a new color masterbatch solution for UBQ Materials' bio-based thermoplastic, UBQ™ in May. Expanding its partnership with the climate-tech developer, Teknor Apex's new solution includes the development and supply of highly chromatic colors that incorporate UBQ's sustainable products made entirely from unsorted organic and unrecyclable waste.

Teknor Apex's color masterbatch solution enables UBQ™ to be compounded with a brighter spectrum of colors beyond the initial brown, black and grey of the climate-positive thermoplastic. Adding specialty colorant masterbatch or specially formulated colorants to UBQ™ compounds allows customers to meet sustainability goals while still providing a visually appealing end-product.

Chromatic colors not previously achievable with UBQ™ are now a reality. The new coloring capability makes UBQ™ a perfect sustainable material swap for applications such as point of purchase displays, pallets and more and has already been in use with major brands in both beverage and industrial

industries. The masterbatch can be added to a wide variety of plastics and can be processed by injection molding, extrusion, and other processes.

UBQ™ is a sustainable plastic substitute converted entirely from unsorted organic and unrecyclable household waste that have been diverted from landfills. It is a novel, worldwide patented material that has already been adopted by leading industry brands for manufacturing durable products with reduced environmental footprints. Teknor Apex has been an early adopter of UBQ™ developing eco-conscious thermoplastic elastomers (TPE) made with 35% sustainable content, paving the way for other materials companies to develop more sustainable products within a circular economy.

"By incorporating UBQ™ into our color matching process, we are introducing options to the market that are both aesthetically pleasing and better for the planet – enabling our customers and furthering our own commitment to sustainability," said Jordan Wolfe, Technical Manager, Color Division of Teknor Apex. "Customers are able to achieve a carbon neutral or carbon negative impact while still maintaining

quality and visually engaging end products for their consumers."

Teknor Apex Company prides itself on offering a full line of custom and standard colors, as well as additives and special effects for a wide spectrum of polymers that include PVC, olefins, styrenics, PET and engineering plastics. Working extensively with sustainable additives, bio-based pigments and polymers and partnering closely with our customers has enabled innovative new color concepts and differentiated products in the marketplace.

"Teknor's color masterbatch products combined with our bio-based thermoplastic strengthens our shared commitment to reshape how things are made and improve the footprint of everyday products," said Liat Arad, VP of Marketing for UBQ Materials. "We all have a role to play in reducing methane emissions, through this new colorful 'Made with UBQ™' product line, manufacturers have the ability to make vibrantly colored products, while contributing to a truly circular economy where human consumption lives in harmony with the planet." **smi**

**Teknor Apex**

[www.teknorapex.com](http://www.teknorapex.com)

*Picture: Teknor Apex*



# LEONHARD KURZ takes the packaging industry one step closer to the circular economy

*The recycled injection-molded granulate already saves up to 40 percent CO<sub>2</sub> compared to virgin material, is suitable for the production of stable and durable plastic products. Thanks to optimized processes, RECOSYS® 2.0 now not only enables even more KURZ products to be reclaimed, but also expands the application possibilities of the recycled material.*



Picture: LEONHARD KURZ

interpack 2023, the world's largest trade fair for the packaging industry and the related process industry, took place in Düsseldorf from May 4 to 10. In line with the trend topics of the circular economy and resource conservation at the event, LEONHARD KURZ presented RECOSYS® 2.0 to the public as a real trade fair highlight. This is the further development of the take-back and recycling system for PET transfer materials launched by KURZ, the first company in the world to introduce a system like this in the plastic industry. The Fürth-based thin-film specialist is thus taking the packaging industry one step closer to the circular economy.

The first major step in this direction was already taken with the introduction of RECOSYS® and the post-industrial compound RECOPOUND®. The recycled injection-molded granulate already saves up to 40 percent CO<sub>2</sub> compared to virgin material, is suitable for the production of stable and durable plastic products, and can also be decorated

to a high quality. Thanks to optimized processes, RECOSYS® 2.0 now not only enables even more KURZ products to be reclaimed, but also expands the application possibilities of the recycled material.

With the help of RECOSYS® 2.0, surplus carrier materials from the graphic industry can now be processed into recycled PET (abbreviated: rPET) for the first time. rPET is used, among other things, in the manufacture of plastic bottles or plastic packaging and also offers a wide range of possible uses. "We are currently the only manufacturer in the industry that converts the PET carrier of our ultra-thin transfer decoration into valuable raw material. Our long-term goal is to recycle all our products and use them to produce new carrier material. This will enable us to achieve a truly circular economy in the future, where excess material no longer has to end up in the trash," says Rolf Schmidtke, RECOSYS® 2.0 project manager at LEONHARD KURZ.

All customers participating in RECOSYS® receive a recycling certificate, which is confirmed by the independent environmental expert organization Intechnica Cert GmbH. This certificate confirms the traceability of the process, and transparency towards end customers and consumers. It also provides information on the annual CO<sub>2</sub> savings. RECOSYS® 2.0 can also reduce scope 3 emissions, i.e., greenhouse gas emissions along a company's entire value chain, by up to 90 percent. This is achieved, among other things, by avoiding burning carrier materials, a lower product carbon footprint (PCF) and general conservation of resources, as the use of primary raw materials for the extraction of PET is not necessary. With RECOSYS® 2.0, KURZ customers get a demonstrably optimized sustainability balance and a distinct competitive advantage that also benefits our environment. **smi**

**LEONHARD KURZ**  
[www.leonhard-kurz.com](http://www.leonhard-kurz.com)

# exhibitions calendar



## PLAST

5-8 September 2023  
Milan, Italy  
[www.plastonline.org/en/](http://www.plastonline.org/en/)



## Fakuma

17-21 October 2023  
Friedrichshafen, Germany  
[www.fakuma-messe.de](http://www.fakuma-messe.de)



## Formnext

7-10 November 2023  
Frankfurt am Main, Germany  
[www.formnext.com](http://www.formnext.com)



## Plastimagen

7-10 November 2023  
Mexico city, Mexico  
[www.plastimagen.com.mx](http://www.plastimagen.com.mx)



## Plast Eurasia

22-25 November 2023  
Istanbul, Turkey  
[www.plasteurasia.com](http://www.plasteurasia.com)



## IPF

28 November -  
2 December 2023  
Tokyo, Japan  
[www.ipfjapan.jp/english/](http://www.ipfjapan.jp/english/)



## CHINAPLAS

23-26 April 2024  
Shenzhen, China  
[www.chinaplasonline.com](http://www.chinaplasonline.com)



## NPE

6-10 May 2024  
Orlando, USA  
<https://npe.org/>

PLAST is an international trade exhibition for the plastics and rubber industry, where interested visitors can get a complete overview of the latest developments in the industry from raw materials to finished products, from machinery to services. PLAST will coincide with the exhibitions Ipack-Ima, Grafitalia and Converflex that are dedicated to packaging, graphics and converting. PLAST hosts three satellite-shows: RUBBER, 3D PLAST and PLAST-MAT.

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 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.

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.

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 more than 60.000 professional visitors from more than 100 countries.

The **IPF - International Plastic Fair** - is Asia's leading trade fair for plastic and synthetic material. International exhibitors, including the world leaders in the industry demonstrate innovative products and machinery once every 3 years (IPF Japan 2020 was cancelled due to the novel coronavirus pandemic). Visitors will find raw materials, machines, molds and services relating plastic and rubber production.

**CHINAPLAS** is the largest plastics and rubber trade fair in Asia and widely recognized by the industry as one of the most influential exhibitions in the world. The rapid development of science and technology has dramatically increased the range of applications of plastics and rubber in various manufacturing sectors, including automobile, electronics and electrical appliances, information technology and telecommunication, building and construction and others.

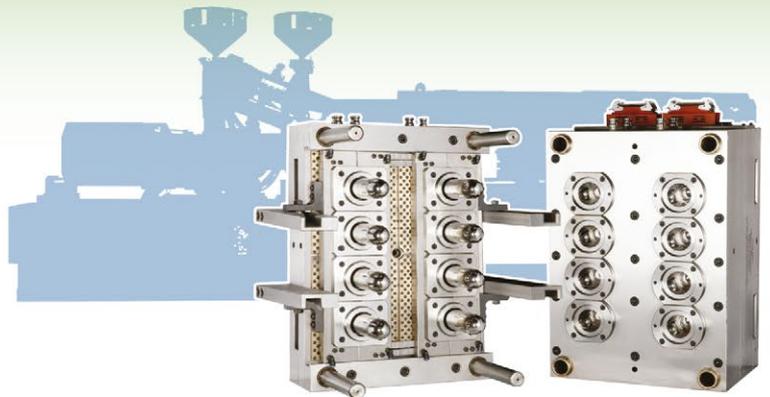
With more than 55,000 leaders from over 110 countries representing every industry—from automotive to healthcare to consumer products to construction and more, **NPE** is the largest plastics trade show in the Americas and one of the most innovative business events in the world. Every three years, bold leaders, creative thinkers, and visionaries gather at NPE to advance their business through innovations in plastics.

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