

# INNOVATIONS

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Hennecke customer magazine for technologies and trends on the polyurethane market



## Next Generation

Metering machines  
on a new level

HIGHLINE MK2<sup>NEXT</sup> GEN METERING MACHINE

ECOPLUS MK2<sup>NEXT</sup> GEN





## SUCCESSFULLY FORGING AHEAD WITH THE TRANSFORMATION TO HENNECKE 2.0

Dear customers and business partners,

After launching our transformation to Hennecke 2.0 in 2019, we are making excellent progress with striking results in many areas. This can be clearly seen in our latest issue of INNOVATIONS, which has a fresh new look, and features an array of new and fascinating topics for you to enjoy.

One important milestone and outcome from the last two years is the focus of our booth at the K Trade Fair: the Next Generation Metering Machines. Our new generation of high-pressure metering machines have been re-engineered from the ground up, combining state-of-the-art technology with decades of expertise. The ECOPLUS MK2 has been available since the summer, and we will be presenting the HIGHLINE MK2 to the public for the very first time at the K Fair in Düsseldorf. Since introducing the Hennecke Business System in 2019, the Hennecke GROUP management has been striving for systematic and continuous development. The next generation metering machines are the direct result of implementing and consistently applying the Hennecke Production System (HPS). Both these systems have been set up successfully across the Hennecke GROUP and have already proven their worth over the past two crisis-ridden years.

Another focal point of our K Fair booth is the ECOFILLER PLUS, a brand-new product from our Environmental Technologies product line. This recycling solution for rigid foam applications represents another of the Hennecke GROUP's contributions to increased sustainability in the polyurethane industry (more about this from page 4). We also report on many other innovations developed in-house at Hennecke, giving operators and polyurethane processors completely new opportunities and standards of quality. A highlight here is the high-pressure HX metering pump that has been specially developed for processing polyurethane. Representing a successful example of our expertise pooled from 75 years of PUR competence, the HX pump is the centerpiece of Hennecke high-pressure machinery (from page 12).

As you will see, Hennecke is moving forward with pure drive and determination. Come and join us on our path!

Yours,

Thomas Wildt,  
CEO Hennecke GROUP

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Living sustainability for 75 years



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Precise, highly efficient, and fit for the future – the new HX pump generation



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Protected through clearmelt technology

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# LIVING SUSTAINABILITY FOR 75 YEARS

There are several reasons why sustainability is one of the prevailing hot topics in the PUR sector and at the K Trade Fair 2022. Environmental and climate protection have long been prompting companies to find new solutions, and the rising CO<sub>2</sub> tax is also playing its part. But it is the current geopolitical events and subsequent energy crisis in particular that are bringing a new impetus and dynamic to the industry.





### PUR – a material for climate protection

Plenty of polyurethane applications are actively contributing to climate protection; there is hardly any other material that offers such comparatively low heat conductivity as polyurethane foam. Insulating with polyurethane lamination boards or sandwich panels considerably reduces energy consumption in buildings – from tiny houses up to large industrial warehouses. Other typical application areas include insulation solutions for refrigerators, freezers, air conditioning units, truck trailers, and pipelines. The automotive industry, on the other hand, profits from modern lightweight applications based on PUR which help to make vehicles lighter and safer, and in turn boost their fuel efficiency.

Polyurethane applications for large-scale production take center stage here and can be found in nearly every single vehicle – trunk floors, linings, roof modules, seats, springs, and many other interior and exterior parts are manufactured using special PUR processing techniques. These are usually sandwich-style constructions with a core made of paper honeycomb or fiber-reinforced structural components, which are both extremely strong and low weight. Insulation with polyurethane also plays an important role in district heating systems, for example in combined heat and power units. These involve safely transporting hot steam through highly complex, underground pipe networks from the point of origin to the point of delivery, without great energy losses. The pipes are manufactured in a continuous process by injecting PUR foam into a casing pipe or using a spray technique, which provides insulation and protection against external influences. The PUR coating maximizes energy efficiency and at the same time safeguards the pipe against damage.

### Sustainability is a gain, not a sacrifice

To put it simply: significant resources can be conserved in many places thanks to diverse polyurethane applications with so many positive attributes. The raw materials used in the process are also a crucial factor. Here the raw material suppliers adopt different approaches, such as bio-based polyols using renewable resources, or recycled content polyols that use a chemical recycling process for making flexible foam products. And the production process itself is also key. By inventing highly efficient high-pressure mixing technology, Hennecke has been pioneering innovations for decades.

## » ENERGY SAVINGS THROUGH 'BLUE INTELLIGENCE'

Under 'Blue Intelligence', Hennecke brings together wide-ranging measures for mechanical, thermal, and hydraulic efficiency. These enable the user to make energy savings of up to 50 percent, depending on the production scenario. This makes a considerable impact, especially with small and irregular production sequences. Besides smart temperature measuring, the set of measures includes an innovative start-stop system that switches the modules that are temporarily required on and off with pinpoint accuracy. Automatically calculated and controlled pump lead times also result in noticeable energy savings with the application. Furthermore, elaborate computer simulations are used to analyze and optimize the fluid mechanics in the metering pumps, injectors and mixheads, increasing their efficiency.

"From the outset, resource efficiency has been deeply embedded in our DNA," says Thomas Wildt, CEO of the Hennecke GROUP. "Based on economic considerations, the goal of Hennecke technology has always been to produce a consistently high quality with the fewest possible raw materials and without waste. And so, as a result, our economic and ecological objectives coincide." Sustainability in the form of efficient use of raw materials was and continues to be the primary selling point for Hennecke's machine and systems technology, long before the concept ever reached the industry. It is no coincidence that over the decades, Hennecke's resource-saving, high-pressure PUR mixing technology has established itself as the global standard.

### Continual development

For all its resource efficiency, however, the high-pressure process itself is an energy-intensive technology. Hennecke is therefore constantly working to improve its machines' energy consumption and continually making new advancements and further savings in this area. The new generation of Hennecke metering machines is a prime example – the Next Generation Metering Machines are highly energy-efficient thanks to innovative technology and digitalization. This involves employing Hennecke's 'Blue Intelligence' (see box) on the one hand and making consistent use of digital possibilities on the other. It includes, for example, using intelligent sensor technology to measure temperature and pressure for monitoring purposes and precision control. A completely new set-up has also been introduced within the control platform to enable operation at different digital levels, including cloud connection and possibilities for remote monitoring. "All the production data can be monitored, controlled and activated as required using the FOAMATIC IoT. This means, for example, that a forklift operator can receive push-notifications when a tank is empty and needs refilling, so that production is constantly running," explains Thomas Wildt. IoT also enhances the area of predictive maintenance, which helps to detect problems and faults in advance, preventing malfunctions at an early stage.

### New product line: Environmental Technologies

In time for the K Trade Fair, Hennecke is launching another innovation as part of a new, sustainable product group. The ECOFILLER PLUS gives operators the chance to re-introduce recycled PUR cuttings and waste from their rigid foam production back into the production process. Developed by Hennecke-OMS in Italy together with a cross-sectional team,

this product is on offer as an add-on to existing metering units. It is a plug and play system, comprising a modular and compact basic structure that groups together the tanks, the various metering units (liquid, fillers and mixture), as well as the electrical control and management panel. Suitable for the most common rigid foam applications, ranging from sandwich panel production to continuous slabstock production, the ECOFILLER PLUS is the perfect complement to all Hennecke GROUP product lines. "The ECOFILLER PLUS is a real asset both ecologically and economically," says Thomas Wildt, "when you consider that

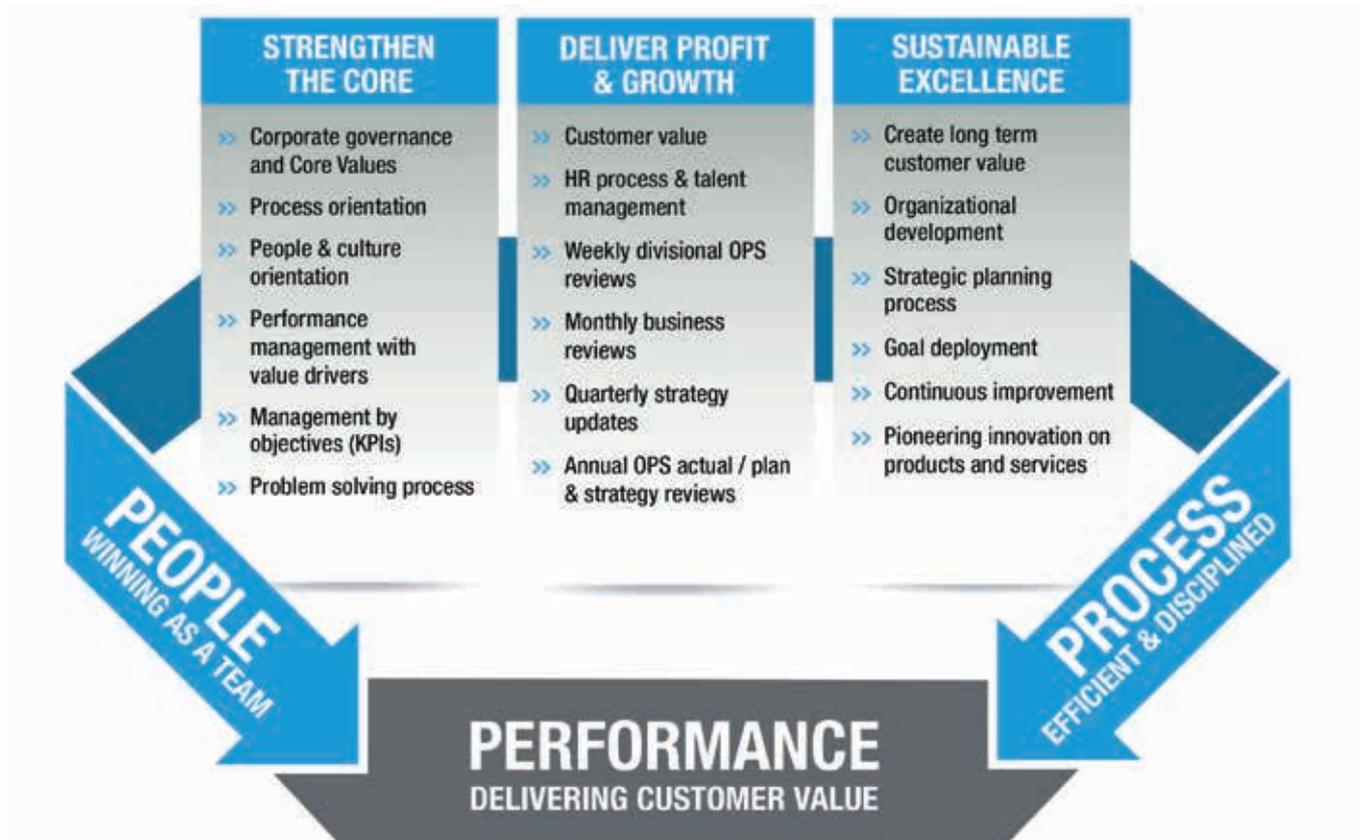


*The ECOFILLER PLUS is the first product from the new Environmental Technologies product line and allows cuttings and material waste from production to be recycled.*

even in highly resource-efficient sandwich panel production, depending on the type and shape of the end product, around 10 percent of the waste generated can now be re-fed back into production."



*The PANELMASTER's innovative and highly efficient heating system significantly reduces the energy used by the plant.*



The Hennecke Business System (HBS) was introduced in 2019 and has already proved its worth in the past crisis-ridden years.

### Fresh thinking in product development

Sustainable aspects are absolutely fundamental to product development for new machines and systems. This is why the company's evaluation tools such as Business Model Canvas include people and planet along with profit. The environmental footprint of all Hennecke products has also been re-defined. This refers not only to the floor space required by the product, but also includes aspects such as transport and logistics. The last two years in particular have demonstrated that a reduction in the machine's floor area makes a real difference, as now two metering machines can be shipped in a container instead of just one. "And last but not least, the extremely long service life of Hennecke products makes a double contribution to sustainability," says Thomas Wildt. "On the one hand, the operators save on raw materials in their production, and on the other hand, they benefit from a long life cycle." Furthermore, Hennecke's retrofit packages provide their customers with crucial technological updates throughout the machine's entire service life.

### Sustainability for future security

Most people think of sustainability in terms of climate protection and energy saving. However, operating a business sustainably also involves forward-looking planning and long-term stability. This gives security not only to the company but also to its customers. Anyone investing in a Hennecke metering machine or entire production line can be assured that the company is cus-

tomers-centered in the long-term, and that its service and retrofit measures will still be available in years to come. As part of the transformation to 'Hennecke 2.0', Thomas Wildt introduced the Hennecke Business System (HBS) in 2019, aiming to create an agile and self-learning organization.

The managers and staff of the entire Hennecke GROUP have been trained using process mapping and standardized problem-solving processes to ensure that all projects and services are provided on schedule to the utmost quality standards. This transformation has begun with great success! The system has already proven its worth during the COVID pandemic. "In contrast to industry trends, we did not have to lay-off any staff, and we emerged from the crisis a profitable company without relying on government loans. Despite the current geopolitical upheavals and insecurities, our customers, banks and investors have complete trust in us," says the Hennecke GROUP CEO. Thomas Wildt has every reason then to be confident about the future. Of one thing is certain – in the next 75 years, Hennecke will remain the first point of contact for resource-saving PUR applications. ■



# NEXT GENERATION MACHINES – METERING ON A WHOLE NEW LEVEL

Under the name 'MK2', Hennecke is bringing a new generation of high-pressure metering machines from its core portfolio to the market. This is not just about making tweaks or modifications. On the contrary, the globally established ECOPLUS, HIGHLINE and TOPLINE products have been completely revamped and redeveloped, with a focus on energy efficiency, sustainability, productivity and digitalization. As well as adding to the names, Hennecke is introducing this new, defining advancement for an entire product line as 'Next Generation Metering'. The name says it all.

### New paths in production

The 'Next Generation' is the successful outcome of a long process that goes far beyond the processing machines themselves. It all began with a step-by-step, resolute rollout of Kaizen projects across the entire Hennecke GROUP. The methodological approach behind the term Kaizen places the pursuit of continuous improvement at the heart of work philosophy. From this emerged the Hennecke Production System (HPS) which aims to ensure a sustainable and successful future for the Hennecke GROUP's international production sites through an effective combination of appropriate procedures and design principles. As a consequence, the HPS is a variant of different lean production systems, fully tailored to Hennecke. The main added-value of the HPS lies in the interlinking of the different production areas, which allows for a synchronized, waste-free production that is aligned with customer demand. This includes reducing stocks and wait times whilst maximizing quality and on-time delivery. "It is important to note that this development was not a one-off challenge for us," explains Svend Weidemann, President BU Germany. "We are constantly reviewing, developing and optimizing our products and our processes."

### The advantages of standardization

With over 75 years' expertise in polyurethane processing, Hennecke now has an extensive product portfolio, and, as a specialist in PUR machine construction, offers customized solutions in an array of different areas and sectors. Hennecke's in-depth knowledge of both the market and its customer needs led the company to re-examine its high-pressure metering machines from different perspectives. But for the 'Next Generation' it wasn't just about typical factors like investment cost, productivity and cost of sales. A lot more consideration was paid to future-relevant aspects. How much energy is required? How sustainable is the product? How much floor space is needed? How can we harness big data through digitalization? What happens at the end of the product's life cycle? These are issues that place customer value in the foreground and are more vital today than ever before. Rather than providing a bespoke approach, the main goal of the redevelopment was to offer pre-configured solutions which would meet the majority of market demands. These new standards can be customized through a number of optional modules, offering the customer major benefits: faster production, shorter lead times, reduced costs and a more simplified process – from machine selection right through to commissioning. The new management systems have led to noticeable improvements here. In the rare case that the options on offer are insufficient for specific production scenarios, Hennecke remains open to tailored solutions. Customers still benefit from the global market leader's full spectrum, even for complex applications or challenging raw material systems. This applies in particular to the upcoming TOPLINE MK2.

### Next Generation – developed for the future

Rather than giving the existing high-pressure machines a simple overhaul, Hennecke has engineered a completely new

machine generation. This is reason enough for adapting the name. MK2, meaning mark 2, is a clearly structured nomenclature that documents the major development of a new product generation without changing the renowned brand names. "This means that, on the one hand, we are retaining the names ECOPLUS, HIGHLINE and TOPLINE, well-established on the market for decades, and, on the other hand, by making an addition to the name, we are clearly demonstrating their extensive upgrade," says Torsten Spiller, Marketing & Communications Director.

The ECOPLUS MK2, an entry-level model, has already been on the market since July 2022. "On 1 January 2023 we will bring out the highly efficient, multi-talented HIGHLINE MK2, followed

***“For Hennecke, the new generation represents another milestone moving forwards.”***

Jens Winiarz,  
Senior Sales Director at Hennecke

by the TOPLINE MK2 in July 2023 as the flagship, high-pressure machine that meets the toughest demands," promises Jens Winiarz, Senior Sales Director at Hennecke. The launch of the new generation also marks the end of a successful era for Hennecke. For production reasons, the previous model generations for the three-machine series are gradually being discontinued, starting with the ECOPLUS.

### Effective savings thanks to Blue Intelligence

Hennecke's first-class, high-quality equipment is the common denominator between all the models. For example, the new HX metering pumps, a state-of-the-art and revolutionary in-house development by the company (see also the report on page 12). The machines are operated using the newly developed FOAMATIC, an innovative and forward-looking control platform based on the latest SIMATIC components, bringing the control system, user interface and data analysis to the next level. Customers will also be impressed by the optimized component parts in the metering lines, a standard feature in all Next Generation machines. The series of mixheads available are top class: manufactured in-house with great precision using high-strength steel and an innovative surface coating, they combine optimal functioning with a long service life. First-class product results can be expected thanks to the enhanced mixhead chamber design and highly efficient static FIXJET or constant pressure FLEXJET SL injectors. The intelligent machine design and modular construction make servicing and maintenance straightforward. Each next generation machine features Hennecke's 'Blue Intelligence' as a standard technology package. This encompasses all types of resource-saving interventions together with smart digitalization. Including, for example, an intelligent temperature control system

and efficient stand-by mode. The combination of these measures effectively supports energy and material savings. Likewise, proactively monitoring the relevant component parts ensures a safe-running production process without interruption.

### Customer-friendly pricing and sales structure

The pricing has also been reworked. Standardizing the models and modules enables a new pricing structure with fixed prices worldwide. Individual modules or an entire package of options can be added to meet specific requirements, like for example the Efficient Temperature Concept which comprises four different elements. For the customer, this makes the selection and ordering process not only clearer, but noticeably easier and quicker. For the ECOPLUS MK2 which is already on the market, it also results in a significantly lower starter price. Even at a time when competitors' prices are going in the other direction. "For the near future, we are also developing a machine configurator on a separate B2B platform," explains Jens Winiarz. Similar to a car configurator, the selected model can be adapted to match the customer's specific requirements. Starting with one of the three models, the order can be tailored to the customer's own production processes with a variety of optional modules or a ready-made package of options.

### Success all round

"For Hennecke, the new generation represents another milestone moving forwards and will reinforce our position as global market leader," assures Jens Winiarz. "Here our company combines decades of expertise in polyurethane processing with focused market intelligence." Driven by sheer determination to continuously improve itself and its products, Hennecke is reaching new heights. The customer benefits from this process, counting as before on extremely reliable and durable machine technology, but still gaining a huge performance plus with the Next Generation machines. And all this at an attractive price, with faster lead times and smart technology that saves energy, raw materials and costs. ■

## CLEAR BENEFITS FOR CUSTOMERS

- **Satisfying all demands:** From the entry-level machine for high-pressure metering up to the multi-functional all-rounder – with the three models in its Next Generation lineup, Hennecke has the perfect machine for every customer.
- **Faster production and lead times:** Order to delivery times are significantly shorter thanks to innovative engineering, a considerably enhanced assembly line, utilization of common parts, and optimized supply chains.
- **Blue Intelligence:** A sophisticated and customized set of measures combining resource efficiency and digitalization. Not just smart and sustainable, but also permanently reduces production costs.
- **Long product service life:** Quality lasts and pays off in the long-term. Many of Hennecke's machines are still operating trouble-free decades later.
- **HX pump technology:** The first metering pumps designed specifically for PUR applications are precise, efficient and fit for the future.
- **Intelligent control system:** The innovative FOAMATIC control system is based on the latest generation SIMATIC components and, together with a premium HMI and high-performance SPS, offers a completely new and intuitive user interface. The operator can be sure of maximum performance and fast access for the widest range of applications. As a global player, Hennecke understands the needs of local customers in its target markets and has ensured that the FOAMATIC can be used with different platforms. In future, it will also be available with Allen Bradley (Rockwell) and MELSEC (Mitsubishi) platforms for specific markets.
- **World-class quality guaranteed:** In 2022 Hennecke was recognized as global market leader for the third time by the German magazine Wirtschaftswoche. Decades of experience as PUR market leader safeguards the quality of the wet parts, manufactured entirely at the company headquarters.

# NEXT GEN

## METERING MACHINE

### ECOPLUS MK2

The entry-level model wins over customers with its shorter lead times, an attractive purchase price that even undercuts the previous version, an innovative concept for temperature control and high-quality components throughout. Like all the models, the ECOPLUS MK2 capitalizes on the new HX metering pumps and features the established MT-E mixhead series with the latest generation of injectors – the FIXJET and FLEXJET SL models. The machines are controlled via the brand new, innovative FOAMATIC operating system that even allows optional remote access from multiple network-compatible end devices simultaneously. A novelty in this product category.



### HIGHLINE MK2

This new, multi-functional model provides a seamless transition to a high-performance machine. It can be extended to a two-mixhead system and processes virtually all raw material systems, including the modern (flammable and non-flammable) blowing agent hydrofluorolefin (HFO). Suitable for the usual wide range of PUR flexible foam applications, the machine is also ideal for insulation applications and can be customized through a number of configurable options. Digitalization and connectivity to the Internet of Things (IoT) benefits the user in terms of energy and resource efficiency, predictive maintenance, and production monitoring.

### TOPLINE MK2

Hennecke's flagship product is and remains the reference point for nearly all PUR applications, meeting the toughest of demands. Besides Hennecke's latest technology, the top priority here is digitalization, as well as IoT connectivity. The TOPLINE MK2 is fully integrable. Thanks to its modular construction, the machine offers considerable long-term flexibility, for example expanding production or combining with other production lines in the future. For the time being, Hennecke is not revealing any further details about the top category in polyurethane processing and centerpiece of thousands of production lines. Customers are looking forward to finding out what performance features they can expect from July 2023 onwards.



# PRECISE, HIGHLY EFFICIENT, AND FIT FOR THE FUTURE – THE NEW HX PUMP GENERATION

Pump technology plays a central role in processing reactive polyurethane components, where precise metering, reproducibility and efficiency are key. Hennecke's new HX pump series, a specialist in-house development, marks another important milestone in polyurethane processing: It is the very first axial piston pump to be produced exclusively for polyurethane applications, offering users real added-value.

Hennecke has always offered an extensive range of first-class pumps in different series. But as the global market leader in PUR technology, Hennecke is entrusted with giving its customers highly specialized solutions for pump technology, just like with its mixhead portfolio. Concentrating on processing aspects and market requirements, Hennecke's application experts have developed a completely new pump generation in the last two years, which is to be manufactured at the company's site in Sankt Augustin, Germany. Here, the focal point is a precise, highly efficient, and future-fit metering line, ready to meet the requirements of the 21st century: the new HX series.

## Powerful 'built-in' cooling – enhanced durability

The modern HX product line is impressive. The enhanced pump housing design has a new bearing seating which allows for maximum flow around the bearing. This ensures efficient heat dissipation whilst at the same time preventing a rise in the reactive media temperature. "In multiple tests, we have demonstrated an effective flow of heat between the functional surfaces and the pump housing, even at maximum operating points. Comparable measurements from conventional pumps on the market show that heat often builds up here even at room temperature and comparatively high temperatures are reached inside and around the housing," reports Helmut Duschanek, Senior Engineering Director at Hennecke. Thanks to its effective cooling capacities, the new HX has significant reserves, even in unfavorable operating conditions with comparatively high ambient temperatures. As the surface temperature of the rolling elements is also considerably reduced during operation, the new pumps' temperature development provides further benefits in terms of durability, particularly regarding chemical degradation from polyol materials.

## Added-value through greater pressure resistance

The pump's pressure resistance reaches up to 16 bar with open circulation. This is up to 60 percent higher than comparative models by competitors. Operating with open circulation brings a

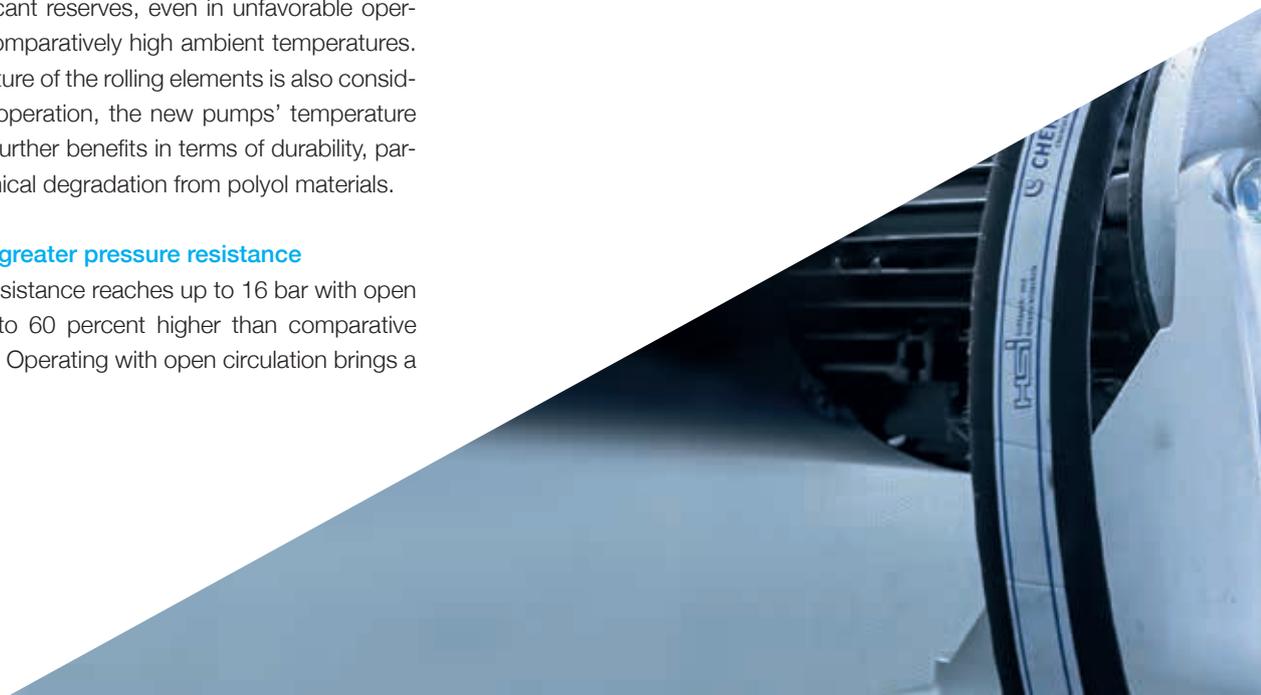
clear advantage in terms of process technology. Combined with the open pump construction and the resulting improved suction, this is particularly beneficial when using highly viscous polyols. And it may even mean that pre-pumps are not required, depending on the application.

## Smart sensors for process monitoring

As well as its extremely broad application range, the HX series features state-of-the-art sensor technology thanks to the smart integration of digital functions. "To ensure for example that the process parameters can be recorded 'on the spot', we have incorporated pressure and temperature monitoring into the pump housing. The pumps also have internal sensors," explains Helmut Duschanek. These include a distance sensor for monitoring the pump bearings, an important feature for predictive maintenance work. The long-term goal is to expand the use of intelligent sensor technology, for example to advise of upcoming maintenance measures in advance.

## Boost efficiency and save energy

The new HX product line also scores points for sustainability. The pumps' increased efficiency is ultimately conveyed through an optimized energy balance in the entire system. Chemical systems using bio-based and recycled content polyols can be





*The HX metering pumps: Pressure and temperature are continually monitored using internal sensors.*

processed easily too. Low noise emissions during operation are another plus point for the pump. Factors such as the easy-to-service design with an integrated safety valve, and the guaranteed supply of spare parts in the long term ensure that service measures can be planned. This is particularly advantageous for customers with complex application scenarios or high production volumes.

The new HX series has been available since July 2022 in sizes HX06, HX12 and HX28, exclusively for Hennecke's new generation metering machines. The HX portfolio will be extended in the future to include even more sizes. ■



#### HIGHLIGHTS OF THE HX PUMP SERIES

- Optimum heat dissipation
- Integrated pressure and temperature monitoring
- Optimized energy balance
- Greater resistance against abrasive materials
- Improved suction
- Easy processing of bio-based and recycled content polyols
- Reduced noise emissions



# NEW MIXHEAD WITH COLOR CHANGING SYSTEM – TIME TO ADD SOME COLOR

Hennecke's recently developed innovation is simplifying color change in PUR processing applications. Fast, clean and straightforward.

Multi-color PUR products are increasingly sought after, whether it be in the furniture, leisure, and automotive industries, or in quite different sectors. Coloring is not just about freedom of design; it is also used for product labelling, which is a key aspect in safety, for example. Switching between different colors during production has always been a challenge.

Unfortunately the conventional solutions for color change have many disadvantages. Either the polyol is colored completely, or the colorant is added to the reactive mixture just after blending the polyol and isocyanate components. These are laborious solutions that can produce a lot of waste before the mixture is ready to be used after the color change. Whilst using a separate mixhead for each color yields clean results, purchasing the machine technology incurs high costs.

## Agitated at full power in the mixing chamber

Hennecke is now taking a completely new approach to achieve the best homogeneous mixture. The perfect production result is based on an innovative 3D V-shaped process with two spatially positioned injectors from the well-established MT mixhead series, allowing the components to come together in the mixing chamber at full power with maximum agitation. A further 'injection point' is located exactly between the entry points for the main components on the mixhead side. This is used to add the third component in the form of an interchangeable, self-contained cartridge that provides the required color. Through an integrated

***“The fast change-over between two different colors is particularly efficient.”***

Philipp Sterzenbach,  
Sales Manager for metering machines

injection block, this cartridge adds the exact amount of color to the reactive mixture for each individual metering operation. The optimal positioning between the two component infeeds means that the colorant is fully mixed with the reactive components at high power, ensuring consistently uniform coloring and largely eliminating the problem of white spots.

## Fast-acting coupling means fast color change

“The fast change-over between two different colors is particularly efficient and considerably shortens the production process,” says Philipp Sterzenbach, Sales Manager for metering machines. Individual color units can be swapped over in just a few minutes using a fast-coupling system. Compared to conventional solutions, users save a lot of time as a hose change and flushing are not required. No rejects are produced from the change-over, which saves on costs and avoids waste. The self-cleaning process after every shot means that color residues, which could lead to unwanted coloring, are not left in the mixhead. The colors can therefore be changed without any material losses.

## One mixhead – four colors

The system comprises up to four identically constructed, self-contained color units that are mounted to the mixhead, and a parking system for the color units not in use. The color paste is kept in circulation here to prevent it from drying out. The individual color units themselves consist of a tank, a control unit, a robust gearwheel pump and a fast-acting coupling to enable quick mounting of the color cartridge (CC) to the mixhead.

Hennecke has so far developed the system for up to four different colors. The new MT12-3 CC mixhead is based on the accomplished MT mixheads. “We are already planning to extend to other mixhead sizes, such as the MT18”, explains Philipp Sterzenbach. “We could conceivably increase to more than four different colors too, depending on customer demand,” he adds. ■



One of many application examples



**A HOST OF USER BENEFITS FROM THE COLOR CHANGING SYSTEM:**

- Fast: straight-forward color change in just a few minutes
- Cost-effective: one mixhead for all colors
- Versatile: parking system for up to four color units
- Efficient: homogenous mixing right in the mixing chamber
- Sustainable: no waste following color change
- Economical: precise metering from the first to the final shot



Individual color units can be swapped over in just a few minutes using an innovative fast-coupling system.

# THE NEW GENERATION STEEL SANDWICH PANEL LINES

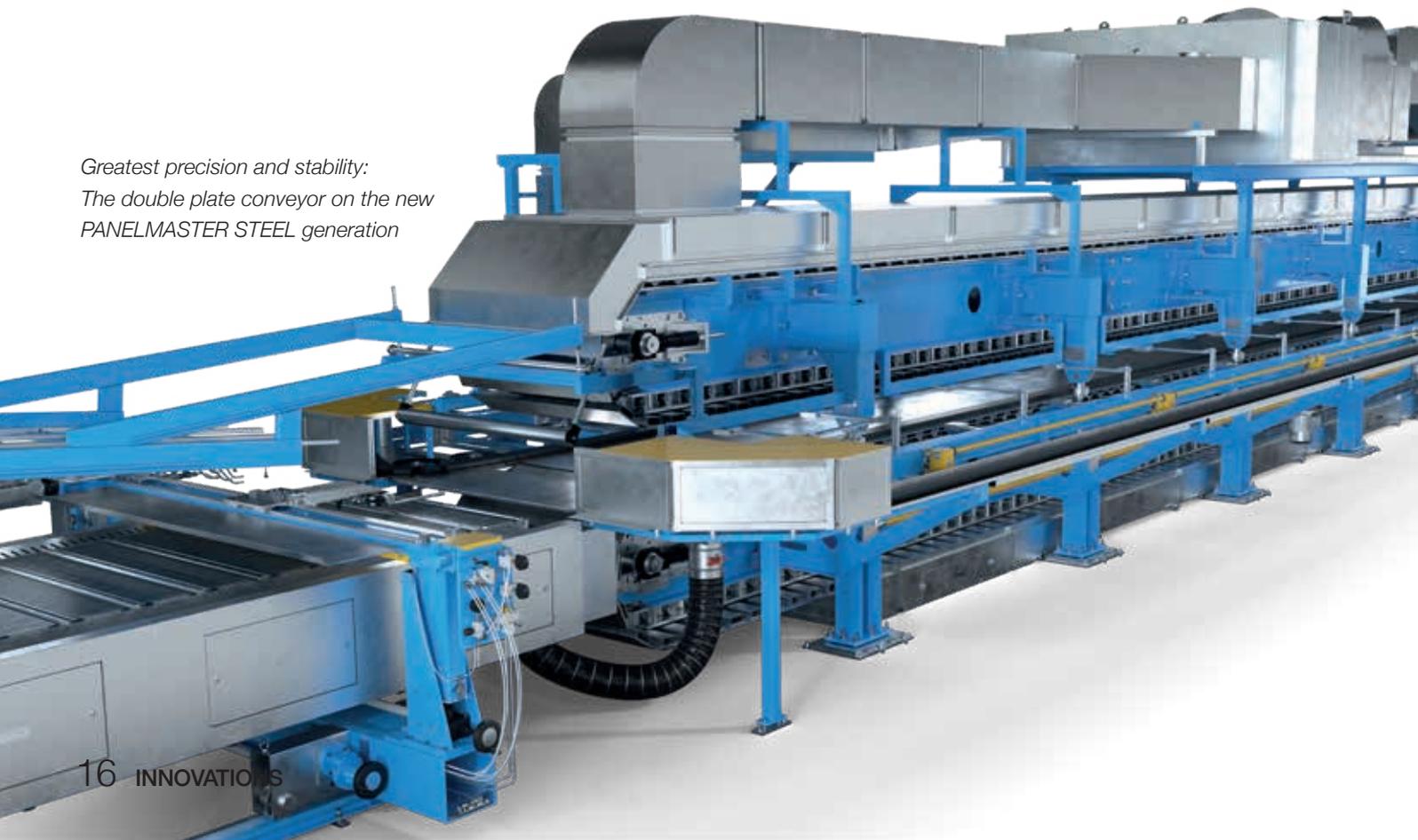
Within the Hennecke GROUP, three strong brands have joined forces and pooled their expertise. The new generation of the PANELMASTER STEEL sandwich panel production line is the impressive result of combined know-how from the brands Hennecke-OMS, Hennecke Polyurethane Technology and Hennecke Roll Forming Technology. Put simply: it brings together the best of three worlds.

Global efforts are currently focusing on how energy can be used as efficiently as possible. Building insulation offers huge potential for making savings. Here polyurethane rigid foam has the lowest thermal conductivity of all insulating materials used in practice. As a result, steel sandwich insulation panels with a core structure made of PIR have long since become the standard choice for constructing industrial buildings and cold storage houses. The PANELMASTER STEEL from the sandwich panel specialists Hennecke-OMS enables continuous production of panels with different facings, thicknesses, and profiles. In order to fulfill the specific requirements of a growing market, particularly with regards to premium products made at high production speeds, the company has now introduced an extensively reworked generation of production lines.

## All from a single source

For decades, sandwich panel production has been part of the core business of the individual companies in the Hennecke GROUP. Even before the merger with the present-day Hennecke-OMS, for this product line, the brand name Hennecke became the absolute standard and the Italian subsidiary a center of excellence. "For the new product generation, it was all about combining the three market leaders' expertise and adopting a common approach to meeting our customer's demands for turnkey solutions – one that is solid as a whole and in the detail. A state-of-the-art production line has emerged seamlessly and entirely from a single source," says Pierpaolo Azzalin, Head of Sales at Hennecke-OMS. Every detail of the production line has been analyzed and evaluated in an intensive development process involving engineering and sales experts from the three companies.

*Greatest precision and stability:  
The double plate conveyor on the new  
PANELMASTER STEEL generation*



### Accumulated competence for top-class quality

Hennecke GmbH Roll Forming Technology is the specialist in the upstream part of the PANELMASTER STEEL – the coil handling, and processing and profiling the metal facings. The controls also had to be reworked, a task that was led by Hennecke-OMS, ensuring that the entire line is operated with one standardized and comprehensive system. Leading-edge electronics and top computer performance ensure that the line operates with maximum safety and production adjustments can be made quickly and mostly automatically.

### A brand new centerpiece

Particularly the middle section of the production line, the centerpiece of the PANELMASTER STEEL, is proof of how the combined expertise from within the Hennecke GROUP takes the new generation to the next level. The formidable expertise of the Italian Hennecke GROUP subsidiary can be clearly seen in the double plate conveyor, which is crucial for product quality. The highly precise and robust elements have been manufactured in-house. Expertise came from the German headquarters to enhance the side conveyor guides and develop an energy-saving heating system for precise process temperature control. “Here we combined the greatest expertise in raw material preparation for high-pressure processing. This is a prime example of how excellent production lines can be improved even more by pooling specialist knowledge,” says Andreas Fischer, Senior Sales Manager Hennecke Roll Forming Technology. The next section

of the approximately 150-meter PANELMASTER STEEL line includes the fully automated units for cooling, stacking, and packing the sandwich panels. Here the panels are examined, assessed and combined with one another to achieve maximum quality, efficiency, and cost effectiveness.

### Reliable, efficient, and cost-effective

The new generation of production lines pays off especially for the customer. The existing line comprising different, independent areas has been reconsidered and redesigned as a whole. “This brings many customer benefits,” explains Andreas Fischer. “The operational sequences are all synchronized with one another, which ensures seamless, continuous production with no downtimes.” State-of-the-art technology and electronics provide savings in both energy and raw material use. In addition, the specialist knowledge about the entire production line is completely in-house and virtually all component parts have been developed and manufactured within the company. This means great production reliability as well as independence from suppliers and external factors. The customer profits here from having one single contact for all enquiries and concerns.

“The first steel sandwich panel lines from the new generation have been constructed and delivered to the customer, where they are already proving their worth,” reports Pierpaolo Azzalin. In the future, he expects around six lines to be produced per year. ■



*The foaming portal is the centerpiece of the PANELMASTER STEEL*

## THE NEW GENERATION HIGHLIGHTS

- Continuous coil handling and preparation, processing and profiling of the metal facings
- Complete equipment for metering, storing, transporting, and monitoring the raw materials and additives
- Well-planned arrangement of individual units for the customers' most diverse product specifications
- Proven high-pressure technology for the foaming portal and mixheads ensures uniform cell structure and efficient raw material yield
- High-precision and robust double plate conveyors and innovative side conveyor guides for consistently high product quality
- Energy efficient heating and cooling
- Comprehensive control system including panel management, process data recording and graphics for evaluation and analysis

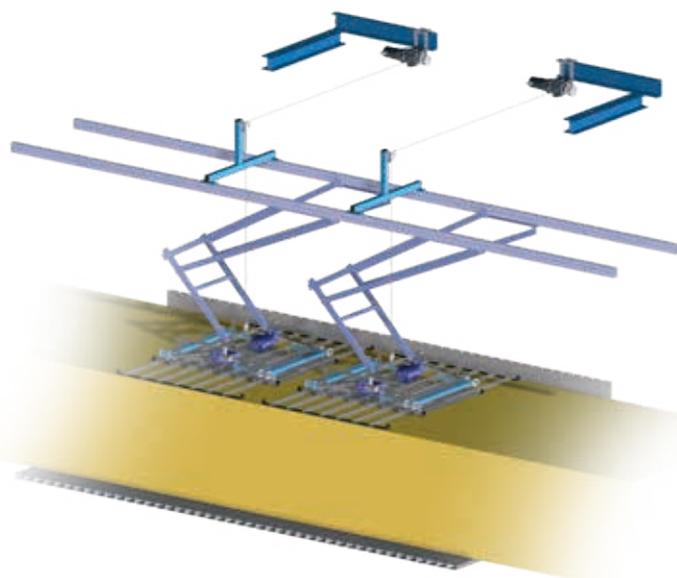
# INNOVATIONS IN SLABSTOCK PRODUCTION

Slabstock foams have become an integral part of daily life and are used whenever cushioning and insulating qualities combined with low weight are important – such as in the ‘comfort’ segment for mattresses and furniture, or in the ‘technical foam’ sector, for example for diverse applications in the automotive industry. Although the basic principles of slabstock production have barely changed over the past decades, the demand for high standards in terms of quality and specific properties has constantly grown. Issues such as energy efficiency and raw material savings have become paramount, especially in recent times. As the world leader in continuous slabstock production lines, Hennecke is constantly developing new products and innovative solutions to give its customers even better quality, and to simplify operation and optimize production processes.

Below we present five innovations that have been specially developed for continuous slabstock production lines. Good to know: these are not only available for newly purchased lines, but can also be retrofitted as an ideal upgrade to existing slabstock lines through Hennecke’s 360°SERVICE team.

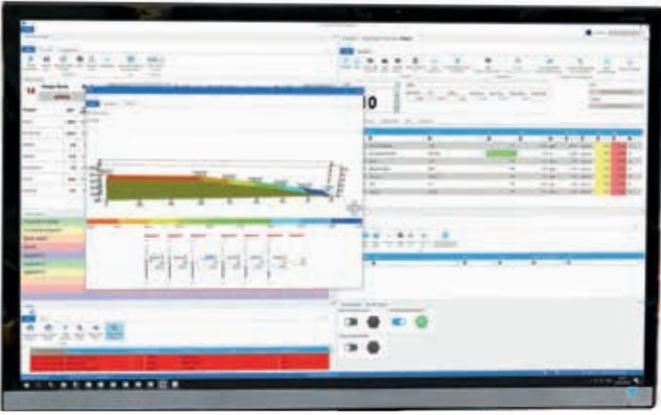
## FOAMWARE: NEW PLANT CONTROL WITH GREAT ADDED VALUE

One almost radical development is the user interface via the FOAMWARE control system which replaces the previous process data recording system. Impressive features include the new high-performance hardware, diverse functions, intuitive user navigation, a multitude of standard tools as well as useful plug-ins and additional options. The free-standing operating console with a new generation SIMATIC Quad Core industrial computer and 32-inch UHD monitor provide ergonomic working conditions and an excellent overview of the entire production process. A printer, uninterruptible power supply, air conditioning unit and remote access router for online support are also integrated. The software affords a clear display of all relevant production data as well offering extensive calibration modules, and tank level monitoring. The data can be individually selected and displayed in separate windows using both linear and logarithmic scales. In addition, process data from the last 300 production runs can be retrieved and compared using an innovative process diagram. A noteworthy highlight is the 'magic eye' function, which recognizes and immediately presents metering deviations and irregularities during operation. Foamers also benefit from a database module that stores information about the mixtures and chemicals and provides active support to adjust and create new formulations. A third-party interface is used to import and export the data and to connect to the customer's own network or, for example, a goods management system, or to communicate with SAP.



## FASTER PRODUCTION START WITH **AUTO-FLAT**

A uniform and even top skin means not only better quality but also less waste, and consequently fewer raw materials are used. Hennecke's well-established solution is the FLAT-TOP system, which has been given another big upgrade through the AUTO-FLAT, making the set-up process considerably easier. The 5-point, fully automatic guiders are controlled by sensors to regulate the pressure from the mats on the top side, whilst servo drives ensure their perfect positioning. These state-of-the-art force sensors make sure optimal pressure is exerted. Even automatic width adjustment is provided as an option. All this gives the foamer a range of advantages: greater reliability from the high level of automation, greater stability and better reproducibility in production – because all the formulation settings are stored in the computerized system. In addition, when starting or stopping production and changing the formulations, less staff are needed for making manual adjustments in the foaming tunnel – also a huge plus point in terms of workplace safety and quality. Each individual mat can be easily operated and monitored with the AUTO-FLAT plug-in to the FOAMWARE control system – either manually, semi-automatic, or fully automatic, as required.



## RISE PROFILE MEASURING FOR THE TOUGHEST DEMANDS

The rise profile measurement system, developed as a valuable addition to satisfy the toughest demands for consistently high-quality production results, is a combination of laser distance sensors with a FOAMWARE plug-in. The rise profile measurement is activated automatically when the machine starts, recording the rise profile with six laser sensors and displaying the information via the software. A further twelve optional sensors also detect the block height during the process. This information is immediately compared to the reference curves stored in the formulation, allowing the operator to adjust the process parameters if there are any deviations. These may be caused by fluctuations in the ambient temperature or the chemical temperature, changes in the weather, an incorrect mat weight or if the plant has heated up during start-up.

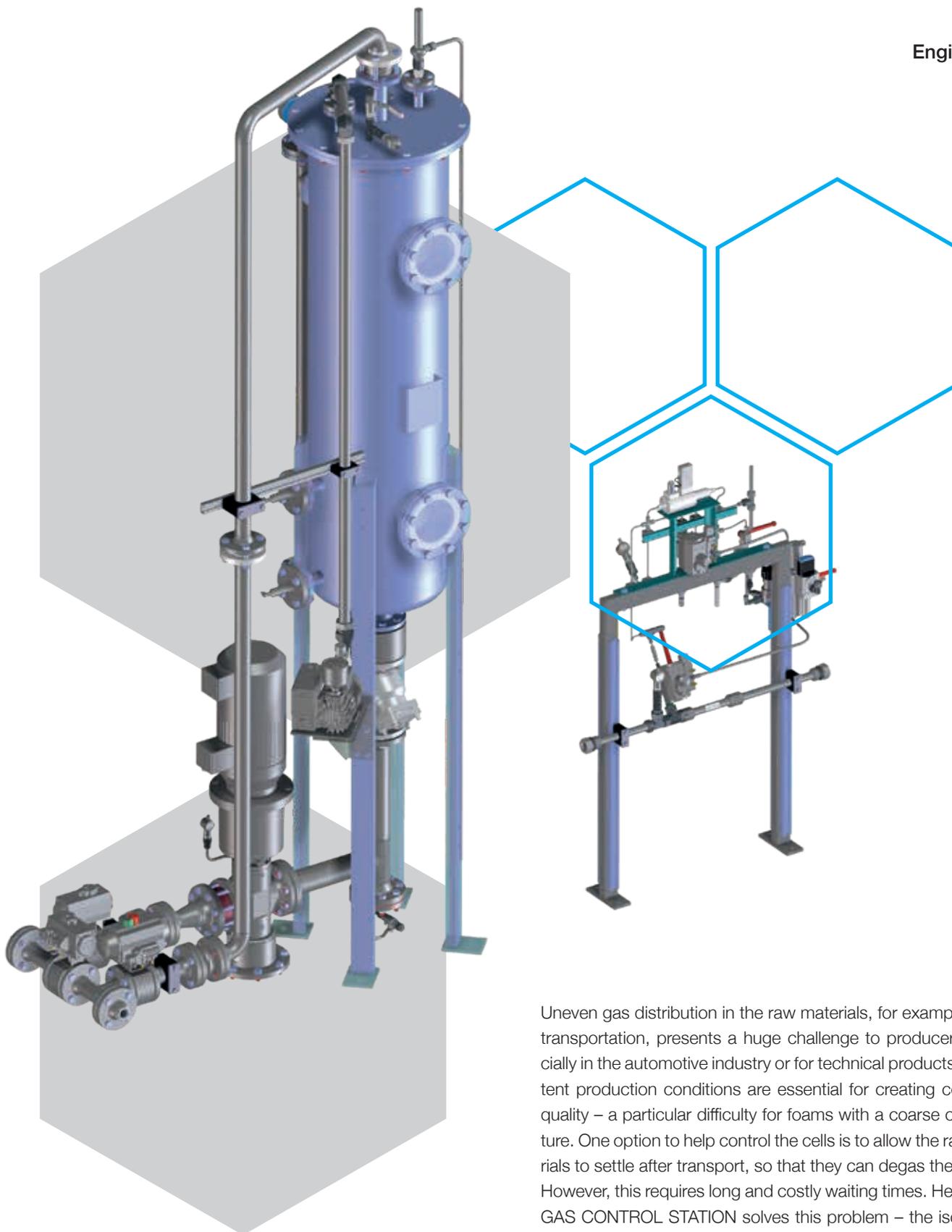


## SIGNIFICANTLY FEWER PINHOLES WITH SPOUT-EX

Hennecke has invented another innovative way of improving quality using the SPOUT-EX. A significant reduction in the number of pinholes in the foam has a huge impact on product quality, especially in foams with fine cells. Pinholes are caused by air bubbles trapped in the raw materials which have not been successfully eliminated in the previous mixing process. Through extensive flow simulations, Hennecke has now found a solution – the SPOUT-EX, an effective extension to the mixing chamber of the MSL stirrer mixheads. Its innovative design has resulted in foam production with 50 to 70 percent fewer pinholes. Thanks to its plug and play installation, the SPOUT-EX can be easily fitted to existing MSL stirrer mixheads in only a few minutes.

***“All these new features  
can be retrofitted to  
existing systems through  
our 360°SERVICE.”***

Markus Häsler,  
Service Sales



## CONSISTENT PRODUCTION CONDITIONS AND QUALITY WITH THE GAS CONTROL STATION

Uneven gas distribution in the raw materials, for example due to transportation, presents a huge challenge to producers. Especially in the automotive industry or for technical products, consistent production conditions are essential for creating consistent quality – a particular difficulty for foams with a coarse cell structure. One option to help control the cells is to allow the raw materials to settle after transport, so that they can degas themselves. However, this requires long and costly waiting times. Hennecke's GAS CONTROL STATION solves this problem – the isocyanate is firstly degassed to some degree using a vacuum pump and is then pumped into an intermediate tank. Here it flows over a bed of columns packed with sintered material, which is used to fully extract the remaining gas through its coarse porous surface area. The degassed isocyanate is pumped off and fed to the metering pump via a pre-pump. Now the exact amount of gas required for the formulation can be added using Hennecke's iso gas loading system. Both pumps interact with a sensor to ensure a constant filling level in the tank. The GAS CONTROL STATION therefore offers uniform and reproducible high-quality foam and enables the chemicals to be deployed quickly after delivery. ■



# SPECIALIST IN EXTRAORDINARY SOLUTIONS

What does a manufacturer of machinery for polyurethane processing in Sankt Augustin, Germany, have to do with growing fresh vegetables in Singapore? How are polyurethane parts used in vertical farming, the practice of growing vegetables in vertically stacked layers? A year ago, no-one at Hennecke GmbH, one of the global leaders in machinery and technology for polyurethane processing, would have been able to say.

## Vertical greenhouses for a metropolis

Singapore is a small country near the equator, with a high population and building density. To become more food-secure and independent by growing more of its own food locally, research in Singapore is increasingly focusing on areas such as urban farming, growing crops in cities, and vertical farming, using vertically stacked layers for cultivation.

The company Keshet Agritech Pte Ltd, works in precisely this area, and is currently establishing automated, high-tech greenhouses known as 'vertical clean greenhouses' on its awarded five-acre land parcel in Singapore. These are not only home to the technology required for vertically stacking and maintaining the cultivation areas, but also protect the crops from adverse weather conditions. The fully insulated greenhouses will be fitted with solar panels and provide for a constant temperature, adapted to the respective plant species, ensuring the best possible conditions for growth. In the future, the fruit, vegetables and salad will be grown and harvested here on stacked layers, fully automated and largely self-sufficient.

## From Singapore to Sankt Augustin

In early 2021, Dieter Müller, Sales Manager at Hennecke GmbH in Sankt Augustin, received an unusual request from Southeast Asia. The customer was looking for a way to externally insulate a prototype of the vertical clean greenhouse, and asked whether it was possible to produce a 2700 mm x 1600 mm sandwich panel with a stainless steel facing and a PUR core, a specific curvature and 100 mm wall thickness, whilst imposing high demands on the material properties, such as flammability, insulation and durability. Extraordinary specifications, but an exciting challenge for Dieter Müller, an expert with over 25 years' experience.

## Pooling expertise at Hennecke's TECHCENTER

He took on the request, located the right manufacturer for the raw materials and supplied the customer with a molding tool from Hungary. Together with the customer and the raw material manufacturer, Hennecke's specialists set up a meeting at



*Urban farming in a tropical metropolis: Fully-automated high-tech greenhouses are under construction for a five-acre land parcel in Singapore.*

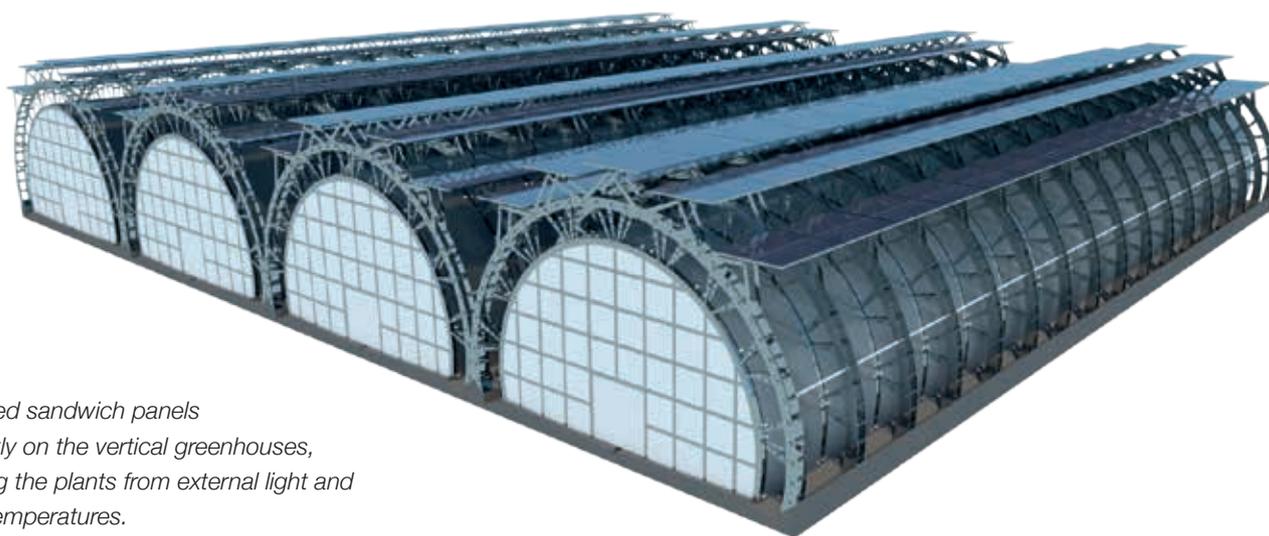
their TECHCENTER to carry out some initial trials. However, due to COVID travel restrictions, the customer was involved virtually. “Our technical center is the right place to test out and realize new solutions and applications,” explains Müller. “The center is equipped with our company’s latest state-of-the-art technology – here the customer benefits primarily from our application experts’ cross-industry experience and specialist knowledge.”

#### Systematic problem solving

The promising first trial run was a good indication of things to come: Expertise teamed with a systematic approach led to improvements in the molding tool, optimum filling and venting holes placed in the mold, and the right chemical formulation. The perfect result and a happy customer, who immediately ordered another 100 panels to set up the prototype for the fully automated vertical clean greenhouses.

#### Presentation at the K Trade Fair

The first vertical greenhouse will be installed in Singapore whilst the K Trade Fair is running in Düsseldorf, Germany in 2022. The systems technology for the upcoming serial production of the greenhouses can then be manufactured in Sankt Augustin. It consists of two reaction casting machines, two semi-automatic shuttle presses and two molds, and will produce the panels at a rate of around ten per hour. Dieter Müller is delighted. “Not only have we fulfilled a new and exciting order, but we’ve also proven our expertise once again with the TECHCENTER. And last but not least,” he says, “we are proud to be making a small contribution to a big goal.” ■



*The curved sandwich panels fit perfectly on the vertical greenhouses, protecting the plants from external light and varying temperatures.*

# PROTECTED THROUGH CLEARMELT TECHNOLOGY

The distinctive, kidney-shaped front module on the all-electric BMW iX is both an iconic design motif and a guaranteed eye-catcher. It is also a leader in innovation as the first serial application for vehicle exteriors to use an integrated process combining polycarbonate back-molding injection with polyurethane flood injection. A clearly visible outcome of the successful partnership between Hennecke and the Austrian machine manufacturer Engel.

The kidney grille is the classic design feature of all BMW models. At first just a radiator grill, today it houses and protects the cameras and sensors for the electronic assistance systems, which are already making semi-autonomous driving possible. The extended functionality of this front module required fundamental changes to both its structure and production process.

## Trailblazing customized solutions

Hennecke experts have been working since 2009 with Engel, the Austrian injection molding machine specialists, on developing innovative solutions for new applications. Engel acts here as an experienced prime contractor, relying on Hennecke's expertise for aspects involving the integration of specific polyurethane applications. The combined process of polycarbonate injection molding with polyurethane finishing through flood injection is one of the focal points of the collaboration. This technology, known as clearmelt, offers users an effective plant concept for finishing thermoplastic substrates using a coating of transparent or colored polyurethane or polyurea systems in the RIM process (reaction injection molding). This method is used to create scratchproof, resistant and functional surface structures for decorative and functional parts in the automotive industry and consumer goods sector.

At the end of 2018, Hennecke received an enquiry about the BMW project from its long-standing partner in Austria: A solution was required at BMW's Landshut plant for mass-producing the kidney-shaped front module with its new requirements. The clearmelt technology had already been tested by the two companies and was to be used here for the first time in mass production for exteriors, a sector with very high demands. Together with raw material suppliers, toolmakers, and clean room specialists, the partners developed a customized solution to meet the Bavarian car manufacturer's requirements.

## Combined process with injection molding and PUR

Using an integrated process in a clean room, a heated functional film is back-molded with polycarbonate, flood injected with polyurethane and securely packaged straight away for further processing. "Extra finishing work is not required with this combined process," says Eugen Kern, Sales Manager for Composites & Advanced Applications at Hennecke. The PUR coating has two functions: it provides not only brilliant optics but also highly

effective protection. Thanks to its material properties, the coating is not just extremely scratchproof; it even has a self-healing effect that compensates for minor dents and scratches. As the front modules on passenger cars are especially prone to stone chip damage, the coating crucially ensures that the front of the car does not lose its flawless appearance after so many miles on the road.

## PUR flood injection replaces painting

Compared to conventional paint finishes, flood injection with PUR offers many advantages besides great scratch resistance: the transparency ensures clear visibility at all times for the sensitive sensor technology. The surface is extremely glossy with a depth effect, which accentuates the overall appearance of luxury. In addition, the PUR flood injection allows different surface structures and thicknesses to be applied in a single piece. This means that a product's top layer can seamlessly change from a glossy, smooth surface with depth effect to a rough, leathery texture, for example. "The PUR solution is also superior to classic painting in terms of sustainability," says Eugen Kern. Whereas painting causes overspray, PUR flood injection uses the exact amount required, so there is no waste.

"It was fantastic working together with all the companies involved," says Eugen Kern, who anticipates further collaborative projects for Hennecke in the future. BMW, as a trailblazer for technology, has created a sensation with the iX and in doing so, has boosted the application options for the clearmelt process. The sales engineer is convinced of the amazing advantages of this technology. "I am sure it will catch on across the board," he says. ■



The iconic kidney grille for the iX is manufactured at the BMW plant in Landshut, Germany



The STREAMLINE MK2 is a tailor-made processing system for realizing transparent and highly resistant polyurethane coatings.



As well as the effective clear-melt technology, Hennecke provides further solutions for producing parts with high-quality, functional surfaces for applications in the automotive industry. These are sold through the strategic AUTOMOTIVE ALLIANCE partnership, established in 2020. Find out more about this on the next page.

# TAILORED SOLUTIONS FOR THE AUTOMOTIVE INDUSTRY

Following the founding of the Automotive Alliance between Hennecke and FRIMO in early 2020, it is now time to look back and take stock of an eventful two years. Despite the backdrop of several global crises, the two companies have been able to develop a well-coordinated and solid partnership.

## Consolidating core competences

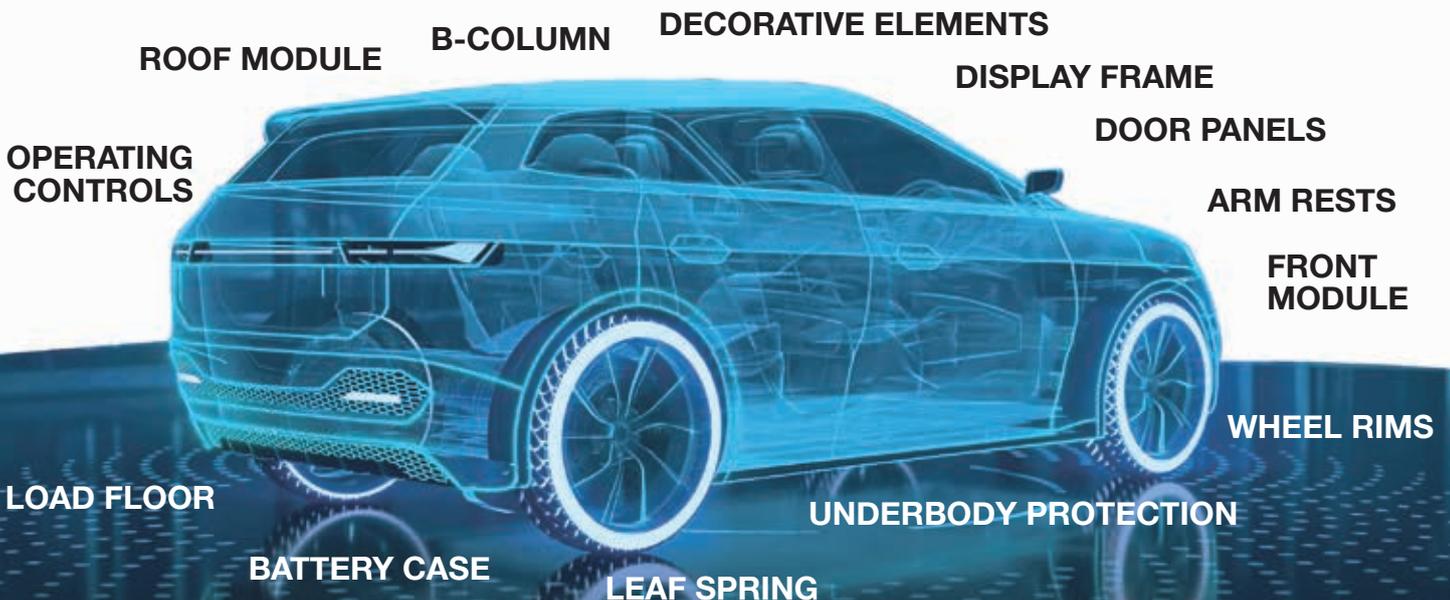
The foundation stone of the Automotive Alliance was laid in February 2020, marking the start of the FRIMO-Hennecke collaboration which focuses on polyurethane and other reactive plastic applications for the automotive industry. In the partnership, FRIMO, a full-service supplier for tooling and automated production systems, contributes its core competences in the areas of molded foam, elastomers and composites. Hennecke is responsible for the metering and mixhead technology, including peripheral equipment and all other systems for handling the raw materials – storage, transportation, preparation and processing.

FRIMO deals exclusively with the sale of HENNECKE products from the partnership, for new systems as well as for the entire service sector.

## Added value for the industry

There are plenty of advantages for automotive customers – they benefit from comprehensive system solutions and individual service from one source, as well as a common point of contact. Another bonus point is the unified customer interface, ranging from tooling to plant automation up to process technology. The core segments of the partnership are the product areas molded foam

## AUTOMOTIVE ALLIANCE



processing, elastomer processing and lightweight composites, including PUR-CSM technology for polyurethane spray applications, as well as flood injection for structural and decorative components. Hennecke also supplies metering machines and mixheads for HP-RTM and WCM (wet compression molding) applications.

**A flying start in turbulent times**

A number of global crises began to overshadow the partnership immediately after its launch. Extensive lockdowns and plant closures, delayed deliveries and closed borders, an international shortage of semi-conductors, and energy shortfalls have all impacted the Automotive Alliance’s principal target group and will continue to do so. “The shift towards electric vehicles also means that requirements have changed,” says Thomas Joachim, Sales Director at FRIMO. “Due to cost-cutting, demand has fallen for back-foamed dashboards in light of the modified cockpit design, and for back-foamed arm rests and door panels.” It is, however, precisely this trend towards e-vehicles that has also contributed to a change in customer demand, because electric cars often require different products to gasoline-powered vehicles – lightweight construction for example is fundamentally important. “Thanks to our unique production concepts in HP-RTM and WCM applications, extremely light structural components are increasingly becoming the focal point of our collaboration. Here we can already offer highly specialized solutions for the numerous enquiries we receive about particular areas of use or specific geometries. And what is more, flood injection technology provides the automotive industry with a multitude of new application options,” explains Dr. Florentin Pottmeyer, Head of Sales for the Automotive Alliance at Hennecke.

**A changing industry**

“New products require new approaches. The new front module on fully electric cars – used in place of the previous radiator grill – is a good example of an element that most gasoline vehicles do not have,” Thomas Joachim adds. “At the forefront here is the integration of the most diverse functions that are made possible through autonomous driving.” PUR flood injection is used to securely and permanently protect this sensitive module, whilst also giving it a luxurious look. Flood injection technology offers not only a variety of application options but also a wealth of benefits compared to painting. Among other things, it is more versatile, more economic, kinder to the environment and produces significantly less waste. The front modules have already successfully gone into production, proving how quickly the offering can be adapted to meet new demands. (See the article on page 24 for more information).

**Safe protection for batteries**

The battery is a crucial part of every electric car and must be well protected. Here the Automotive Alliance offers effective concepts for producing lightweight, robust and crash-proof enclosures for battery cells. Made using WCM or HP-RTM processes, they protect the sensitive energy packs. In addition, the



*A perfect pairing for diverse applications in the automotive industry: Four-component mixheads with hermetically sealed FLEXJET GL injectors.*

partnership offers solutions for foaming cavities, known as gap fillers. There is also high demand for parts that protect the vehicle underbody. Here the partnership provides solutions either based on WCM technology, or combined with a PUR rigid foam application, in which individual reinforcements are made through PUR-CSM spraying.

**Roof and floor solutions**

The desire to reduce weight but maintain maximum load bearing capacity, along with design freedom, provide the background to creating innovative modules based on lightweight composites with a polyurethane matrix (PREG technology). Here both the module’s facings are composed of a fiber composite material, spaced apart by a core made of paper honeycomb. These are used to produce extremely sturdy yet ultra-lightweight roof modules and load floors. Solutions have also been brought to market for multi-part hardtops, where the individual sections can be easily stored in the trunk or boot. “As a result of continual technological advancement, it is no longer difficult to make real three-dimensional component parts,” says Dr. Florentin Pottmeyer.

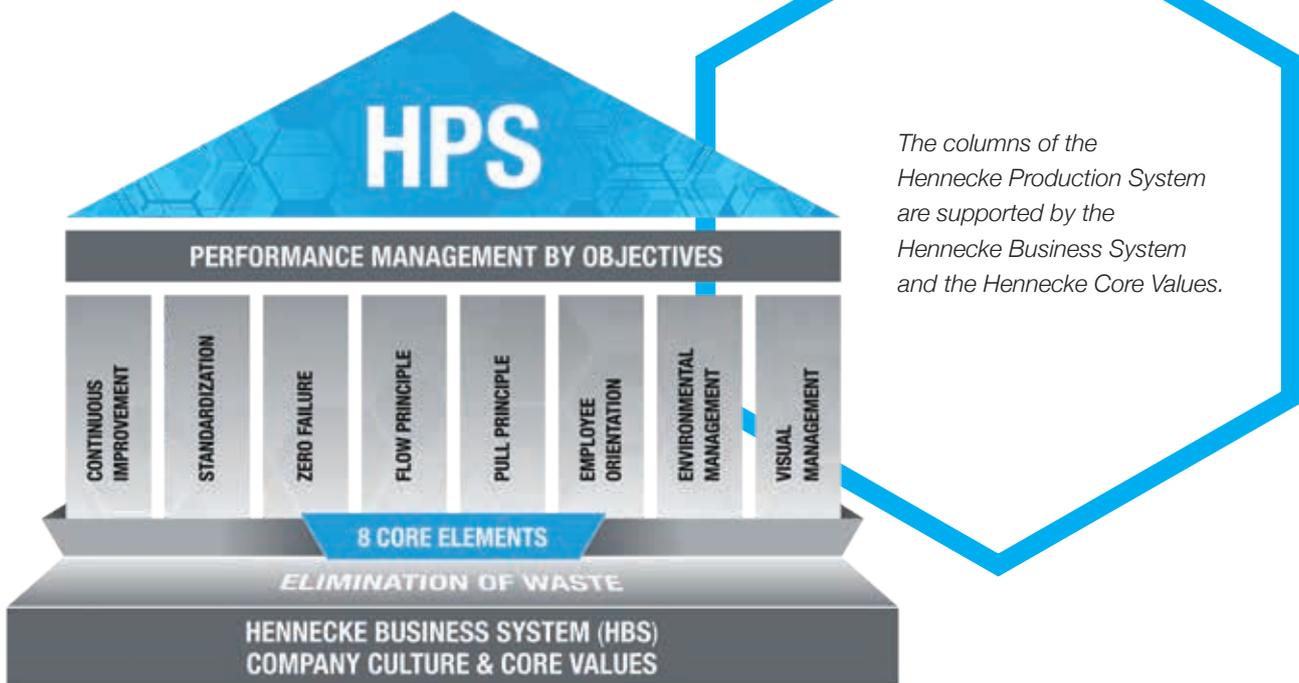
**A positive future ahead**

Thanks to its extensive portfolio and innovative solutions, the Automotive Alliance is weathering the current crises and adapting to the transforming automotive industry. Automotive customers know that they can rely on tailored system solutions from both specialists and reap the benefits of a comprehensive service from one single source. ■



# INTERNATIONAL ROLL-OUT FOR THE HENNECKE PRODUCTION SYSTEM

The new 'Hennecke Production System' (HPS) was launched in mid-2020 along with the associated plans for reorganizing metering machine production at the company's Sankt Augustin site in Germany. Step-by-step, the HPS has been introduced at the other Hennecke GROUP sites in Verano Brianza (Italy), Pittsburgh (USA) and Jiaxing (China).



The company is investing several million euros in this gradual organizational transformation across the world. Not only will it increase production efficiency, but also offer many benefits to Hennecke’s customers as the optimization measures bring a noticeably faster throughput. “With our stand-alone metering machines, for example, our customers are already profiting from shorter lead times and a lower base price for standard configurations. Something which is definitely not a matter of course these days,” says Sabine Rudolf, Global Director for the Hennecke Business System.

Thomas Wildt, Hennecke GROUP CEO, explains the significance of the new production system: “By combining practical methods and design principles with maximum efficiency, the new HPS aims to achieve sustained success for the Hennecke GROUP.” Inspired by Toyota, the HPS is a modernized production system that has been fully tailored to Hennecke. The production methodology is based on eliminating waste, whilst at the same time representing the company culture of the future for the international corporation. The HPS content is tailored to the specific needs and requirements of the respective Hennecke production site. Here all the sites are faced with a so-called ‘brownfield’ of existing production areas (the opposite to a ‘greenfield’, where a factory can be created on open countryside without restrictions). This means that the current design of the production areas limits productivity, and especially expansion. The set of measures also includes a realignment of the global Hennecke organization. “Here our company is unbundling its organizational complexity: what was previously designed and built at several sites in parallel is now being produced at only one of the four centers of excellence,” explains Sabine Rudolf.

**Production layout is restructured**

One of the focal points of the HPS is to connect the different operational areas, allowing for a synchronized, waste-free production that is aligned with customer demand. Here the objectives are to reduce stocks and wait times, maximize quality and adherence to delivery dates, and use the assembly space to add value. Optimizing the production layout plays a mayor role here. Removing the partition walls and distinctly separating the areas for assembly and material supply creates greater adaptability for assembling freely configured and flexibly designed machines and plants with largely standardized products. Separate areas are also dedicated to pre-assembly and customization.

**First site completed**

Development, planning and manufacture of all the high and low-pressure PUR machines and available mixhead systems have been consolidated at the headquarters in Sankt Augustin. The reconstruction has been successfully realized; the space-saving and largely automated storage towers have recently been approved for start-up, and a new logistics center has just been completed. At the Verano Brianza site in Italy, home to Hennecke-OMS with its market-leading portfolio of sandwich panel production lines, the measures are also close to completion. Since the official start in December 2021, every square centimeter has been analyzed and adapted to meet the new requirements. The work has focused on maximizing production space and capitalizing on the benefits of the fourth industrial revolution (Industry 4.0), as well as creating a modern working environment for the staff. The reconstruction began in March 2022 and has been carried out without causing any disruption to the ongoing production. At the same time, great efforts have been devoted to

improving work processes and reorganizing the different areas. The transition is almost complete. Finally, an area measuring approximately 900m<sup>2</sup> in size will be ready for creating long-term customer value. Works are now underway to put the storage towers into operation – making the logistics processes more efficient – and to install a new energy-saving heating system. All the modernization work and structural changes have been carried out under close consideration of Hennecke’s ecological footprint and the company-wide ESG objectives.

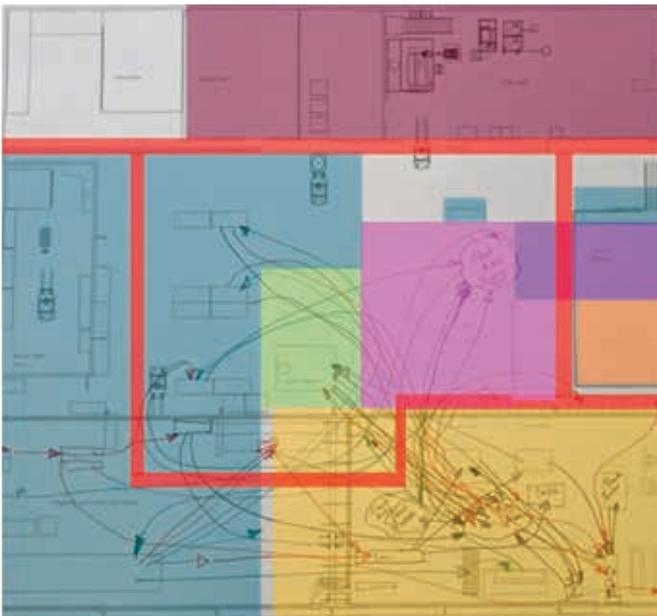
### Step-by-step global expansion

“After the success of the HPS roll-out in Germany we didn’t want to wait,” reports Sabine Rudolf. Subsequently, the launch date for North America was set for October 2021. The Pittsburgh site is responsible for tank farm technologies for the entire system business of the Hennecke GROUP. The production areas have been analyzed in detail and plans drawn up for the new layout: The value-adding area will be enlarged by around 340 square meters, separate areas will be created for logistics and production, and the transport spaces will be reduced to the minimum required. New tools and equipment will be procured to make work at the site more efficient and ergonomic, whilst reducing the risk of hazards and injury. All these measures are due to be completed next year.

### First steps in China

The site in China has suffered from delays due to the pandemic. Shanghai and Jiaying are home to the global competence center for the construction of plant dry parts for slabstock foam, molded foam and the technical insulation lines. Travel restrictions have meant that so far the initial steps could only be made digitally. As part of the standardization strategy, design guidelines have already been introduced, as well as a variety of assembly and testing instructions to ensure consistent quality. The layout will be redesigned in the same way as at the other sites, conforming with the HPS principles. Besides order and cleanliness – “a place for everything and everything in its place”, as the saying goes – the focus here is also on general structuring, maximizing and separating the value-adding areas from the transport areas. Other ongoing projects concern resource efficiency and environmental protection, as well as improving employee-centered management. Implementing the standardized project planning guidelines for all new incoming orders and making detailed improvements to design plans are further priorities.

Sabine Rudolf is delighted with the progress: “We have finished implementing the measures at our German site for the time being and can now move on to the next level, Italy is on the verge of completion, and USA and China are also on their way. The Hennecke GROUP is set up extremely well for the future!” ■



- Logistics
- Electric Sub Assembly
- Pump Shop and Lab
- Mechanical
- Assembly
- Walkway
- Painting
- Tool Room

The production area at the Pittsburgh site will be extended by 340 square meters through the new layout. Old layout on left, improved layout on right.



## A NEW PRODUCT LINE AND ENHANCED DIGITAL PORTFOLIO

With its 360°ENVIRONMENTAL SERVICES Hennecke is focusing on sustainable PUR production in customer support too. Services here include a platform for used machines, as well as EOL solutions when the machine or plant has reached the end of its service life. The new service portfolio also scores points for digitalization with an extended range of 360°CONNECT offerings. The 360°SERVICE portal features a new webshop and enhanced functions for documentation and support. Customer service now includes digital service contracts that generate real added value using Hennecke's IoT solutions. ■



## HENNECKE IS A FOUNDING MEMBER OF THE BONN/RHINE-SIEG PLASTICS INITIATIVE

Hennecke GmbH has joined forces with six other local companies and organizations to create the Bonn/Rhine-Sieg Plastics Initiative. With the aim of attracting more participants and support and generating greater public discussion, the Plastics Initiative has its own online presence and social media account, and hosts regular events focused on different aspects of this universal material. A number of priorities have been determined by the group. One focal point is the issue of sustainability, and how, for example, plastics can have a positive impact on CO<sub>2</sub> savings and on our daily lives. Plastics also play an important role when it comes to career prospects and apprenticeships in the working world. Rolf Trippler, Hennecke GROUP CSO, referred to this at the founding meeting, highlighting the importance of the industry as an employer. "We offer a wide range of stable and long-term career prospects, from forward-looking apprenticeship trades to dual study programs," he said. "The seven companies in the Plastics Initiative alone recruit around 40 trainees every year." ■

## TRADE FAIRS 2023



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