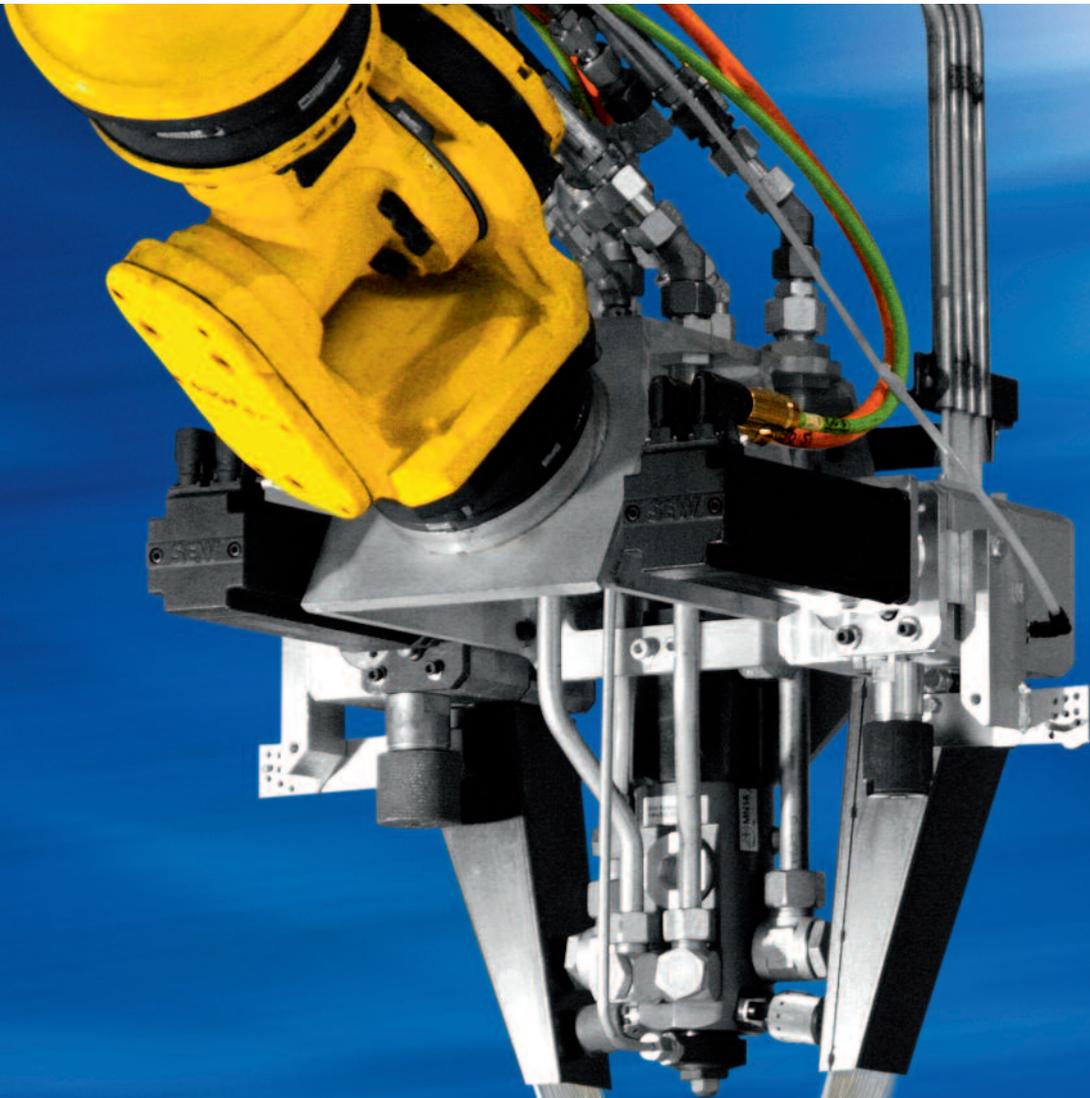
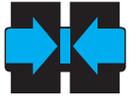


# 110 INNOVATIONS

Journal for technologies and trends on the PU market

Hennecke  
Polyurethane Technology



# PURE OUTPUT

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Trade fairs, seminars, conferences and symposiums in which Hennecke will participate

Hennecke ELASTOLINE-Days  
Sankt Augustin • 15. - 16.06.2010

Chileplas  
Santiago de Chile • 01. - 03.09.2010

Composite Europe  
Essen • 14. - 16.09.2010

UTECH North America  
Houston • 11. - 13.10.2010

Hennecke World Sales Conference  
Siegburg • 25. - 26.10.2010

K 2010  
Düsseldorf • 27.10. - 03.11.2010

As at May 2010



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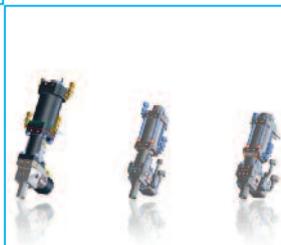


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**is concerned - 360° RETROFIT**



*Dear customers, dear readers,*

*Even those who set the standards cannot rest on their laurels. This awareness has been an integral part of our business philosophy for decades. It ensures that our customers and Hennecke are right at the very peak of technology when it comes to processing polyurethane. The current issue of INNOVATIONS includes several examples of this.*

*We report on the consistent further development of PUR-CSM technology and the most comprehensive mixhead portfolio for polyurethane spray applications in the world (see p. 14). Thanks to the customer-oriented 360° RETROFIT Service, Polyurethane processors also benefit from the consistent further development of Hennecke mixhead technology when retrofitting it to existing production technology (see p. 18). New variations on tried-and-tested machine designs such as ELASTOLINE F or the new QFOAM XL (see p. 11) prove that we always have the concrete needs of the market in focus when we explore our innovative potential.*

*On top of being innovative in machine and plant engineering, it also makes sense to put organizational processes to the test. It is not without pride that we can announce the comprehensive reorganization of our worldwide sales network: We have established new companies in Moscow (Russia), Mexico City (Mexico), Seoul (South Korea) and one branch in Hyderabad (India). The establishment of a new agency in South America (see p. 13) indicates that know-how and customer service are also required in local regions. These efforts enable us to concentrate fully on a great number of different markets and ensure that satisfied customers get optimum local service. You can find out how satisfied they are by reading about the Indian company Sheela Foam (see p. 4).*

*It is a great pleasure to invite you to read this new issue of INNOVATIONS and I look forward to entering a dialogue with you.*

A stylized, handwritten signature in black ink, appearing to read 'Rolf Tripler'.

*Rolf Tripler*  
Managing Director, Sales

## "We should have invested earlier in Hennecke plant technology" – Slabstock production at Sheela-Foam India



India is a country in transformation in many ways. The most-populated democracy of the world has a culture and tradition that goes back for millennia. Thanks to the local know-how in various, highly-modern key industries, it also has an extremely promising future ahead. Ever since market liberalisation in 1991, the economy has grown rapidly and steadily. Today, India has one of the world's most important economies and reaches international top levels in several fields. This is also true for the Indian PU industry, especially for Sheela-Foam. By far the most important manufacturer of PU foam goods in the South Asian nation, the company covers the growing domestic demand for high-quality slabstock using Hennecke machinery and plant technology.

Sheela-Foam has long been a known name in the PU world. The international company was founded in 1972 by Sheela Gautam and was pioneering in the Indian

PU industry. Today, the PU processor is especially cherished for its wide and diverse product range and it can look back proudly on impressive growth. In India alone, Sheela-Foam has ten ISO-certified manufacturing bases. There are five more bases on the Australian continent.

Apart from high-quality standard foams, the company offers a variety of technical foams for special industrial



Tushaar Gautam (l), Rahul Gautam (r)

applications. For these, Sheela-Foam uses machinery and plants made by Hennecke, the long-established PU machinery supplier. By commissioning a QuadroFoamat (QFM) slabstock plant, it was able to recently establish the continuous manufacture of slabstock under high pressure in its production process.

The INNOVATIONS team spoke to Tushaar Gautam, the grandson of Sheela-Foam's founder and the company's current production manager, about the business relationship with Hennecke, the company's experiences with high-pressure machine technology and the future of the Indian PU industry.

*Mr. Gautam, you have been manufacturing PU foam products for 30 years already. And yet, the first Hennecke QFM slabstock plant only came on stream in 2007. What were the reasons behind this decision?*

Today, the Indian PU market has reached a stage where a great deal more quality and an increasingly wide product range are demanded. This is only possible with high-pressure component mixing.

By deciding to use Hennecke plant technology in our production process we have reacted successfully to the needs of the market.

*The QFM plant enables the continuous production of high-quality foam products. What has changed thanks to this in your production process?*

Apart from a remarkable plant reliability we have observed a significant increase in production efficiency. Moreover, we have the possibility to use all sorts of raw materials and therefore we can gradually expand our product range. Sheela is the first Indian company to offer polyester-based foam products. Before, these always used to be imported. If anything, we regret not investing in Hennecke plant technology earlier.

*Your first contact with Hennecke GmbH dates back to 1994. What can you say about your work with the German PU experts to date?*

I associate Hennecke with excellent customer service, before, during and after an order is placed. What should especially be mentioned is the overall service and production assistance in the initial start-up phase. Furthermore, Hennecke is always a reliable partner when it comes to questions about the processing technology in general and system technology and control in particular.



From left to right: KK.V.R. Prasad (Representative Hennecke India), Tushaar Gautam (Chief Operating Officer Sheela), Karsten Brückner (Sales Manager Hennecke), Arvind Kumar (Vice President Sheela), Rahul Gautam (Managing Director Sheela)

*What trends can you currently observe on the Indian PU market?*

In the past, we have observed a growing demand for complex and high-quality foams. I think that there is still a great potential here and we're well on the way to tapping into it.

*Despite the success of Sheela, the use of PU products is still quite low in India when one looks at the population figures. What more could be done to change this?*

Well, the excellent quality of our products obviously offers the possibility to increase the demand for polyurethane.

High-pressure technology also opens the gate for many other appealing characteristics. Because of the effective exploitation of raw materials, the QFM system noticeably increases our production efficiency. Furthermore, we have to inform existing and future consumers more about the possibilities offered by polyurethane. This way, we can tap into new fields of application. The best example is the increasing number of technical foams that we now offer on the Indian market.

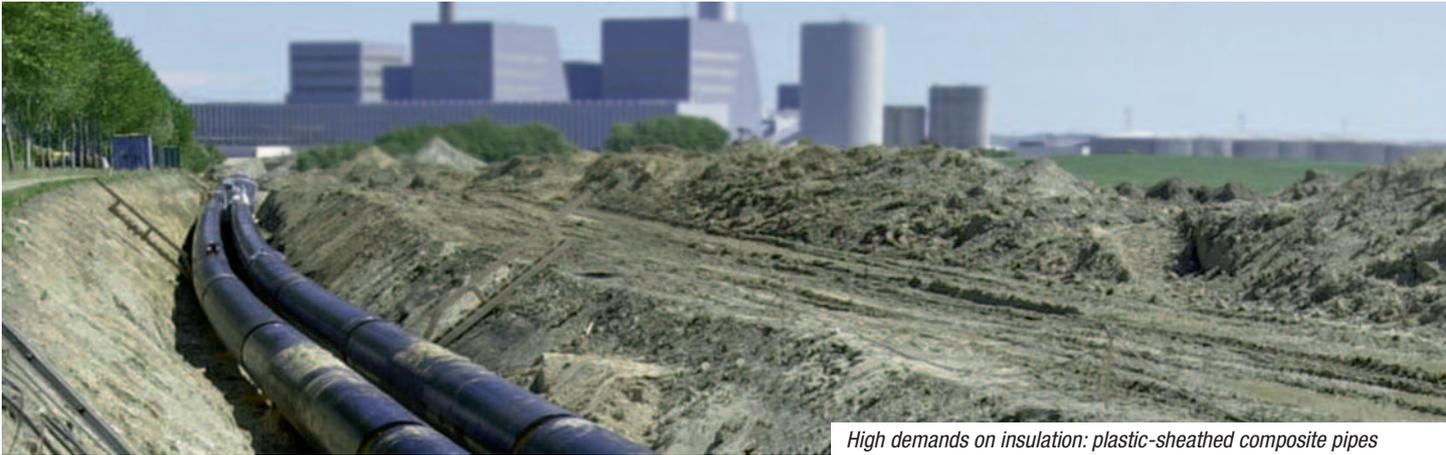
*Thank you very much for the interesting talk. We wish you and your company further success in the future.*



*Continuous production of high-quality foams:  
QFM slabstock plant*

# Pipe insulation

## It's all down to insulation



*High demands on insulation: plastic-sheathed composite pipes*

**Combined heat and power is the motto when it comes to the future of energy generation. In order to save on raw materials and CO<sub>2</sub>, the waste heat that occurs when electricity is generated will no longer be able to escape unused in cooling towers but will be utilized as district heating or cooling. Insulated pipes are necessary to make sure that the heating or cooling takes place where required. The demands placed on these so-called plastic-sheathed composite pipes in terms of insulation are steadily growing.**

**Hennecke's polyurethane high-pressure technology optimizes the pipes' insulating properties and provides the necessary high quality.**

"For our insulated pipe system customers, one factor is definitely becoming more significant: energy loss over time," says Kristian Overgaard, Technical Director at Logstor in Denmark. "Therefore, the quality of the insulation is becoming increasingly important." Logstor manufactures pre-insulated systems in 11 factories in seven countries. Apart from being used in district heating technology, they are also deployed in on and offshore applications for transporting oil and gas products, in the process industry as well as in shipbuilding.

Part of the steam that is produced in heat and power cogeneration in a power station is used for heating purposes. There is a marginal drop in the degree of efficiency in energy generation but the total degree of efficiency increases considerably. "The best combined heat and power plants in Denmark today have a total degree of efficiency of over 90 percent. By comparison, many conventional power stations in Europe have a utilization factor of between 30 and 57 percent because residual heat is not used," explains Overgaard, making clear how much saving potential there is. The plastic-sheathed composite pipes that are required in district heating networks commonly exist in lengths of six, twelve or sixteen meters. They are made from different materials. The medium pipe can be made out of steel, copper or plastic, whereas the thermal insulation is made of foamed PU and the jacketed pipe consists of PE. The medium pipe sticks out on both sides beyond the jacket so that the pipes can be joined together on the construction site. After the medium pipes have been connected, a PE fitting is positioned over the non-jacketed section and the cavity is filled with foam.

### **Different manufacturing processes**

There are four continuous production lines comprising four TopLine metering machines with MX mixhead technology and pentanization in online operation at the Danish Logstor factory for manufacturing these insulated pipes. There are also two special lines for production in a traditional discontinuous process.

In the conventional process, pipes with fixed lengths are manufactured one at a time. The medium pipe is equipped with spacers and then fitted with a jacket pipe made of polyethylene. Then the PU foam is poured as rapidly as possible into the cavity between the slightly tilted medium and jacket pipes where it subsequently expands from top to bottom. However, this production option poses several problems and necessitates the right hardware in the form of state-of-the-art mixhead technology, as Hennecke Sales Manager Dieter Müller explains: "To date, the process is the most common because it requires the least investment and is easily convertible and flexible. However, there can be turbulence during PU injection leading to a formation of voids and variations in density. It is decisive to fill the pipe with as much reaction mixture as possible within a given time.

# Pipe insulation

Hennecke's MXL mixhead is perfectly suited for this and produces optimal results." Logstor still uses the classical process for smaller batches because of the lower plant investment.

In the continuous version, the pipes are cut to the desired length after they have cooled down. To begin with, the inner pipes are fixed continuously and at the same time, aluminized foil is preformed into a U-shape. In a next step, a mixhead pours the reaction mixture onto the foil,



*Dieter Müller  
(Hennecke-Sales-Manager)*

which is subsequently closed so that it envelopes the inner pipe. Afterwards, the pipe, foil and rising foam pass through a calibrating unit for curing. The foam-insulated pipe is then put into an extruder where it is coated with polyethylene. The pipe is drawn uniformly during the entire manufacturing process, which offers one significant advantage, according to Dieter Müller: "The PU foam just has to rise and doesn't have to overcome a flow distance as in the traditional process. This means that an extremely homogeneous density distribution and insulation is achieved."

## Higher mixing quality thanks to high-pressure technology

Besides the type of production, there are significant differences when it comes to mixing the polyurethane components polyol and isocyanate. Usually, these are mixed in a low-pressure process with the help of a dynamic stirrer. But because deposit accumulates in the stirrer in the course of time, producers using this process always have to wrestle with a reduction in mixing energy and a drop in the specific mixing quality as a result. Moreover, an uneven cell structure arises because of the escape of pentane in the mixing chamber. Further disadvantages include trapped air caused by the stirrer, the fact that the mixhead has to be cleaned with solvents after just a few hours, and the impossibility of varying the output during a production run.

With high-pressure technology, however, polyol and isocyanate are atomized with high energy according to the impingement mixing principle. This leads to a significantly improved mixing quality. Pentane can also be processed in a safer manner. "The PU foams have a very homogeneous cell structure. The cell sizes are smaller and more uniformly spread than when low-pressure technology is used," explains Müller. Overgaard adds: "The use of the systems is much more comfortable: great output variability, additional components, such as activators, can easily be metered, there is less cleaning of the mixing chamber and no need for using solvents."

## Higher market chances with high pressure

Using Hennecke's high-pressure technology is doubly beneficial for Logstor. On the one hand, the company can fulfill the industry's requirements for high-quality insulating properties and on the other, it can be sure of efficient and reliable production. An investment in the future, since the market for plastic-sheathed composite pipes will grow considerably in the next few years, says Overgaard. "All over the world, efforts to protect the environment are taking place and we can also contribute to the reduction of CO<sub>2</sub> emissions with our solutions. European governments and the European Union have been promoting combined heat and power systems for years. We expect this to happen in Eastern Europe and other parts of the world too."



## Award-winning innovation with Hennecke machine technology – the Durflex® track bed system



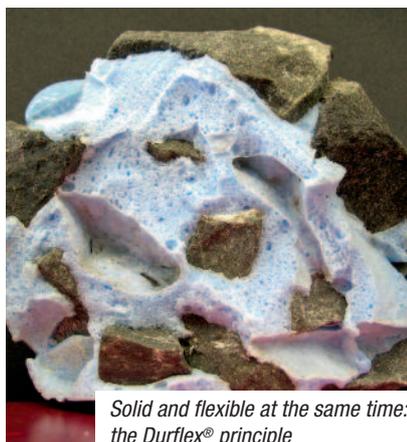
*May be out of date soon thanks to Durflex®: noise barriers along rail tracks*

**With its ballast bed partly foamed with Durflex®, Frenzel-Bau GmbH & Co. KG has developed a real innovation in the field of track bed systems.**

**The technology that results from close cooperation between Hennecke GmbH and Bayer Material Science has now been awarded by the “Germany – Land of Ideas” initiative.**

Durflex® is a system that effectively optimizes track bed systems with regard to airborne noise, structure-borne noise and stability. When using Durflex®, the ballast body is fixed under a sleeper by injecting a polyurethane (PU) system. In this way, hollow spaces can be completely filled preventing the ballast material from moving whenever trains cross the rails. This works in new railway construction and renovation.

Thanks to the additional option of mixing time-critical components (online batch process), it was possible to optimally fit the machine to the Bayflex® PU system. The results of the measurements and numerous test series prove that the system lives up to its promise. There is a significant reduction of emissions as well as operational and life-cycle costs. Repacking is not necessary and the



*Solid and flexible at the same time: the Durflex® principle*

The potential of the new technology was already apparent during the first test series in Hennecke’s technical lab. Already in the middle of 2007, a 300-meter-long pilot section was put into operation in Uelzen (Lower Saxony) to test the knowledge acquired in real-life conditions. For this purpose, a specially-designed high-pressure metering machine of type TopLine HK650 was installed in a train container. A triple deviation Hennecke MX mixhead was selected for injecting the metered mixture.



*The central part of the plant: TOPLINE HK high-pressure metering machine*

track's service life is considerably extended. Moreover, track deformation is avoided, thus reducing the number of broken sleepers and rails. Therefore, the new technology further revolutionizes existing track systems both in economic and ecological terms.

These many advantages were honoured with a "Selected Landmark" award by the "Germany – Land of Ideas" initiative and its patron, German President Horst Köhler. Hennecke congratulates Frenzel-Bau on this special honour and is proud to have contributed to the realization of such promising technology. In the long-

established company's opinion, Durflex® is an example not only of the wide range and applicability of polyurethane but also of the innovative force of German medium-sized companies. Or, to put it in the words used at the awards ceremony – "forward-looking, innovative, creative and modern."

Find more information about "Germany – Land of Ideas" at [www.land-der-ideen.de](http://www.land-der-ideen.de)



*Polyurethane injection into the track bed*

Durflex® is a registered trademark of Bayer MaterialScience AG.

## Added Value Extra Large - the New QFOAM XL

**With the aim to ensure that there is an optimal solution and great practical advantage for each user and application, Hennecke GmbH has drawn on its vast experience last year already to develop a new generation of extremely compact metering machines based on Hennecke's well-tested technology – the QFOAM series. The machine and plant manufacturer has now added the XL version that stands out for its considerably enhanced scope of equipment even for special applications.**

The fact that QFOAM metering machines allow real added value to be achieved in

the production process has become common knowledge about one year after the market launch. This is certainly because the major benefit of the QFOAM can be explained in a few words: The machine concept combines the advantages of polyurethane high-pressure technology with an extremely convincing price-performance ratio. Hennecke's comprehensive expertise and well-known quality are aboard anyway and make the two-component machines an ideal alternative to low-pressure systems. Due to the positive customer feedback and because Hennecke sees further potential in the market for series products in particular, the new QFOAM XL has been added to the QFOAM series.

The name says it all: The XL version provides an extended basic configuration and compared to the standard type, it offers polyurethane processors a much greater range of options - also and above all for special applications.

### **Clear and intuitive control system**

As in the standard version of the QFOAM, the operator uses a Windows CE-based operator panel. The operating and monitoring device has a fully graphics-capable display and allows easy and intuitive operation. On top of the panel, the whole PLC automation is equipped with state-of-the-art components that are housed in an ergonomic operating system.





QFOAM and QFOAM XL control system

### **Tried-and-tested air-cleaned MXL mixhead**

The machine concept of the QFOAM XL also relies on the air-cleaned MXL mixhead and the tried-and-tested metering technology of the TOPLINE series. This combination enables polyurethane processors to meter the PU components precisely and achieve an excellent mixing quality for a great number of applications in the most varied areas. The MXL 14-2 mixhead functions according to the impingement injection principle. The whole recirculation of the components is groove-controlled so that there is already well-conditioned material at the beginning of a shot. In addition, the MXL for the QFOAM and QFOAM XL is equipped with Hennecke's patented constant pressure injector right from the factory. Thanks to the flow-optimized injector geometry, there is a significant increase in production efficiency. And because generally a lower operating pressure is needed, there is less wear and noise development in the metering pumps, and the energy consumption of the whole metering system is reduced. The main applications of the hand-operated mixhead are cold-curing flexible foam, compact systems, filling foam, integral skin foam, energy-absorbing foam and

rigid insulating foam. The high-tech component has a low weight because of its efficient design. It therefore enables ergonomic operation and less tiresome work for the user even if moulds are difficult to access. In addition, the air cleaning of the mixing chamber completely eliminates the need for solvents that are, for example, used for cleaning customary low-pressure mixheads.

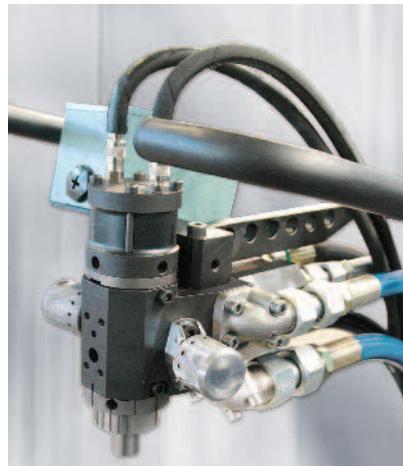
### **Efficient machine concept with larger work tanks**

Compared to the standard QFOAM, the most outstanding feature are larger work tanks in double-walled design and optional heating sleeves for a homogeneous temperature control of components. Thanks to standard edge filters and the option of retrofitting magnetic couplings, the XL version is much easier to maintain. In addition, there are useful features like the optional tank farm connection, for instance. In spite of larger work tanks and the extended base frame, Hennecke has implemented the typical QFOAM mobility also in the XL version. Due to the compact design and plug-and-play installation that is typical



Double-walled 250-l tank in the QFOAM XL

for Hennecke, the QFOAM XL can very easily and rapidly be integrated into the production process and moved, if necessary – even if the user is new to PU. The delivery times are also fast. Because of optimized production logistics, the QFOAM XL can already be on its way to the customer about four weeks after an order has been placed. From this moment on, at the very latest, the customer will benefit from Hennecke's excellent service on everything that has to do with the new QFOAM XL.



New MXL mixhead with constant pressure injectors

# Agency in Argentina

## Know-how and customer service on site – New Hennecke agency in South America

**Hennecke GmbH has established a new agency in South America in close cooperation with the Argentinean enterprise Jose Iturraspe S.A.I.C. The focus of the cooperation is on selling the Hennecke product portfolio and on qualified technical customer services.**

Iturraspe, which is headquartered in Rosario in the Argentinean Province of Santa Fe, was established back in 1950 and, as leading Argentinean manufacturer of hydraulic presses, has an excellent knowledge of the market and plenty of experience in the local mechanical engineering sector. This makes the company with long-standing tradition an ideal partner for the systematic expansion of the Hennecke sales and service network on the American continent.

According to information from the Hennecke management, the new agency is a response to the increasing potential of the South American market and the growing demand for high quality, polyurethane-based products within the region.

The experienced team of sales specialists and technical experts wants to support the processors of those products with a broad spectrum of services in the local language. This also guarantees the shortest possible response times for delivery of plant and machine technology as well as spare parts. In addition, Hennecke and Iturraspe will also pool their know-how in terms of high quality hydraulic presses for the discontinuous manufacture of polyurethane sandwich panels. Within the product group of sandwich elements, the sales area of the new agency covers the whole South American land surface up to the state border of Panama including Cuba.

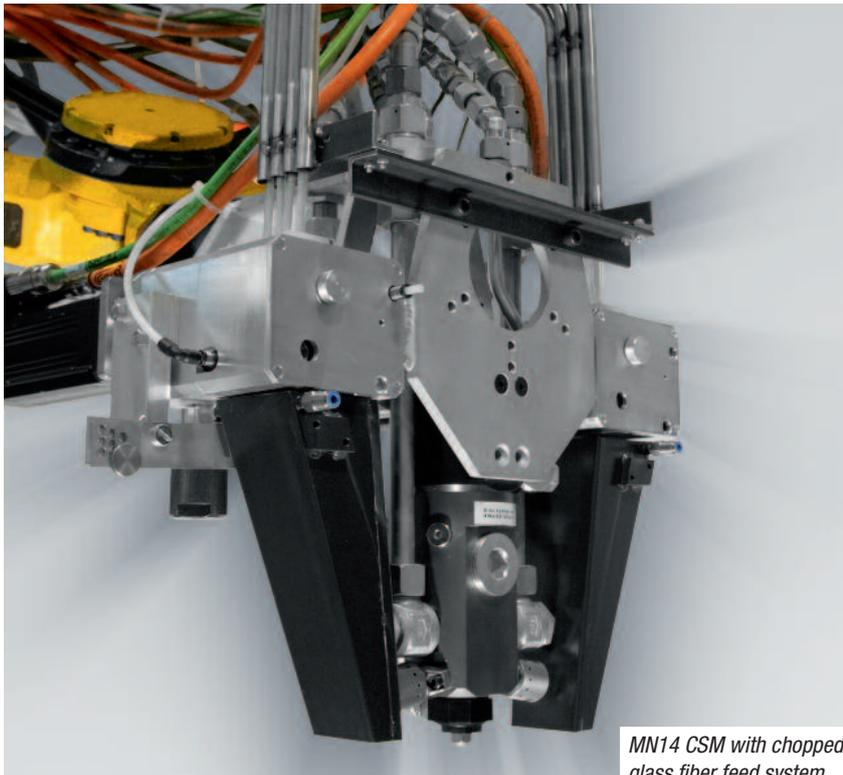
Iturraspe will also offer all other components of the Hennecke portfolio, except within the sales region of Brazil, where the long-term and competent Hennecke partner RoWe will continue to handle questions from local customers quickly and efficiently. Interested companies can find more information about Iturraspe on the Internet at [www.iturraspe.com.ar](http://www.iturraspe.com.ar).



*From left to right: Jorge Alonso (Sales Manager Iturraspe), Carlos Garcia (Ambassador - External Relationship Ministry), Hector Iturraspe (Managing Director Iturraspe), Alois Schmid (Managing Director Hennecke), Dieter Müller (Sales Manager Hennecke), Carlos Martese (Ambassador Coordinator - External Relationship Ministry), Mariano Iturraspe (Managing Director Iturraspe).*



## Pur(e) output: the PUR-CSM mixhead portfolio



*MN14 CSM with chopped glass fiber feed system*

Meanwhile, PU processors all over the world are aware that Polyurethane Composite Spray Moulding (PUR-CSM) uses spray technology to manufacture fiber-reinforced parts or compound moulded parts from filled or unfilled polyurethane systems. However, thanks to constant further development and the modular expansion of the product portfolio, new areas of application are always being identified. One of the key reasons for this is the use of state-of-the-art mixhead technology. At the JEC trade fair in Paris, Hennecke's composite experts are presenting two new types in addition to their existing CSM mixheads, which makes their polyurethane spray technology mixhead portfolio the most comprehensive in the world.

Ten years after it was invented, the field of application for CSM polyurethane spraying technology reaches far beyond the automotive industry. The great variety of use in the utility vehicle, sports and sanitary industries forms the basis of perhaps the most advanced way of processing polyurethane. The main reason for this is close cooperation with users as well as continuous research and development in machine and plant technology. Here, the mixheads are especially important because their manufacture requires a high degree of know-how and experience. Hennecke has excellent expertise in this area and builds its mixheads, with the exception of a few standard parts, in its own factories – a novelty in the European competitive environment and a guarantee of high-class economical polyurethane processing. There is a reason why

Hennecke mixheads have an excellent reputation: They are used in existing systems with over a million meterings a day.

### **Inclusive of competitive unique selling points**

The base material for the mixhead housing is high-grade tool steel. In order to ensure a flawless quality, the chemical composition of the steel is checked and documented with a spectral analyzer before the production go-ahead is given. Then the blank is shaped into its final form by various automatic lathes and millers in the company's own processing center. Up to 100 different moulds are used in the process. In order to achieve the required and extremely high dimensional stability, state-of-the-art computer technology and a high degree of intuition are needed. Intuition is ensured by training employees for many years. These efforts guarantee the user optimum production results and reliable plant technology, inclusive of competitive USPs. All CSM spray mixheads, for example, benefit from the possibility of being able to interrupt shots during spray application. This has great customer value because a uniform spray coat and reduced material consumption are achieved. Besides, the self-cleaning spraying injector that is typical of CSM technology means that minimum effort is required when it comes to maintenance and cleaning. A positive side effect of CSM technology is that there is no need for using solvents at all. This does not only reduce production costs but also lessens the impact on the environment. It therefore makes sense to use CSM technology from both an ecological and economical point of view. Apart from meeting the highest requirements regarding flexibility in production, reproducible part quality and efficient

utilization of materials, CSM hardware also has another key advantage: the modular development and combination possibilities of different CSM product modules. For instance, a customer can decide whether to install the chopped glass fiber feed system at the beginning or retrofit it later on. Customers can thus make targeted investments without having to buy parts that are not required in the current process. This is more important today than ever before.

**Best results when dealing with high outputs – the MN14 CSM**

The chopped glass fiber feed system of the newest member of the CSM mixhead family also has an adaptable modular design. But even without it, the MN14 CSM has remarkable performance characteristics that are of special advantage to PU processors when it comes to manufacturing large-sized composite parts. The newcomer can provide between 150 and up to 800 impressive grams of reaction mix per second, as required. With the chopped glass fiber feed system, the MN14 CSM enables a total system output of over 1,000 grams per second – unique in the area of polyurethane spray processing. The optional chopped glass fiber module can be activated separately. With its electromotive drive and an output of up to 300 grams per second, it provides for the necessary reinforcement in the end product.

**Open for many applications – MN10 CSM and MN8 CSM**

With outputs from 30 to 350 grams per second, the MN10 CSM covers a very wide output range - even for up to four raw material components. On the one hand, this multi-component technology allows for the use of several



*A strong point of the MN10: honeycomb parts*

PU formulations from the same raw material family, which may differ in terms of reactivity, in order to serve moulds of different sizes on one system. On the other, totally different PU systems and thus various manufacturing processes can be handled on one plant. At a time

when the manufacture of composite parts is becoming more and more important especially because of the growing significance of lightweight construction, this is of great customer value.

CSM semi-finished product processing and CSM chopped fiber technology can be combined for instance. The additional chopped fiber module needed for this can be used both as an important technological tool in chopped fiber technology for fiber reinforcement and as a useful and efficient supplementary module in semi-finished product processing for providing local reinforcement. For two-component applications that require a lower output, Hennecke customers can also take advantage of the MN8 CSM as from now. The MN10 CSM's "little brother" has been specially designed for the output range of 20 to 150 grams per second, enabling an excellent mixing quality for systems that are difficult to mix.



*MN10 CSM*



## Filler-capable for “toughest” application conditions – MN10F CSM

Systems that are difficult to mix also form the focus of attention when it comes to spraying filled PU systems. In addition to the suitable metering machine technology, a corresponding filler-capable spray mixhead, the MN10F CSM, is available to meet the - in the true



Improvements in detail: the new MN8

sense of the word - “tough” conditions when filler is being used. Adding fillers to the media components such as heavy spar for reducing noise of parts in vehicle interiors or calcium carbonate for reducing exothermic reaction temperatures – to name but two conventional fillers – is an everyday application for this mixhead. The MN10F CSM combines the capability for solids with a special injection technique inside the mixing chamber. The so-called back flow mixing technology ensures optimum mixing and therefore excellent product quality. But also when it comes to processing filled PU systems, Hennecke does not rest at the classical two-component spray mixhead. Applications for which a single heavy-layer structure

is not sufficient can rely on the four-component version of the MN10 F CSM.

## Demanding in terms of quality, modest in terms of material: Polyurethane sprayed skins

For spray applications focusing on thin layers or difficult access, outputs at the lower end of the high-pressure metering application are important. The benefits of CSM spray technology especially pay off when it comes to the surfaces of complex components such as instrument panels or door trims. In the field of car interiors in particular, the most varied requirements come together. The dashboard of the new BMW 5 GT is an example of such a complex application. Thanks to the soft touch effect, users can achieve an excellent surface feel. However, PUR sprayed skin is not only one of the most high-class surface technologies, it is also very attractive in terms of cost. Thanks to the option to interrupt shots during the CSM spray application, depending on the complexity of a part, there can be material savings of over 10 percent.

## The hummingbird of spray mixheads – MN6 CSM

The MN6 CSM was especially developed for these applications. The mixhead for very small outputs has an output range from 40 grams per second at the upper end to below 10 grams a second at the lower end of the spectrum. Depending on the PUR system, the spray output can even be reduced to 6 grams per second – a novelty on the market. At the same time, the MN6 CSM is already fit for future applications, such as when it makes sense to combine two PUR systems with the same base components. With this in mind, the MN6 CSM was designed as a multi-component mixhead for

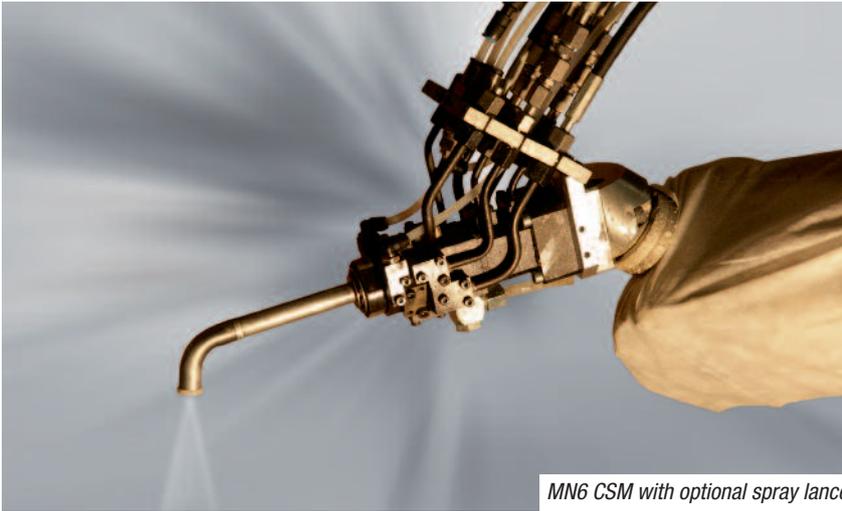


Dashboard of the BMW 5 GT

processing up to three base materials right from the start. Moreover, the MN6 CSM is also suitable for PUR systems that are rather difficult to mix. Not only the output but also the design of the mixhead is quite minimalistic. With dimensions similar to those of a TV remote control, it is particularly suited for applications with difficult accessibility. In combination with a further new development, the MN6 CSM is even appropriate for very narrow component sections and highly-complex geometrical shapes. A strongly modified spray injector in the form of a spray lance that is just as thick as a finger and up to 250 mm long is used for this. Moreover, because the spray lance does not only function as an extension of the spray injector but is also available with different outlet angles, the user can perform the spray application at different angles to the mixhead axis. Equipped with a spray lance, the MN6 CSM truly lives up to its nickname – internally the high-tech part is often described as the “hummingbird”. The spray lance is also available for the MN8 CSM and MN10 CSM mixheads.

## Standard in the field of sandwich components

The sum of advantages makes CSM technology an indispensable partner when it comes to polyurethane spray coating. More and more users are



MN6 CSM with optional spray lance

acknowledging this, to Hennecke's great pleasure. In the manufacture of sandwich components, the CSM plant technology has a market penetration of almost 90 percent and practically sets the standard. At the same time, there is a growing number of classical production processes for which PUR-CSM represents a convincing alternative because Hennecke

spray technology adjusts to a particular application and not vice versa. By consistently expanding its CSM mixhead portfolio, Hennecke meets the concrete requirements of the market. Its "pure output" can be adapted to all thinkable and unthinkable application scenarios - maybe also to yours.

Mixhead	Output*	Numbers of components	Spray nozzle	Main applications
<b>MN6 CSM</b>	06 - 40 g/s	2 to 3	○	Sprayed skin Chopped fibre glas in open mould technology
<b>MN8 CSM</b>	20 - 150 g/s	2	○	Chopped fibre glas in open mould technology Long fibre technology (LFT) CSM-multi component technology
<b>MN10 CSM</b>	30 - 350 g/s	2 to 4	○	Paper honeycomp technology Long fibre technology (LFT) Chopped fibre glas in open mould technology CSM-multi component technology
<b>MN10 F CSM</b>	30 - 350 g/s	2 to 4	—	Heavy layer parts Spray of filled material
<b>MN14 CSM</b>	150 - 800 g/s	2	—	Long fibre technology (LFT) Chopped fibre glas in open mould technology

\*PUR mixture without chopped fibre glas

— = not available

○ =optional equipment

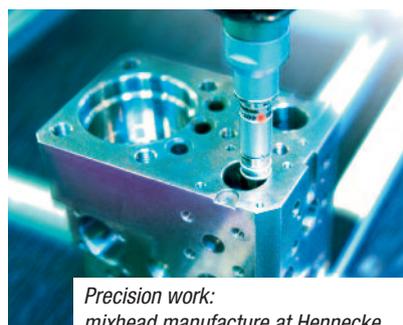
## Uncompromising where customer benefit is concerned - 360° RETROFIT



*"Optimizing plant technology effectively"*  
Peter Böhm, Manager, Service-Sales

**Under the name 360° RETROFIT, Hennecke GmbH has set up an individual sales area with its own team of designated experts. The service specialists want to concentrate even more intensively on tailor-made retrofitting solutions. The MT, an efficient new mixhead series that has an extremely wide range of applications and is well-suited to the "Innovation for Retrofitting" slogan, has been in the spotlight right from the start. Customers are guaranteed excellent production results at a very attractive price/performance ratio.**

The term Retrofit generally describes the modernization or expansion of existing production systems. For the longstanding service expert Peter Böhm, in charge of Hennecke's service sales department, the



*Precision work:*  
mixhead manufacture at Hennecke

focus is on securing Hennecke's high standards in the long term: "For Hennecke, Retrofit means optimizing our proven machine and plant technology effectively in decisive areas and making it appropriate for future applications. Customer benefit is always in the forefront." All the machinery and plant manufacturer's Retrofit measures are based on decades of experience, especially regarding the analysis of concrete customer demands. Carefully-constructed complete solutions ensure maximum production results. In this way, Hennecke customers are offered far more than simple replacement parts and instead presented with real innovations for retrofitting purposes.

The MT series is a particular highlight in this regard. MT mixheads use state-of-the-art technology and improve it in significant respects. The series is especially suited to applications in the areas of refrigeration and moulded foam, and was developed for PU systems that are more difficult and very difficult to mix. Thus, the MT is an optimal addition to the MX, which was designed for components that are particularly difficult to mix. The youngest member of the Hennecke mixhead family operates according to the deviation principle, which fosters the mixing process, calms the mixture and ensures a laminar, non-splashing output. The development is based on the state-of-the-art methods of flow simulation that have been created in close cooperation with the renowned Fraunhofer Institute. Decisive improvements have also been made with regard to the materials used and the operation and maintenance of the mixhead. The sum of the advantages for the customer signifies a major increase in efficiency over similar competitive models in the market. Moreover, because the MT can also prove its superiority in

**Well-equipped for each application: the line-up of the two-component MT series**



MT 36-2

MT 26-2

MT 18-2

MT 12-2

MT 8-2

MT 6-2

Type	MT 36-2	MT 26-2	MT 18-2	MT 12-2	MT 8-2	MT 6-2
<b>Output</b>						
Minimum [cm <sup>3</sup> /s]	500	300	125	50	25	8
Maximum [cm <sup>3</sup> /s]	5000	2600	1200	600	300	50
Max. (laminar) [cm <sup>3</sup> /s]	2500	1300	600	300	150	50

Special and multi-component mixheads are not illustrated; MT 12 and 18 are also available as multi-component mixheads

metering machines made by other manufacturers, it is interesting for PU processors that have not used Hennecke systems technology before.

In the area of injector technology, the MT series is also very convincing. The injectors' so-called double-V-Adjustment guarantees maximum mixing quality and material utilization. The modular injector design enables different injector sizes to be easily exchanged so that an optimum adjustment to the respective output is possible. Thus the user can already achieve perfect results with the standard injector. However, the MT series also comes with the optional innovative constant pressure injector, which needs little maintenance thanks to flow-optimised geometry so that production is considerably more efficient. Because of the lower overall operating pressure, there is not only less wear and

accumulation of noise in the metering pumps, but the power consumption of the whole metering system is reduced as well. On top of that, the constant pressure injector offers the user more flexibility in the production process because output changes are possible from one shot to the next without the injector having to be readjusted. Therefore, changes in production occur rapidly and at low cost. Moreover, the part is a winner when it comes to reliability. Dirt particles in the component are simply washed out by an automatic readjustment of the throttle gap. In order to achieve a maximum degree of automation, Hennecke's 360° RETROFIT also offers a pneumatically-assisted type of constant pressure injector that allows the pressure to be remote-controlled from shot to shot or even during shot operation. Of course, the experts also provide further services regarding the new MT series as well as

useful spare parts packages. For the user, this means that orders are processed fast and simply and maintenance is easy. All MT-type mixheads are already available. Further information about current retrofitting measures can also be found on the back page of this issue of INNOVATIONS, by calling +49 (0)1805 339 200\* or by visiting [www.hennecke.com/360](http://www.hennecke.com/360).

\* (14 Cent / Min. from a German landline; different prices from mobile networks.)

# Innovation for Retrofitting

## 360° RETROFIT



CONSTANT  
CONSTANT PRESSURE INJECTOR

**980,\*** EUR

\* This is the price of one injector, ready to ship within 24 hours, excl. VAT.

The constant pressure injector is 100 percent compatible with Hennecke's standard injectors. They can be exchanged in little time without using special tools.

The new Hennecke constant pressure injector offers you patented innovation for fast and simple retrofitting. The low-maintenance injector optimizes machine performance effectively and offers significant advantages to the production process at an extremely attractive price/performance ratio.

- **Maximum operating safety** - because dirt particles are rinsed out thanks to the automatic readjustment of the throttle gap
- **More flexibility** - because changes of output are possible from shot to shot without any further adjustments having to be made to the injector
- **Shorter cycle times** - because the machine's lead time is reduced due to a significantly faster pressure build-up
- **Maximum efficiency** - because there is less wear and tear and noise development in the metering pumps thanks to the flow-optimized injector geometry. A positive side-effect is a reduction in energy consumption

» For information about further attractive retrofit offers, please see [www.hennecke.com/360](http://www.hennecke.com/360)

