



211 INNOVATIONS

>> Hennecke customer journal for technologies and trends on the PU market

COVERSTORY

**A very special type of
ELASTOLINE F**
A rarity on the market

ENGINEERING

**1,000 percent more
service life**

Revolutionary glass fiber cutter

HENNECKE GROUP

**Hennecke Machinery
Shanghai**
Expansion in China





Dates

ACMA

Las Vegas

21.02. - 23.02.2012

JEC

Paris

27.03. - 29.03.2012

PLAST MILAN

Milan

08.05. - 12.05.2012

UTECH EUROPE

Maastricht

17.04. - 19.04.2012

As at February 2012

Dear customers,
dear readers,

The fundamental data leave no doubt about it - this year will again be marked by economic uncertainties around the globe. But aside from this macro-economic assessment, the Hennecke Group is looking optimistically into the current business year. We base this view on our broad product portfolio on the one hand and continuously high R&D investment on the other. In the global marketplace, Hennecke needs not fear comparison given the rising importance of polyurethane-based products, not just in high-growth business segments. What we have been observing in recent years is that PU demand in many industries does not necessarily follow their general economic trend. Moreover, diversification is the magic word – not many materials are so much "at home" in diverse industries and applications and new fields of use are being added all the time. This does not mean, however, that Hennecke products and technologies will become a "self-selling commodity". Lasting success in the marketplace can only be achieved by those who take efficiency and innovation seriously, combining existing solutions with new design concepts, and who remain firmly focused on customer requirements. Our continued further development of proven technologies in slabstock production (see p. 10) and tailor-made solutions for sophisticated cast elastomers (see p. 4) are just two cases in point. In order to benefit from and build on these competitive advantages in the global arena, we rely on a broadly based and ever-growing network of subsidiaries and cooperation partners. This is perfectly illustrated by the inauguration of a new site of our Chinese subsidiary, HMS (see p. 14), and by the establishment of a Brazilian subsidiary, Hennecke do Brasil (see p. 18). All this provides us with sufficient presence to keep on convincing the world's fastest growing markets - and in fact, all markets in the world – of the merits of our products and services, in line with our commitment to support our customers all along their way. In this spirit, I hope you will enjoy reading this latest issue of Hennecke Innovations!

Alois Schmid
Managing Director Technology

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A very special type of **ELASTOLINE F**

A rarity on the market

The name puralis stands for decades of experience in the area of semi-finished products and moulded parts made from cast elastomers. Located in the Schwarzzeide Chemical Park, the company was initially unable to find an appropriate partner when it wanted to upgrade a very sophisticated casting system from a manual to a largely automated production process, but this all changed with the use of an ELASTOLINE F from Hennecke GmbH.





Schwarzheide, August 2011: Four men congratulate each other. One is puralis Project Manager Alexander Augat, the second is puralis Manager Jürgen Lemke, the third puralis CEO Oliver Schmid, and the fourth is Matthias Klahr, Head of Sales for elastomer metering machines at Hennecke GmbH. The four are very satisfied that they have completed their challenging project successfully by putting the ELASTOLINE F into operation. The plant had already been put to the acid test at Hennecke HQ in Sankt Augustin-Birlinghoven.

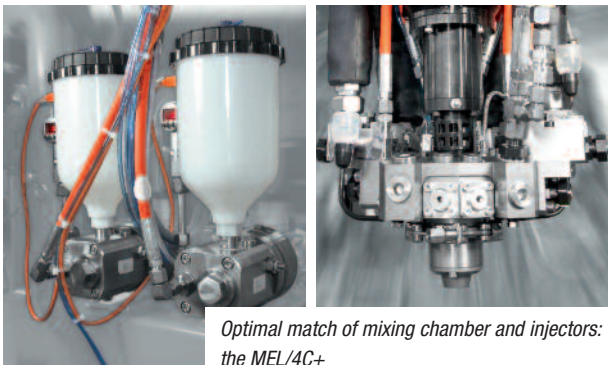
The run-up: puralis confided to Hennecke at the ELASTOLINE DAYS 2010 that it wanted its manufacturing processes to be more automated regarding special applications so that production could become even more customized. A very fruitful technical partnership then developed between Hennecke and puralis GmbH, which employs some 45 people at its HQ in Schwarzheide. The comprehensive standards that were required of the system were defined in a specification and Thomas Beck (mechanical design) started running complex and detailed trials in the lab to configure the ordered production system appropriately with regard to pump output and other parameters.



*From left to right: Oliver Schmid (puralis CEO),
Matthias Klahr (Head of Sales Elastomer Metering Machines)
Jürgen Lemke (puralis Manager),
Alexander Augat (puralis Project Manager)*

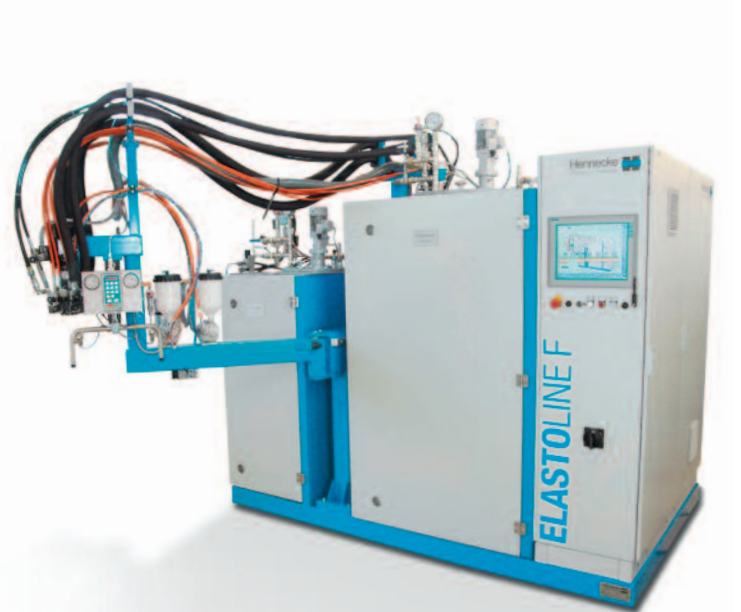
One particular requirement was the manufacture of a complex cast elastomer, a one-shot system. This five-component cast system calls for very high metering precision and for exact temperature control of the components. Hennecke met the special requirements straight to the point.

Made-to-measure pump units and mixheads



Optimal match of mixing chamber and injectors: the MEL/4C+

A metering pump that can meet even the highest and most difficult requirements regarding wear-and-tear of the isocyanate metering line was developed. Hennecke worked in close cooperation with longstanding pump suppliers to reach a satisfactory lifetime. The pump is easy to maintain, appropriate for the materials and a novelty on the market. The same is true for the MEL/4C+ mixhead whose mixing chamber and injector adjustment were tailored to the particular application. Because the requirements of the MDI isocyanate are very high when it comes to filtering and cleanliness during processing, Hennecke consulted longstanding filter suppliers to configure the filters individually.



Eight-component system that seeks its equal

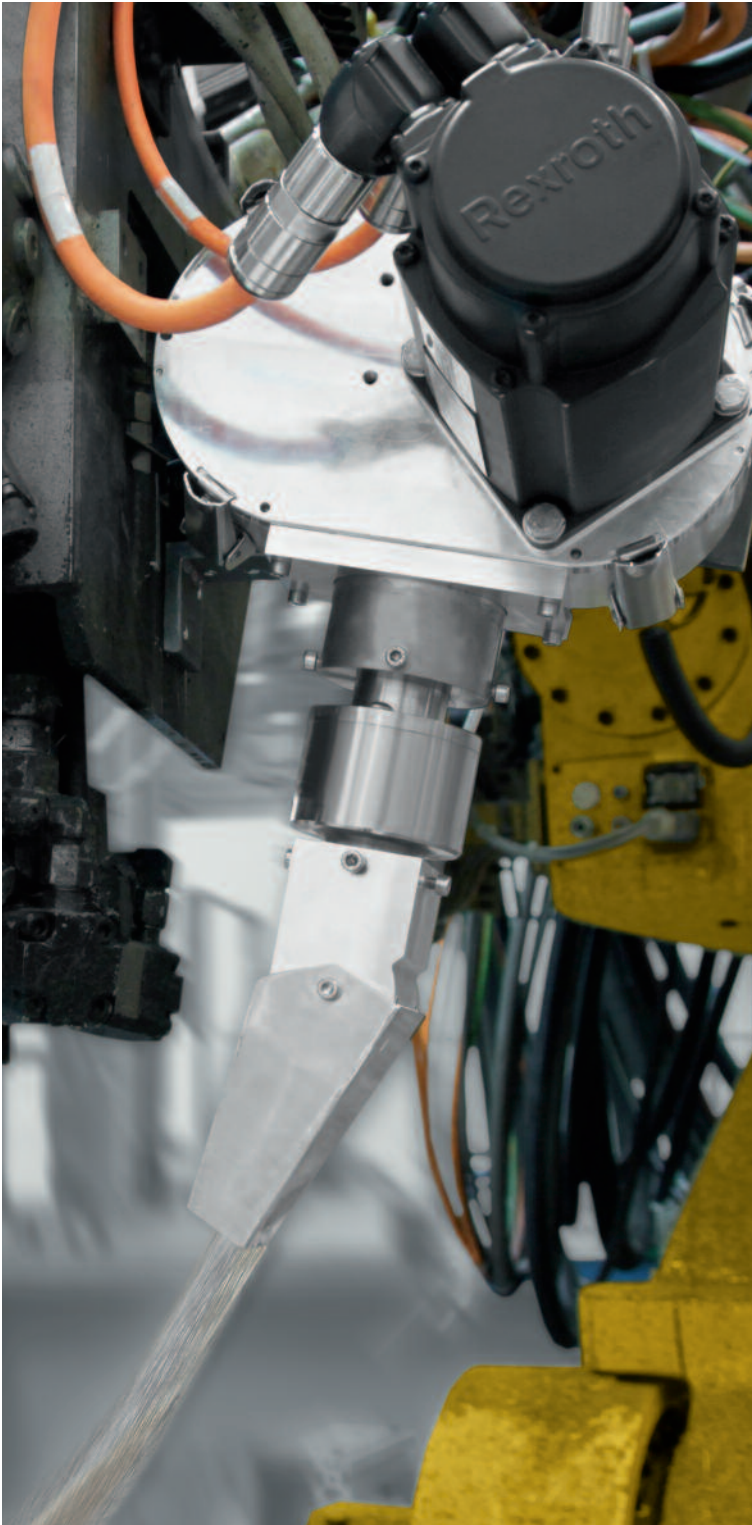
Apart from the five reactive components of the one-shot system, the ELASTOLINE F was also equipped with two colour components and a cleaning component. This corresponds to a very customer-specific configuration that is rarely seen on the market. The ELASTOLINE F is designed for 15kg/min, which enables parts weights of over 30 kgs and a great product range. puralis mainly makes high-quality cast elastomer parts for the construction machinery industry (e.g. strippers, mixing shovels), for harbour and ship construction (fenders), as well as for pipe and pipeline technology (e.g. scrapers and screw conveyors). Cylinders, clutches and gaskets for different industrial applications can also be made. puralis and Hennecke plan to continue their successful cooperation and develop their win-win situation. Hennecke has acquired a new distinguished customer and puralis now has a reliable machine builder with comprehensive expert know-how. Another plant is in the final stage of negotiation.

ELASTOLINE – known for decades

The ELASTOLINE series machines are for processing cast systems and raw materials based on PUR. They fulfill the highest requirements and guarantee high-quality end products with excellent dynamic properties. ELASTOLINE F is a flexible engineering design that can perfectly be adapted to customer requirements when it comes to processing raw material systems based on MDI and TDI. The ELASTOLINE V is particularly good at processing NDI systems (e.g. Vulkollan®) thanks to its high-quality temperature control design for optimal component conditioning.

1.000 percent more service life

Revolutionary glass fiber cutter

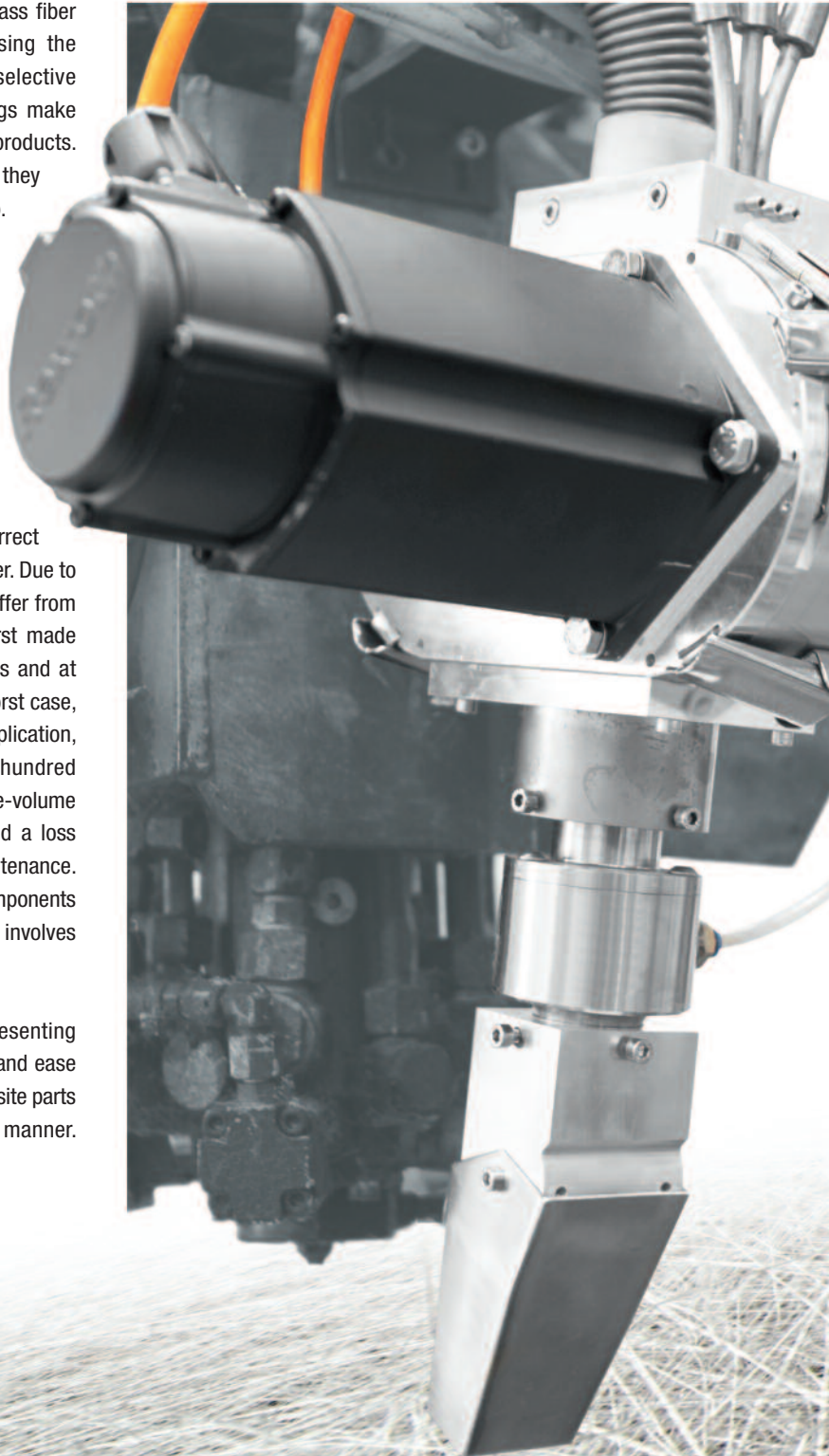


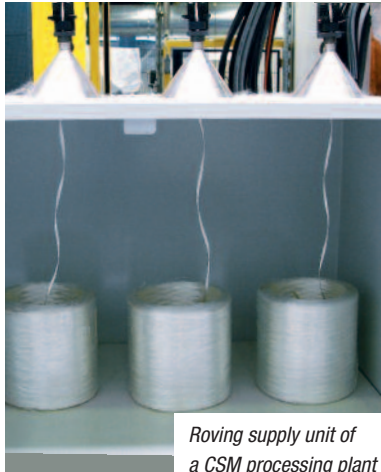
PUR-CSM is a recognized standard in the production of fiber-reinforced parts or compound mouldings. The modular setup and expansion of the CSM product portfolio is not only attractive to Hennecke customers thanks to new applications, but also because the CSM concept pays off when it comes to retrofitting equipment. The latest example for this is a revolutionary cutting unit for CSM processing plants with chopped fiberglass metering system that has a ten times longer service life than other processes on the market because of a new cutting technique, thus significantly reducing downtime, maintenance and costs.

The use of chopped fiberglass in the form of glass fiber rovings when producing composite parts using the PU spray process as a continuous or selective reinforcement is often indispensable. Fiberglass rovings make for less expensive base material than semi-finished products. Moreover, less glass is wasted during processing and they do not have to be pre-formed as semi-finished products do. In the CSM process, glass fibers are cut to the desired length with a cutting unit that is attached directly to the mixhead. The Venturi effect that occurs when the fibers are metered directly into the spray jet provides optimal wetting and saves the user time since the mixhead does not have to be cleaned with solvents as is absolutely necessary in an integrated fiberglass metering process.

Customary cutting units cut the glass fibers to the correct length by using a knife roller which is next to a press roller. Due to the system, the knife roller and the integrated blades suffer from a relatively high degree of wear and tear, which is first made visible by the changed length of the chopped fiberglass and at a later stage can even lead to blades breaking. In the worst case, broken bits can end up in the part. Depending on the application, the roller has to be changed after less than a hundred kilograms of glass fibers have been cut. In cyclical or large-volume production this can result in significant downtimes and a loss of valuable working time because of subsequent maintenance. In the past, great importance was placed on changing components as fast as possible but any change under time pressure involves additional risks that jeopardize smooth production.

Hennecke GmbH's composite specialists are now presenting a new cutter which is attractive in terms of service life and ease of maintenance, and thus enables fiber-reinforced composite parts to be produced in a more reliable and cost-efficient manner.





Roving supply unit of a CSM processing plant



External chopped fiberglass metering system: no need for cleaning the mixing chamber

This is thanks to a completely new cutting process that needs neither a knife roller nor blades and therefore eliminates the main cause of downtime when cutting fiberglass rovings. The service life compared to standard cutters is increased by over 1000 percent and furthermore the process is only interrupted when the rovings are changed. The formation of atomized spray depositions is prevented thanks to the unit's special geometry, which has been specially tailored to suit Hennecke's spray mixheads. And, as is characteristic of Hennecke, the advantages are not only for new customers to discover, but can also be enjoyed by existing customers. Thanks to the modular design, they can have the cutter retrofitted to their existing CSM spray mixheads in a fast and easy manner, regardless of whether these are already equipped with a chopped fiberglass metering system.

The possibility of combining different CSM modules with each other or retrofitting them is a typical characteristic of this processing technology. Thanks to its flexibility customers can make targeted investments without having to foresee the advance use of components that are not required for a current process. As a matter of fact, however, the competitive USPs of the mixhead technology are always inclusive. Thus, all CSM spray mixheads allow shots to be interrupted at any time during the spray process and the spray nozzle's self-cleaning function ensures minimal maintenance and cleaning. Moreover, solvents are not needed at all which not only lowers production costs but reduces the environmental impact. Thus, CSM technology makes sense in both economic and ecological terms.

PUR
CSM



One technology – double benefit for customers

Hennecke slabstock lines increase
both raw material yield and foam quality



Slabstock foams are not all the same and not all slabstock lines are equal. The difference lies in how precisely raw materials are mixed with each other, how the reactive mix is poured and how the top crust formation is minimized and transformed into usable foam. Hennecke has developed a very special technology, with which it holds a leading position in the global market.



Low or high-pressure technology?

Users who are new to slabstock foam production will pose this question, as will those still using low-pressure systems and thinking of switching over to high pressure. Whatever the case, all users have to face the fact that 80 or 90 per cent of slabstock foam production costs are made up of the raw materials, whereas the other 10 to 20 per cent go on machines, production halls, energy and sales. That's why it makes perfect sense to save money on raw materials in order to reduce operating costs.

Leading slabstock foam producers that have experience with both low and high-pressure systems are opting for Hennecke high-pressure technology, which involves mixing isocyanate into the mixing chamber at high pressure. This results in a better mixing quality of the raw materials and a higher reaction efficiency factor than if low-pressure technology is used.

Up to 4 per cent of isocyanate can be saved, corresponding to savings of 100,000 euros at an isocyanate price of 2.5 euros a kilo based on an annual slabstock production of 3,000 tons – this money can be invested elsewhere. These calculations were made during tests and trials and have since been confirmed by operator companies who have switched from low to high-pressure Hennecke technology (see box). Another advantage of high-pressure metering is that the cell size can be better controlled. If the isocyanate injection pressure is high there is a fine cell structure, whereas if it is low the cell structure will be coarser.



Making a profit with high pressure

Example calculation:

Annual slabstock production:	3,000 tons
Tonnage of ISO:	ca. 1,000 t → 1,000,000 kg
Material costs of ISO:	ca. 2.50 EUR/kg
Total ISO costs:	2,500,000.00 EUR

4 % ISO savings: 100,000.00 EUR/year

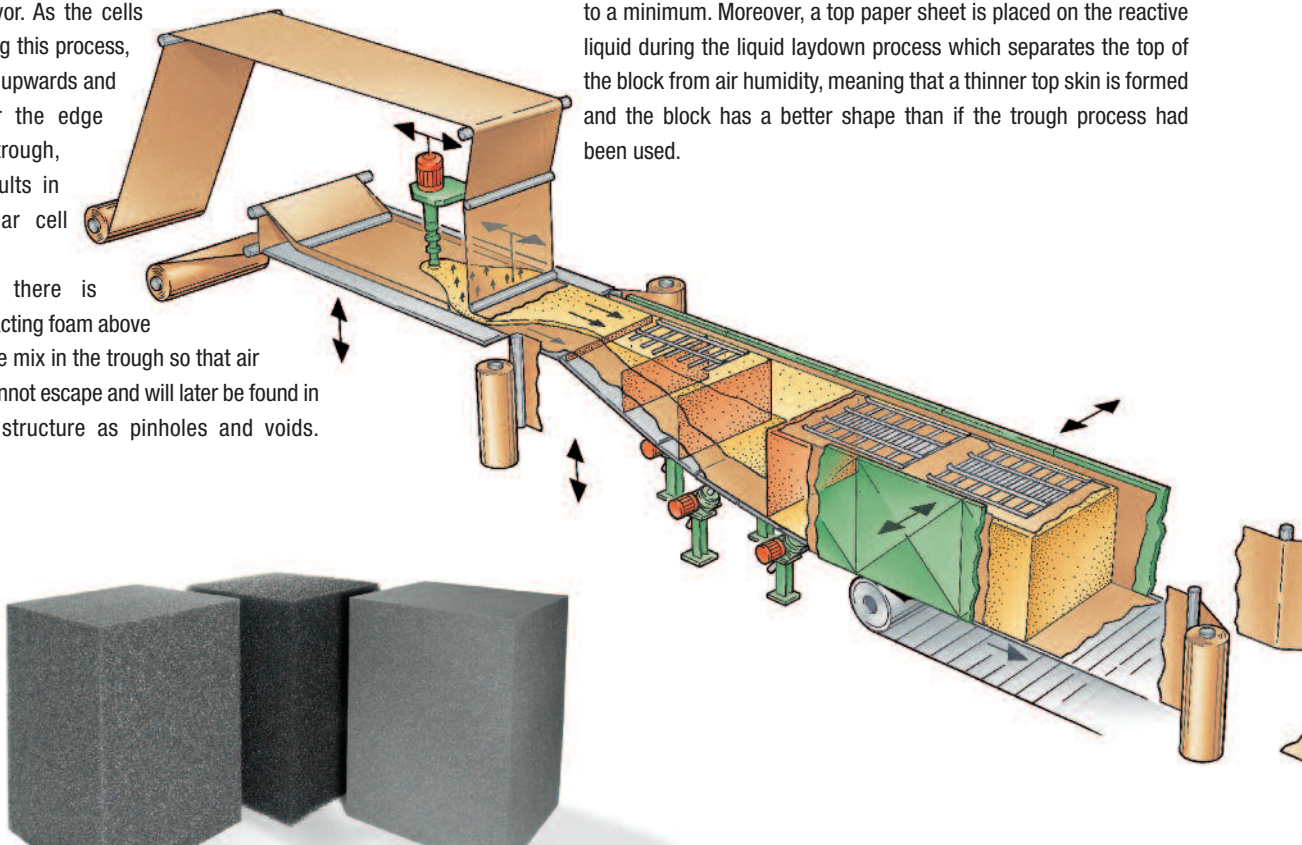
Trough or liquid laydown process?

Depending on how the reactive mixture is introduced to the foaming process, a distinction is made between using the trough or laydown process in practical applications.

As the name indicates, if the trough process is used the reactive mixture moves from the trough to the conveyor. As the cells grow during this process, they move upwards and bend over the edge of the trough, which results in an irregular cell structure.

Moreover, there is already reacting foam above the reactive mix in the trough so that air bubbles cannot escape and will later be found in the foam structure as pinholes and voids.

Hennecke's liquid laydown process works differently. The reactive mix is poured onto a sheet of paper, which is on the conveyor, and the reaction takes place upwards and downwards, thus allowing the foam to form a regular cell structure. Because the reactive mixture is poured onto the conveyor from above, air bubbles can escape before the reaction takes place so that pinholes and voids are kept to a minimum. Moreover, a top paper sheet is placed on the reactive liquid during the liquid laydown process which separates the top of the block from air humidity, meaning that a thinner top skin is formed and the block has a better shape than if the trough process had been used.



Further advantages

Flexible applications

As an option, Hennecke slabstock lines can (also subsequently) be equipped with NovaFlex® technology for producing CO₂-blown flexible slabstock foams with low densities. NovaFlex®-MultiFill also allows functional fillers, such as melamine or CaCO₃ to be processed. Operator companies can thus react flexibly to the demands of the market and environment, and produce special foams in a profitable manner.

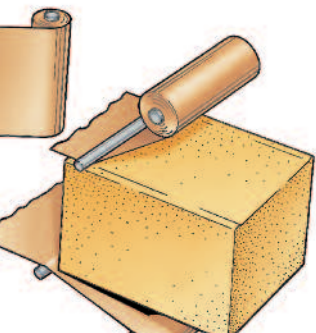


RS or flat-top system?

As was mentioned at the start, 80 to 90 per cent of the costs in slabstock foam production consist of the raw materials, which is why many slabstock producers strive for a higher material yield. The RS system, in which the shape of the block is achieved by lifting a laterally moving plastic sheeting, has its limits because a top crust that cannot be used forms on the surface.



But if the Hennecke flat-top system is integrated, blocks with an almost plane-parallel rectangular effect are achieved by sliding mats onto the upper surface of a block. The top crust is minimized to a thin top skin and transformed into usable foam. In addition, there is an important synergy effect as the foam rises because of the moving top paper that keeps the reaction heat within the slabstock and allows for more intensive foam reaction beneath the block surface. The top skin is also thinner and the material yield is higher. Thus the user can save up to 3 per cent on raw materials (see box). Moreover, by covering the block on all four sides air humidity is prevented from entering during the maturing process. As a result, there is a higher degree of hardness and a uniform hardness distribution is achieved.



Higher material yield thanks to Hennecke flat-top system



Example calculation:

Annual slabstock production:	3,000 tons
Material costs per kg of foam:	ca. 2 EUR
Total material costs:	6,000 EUR

Savings at 3%: 180,000.00 EUR

Faster liquid laydown

A new, electrically height-adjustable mixer for MULTIFLEX lines that is delivered with the outlet as a unit offers users a better foam cell structure because the reactive mixture is discharged faster. This results in foams that are practically free of pinholes and voids.

New dimensions of freedom

A new screw-type stirrer for the continuous MULTIFLEX, QFM and UBT slabstock lines, which reduces the mixing chamber pressure, enables the foamer to have more influence on cell size, meaning there is more freedom in cell control.

Hennecke Machinery Shanghai

Expansion in China



Hennecke Machinery Shanghai (HMS)'s new development, production and administrative site was opened in a festive ceremony in the heart of Shanghai. At an open-house event, the team headed by Andrew Chan, the experienced General Manager, inaugurated the new HMS site. This set an important milestone for the company's future course in China and the whole Asian region. Comprehensive investments have been made to ensure HMS's long-term expansion.



Hennecke recognized the importance of the Asian, and especially the Chinese, market at an early stage. It has had a sales and service center in China ever since the market opened up, and has continually built up its activities in one of the world's fastest-growing and most promising markets. Today, Hennecke Machinery Shanghai is one of the company's most important subsidiaries and has just underscored its success by opening a new, representative headquarters and expanding its production capacity. HMS will use the new plant to manufacture PU plant technology for producing components for the automotive industry.

It will also increase its services thanks to the new company headquarters. And with the integration of ALBA tooling & engineering GmbH, an experienced partner for manufacturing moulds has been gained.



More than 200 guests from all over the world



Great interest in the WKH presentation

Over 200 guests, including industry leaders BASF, Johnson Controls and Lear, and media representatives from all over the world enjoyed a rich and varied program at the open-house event. And although the evening event took place at a fascinating spot, the main focus remained on machine technology.

The guests enjoyed the presentation and commissioning of a WKH 32. WKH-type oval conveyor plants are becoming increasingly popular in the automotive industry. The mould carrier trolleys of the WKH allow a great variety of products to be manufactured. Andrew Chan was also able to impress his national and international guests with Hennecke's mixhead technology. A six-component MT mixhead was presented and appraised by the specialist audience. The MT 22-6 is perfect for manufacturing high-quality modules in car parts production thanks to the fact that the main components can be individually switched. Overall, the event was considered a great success by customers and Hennecke employees alike.



In China, Hennecke is combining its pioneering engineering skills with the knowledge, experience and qualifications of the Chinese managers and employees. Thus, Hennecke can offer all its Chinese customers even more comprehensive solutions and a complete after-sales portfolio. The company is now in an ideal position to act locally and provide more services and meet customer demand as efficiently as possible.



A good atmosphere at the evening event in Far Eastern setting



Nils Boigk (Sales Manager Moulded Foam) talking with Hawk Wu (Sales Manager)



Welcoming the international audience and informative presentations, from left to right: Fannie Fan (Head of Finance and Administration HMS), Andrew Chan (General Manager HMS) and Hawk Wu (Sales Manager HMS)

New sales structures in South America



With the establishment of the Brazilian subsidiary "Hennecke do Brasil" in São Paulo, Hennecke is laying the foundation for optimizing its coverage of the South American market. The investment in the Brazilian market reflects the company's consistent implementation of its worldwide expansion strategy.



"Hennecke do Brasil" based in the imposing E-Tower in the heart of São Paulo

The Hennecke Group has been active in South America for 20 years. Hennecke established a subsidiary in São Paulo on 1 July 2011 in order to better serve the regional market, be closer to the local customers and provide more efficient service lines. „Hennecke do Brasil“ focuses on expanding the existing sales structures and setting up a far-reaching range of services and after-sales support that is tailor-made to suit the requirements of the region. In this way, Hennecke wants to make its comprehensive portfolio of machine and plant technology for polyurethane processing even more attractive to South American customers.

In subsidiary manager Thorsten Warm and sales manager Anselmo Costa, local customers will find an experienced team to rely on. Anselmo Costa alone can look back to over 14 years of experience in the PU industry. The responsibility for smooth interfacing with the German headquarters remains in the hands of Dieter Müller (Regional Sales Manager for South America). More backup for the new subsidiary will be provided by Hennecke's branch office in Mexico, which, by recruiting Eduardo Gutierrez and Nicolas Reynoso in addition to its experienced sales manager Omar Castaneda, has been able to gain two well-versed service technicians with ample expertise. "With this team we are ideally equipped to cover the regional and supra-regional demand for high-quality polyurethane processing technology and all the accompanying services," explains subsidiary manager Thorsten Warm.



*Thorsten Warm
(Subsidiary Manager)*



*Anselmo Costa
(Sales Manager)*

Key projects involving discontinuous presses will be handled by "Hennecke do Brasil" in cooperation with Hennecke's partner Iturraspe. Iturraspe has many years of experience in the discontinuous production of sandwich panels and also provides support with complimentary products in the manufacture of building material. In many applications, PU sandwich panels provide an alternative to traditional construction methods - not only in economic, but above all in ecological terms, given their excellent range of properties. All requests for this will be received centrally by the Brazilian subsidiary.

With the award of a contract for a major project for the production of foamed automotive seating, the timing of the new subsidiary's market entry could not have been better and the contract will of course have a positive impact on projected growth. Future steps have already been charted out; thus, the team will be reinforced with a new service technician by the end of the year. For 2012, extensive capacity for spare parts storage is planned to be created. This will enable the new subsidiary to carry out service and maintenance work locally, e.g. by repairing mixheads and pumps.



360° TROUBLESHOOTING

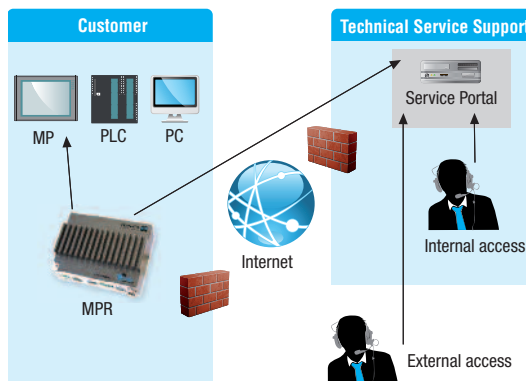
Professional and secure assistance

REMOTE SERVICE

» Efficient remote support
for optimization and troubleshooting



Many failures in the production process can be quickly localized and remedied by accessing the automated PLC system in a focused way. Based on secure data connections, the 360° TROUBLESHOOTING remote service allows you to benefit from the know-how of Hennecke systems specialists all over the world without incurring traveling costs.



Secure and reliable

because the link between the automated PLC system and the support client is encoded and safe, with all interventions being automatically recorded. That way your production process will never be exposed to unnecessary risks.

Total cost control because the price of the concrete support is calculated as a one-off service fee and depends purely on how long the connection lasts. There are no monthly fees or other service fees, and you also save on local support or transport costs.

Compatible with your production because many Hennecke systems are already equipped with the necessary Meeting-Point-Router (MPR) as a standard. The 360° RETROFIT portfolio also allows for older production systems to be upgraded to MPR after a one-off test.

Costs for remote access

per ticket

120⁰⁰
EUR



Data connection
per minute

2⁹⁰
EUR

The one-off service
fee includes:

- Support and localization of problem via telephone
- Compilation of necessary documents
- Consultation with a team of experts at Hennecke Service HQ to solve the problem

For information about
further attractive retrofit
offers, please see

www.hennecke.com/360

