



Siempelkamp

Issue 02 | 2013

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**The whole nine yards:** Siempelkamp's first ring-rolling mill – innovative, precise and complete  
**Hot cell for Seibersdorf:** A turnkey project of beneficial value to everyone  
**In-depth crane technology:** Siempelkamp supplies floor conveyors for the Flensburger Schiffbau-Gesellschaft

# bulletin

The Siempelkamp Magazine

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Dr.-Ing. Hans W. Fechner  
Chairman of the Executive Board  
G. Siempelkamp GmbH & Co. KG

## Dear Readers:

The German philosopher Carl Friedrich von Weizsäcker once said: "Tradition is proven progress, progress is continued tradition." This exactly describes the innovative mentality which Siempelkamp has cultivated for 130 years and which we would like to illustrate with this edition of Bulletin.

An excellent example for a progressive mentality is the life work of Dr. Dieter Siempelkamp – chairman of the advisory board and grandson of our company's founder. He realized early on that innovations determine the success of a company. In October we celebrated his 80th birthday at the Krefeld location, 55 years of employment with the company and the 130th company anniversary.

This mind-set guides the company even today. New products are developed, such as a LVL (Laminated Veneer Lumber) press for beech wood at Pollmeier or a new ring-rolling mill for products in the aerospace industry. But also within the company there have been new developments that have advanced us further: the company-wide Energy Management System (EnMS) helps us closely examine processes for an energy-efficient future.

Furthermore, we concentrate on the further development of existing products. We report on innovative pressure distribution plates in our proven ContiRoll®, on expanding our Ecoresinator family and on nodular graphite cast iron component parts which were poured from up to 320 t of molten iron. This illustrates, our products provide added value to our customers.

We hope that you, dear readers, will enjoy this issue of Bulletin and we would like to take the opportunity to wish you a happy and successful year 2014! Our plan at Siempelkamp for the next as well as the coming years is to preserve progress and continue our long-standing tradition.

With best regards from Krefeld

A handwritten signature in blue ink, appearing to read 'H. Fechner'. The signature is fluid and cursive, written in a professional style.

Dr.-Ing. Hans W. Fechner



Dr. Dieter Siempelkamp

# Siempelkamp celebration in Krefeld: Three jubilees, one guest of honor

Together with the staff at the Krefeld Siempelkamp location, the chairman of the advisory board and grandson of the company's founder Dr. rer. nat. Dr. h. c. Dieter Siempelkamp celebrated his 80th birthday and 55 years of employment with the company in October. At the same time, the guest of honor also celebrated the 130th anniversary of the company together with Krefeld employees and his entire family. Various program items, good food and a festive atmosphere provided for an unforgettable evening and were a successful tribute in honor of the triple jubilee.

by Ralf Griesche and Inga Bambitsch

Many Krefeld employees attended the Siempelkamp celebrations on October 11, 2013. All employees of Siempelkamp's machinery and plant engineering, foundry technology, nuclear technology, machine factory as well as Siempelkamp Logistics & Service, ATR Industrie-Elektronik and Büttner Energie- und Trocknungstechnik at the headquarter in the Lower Rhine region were invited to attend the evening festivities. The event was started with the welcoming speech by both managing directors of the Siempelkamp Group: Dr.-Ing. Hans W. Fechner and Michael Szukala.

The first few sentences by Dr.-Ing. Hans W. Fechner were followed by long applause and standing ovations for Dr. Dieter Siempelkamp. This gesture demonstrated the high level of loyalty of the employees towards the former sole managing director and today's chairman of the advisory board. Michael Szukala summarized for the guest of honor: "80 is an admirable age. Your employment with the company of 55 years is also admirable. During these 55 years you have advanced the company with innovative spirit and entrepreneurial skills. That's why we would like to use this occasion to say thank you! Thank you for

your dedication and commitment for the Siempelkamp company. Thank you for your understanding and trust in the employees. And thank you that we can all proudly claim to be part of Siempelkamp."

## 55 years for the company

During his 55 years period of employment, Dr. Siempelkamp has achieved much for the company. After joining the company in 1958, he became the sole managing director of Siempelkamp's machine and plant engineering business unit in 1970 and stayed in this position until 2003. He then handed the management over to Dr.-Ing. Hans W. Fechner and Michael Szukala. Dr. Siempelkamp has been affiliated with the company as the chairman of the advisory board for the last ten years. Almost daily he still shows up for work at Siempelkampstraße.



Opening of the celebrations



780 invited guests

Governor Jimmy Carter 1972



Hand-over of the management



### Further development and breaking new grounds

Dr. Siempelkamp advanced the development of numerous technologies. For example, together with his employees he developed the continuous press technology in the form of the ContiRoll® in the beginning of the 80s. This development represented a milestone for the company and the entire wood-based materials industry. In the beginning of the 80s the technology for the discontinuous pressing of boards in multi-opening presses was exhausted. A new technology was needed. The development of the ContiRoll® was foremost carried out in Siempelkamp's in-house research and development center. The construction and equipping of the Krefeld-based development center in 1973 which was then, and still is, the largest in the wood industry was another

forward-looking action of Dr. Siempelkamp. Machines and processes are tested here until they are ready for the market. This also included the first ContiRoll® press, which was developed in 1984.

This continuous press had a length of 16 m and produced 300 m<sup>3</sup> of boards daily. As a comparison: Today Siempelkamp builds ContiRoll® presses with a length of 77 m with a daily board capacity of almost



The first ContiRoll® in the testing facility with American customers 1984



ContiRoll® Glunz 1987



Awarding of the honorary doctorate from the University of Hamburg



Everybody in high spirits

3,000 m<sup>3</sup>. The ContiRoll® became a resounding success and only a few years later the company had sold 100 presses of this kind. To date 272 ContiRoll® presses were sold and put into operation. Thus, Siempelkamp has the largest installed base worldwide and has become the world market leader in this segment.

novative attitude which Dr. Siempelkamp exemplified through his own life. The ContiRoll®, however, is only one representative for many other products from the areas of metal forming, foundry and nuclear technology within the Siempelkamp enterprise.

#### Siempelkamp worldwide

During the awarding of his honorary doctorate at the University of Hamburg in 2004, Dr. Siempelkamp stated modestly: "The machine technology and the technology for the production of wood-based materials was and is my great passion. (...) However, today my particular thanks goes to those that helped implement these technologies in tests, designs and machines. A successful development is always the result of many people working creatively together." The development of the ContiRoll® was a great success and is an example of the in-

Not only was he a driving force for innovation, in this way achieving international recognition for his company; the internationalization of the sales and after-sales services was also one of his great lifetime achievements. Dr. Siempelkamp has a nose for markets and established branch offices on all continents under his management. "We are where our customers are!" is the Siempelkamp slogan that is still valid today. The first market opened up by Dr. Dieter Siempelkamp after he had joined the company was North America.



The men of the Siempelkamp family (f.l.t.r.)  
Florian, Philipp, Dieter and Christian

#### The Siempelkamp Service Team



### Siempelkamp representative offices worldwide

1972	North America	2000	Canada
1982	Singapore	2003	Russia
1986	China (Beijing)	2005	China (Wuxi)
1989	Australia	2008	Czech Republic (Blatnice)
1993	Italy	2008	Spain
1998	France	2010	Turkey
1999	Brazil	2013	India

He tested his abilities in the development of a new market for particleboard plants because this German product was mostly unknown in America at the time. The initial stage started off with an agent and took ten years until completion. In 1972 the first Siempelkamp branch office opened and from this point on the market was redefined. In the next five years, three times as many plants were sold than during the previous ten years. Following the development in North America, other branch offices were opened up worldwide. To date 13 representative offices exist. On the occasion of Dr. Siempelkamp's birthday, their employees have sent their congratulations via video messages.

**The Siempelkamp company has become a complete solutions provider**

Dr. Dieter Siempelkamp's life work would

not be complete if we didn't take a look at the third pillar of his success story: the complete plant. His efforts to sell machines other than the press for the production of wood-based material panels, that is to supply complete plants, was very pronounced already back in the 1950s.

Dr. Siempelkamp realized that he would first have to understand the process for the production of different products in order to build the corresponding machines. This made the future direction clear: In 1974 Sicoplan Engineering in Belgium was founded. In 1979 Siempelkamp took over Dr. Schnitzler Engineering, a planning professional which had worked for the company for many years as a contractor. Now Siempelkamp could plan complete plants and carry out their technological start-up. This was a big advantage in

the competitive market for wood-based material production plants.

As the "master of the process" and with an excellently equipped research and development department, Siempelkamp could develop machines which would provide customers with a competitive edge. In 1980 Siempelkamp became a shareholder of Texpan, an Italian company specializing in complete plants for particleboard. Starting in 1982 IMAL supplied the resin application technology; SHS started supplying finishing equipment for the production of panels in the same year. In 1984 Siempelkamp became a shareholder of CMC in Italy which later merged with Texpan. The main product were mat forming machines.

In 1985 Siempelkamp acquired ATR shares and thus incorporated measurement as well



Complete provider of production plants for wood-based products, here: dryer and energy plant



Top:  
Portal milling machine in the large-scale machining center  
Bottom:  
Vertical lathe



as control and regulating technology for integrated process control technology of the plants into its range of products. In 1995 Siempelkamp took over Büttner – a dryer specialist. With the acquisition of minority interest in PAL in 1996, Siempelkamp added machinery for the chip preparation to its portfolio. Hombak, manufacturer of milling and flaking technology, became part of Siempelkamp in 2005. Two years later, Siempelkamp Energy Systems, contributing to the product range with energy plants, was founded.

Production was also expanded and internationalized: First, at the Krefeld location with new large-scale processing machines. In 2005 Wuxi in China was founded, in 2008 Blatnice, Czech Republic; CMC in Italy became 100% owned. Today Siempelkamp is completely restructured. The company plans, engineers, builds, installs and starts up plants. No matter where our services are needed, Siempelkamp delivers.

### Technical and social commitment beyond company boundaries

Not only Dr. Siempelkamp's achievements for the company are noteworthy: Beyond his achievements for the company, he was the chairman of the executive board of the German woodworking machinery manufacturer's association within the German Engineering Federation (VDMA) for 22 years. For his many years of service at the industrial court in Krefeld he furthermore received the Federal Cross of Merit. In this context his commitment to young people was also emphasized, for example within the VDMA activities at LIGNA, the Pro-Wood Foundation as well as the Eugen Siempelkamp Foundation. Furthermore, Dr. Siempelkamp has always been involved with the World Forestry Center in Portland, Oregon, to promote sustainability of forestry and the use of wood. In 2011 Dr. Siempelkamp was awarded the famous Schweighofer Prize in recognition for his services in the area of wood-based materials. Dr. Siempelkamp's

merits for the company and employees as well as his technical and social commitment were reason enough to celebrate his 80th birthday, 55 years of employment with the company and the 130th company anniversary together with the employees at the Krefeld location. The celebration was guided by host and magician Marc Gassert and accompanied by the "Szenario" band including violinist Christoph Broll, drummer Mario Wissmann and three extraordinary singers, who all did their best to heat up the crowd. Another highlight was the present of the management: Jean-Paul Blanchard, a celebrated French artist, created in front of all guests and in only five minutes a portrait of the honorary guest which was solemnly presented to him afterwards.

"The celebration this evening was the highlight of my day. It has been a wonderful party. I would like to thank everybody involved and all guests who made this possible. I hope we will all see each other again on the occasion of my 100th birthday!" said Dr. Siempelkamp happily in his thank you speech.



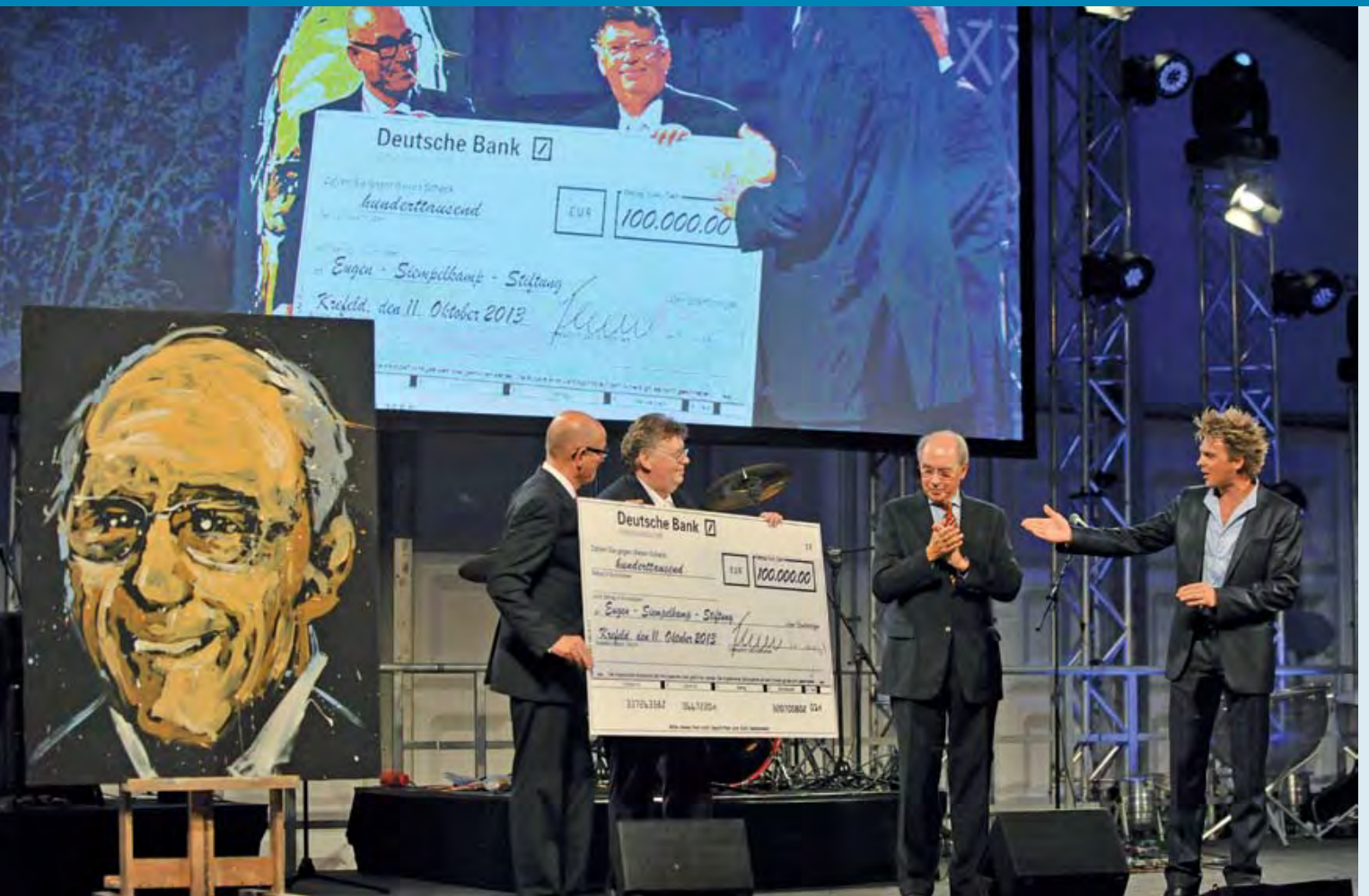
Dr. Siempelkamp and Mr. Knoll at the meeting of the members of the Association for German machine and plant engineering in Hamburg in May 2006



Schweighofer Prize June 20, 2011



A donation for the Siempelkamp Foundation



Top entertainment





Siempelkamp Ecoresinator

# Siempelkamp's Ecoresinator family: Fibers or particles: saving resin is most important

When Siempelkamp presented its innovative blending system for fibers, the Ecoresinator, in 2011 for the first time, nobody could have guessed how successful this technology would become. Today we know that the Ecoresinator has met the demands of the market and the requirements of the customers. Resin savings, improved surface quality and capacity increases are more important than ever for the production of first-class MDF. 18 sold plants to date not only prove the high demand of the market but also that the Ecoresinator concept has provided convincing results. For Siempelkamp this was reason enough to launch another cost-reducing blending system: the Ecoresinator for particles.

by Inga Bambitsch



Siempelkamp developed the new optimized blending process for fibers, the Ecoresinator for fibers, based on the two-component nozzle technology by Schlick in 2011. Customers using this technology have confirmed resin savings of up to 20%. At the same time, the process ensures high board quality regarding the mechanical properties as well as the look and feel of the board. In cooperation with its subsidiary CMC Texpan, Siempelkamp recently developed an innovative blending system for particles. The special nozzle technology, which is used for this technology as well, promises up to 10% resin savings for particleboard production. This means Siempelkamp now not only offers state-of-the-art blending technology for MDF production but has adapted the successful Ecoresinator technology for particleboard production.

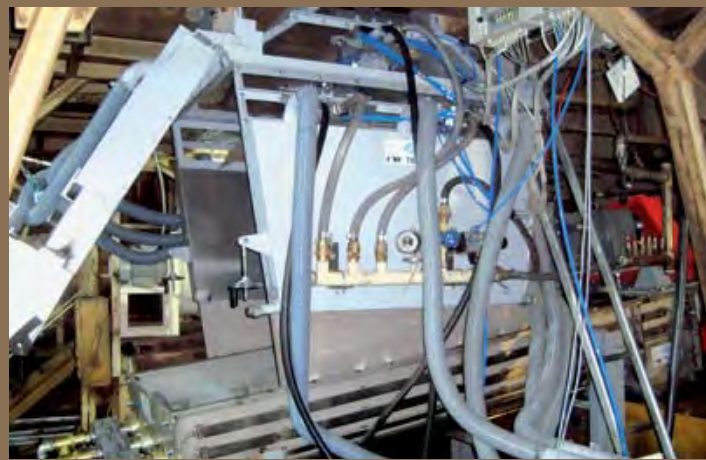
#### Large saving potentials with the Ecoresinator for particles

Next to resin savings, plant operators also save energy costs by using the Ecoresinator for particles. This is how it works: The new system operates with special two-component nozzles developed by Schlick and CMC. Via a mixture of resin and compressed air, the nozzles ensure fine and even resin-coating of the particles. To do so the particles first have to go through a material flow divider. Afterwards, the nozzles, which are arranged in a staggered manner opposite from one another, apply a fine mist of resin to the two particle flows from the inside and the outside. The optimal spraying pressure guarantees a fine resin mist and low wear of the nozzles. The self-cleaning nozzles minimize the maintenance costs for this system.

By applying the resin uniformly onto the particles with a multitude of nozzles, less energy is needed for the subsequent blending process. The blender runs slower. Therefore, the particle structure is maintained and the wear of the machine minimized. The cooling energy needed in the traditional system to generate condensation on the machine walls is also reduced. Due to the type of material flow generated by the special structure of the Ecoresinator and nozzles arranged across from one another, contact of resin-coated particles with the machine wall is avoided.

The Ecoresinator for particles is a profitable system. It leads to a quick return on investment due to high resin savings and the gentle handling of particles. The system is suited for new plants or can be added as a retrofit if certain space requirements are met. The Ecoresinator is either attached to the customer's existing blender or is supplied together with a new blending conveyor which provides additional energy savings. Due to the fact that resin was already applied to the particles in the Ecoresinator, less blending energy is needed for the mixing of resin and particles at

Ecoresinator for fibers during testing in Krefeld



Ecoresinator for particles during testing

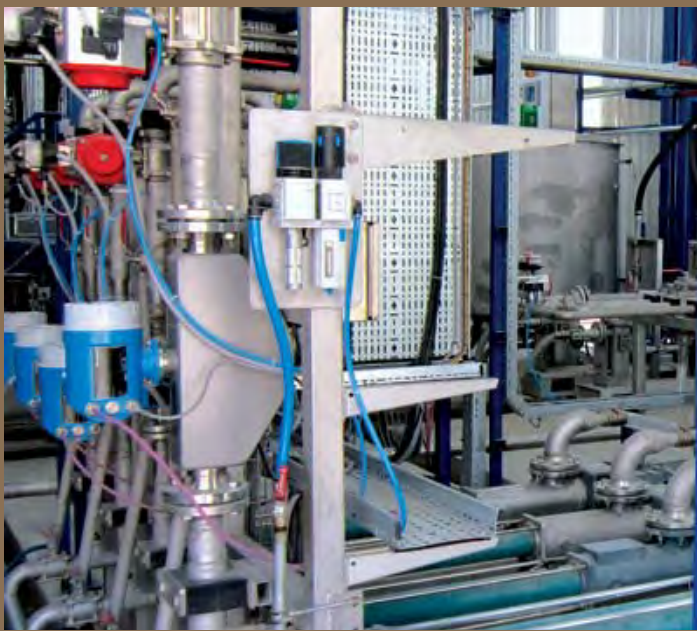
Ecoresinator for particles



Hard to believe – 20% resin savings



Ecoresinator in a new plant at Yildiz Entegre



Siempelkamp glue kitchen at Yildiz Entegre

this point. The customer's glue kitchens including the dosing systems remain unchanged.

A prototype system is currently undergoing testing under real manufacturing conditions at a customer's facility. The system will be introduced to the market in 2014.

**The Ecoresinator – a success story: high saving potentials + quick installation = best quality + low costs**

Two and a half years ago, Siempelkamp launched its Ecoresinator – the innovative blending technology for fibers during MDF production. Success: All installed and accepted systems to date have met the expectations of customers and machine builders. Well-known customers including Starwood and Unilin are more than satisfied with their new blending systems.

## A fine mist of resin for an optimal result

The controlled injection of steam with the traditional Ecoresinator results in the optimized swirling of the fibers in the blowline. A fine resin mist coats practically every fiber and avoids resin spots on the board. This improved technology significantly reduces the resin and fiber consumption while keeping the same high board quality. Potential resin savings of up to 20% are possible with the Ecoresinator and have been confirmed by many customers. This makes this system recommendable for all MDF plants, especially for the production of thin MDF.



To always meet customer requirements, Siempelkamp is continuously developing its products. This is also true for the Ecoresinator for fibers: To ensure quick installation and start-up, the system is sold as a modular design concept. Module 1 includes the steam supply; Module 2 includes the blowline incorporating the nozzle technology by Schlick; resin and water distribution are part of Module 3. The modular design makes it possible to tailor the Siempelkamp blending technology to each specific customer plant and the conditions on site. Furthermore, the pre-assembled and tested modular system is easy to transport.

The preliminary work of the customer is also minimized due to the modular concept: Only water, resin, and power connections are needed; the connection elements are supplied by Siempelkamp. The Ecoresinator is supplied as a ready-to-install complete blending system including switchgear cabinet and automation software.

Ecoresinator for retrofitting



Ecoresinator for fibers during installation at Starwood

**New installation or retrofit?**

**No problem with the Ecoresinator**

Due to its simple installation the Ecoresinator is a worthwhile investment not only for new plants but especially as a retrofit for an existing plant. The installation is carried out quickly and with little effort. If everything is optimally prepared, the installation is handled in 48 hours with minimal downtime. A convincing concept: many Siempelkamp customers ordered the Ecoresinator as a retrofit and are thrilled about the resin savings.

Siempelkamp has also optimized its ProdiQ® system. Production data is easily monitored; optimization measures of the production process can be administered in a targeted manner. The self-sufficiently operating ProdiQ® system monitors the functionality of the blending system as well as the distribution of the steam, water and resin. Thus, the system guarantees high plant availability and low maintenance.

With the new developments, the success story of the Ecoresinator will continue. No matter whether fibers or particles are used, the goal for wood-based panel production is to save resources and costs. The Ecoresinator makes that possible.

Everything under control



Flow display in the controller room

## Interview with Heinz Classen

**The development of the Ecoresinator is a success story. Heinz Classen, Managing Director of Siempelkamp, explains to Bulletin how it all happened and how the success benefits the customer. As the head of the division for wood-based products at the Krefeld equipment manufacturer, he launched the Ecoresinator concept and played an important role in making this project a success.**



**Bulletin:** The Ecoresinator concept has become a sales hit: 18 sold plants for MDF production as well as the success of the systems that have already passed their acceptance tests are the proof. Why is this product so successful?

**Heinz Classen:** With the Ecoresinator we have provided our customers with the right product at the right time. For wood-based materials manufacturers the topic of saving resin is an important one. Rising costs for resin increase the demand for resource-saving machines. Furthermore, our Ecoresinator is constructed logically, easy to install and can be up and running immediately after installation. Every system that we have started up has achieved convincing results and therefore met the needs of our customers.

**Why did Siempelkamp want to place its own blending system in the market?**

**Heinz Classen:** To provide our customers in the market sector of blending technology with more security regarding the interaction of the individual machine components, we completed our product portfolio with a modern resin dosage system. Even though Siempelkamp has not been known as a manufacturer of blending systems for too long, we have achieved big success to date. Some people were probably surprised that, at first try, we hit the mark with the Ecoresinator. This is the result of first-class research and development work.

**What is especially important when it comes to new developments such as the Ecoresinator?**

**Heinz Classen:** The Siempelkamp division for wood-based materials with its experienced technologists and designers is extremely efficient. If you get the right people together, you achieve a high concentration of innovative capacity. Because our

specialists are highly motivated and dedicated, we quickly achieve objectives. Furthermore, we have worked closely together with customers in the development of the Ecoresinator. For such a "development partnership" there has to be a high degree of mutual trust among both parties. The Turkish company Starwood is one of those partners with which such a close cooperation is possible. The customer provided us the ideal opportunity to test our system. On our side of the bargain, we made sure not to disappoint their trust in Siempelkamp – and we didn't.

**How do you go about when introducing a product to the market?**

**Heinz Classen:** In our industry personal talks and the recommendations our sales employees give to our customers still play a major role. We communicate with our customers at trade fairs and talk to important opinion leaders on the phone. Of course, reference projects at important key customers are also essential for the successful launch of a product. And finally, product PR and advertisement provide an important source of information.

**What feedback do you receive from customers which are using the system? Do the benefits of the application live up to their promise?**

**Heinz Classen:** The customers are absolutely convinced; we have only received positive feedback. Many of our customers are relieved regarding the excellent results achieved by the Ecoresinator. After many years of working with systems which promised resin savings and high product quality – but couldn't keep such promises, many customers were frustrated. With the Ecoresinator they are more than satisfied – our system is simply reliable.

**Now significant amounts of resin can also be saved in particleboard production...**

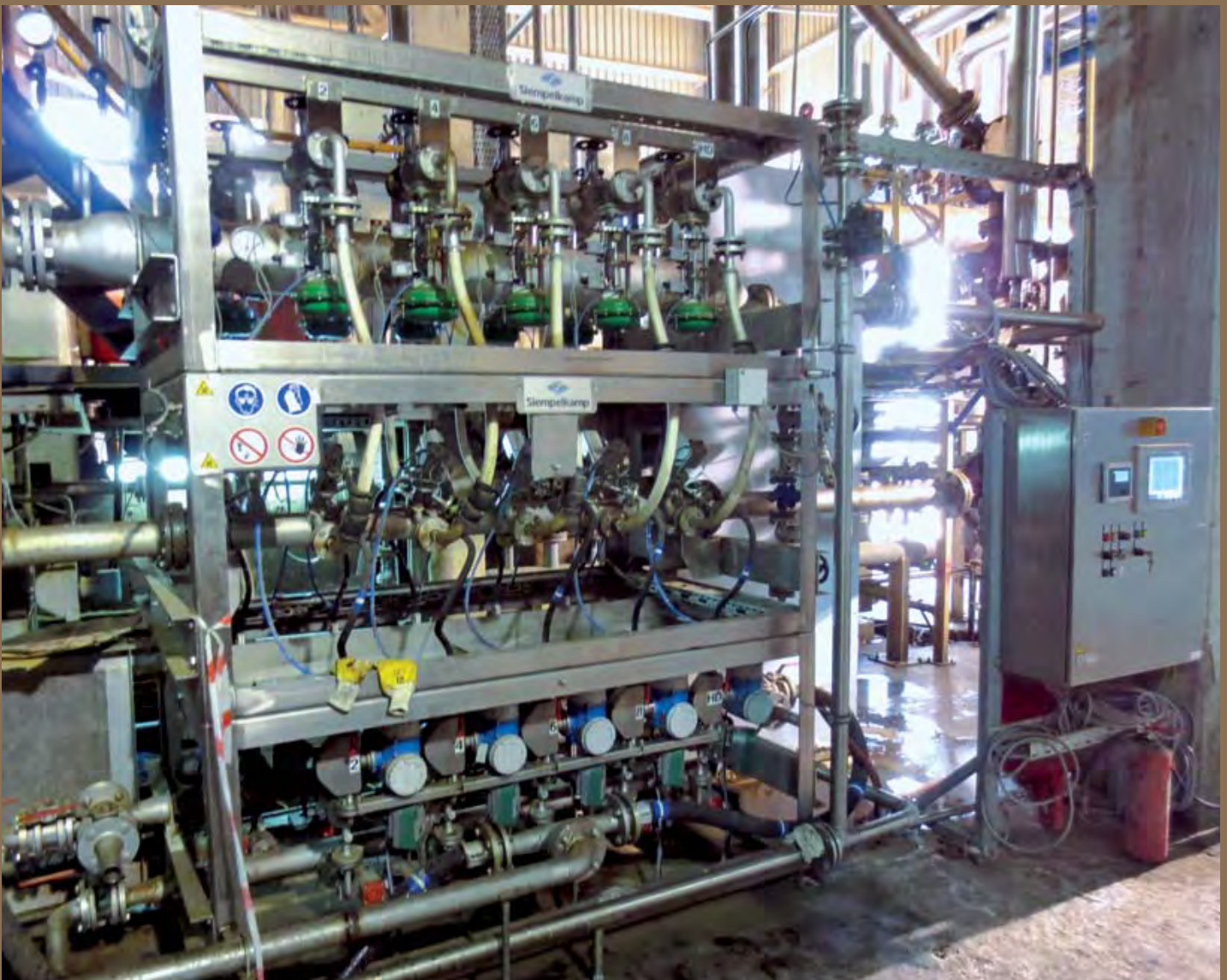


**Heinz Classen:** Even though the Ecoresinator for particles is not the same system as the Ecoresinator for fibers, both systems share the same objective: to achieve resin savings. As soon as the new Ecoresinator for particles has matured, it will become the new industry standard. For a plant with a daily particleboard production capacity of 1,500 m<sup>3</sup>, we offer our customers the prospect of a yearly saving potential of approx. 1 million euros.

Are the products of the Ecoresinator family only suited for new plants?

**Heinz Classen:** No. In fact, the majority of sold Ecoresinators for MDF were retrofits to existing plants. That is the special feature of this system; retrofitting is so easy and does not require long shutdowns of the plant and no complex system integration. In only 48 hours the system is operational and the savings can begin – that is the motto.

This interview was conducted by Inga Bambitsch, Marketing Siempelkamp, on October 23, 2013.



Ecoresinator at Gebze, Turkey

Wood fiber insulating board plant for Pavatex:

# Operational launch of the most modern dry-fiber production for wood fiber insulating boards

The world's largest and most modern dry-fiber production for wood fiber insulating boards started operation in April 2013: Approximately 1½ years after signing the contract, the 8.5' wide plant by Siempelkamp produced its first board in Golbey, France. Plant operator Pavatex was thrilled, not only about the excellent cooperation but also about the new production line for wood fiber insulating boards which is one of the most energy-efficient and resource-conserving lines. Numerous Siempelkamp technologies ensure that the production meets the customer's high demands on sustainability and energy efficiency.

by Ralf Griesche



Pavatex plant in Golbey, France



## About Pavatex

Over 80 years of experience and continuous product development as well as new developments have turned Pavatex into the world's leading provider of high-quality wood fiber insulating systems for building shells. Conserving the environment has played a significant role since the company's founding in 1932. Pavatex's production locations are the most efficient and environmentally-friendly in the sector. The Swiss company puts great emphasis on sustainability regarding the resources used as well as its production and transport processes.

The Pavatex Group with its parent company Pavatex Holding AG is based in Cham, in the canton of Zug, Switzerland. The operative business in Europe is carried out by the 100%-owned subsidiary Pavatex SA in Fribourg, Switzerland, and its individual foreign subsidiaries in Germany, France, and the Benelux countries. The Japanese subsidiary Pavatex Japan K.K. is responsible for sales in Asia. Partner companies sell Pavatex insulating systems in Italy, the United Kingdom, Scandinavia, Spain and Eastern Europe. Production locations can be found in Cham and Fribourg, Switzerland, and in Golbey, France. The Pavatex Holding AG is partly owned by Chemolio Holding AG (33%), Martin Brettenthaler (25%) and BeCapital (25%). Further shares are held by Norske Skog, the Institut Lorrain des Participations and Fonds Lorrain des Matériaux as well as by the board of directors and the company's executive management.

Used as insulation in roofs, walls and floors, the Pavatex product range is versatile and can be used in new construction as well as for renovations. The insulating boards provide excellent thermal insulation against cold and heat as well as high acoustic insulation. At the same time they guarantee humidity control and a contaminant-free indoor climate as well as the sustainable use of wood resources. Here the Swiss company concentrates on the principle of sustainability. Wood fiber insulating boards by Pavatex also lower the energy consumption of the buildings they are used in by up to 50%. Next to the highest quality standards, the company also provides for the conservative use of resources and minimal energy consumption – and this already during production.

In October 2011 Pavatex decided to buy a Siempelkamp plant to be built on a greenfield site in Golbey, France. When making this decision, the plant operator was not just looking for a supplier but for a competent partner with which innovative concepts could be developed and existing technologies further developed. Siempelkamp stood out as the only supplier which had provided 8.5' wide lines to date – a size that offers operators a higher capacity, less trimming and a large product variety. With the plant, Pavatex is able to manufacture boards with a thickness ranging from 20 mm to extremely thick insulating boards of 300 mm – and in fact will achieve an annual production capacity of 50,000 t. The Siempelkamp concept is based on the process for the industrial production of thick fiber insulating boards with the in-house developed continuous dry process technology.

### Siempelkamp's "all from one source" principle

The order volume which Pavatex ordered from Siempelkamp started with the engineering services by the Belgian Siempelkamp subsidiary Sicoplan. It included the complete process technology including the screen for the chips which is manufactured by the 100%-owned Siempelkamp company CMC Texpan in Italy, the stretch hood packaging system incorporating the

complete installation and the steel construction. The chips for its production are primarily supplied to Pavatex by the paper manufacturer and shareholder Norske Skog, which is located in the proximity.

Following the screening process, the chips are thermally and mechanically fiberized and then dried in a 120 m long flash dryer made by the Siempelkamp subsidiary Büttner. Furthermore, Büttner supplied the steam heating system for the Pavatex plant



Chip silos with discharge system and oscillating screen

Blending system for dry fibers



and integrated a modern heat recovery system which saves up to 20% of thermal energy. Here, synergies with the neighboring Norske Skog, one of Europe's most modern paper companies located in the Green Valley Cluster, were generated by using their excess steam for the dryer and the heat supply for the environmentally sound Pavatex production line for wood fiber insulating boards as well as other shared services.

An exhaust gas cleaning system, provided by the customer, provides for resource-saving recycling. The wet electric filter reduces the dust and VOC emissions to a minimum and ensures that the plant dissipates only clean air into the environment. At the same time the filter uses the heat contained in the air for water extraction and for heating the buildings: a approx. 2 million euros investment which pays off.

#### Wood fiber insulating boards manufactured with continuous dry process technology

The blending system units, which can be used flexibly, are the special highlight of the insulating board plant. After leaving the dryer, resin is applied to the fibers. Upon exiting a chute, a special, fast curing resin is applied to the fibers inside a dry blowline which was specially developed by Siempelkamp. Generally, synthetic binders are added during the production of wood fiber

Forming station and pre-press



Forming line



Dryer with wet electrostatic precipitators



insulating board. In close development cooperation, Siempelkamp and Pavatex succeeded in optimizing the production process in this regard. Pavatex uses a special Polyurea for its new plant.

Compared to other resins used in the wood-based materials industry, this binder is especially suited for applications that have to meet high demands in regard to moisture resistance or formaldehyde emissions such as insulating material for buildings. By using two-component glue system, the amount of bonding agent and isocyanate resin could be reduced while product properties were maintained. The finished products will be completely free of isocyanate and thus will meet the strict Natureplus® criteria, the sign of quality for ecological building products which are tested for health, environment and function. Pavatex and Siempelkamp have announced to further develop the production process in a close and well-directed research program. Next to the blending system, Siempelkamp supplied the silo and bunker systems as well as all extraction systems including pipelines for the entire plant.

Following the resin-blending process, the pre-pressed fiber mat is heated by a steam-air mixture and calibrated in a modified ContiTherm®. In doing so, the steam of the mixture condenses and heats the fibers rapidly to the dew point temperature while,

## Wet versus dry process technology

Contrary to the dry process technology developed by Siempelkamp for the production of wood fiber insulating boards, Pavatex, along with many other producers, applies the wet process technology in its Swiss plants in Cham and Fribourg. During the wet process the chips are softened with water vapor at a pressure between 3 and 8 bar and afterwards fiberized. Following, the fibers are suspended with up to 98% water. Finally, they are drained inside the forming machine and formed to a fiber mat. The mat is then cut lengthwise and transported into a drying channel where it is dried at temperatures between 160 and 200 °C.

The wet process technology is especially well suited for the production of thin and heavy boards as well as for combination boards. Because of the complex drying of the boards and the extensive water management, the wet process is the more energy intensive process, however, in the case of Pavatex, the necessary energy can largely be produced without generating CO<sub>2</sub>. By developing the dry process technology, Siempelkamp reduced the energy consumption by more than 30%, lowered the board density and, furthermore, produced homogeneous insulating boards with a thickness of up to 300 mm in one process step.



Saw system after mat-forming

Controller room



Longitudinal saw

according to the process, the desired equilibrium moisture is kept. The bonding agent forces are activated and the boards cure.

### New products for new applications

A Siempelkamp finishing line including a saw system, tongue and groove line, stacking station and packing line, prepares the wood fiber insulating boards for shipment. The up-to-date systems technology allows for more than the production of wood fiber insulating boards with a thickness of up to 300 mm in one piece. With the modern finishing line, new board sizes can be produced allowing Pavatex to open up new application areas in the future. The Siempelkamp concept is completed by the SicoScan measurement system and a process control system for the entire plant which is especially designed for the production of wood fiber insulating boards. The ProdlQ® software represents a central building block for quality assurance in the process chain.

Pavatex invested 60 million euros in the new plant in Golbey for the sustainable production of wood fiber insulating boards and thus opens up new markets. This third production location optimally complements the company's Swiss main plants in Cham and Fribourg which helped Pavatex rise to the leading provider of sustainable insulating systems based on wood fibers in the last ten years.

The groundbreaking for the new plant was held on March 13, 2012 – the ceremony was attended by many well-known local politicians and businessmen as well as the media. During the ceremony Mr. Martin Brettenthaler, CEO Pavatex Group, stated euphorically: "Here we are building Europe's most up-to-date and efficient plant for the production of wood fiber insulating boards which will operate economically, ecologically and with high quality. The wood fiber insulating boards produced by this plant will perfectly complement the existing Pavatex product range offered by our Swiss plants. At the same time we will develop new, innovative products for new application areas here."

### The successful completion of the project

Against the background of the challenging environment regarding industrial production in Switzerland which is a result of the ongoing strength of the Swiss franc, especially in relation to the euro, the construction of the new plant in France was logical – also with a view to securing the Swiss main plants. The new plant creates 50 new jobs. Arrangements for the installation of a second line have already been made.

The successful production start at the new Pavatex plant in April was not only a technical masterpiece but also the result of good cooperation between the Pavatex team and Siempelkamp and all other suppliers from Switzerland, France, Germany, Austria and other countries. "This success is foremost the result of the excellent teamwork of all parties involved and happened despite all linguistic and cultural challenges," concludes Brettenthaler. "At the same time we are very pleased that we could start production at the beginning of the construction season 2013 and that we stayed within budget. The construction is wholly in line with our expectations," was the final statement on the completion of a successful Siempelkamp project.

Board stacking



Finished insulation boards



Tongue and groove line



Packing system

## Interview with Martin Brettenthaler

**Now that Pavatex's wood-fiber insulating board plant in Golbey is in operation, we can look back on the excellent cooperation between the Swiss company and Siempelkamp and conclusions can be drawn from a project that was completed successfully. Bulletin spoke with Mr. Martin Brettenthaler, CEO and delegate of the Board of Directors of the Pavatex Group, about technology, sustainability and the challenges of a multicultural construction site.**

**Bulletin:** Pavatex has a long history: Please tell us about the milestones of the company's development.

**Martin Brettenthaler:** Pavatex, as known today, was founded in 1932 as a division of a paper plant which later entered into the production of hard wood fiber board for the furniture industry. Already in those days the first press was a hard fiber line by Siempelkamp. The new project thus closed the circle of a long-standing business relationship. Back then we supplied the hard wood fiber boards to the furniture industry. Since 1990 we started focusing on insulating boards for building shells. Pavatex became one of the first companies supplying products to this application area. Until 2004 Pavatex belonged to the HIAG Group. A management buy-out took place from 2004 to 2007. Since 2011 the Pavatex Holding AG belongs, amongst other owners, to the Chemolio Holding AG, BeCapital and me.

**The company's third plant, located in Golbey, has recently been started up and is operating according to a new process. Why did you decide to use a dry process technology for the production of wood fiber insulating boards?**

**Martin Brettenthaler:** Siempelkamp's dry process technology complements our two existing and performance-proven wet process fiber board plants in Switzerland. Thus, we are able to manufacture a different product with each plant. The dry process technology offers advantages in the area of energy efficiency and environmental protection for thick and light boards. The wet process technology is best suited for thin and heavy boards as well as combination boards. However, the topics of energy efficiency and sustainability also play a large role here.

**What do you find especially positive regarding the Siempelkamp process?**



**Martin Brettenthaler:** The technological security which Siempelkamp as a company with 130 years of experience in press construction can offer convinced us. With the innovative blending system which can be flexibly changed over from a dry blowline, best suited for PMDI resin, to a traditional blowline, Siempelkamp developed a future-proof system for us. After all, our focus is on longevity and quality. Furthermore, we are impressed with the production monitoring system via the process control system ProdiQ®. For our company this system translates into ongoing quality and process improvements. Pavatex and Siempelkamp have been able to significantly optimize the production process for wood fiber insulating boards during the course of this project. Our decision to buy a Siempelkamp plant was also based on the ability to produce extremely wide boards with a thickness of up to 300 mm.

**Was that a key factor in the decision to buy from Siempelkamp? And why did you decide to buy a complete plant?**

**Martin Brettenthaler:** This joint project had and still has an extremely high importance for us. Back when we were making our decision, we did not only look for a supplier but also a partner which offers innovation and maximum safety at the same time. Siempelkamp convinced us: The expert for wood-processing press lines was willing to develop the project with us. In this context the testing field of the research and development department at the Siempelkamp headquarters in Krefeld was of great importance to us. Here we were able to try out everything, from the production of chips to 4' wide boards according to the continuous curing process. Due to an extremely tight schedule and the strategically meaning of the project, a successful outcome was very important to us. That's why our decision was also based on competent project execution of the supplying companies. Pavatex also contributed largely to the project. How-



ever, we did not want to put together all plant components on our own in the end. Finally, Siempelkamp with its competitive processes was most convincing to us as a complete provider of the machine systems.

#### Why is a Swiss company building a plant in France?

**Martin Brettenthaler:** After an in-depth analysis of five locations in three countries we decided for the Golbey location on the Lorraine slopes of the Vosges. A decisive role for this decision were foremost long-term factors such as the supply with wood and energy, the availability of good workers with industrial experience and the proximity to our customers. The formation of a cluster with Norske Skog in the area of thermal energy and wood supply as well as the excellent logistical location in the Green Valley around the cities of Golbey and Epinal were decisive. As a company of Western Switzerland, French is also a Pavatex language. Furthermore, we received political support from the city of Epinal, the Departement Vosges, from the Lorraine region and from France in general. Personally, I do not understand the complaints about France being a bad location for industrial activities. The reality demonstrates that we completed a complex project swiftly and on schedule – from our first visit in Golbey in August 2010 to our first board on April 14, 2013 everything happened quite quickly.

#### How do you cope with a multicultural construction site?

**Martin Brettenthaler:** It needs a lot of patience and understanding. Due to the fact that workers from many different nations were present at the construction site, primarily language barriers presented an obstacle. The motto was: Communication, communication, communication and making sure that everyone understood what was wanted from them. The teams that formed as a result of this were first-class. Furthermore, we already hired a lot of personnel, especially executives, during the project phase in order to let them become familiar with the Pavatex corporate culture. The new employees attended an introductory seminar familiarizing them with the entire management structure and received training at the Siempelkamp Academy in Krefeld as well as at the Pavatex headquarters in Switzerland. The cooperation with the Siempelkamp experts was excellent.

#### The new plant – so you say – sets standards in the fields of ecology, energy efficiency and environmental protection. How can you explain that?

**Martin Brettenthaler:** That is indeed so. We are the first company in our sector in Europe which is using wet electric filters for exhaust air treatment. Furthermore, we implemented a

cluster solution together with the neighboring paper manufacturer Norske Skog: We use the excess steam generated there for our dryers and other heat supply units in our plant. Furthermore, an innovative fiber recovery and closed exhaust air circuits provide for high energy efficiency. The large size of the production line results in important economies of scale so that the overall consumption of energy per produced square meter of wood-fiber insulating board is reduced. Altogether we invested roughly 2.4 million euros in environment-friendly measures.

#### You are operating a very flexible line now which can manufacture a variety of products by using different resins, allowing different sizes, thicknesses and densities. What will the product mixture for this plant within the Group look like?

**Martin Brettenthaler:** We will continue to produce our proven combination products in Switzerland. In Golbey we will primarily manufacture thick volume products. The possibility to manufacture boards with a thickness of up to 300 mm opens up interesting new application areas at this location.

#### What is your product positioning and what are your key markets?

**Martin Brettenthaler:** Pavatex stands for insulating and sealing in the modern wood construction industry. That's why we strive to offer our customers including timber builders, carpenters and roofers complete solutions in this area. Pavatex guarantees all its target groups safety and reliability throughout the entire chain of services. Next to the processors, this includes specialist shops, planners and builders.

#### What was the biggest surprise for you in the last 1½ years?

**Martin Brettenthaler:** The biggest surprise was the enthusiasm and motivation of the Siempelkamp specialists and our staff on site. The entire project and production team demonstrated a high level of commitment from the beginning until the completion of the project. The cooperation was outstanding.

This interview was conducted by Ralf Griesche, Marketing Siempelkamp, on July 18, 2013.



# Siempelkamp supplies LVL (laminated veneer lumber) press to Pollmeier: Advance innovations together

Siempelkamp Maschinen- und Anlagenbau GmbH & Co. KG unites two important factors: 130 years in press construction and innovative technologies. Not without reason our motto is "Innovation is our tradition". With this mixture of competence we have once again convinced a customer from the wood-based materials industry. In September 2012 Pollmeier Furnierwerkstoffe GmbH & Co. KG ordered for their location in Kreuzburg, Germany, a 6' x 60.3 m ContiRoll® for the production of laminated beech veneer lumber. In close cooperation Pollmeier and Siempelkamp developed the highly modern plant engineering for this innovative product. Construction or furniture industry: laminated beech veneer lumber will stir up the wood-based materials market.

by Jochen Dauter



ContiRoll® with a length of 60.3 m



“To turn trendsetting ideas into action” – this is Pollmeier’s mission. When it comes to innovations, the German company had an experienced partner in Siempelkamp by its side. For two years Pollmeier and Siempelkamp experts tested the design and construction of an LVL press for beech wood in a joint effort, amongst others inside the Siempelkamp testing facilities in Krefeld. With success: The result is the fully-automatic production of an innovative product which has many applications in construction and furniture industries. Next to the Generation 8 ContiRoll®, the scope of supply consists of a high-rack storage system for veneers, the resin storage, the resin preparation and dosing system, a double diagonal saw, a Büttner energy plant with 13 MW heating capacity as well as the measurement and control technology all the way to the saw.

#### Innovative product for numerous applications

Pollmeier has been operating hardwood sawmills equipped with the latest technology in Creuzburg and Aschaffenburg since 1987. Today these plants are amongst the most efficient in Europe. For the construction of two new production facilities for the new veneer lumber plant on a total area of 27,000 m<sup>2</sup>, the plant operator invested in Creuzburg another 105 million euros in the area of beech wood processing. With the

laminated beech veneer lumber, Pollmeier’s objective is to supply the European markets in Germany, Austria, Italy and France as well as the markets in inter-continental destinations.

Highly-stressed component parts such as airplane propellers have been made from laminated beech veneer lumber since the 1930s. This custom work was however relatively expensive. Due to its significantly higher degrees of swelling and shrinking, beech wood also puts increased challenges on processors. With a new continuous production technology, Pollmeier and Siempelkamp allow the economic production of laminated beech veneer lumber at a competitive price.

The consumers for laminated beech veneer lumber are mainly from the area of modern and constructive wood building. Due to the high strength values, even small cross sections of beams allow large spans – without joints a length of up to 18 m. In interior construction laminated beech veneer lumber is used as flooring or furniture board. In this area not only the strength of beech wood proves useful but also its urban look. Due to its knot-free surface and its special color, beech wood is pleasing to the eye. Pollmeier will offer its final products for different application areas with a natural finish, polished or painted.

## Beech wood for any situation

The strength values for beech wood (70 N/mm<sup>2</sup>) are three times higher than those of soft-woods such as spruce or fir. With a raw density of 720 kg/m<sup>3</sup> it is an extremely heavy hard-wood which is characterized by its homogenous density and high strength. Due to its favorable peeling and bonding characteristics, beech wood is well suited for the production of wood-based products.

Large amounts of beech wood are available in Central Europe from South Scandinavia to Sicily. Its share in the areas of temperate latitudes increases continuously due to the climate change. As the world’s first and only provider of laminated beech veneer lumber, Pollmeier processes only wood from 100% sustainable forest management and primarily from regional PEFC-certified forests.



The two new production halls



Different products for laminated beech veneer lumber



Ulrich Pollmeier shows the new product



High-rack storage system for veneers



ContiRoll® outfeed area and double diagonal saw

### Siempelkamp technology – each component a highlight

For the production of laminated beech veneer lumber, Pollmeier first “steams” beech wood trunks with diameters between 25 and 40 cm. Afterwards, the wood is peeled into thin veneer strips with a thickness ranging from 2 to 3.7 mm. Following storage in Siempelkamp’s high-rack storage system, phenolic resin is applied crosswise or parallel to the grain of the veneers. Afterwards, the glued veneer sheets are laid into a package and partly pre-heated via microwaves. The resin storage, preparation and dosing systems are also made by Siempelkamp. With a feed rate of up to 200 mm/s and press forces of up to 500 N/cm<sup>2</sup>, the veneer package is pressed continuously inside the 6’ x 60.3 m Siempelkamp ContiRoll® press. Due to the high press force, even for the extremely dense beech wood there is still potential for higher compression; the special width of the press makes for the high capacity of the plant. An enlarged

heating circuit with a booster hotplaten at the press infeed ensures quick heat absorption of the veneer package. The Generation 8 ContiRoll®, however, is especially characterized by its even pressure distribution which is achieved with pressure distribution plates. With this Generation 8 ContiRoll®, Siempelkamp supplied Pollmeier with a press which operates virtually isobaric and produces a first-class product. Because of the even pressure distribution in the press, the adhesive bonds cure homogeneously.

The scope of supply also includes the proven Siempelkamp double diagonal saw combination for the edge-trimming and cutting-to-length of boards. Automatically adjustable trimming units with high cutting speeds result in clean edges which are of finish cut quality. In cooperation with the subsidiary Büttner Energie- und Trocknungstechnik GmbH, Siempelkamp also supplies a 13 MW energy system with grate furnace. The fueling with waste wood from the production process pro-

vides further benefits: beech wood is a suitable fuel wood characterized by its long burning time, strong ember generation, and high burning value.

The measurement and control technology for the entire production line is another Siempelkamp product. The process-integrated measurement system SicoScan is used to measure board thickness and detect blows and blisters during production. The control technology system Prod-IQ® includes the areas of production management, quality control as well as maintenance and service. The customer benefits from improved cost transparency, resource savings, and an increase in plant availability. The installation for all heavy Siempelkamp components is already completed. The production of the first board is forecast for January 2014. With the new line, Pollmeier creates approximately 150 new jobs.





Installation of pressure distribution plates

## Interview with Ralf Pollmeier



**Bulletin:** Why did you invest 105 million Euro to put a new wood-based product on the market?

**Ralf Pollmeier:** We are currently building a new plant for the production of laminated veneer lumber made of 100% beech wood in Kreuzburg, Germany. Laminated veneer lumber is not a new product, currently it is made of softwood. The market

for this product is relatively small and cannot be compared to the development of other wood-based products including particleboard, MDF or OSB. We are the largest manufacturer of solid beech. Two years ago we decided to invest largely in the area of laminated beech veneer lumber because we believe in this product.

1. Due to a new continuous peeling and press technology, veneer wood can be produced economically with standardized quality today. We will introduce the new product to the market at a top price-quality ratio.

2. The outstanding strength values of beech wood are, for the first time, implemented in a panel-type product – for new applications in the area of constructive wood building.
3. Look and feel of beech veneers make it a first choice for a material mix with steel, concrete and glass.
4. The largest advantage of laminated beech veneer lumber is its high strength: the bending strength is three times higher than that of laminated veneer lumber made of coniferous wood.

**What different types of products will you offer?**

**Ralf Pollmeier:** We will offer laminated beech veneer panels with a length of up to 18 m and a thickness of up to 85 mm which will be used primarily as posts and bars in modern glass façade construction or as ceiling panels. Compared to rustic softwood, these panels captivate with their elegant and sleek look.

Furthermore, we will offer beams made of laminated beech veneer lumber with a height of up to 1,350 mm. Due to the high strength of beech wood, greater spans with reduced cross sections can be achieved which makes the supporting structures look thinner and more delicate. We will also offer our product for applications in interior construction and for furniture production. Because of its unique look – the veneer plies are arranged perpendicular to the surface – our product



The 13 MW Büttner heating and power station





A special crane moves parts of the discharge roller seat to their location



scores points in this application area. However, not only the look of our product plays a role here; its hard surface opens up new application areas .

**How are you going to market these products?**

**Ralf Pollmeier:** The new constructive material appeals primarily to architects for which the product opens up new design opportunities. However, our target group will also include the furniture industry, interior designers and shopfitters. We will distribute the products via wood wholesalers and retailers but also directly.

**This concludes my questions about the products and their markets. At the new plant, the installation of all heavy component parts is completed. You expect to manufacture the first board in January 2014. Are you satisfied with the construction progress?**

**Ralf Pollmeier:** We are ahead of schedule when it comes to the completion of the project. Anyway, I think nothing about slavishly keeping to a time schedule. We will do so in a reasonable manner and will not create unnecessary time pressure which will be at the expense of the quality. In December we will prepare the market with a marketing campaign.

**How are things at the construction site – after all, there are many machine interfaces?**

**Ralf Pollmeier:** We think everything is going great. This is probably due to the fact that we placed separate orders to the

individual suppliers of different disciplines. Peeling, grading, drying, resin application, pressing and handling are self-contained disciplines with defined requirements. We have, however, set great value on the selection of our providers.

**According to what criteria did you select your providers?**

**Ralf Pollmeier:** In general, according to their good reputation which is made up of many years of experience in plant engineering and a low error rate. When it comes to Siempelkamp, especially the large number of worldwide installed continuous presses and the company's experience with especially long presses was convincing to us. After all, our press is 60 m long, such a press is not built every day. When making our buying decision, the quality of the technical solutions and the dedication of the people developing these technical solutions took priority over the price.

**We have the impression the mood here on the construction site is upbeat?**

**Ralf Pollmeier:** It is nice that you have noticed that. We can see that all installation teams are making their best effort to perform good work. We place high importance on the feel-good factor at the construction site. The site is clean, we try to provide good food and whoever wants to can use the fitness center in town for free. We think it is important to meet people at eye level. I am convinced this is an investment that will pay off after only a short time.

This interview was conducted by Ralf Griesche, Marketing Siempelkamp, on October 30, 2013.

# Siempelkamp expands product spectrum: The whole nine yards: Siempelkamp's first ring-rolling mill – innovative, precise and complete

In July 2013 the wait was finally over: Siempelkamp's first ring-rolling mill was started up in Krefeld's production halls. Approximately two years after signing the contract, this start-up represented the highlight of the project "ring-rolling mill". This was an exciting affair because a new product is always a challenge for the development, design, production and assembly personnel. In October the ring-rolling mill was disassembled and prepared for transport to the customer in Russia.

by Emilien Collard

With the new product Siempelkamp proves once more its competence as a system supplier and provider of complete solutions in the area of metal forming. Apart from machines and process technology regarding metal forming presses, Siempelkamp now also offers technology for further processing. And Siempelkamp does this on a large scale. With maximum radial and axial pressing forces of 6,300 kN each, the ring-rolling mill is one of the largest of its kind worldwide.

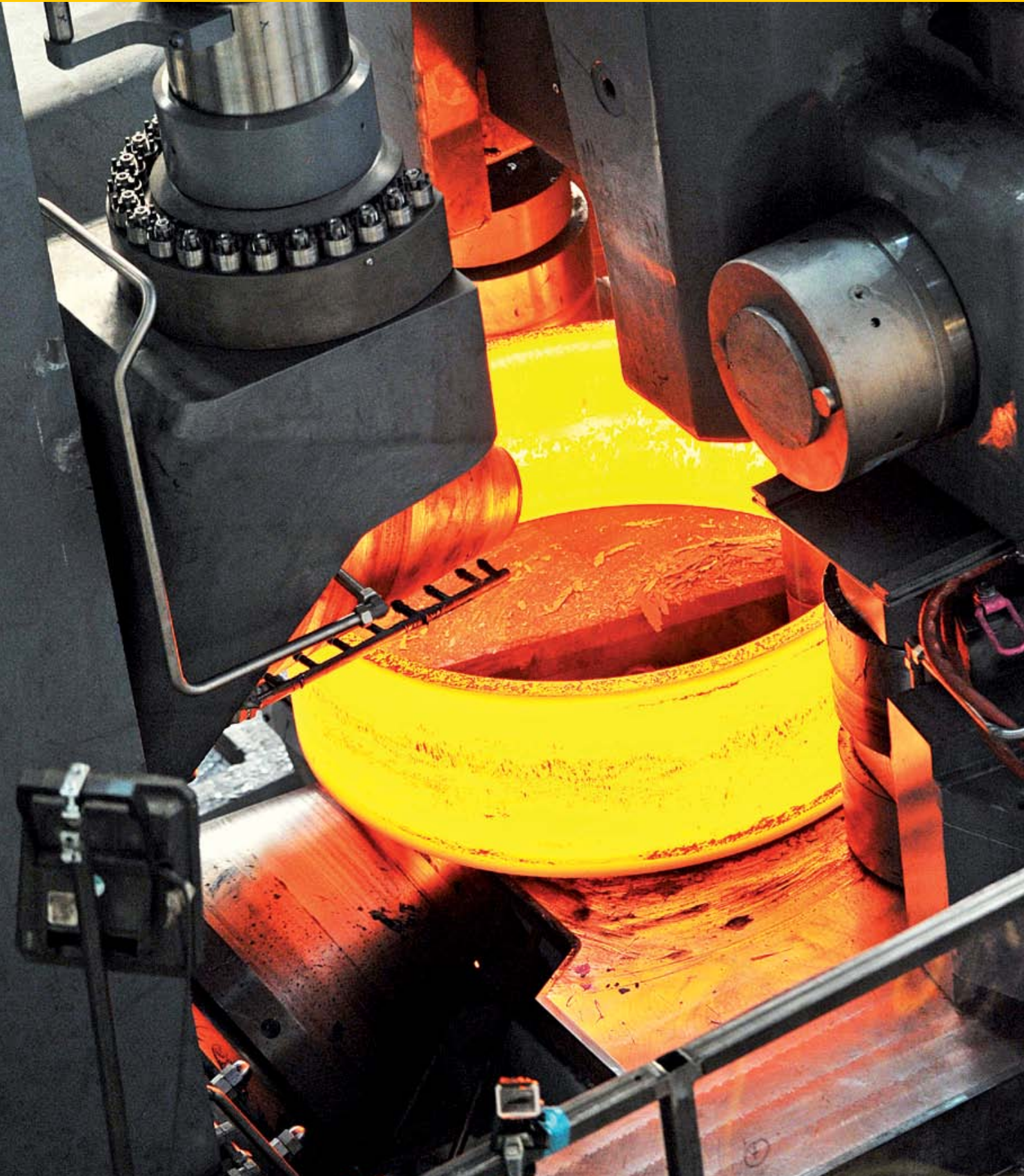
To test the machine, the Siempelkamp experts in Krefeld manufactured several rings with different dimensions using the hot-rolling process between July and October 2013. The customer JSC Metallurgical Plant Elektrostal will manufacture rings made of steel and special materials such as nickel-based, titanium and aluminum alloys with the mill. The mill was initially designed to produce rings with a maximum diameter of 2,500 mm. During the testing phase



Ring-rolling mill ready for acceptance



Rolling process





in Krefeld, the maximum diameter was extended to 4,000 mm; the maximum ring height is about 600 mm. These rings are primarily used as mechanically and thermally stressed components in the aerospace industry. Electrostal makes the blanks for the rings on a 20,000 t high-precision closed-die forging press made by Siempelkamp. The customer carries out the entire production process in-house and therefore increases the depth of value added for its production.

#### New product – proven procedures

At Siempelkamp the concept of a new product is an ongoing process in which engineers from many different fields are involved. In a continuous dialog between design department, calculation department, foundry, and production as well as in close cooperation with the customer, the optimal solution was found. The design process for the ring-rolling mill was followed by the detail engineering. By using design principles that have

Roll table, left centering arm with 200 mm diameter mandrel



Ring with 3 m diameter



Motor and gear unit leading to the main roller shaft



proven themselves in other Siempelkamp metal forming presses, the ring-rolling mill achieves a long operating life. Statics and dynamics of the mill were extensively analyzed using different FEM systems. During the design process, the Siempelkamp design engineers placed great importance in using many standard components especially for highly stressed component parts. In this way, spare parts can be procured quickly for maintenance tasks or in the event of a failure. For Electrostal this translates into tremendous cost savings.

The ring-rolling mill is equipped with numerous technical innovations allowing high operating precision and best product quality. The machine frame is designed in such a way that it can absorb all forces and torques produced during the rolling process. Thus, extensive foundation work at the customer's site does not apply. The roll gap is adjusted by means of hydraulic cylinders which guarantee high positioning accuracy and compensate the expansion of the axial frame. The axial rollers are furthermore equipped with wear caps. These caps can be replaced quickly which makes the time-consuming disassembly of the axial rollers for the re-machining of the surfaces unnecessary.

## The Siempelkamp ring-rolling mill at a glance:

<b>Ring dimensions:</b>	Maximum diameter 4,000 mm; height 40 to 600 mm
<b>Rolling force:</b>	Radial 6,300 kN; Axial 6,300 kN
<b>Drive capacity:</b>	Main roll 1,260 kW Axial roll 2 x 630 kW Total approx. 3,200 kW
<b>Roll speed:</b>	Control range 0.3 – 1.2 m/s Rated speed 0.7 m/s
<b>Diameter:</b>	Mandrel rolls 200 mm – 400 mm Main rolls max. 1,500 mm
<b>Axial rolls:</b>	Angle of taper 2 x 22.5°
<b>Travelling distance:</b>	Upper and lower carriage of the mandrel roll 1,100 mm Axial frame 5,000 mm
<b>Dimensions:</b>	Main dimensions approx. 22,000 mm x 6,500 mm



Roller cap during disassembly



Hollow shaft with tension rod

Siempelkamp not only completely manufactured the rolling mill at the Krefeld location but also assembled and started it up there as well as extensively tested the hot rolling process before the mill was delivered to the customer in Russia in order to supply a comprehensively tested product.

The start-up in Krefeld has proven that the plant not only meets Electrostal's desired specifications but even exceeds them in some areas. Many other interested companies including Aubert & Duval, Snecma, Forgital and Rothe Erde, some of which are already Siempelkamp customers and suppliers to the aircraft industry, could be convinced of this during a presentation of the rolling mill in Krefeld. Next to the rolling mill, the scope of supply for Electrostal also includes the complete hydraulic system, the automation system as well as the newly developed SicoRoll control.

#### Precise and individual rolling processes with SicoRoll

SicoRoll was specially developed for ring-rolling: The program package SicoRoll supports the user already during process

planning. With advanced simulation, which is taking the threshold values of the machine into account, all relevant rolling parameters are determined. The program uses a database which stores the tool and material data. Furthermore, it contains the common rolling curves and strategies as the basis for the planning process. The user can also enter or add data about rolling processes. This open structure allows the customer to have an extensive influence on the rolling process. This advantage of the Siempelkamp SicoRoll system differs strongly from other products.

The FEM software for forming simulations by Simufact, a Siempelkamp cooperation partner, can be used to analyze the forming process three-dimensionally and in detail concerning the degree of forming, the forming speed and also the temperature gradient. Currently, Siempelkamp experts are working on creating a direct link between SicoRoll and Simufact.

The calculated rolling parameters regarding the positioning, ring temperature, rolling forces and torques as well as the parameters of the ring are transmitted to the machine control. Thus, SicoRoll ensures the optimal ring-rolling process and synchronizes the



Rolling process



parameters with the process. Furthermore, parameters can be adapted in SicoRoll and finally the plant operator can adjust the process during ring-rolling. The entire process is documented and archived completely by Siempelkamp's in-house documentation system DAHMOS.

### The Siempelkamp structure stands for high customer satisfaction

As the leading supplier of plants for metal forming, Siempelkamp has been setting standards worldwide for over 80 years. Our knowledge in the areas of plant engineering and process technology is unique, not least because the individual technical features ranging from design to start-up come together in one coherent solution. Siempelkamp supplies not only the machine expertise but also offers the customer the associated process technology. "Customers around the world value our 'all from one source' motto", says managing director and among others head of the development construction Dr. Joachim Martin.

A dedicated sales team led by Samiron Mondal, assistant managing director of Siempelkamp's Machine and Plant Engineering business unit, represents the area of metal forming to the outside world. Even the areas of design and project management are specialized in the area of metal forming. The Siempelkamp offering in the area of metal forming is completed by our competent service. The engineering competence as the original equipment manufacturer allows us to perform services in the areas of mechanics, electrics, automation technology as well as hydraulics. The customer benefits from concentrated technical know-how and first-class customer care.

The ring-rolling mill will be installed in Russia in the coming months and started up in 2014. The Siempelkamp teams on site at the customer's premises will ensure a competent and efficient installation of the equipment. The preliminary start-up, which took place at Krefeld's production facility, and the start-up at the customer's site, which will be carried out by our specialized employees, ensure that we have supplied our customer with an optimum product.



Finished ring

Control console for the ring-rolling mill



SicoRoll software





# Closed-die forging press for the Nanshan Group: World record casting with 320 t of molten iron

With the casting of a 320 t lower press beam, which is part of a 12,500 t closed-die forging press for plant operator Nanshan in China, Siempelkamp broke its own world record on September 11, 2013 – for the third time this year. All 22 cast components for the two presses ordered by Nanshan, a 12,500 t and a 50,000 t closed-die forging press, are designed by Siempelkamp, cast in Siempelkamp's own foundry and finish-machined in Siempelkamp's machine factory. 13 of the huge castings have molten iron weights ranging from 250 to 320 t. With both orders Siempelkamp has once again proven the successful cooperation within the Group of companies.

by Ralf Griesche





World record casting: 320 t lower press beam for the 125 MN Nanshan press



50,000 t press with sliding table



Foundation beam



Siempelkamp makes foundry history: For the third time in 2013 Siempelkamp Giesserei broke its own world record with a spectacular 320 t casting. "We have approached this new dimension very slowly and with concentration," says Dirk Howe, sales management of Siempelkamp Giesserei. After the first world record casting of 296 t on July 12, 2013, the next world record casting with 301 t of molten iron followed only a week later. With 320 t of molten iron poured from five ladles and at a temperature of 1,350°C, Siempelkamp now – once more – broke its records from the previous months. What precedes such a casting and what happens with the cast component afterwards?

From designer to founder to cutting machine operator: at Siempelkamp we work hand in hand – across the individual business units. For the production of the separate components for the Chinese customer Nanshan, next to the concentrated knowledge of the individual technical and business areas, the synergies within the Siempelkamp Group played an important role. This principle has proven itself once again.

### Presses with mega press forces

The Chinese Nanshan Group in Longkou, Shandong Province, China, commissioned Siempelkamp with the design, construction, and installation of a 50,000 t closed-die forging press in December 2012. Only four months later, another order for a 12,500 t closed-die forging press was placed for a newly designed plant on a greenfield site. The decisive factor for awarding the contract to Siempelkamp was Siempelkamp's proven competence in heavy forging presses.

To understand the dimensions of both presses: the larger of both presses has a press force of 50,000 t, a height of 30 m and weighs more than 7,500 t. Eight cylinders with a pressure of 6,250 t each operate the moving beam. With an output of roughly 24 MW, the oil-hydraulic drive, which operates with 60 high-pressure pumps, applies a pressure of 420 bar.

The second press with a height of 20 m and a total weight of 2,200 t is smaller but nevertheless a colossus. It is equipped with two hydraulic cylinders. The press table has dimensions of 2 x 4 m. Both presses will be installed by Siempelkamp and are forecast to be started up in early summer 2015.

## Nanshan Aluminum

The Nanshan Aluminum company is part of the Nanshan Group and located in Longkou in the Shandong Province. The company which was founded in 1978 has become one of China's best known aluminum processors. Next to aluminum rolling mills, the company primarily operates extrusion presses for the production of aluminum profiles. Currently, Nanshan is investing in the production of forged parts made of aluminum and titanium alloys. To do so Nanshan is building a completely new forging mill including open-die and closed-die forging presses for the manufacturing of structural component parts for the aircraft industry.



## Design phase



FEM calculations



Casting process simulation

### Siempelkamp's Machine and Plant Engineering business unit, Foundry Technology and Machine Factory work hand in hand

Siempelkamp will supply the complete presses from a single source. This includes the design, the casting and machining processes of the component parts as well as their installation and the start-up of the presses on site. Siempelkamp is the world's only manufacturer of presses of this magnitude which can offer customers such a large scope of supply. One of the deciding factors for winning this contract was the material: the heavy component parts of the press with finished weights of up to 300 t are made of nodular graphite cast iron. Siempelkamp's foundry manufactures a total of 22 castings for this order in Krefeld. Afterwards, on the same company premises, at the Siempelkamp Machine Factory, these castings are machined. In order to handle such large orders efficiently, the production inside the Krefeld facilities was strategically equipped for heavy component manufacture in 2010. With its important synergies with the Siempelkamp Giesserei were created. Large casting components and their mechanical machining from one

supplier – that is a unique selling point for the Krefeld location. Nowhere else can customers obtain precision-machined and pre-finished castings of this magnitude made of nodular graphite cast iron.

#### Each step a milestone: from the concept to the finished product

For presses from a performance category such as both closed-die forging presses for Nanshan – ultimately for each Siempelkamp metal forming press – each press concept is unique. Everything starts with the design: designing a new press is a repetitive process in which engineers of different fields take part. Design engineering, engineering, foundry and production departments of the Foundry Technology and Machinery and Plants Engineering business units make sure that the optimal solution is found for each customer. The latest simulation methods and the experience of more than 130 years in designing and building large presses support this process.

Presses of Siempelkamp's size present challenges even to the experts. This starts with the planning of the casting process. How can component parts exhibit high

## Nodular graphite cast iron casting – the technically best and most economical solution

Cast iron with nodular graphite allows the casting of thin but stable structures for highly stressed components. The mechanical properties of nodular graphite cast iron in regard to tensile strength, yield strength and elongation offer clear advantages compared to steel castings – especially for components that are exposed to large forces. Siempelkamp Giesserei processes cast iron grades which are adjusted to the specific customer requirements of different industrial sectors. High fracture toughness and fatigue strength as well as good damping properties stand for a long life of nodular graphite cast iron and are convincing factors for many customers. The fact that no heat treatment is necessary and mechanical machining is simplified due to near-net-shape castings relieves the customers' budget and is the guarantee for a quick return on investment.

## Finest surface finishing

Molding shop: inserting of the cores

Left:  
Lift out of the lower press beamRight:  
Inside the fettling shop

strength and have the lowest possible weight at the same time? How can the look of a component part be optimally adjusted to its function? In what places can material be added and where can material be taken away? To manufacture an optimal product, detailed knowledge of the used material is essential.

After calculation and design processes are completed, Siempelkamp carries out the casting process of the structural components in one of the largest hand-molding foundries worldwide: the company's own foundry. Here, roughly 70,000 t of molten iron are produced annually. Castings with more than 200 t

of molten iron are routine; castings with up to 320 t are possible from now on. The entire production process from the design stage, calculation, to the construction of a pattern, to the pouring of the casting to the fettling shop is centrally monitored and controlled.

After casting, cooling and fettling, the cast components are transported on special heavy-weight transporters across the company's premises to the machine factory. Here, Siempelkamp operates large CNC-controlled machinery as well as a portal machining center in gantry design which can process parts with a length of up to 22 m and a height of up

to 6 m. The factory also houses a large-scale vertical turning lathe with a diameter of 16 m. Next to presses for wood-based products and components for job order production, primarily customer-specific metal-forming presses with large press forces including open-die forging presses, closed-die forging presses, straightening presses and others are manufactured here. The delivery of the parts anywhere in the world and for every industry takes place from Krefeld. The installation and start-up on the customer's site are part of the scope of supply and complement Siempelkamp's range of products and services.



Final inspection via ultrasound



Transport of the heavy components to the port



Installation



Transport via ocean freight

Start-up after completion



# Energy management at Siempelkamp: From the crucible furnace to the brainpool

The physicist and philosopher Werner Heisenberg once claimed: "Energy is the reason for all the changes in the world". Even in Siempelkamp's world the energy topic plays an important role. A lot has been done in all three business units in this concern, the simple procurement of energy is a thing of the past, energy management is on the agenda today.

by Sergej Rubzow, Benedikt Szukala and Klaus Gartz



Energy-intensive process: pouring of the molten iron into the induction holding furnace

When it comes to the company's energy concept, Siempelkamp Giesserei takes the lead: the foundry's energy need takes the lion's share in the entire Group. The logical consequence was that this business unit, and particularly the energy management department, became responsible for sourcing the required energy for the Krefeld location. This, not least, ensures significant purchasing advantages.

Before the purchase, numerous consumption forecasts are developed: yearly, quarterly, monthly and even weekly forecasts about the energy consumption have to be generated and submitted online to the energy supplier.

The task profile of the energy management department also includes topics such as energy law and energy efficiency and



technology. Other companies of the Group, such as Siempelkamp Krantechnik (crane technology), benefit from this pool of knowledge.

### Energy law: knowledge generates competitive advantage

Topics concerning energy law are part of the key issues of Siempelkamp's energy management: here large energy-saving potentials have opened up; a large part of these have already been implemented. The optimization of legal components, such as the electricity tax, the German renewable energies act levy and the cogeneration levy (see box), contributes largely to the fact that Siempelkamp can continue to operate its production facilities economically in the competitive international market. Accordingly, a main focus is on the political developments of the energy market

Politics have contributed largely to the fact that the situation for industrial companies has become increasingly more complex. There is no shortage of new laws and regulations in Germany, for example, the renewable energies act, the electricity tax act and the combined heat and power act.

Consequently, companies are increasingly faced with legal topics concerning energy. Politics increasingly intervene in the energy market, partly to prevent placing the industry, in particular small businesses, at a competitive disadvantage due to escalating costs. Also to keep private households from carrying all the financial burdens of the turnaround in the German energy policy.

Ultimately, politics are focusing on a European solution because the massive changes in the German energy landscape have an influence on the neighboring countries. All this keeps industrial companies on their toes.

**German renewable energies act levy:** A consequence of the renewable energy sources act, which manages the feeding of electricity from renewable energy sources into the grid. According to § 37 of the act, German electricity providers have to pay a levy to the transmission system operator for each kWh of electricity supplied to the final consumer.

**Cogeneration levy:** Operators of combined heat and power plants have to pay a statutory fee. These costs are passed on to the consumers according to the combined heat and power act.

### Compressed air initiative: no hot air

Though the successes in the areas of energy procurement and energy law come along with an effort that is not to be underestimated, compared to saving potentials in the area of energy technology, they can be regarded as "low hanging fruits". This is because savings can often be achieved with relatively little effort.

An example of small but far-reaching organizational changes is the topic regarding compressed air. To find leaks in the compressed air network, Siempelkamp's energy management developed a table that helps to identify leaks systematically and determines measures to correct leaks in a timely manner. This small but helpful tool helped to save a high five-digit amount.



Right:  
Tapping: pouring of molten iron from the melting furnace

Left:  
Effective energy management for the economic production of engine blocks for use in decentralized energy generation

Furthermore, Siempelkamp is continuously working on improvements in the areas of energy efficiency and technology, for example, when it comes to lowering the specific use of energy per ton of molten iron, using the waste heat from compressors, managing leaks in the area of compressed air supply and building self-generating plants (combined heat and power plants).

Next to savings through organizational changes, a lot of potential can only be implemented through investments in new equipment. To check the effectiveness of these measures, information from the area of energy management is often needed including energy consumption, energy costs and impact on the procurement. This is where the cycle consisting of energy sourcing, energy law and energy efficiency and technology closes.

### Energy know-how: everything flows

Not only Siempelkamp Giesserei and Nukleartechnik benefit from the knowledge of the energy management department but also the Machine and Plant Engineering business unit as well as Siempelkamp Krantechnik in Moormerland. By centralizing all energy-related issues, a pool of knowledge has been created which is not only available to the companies of the Siempelkamp Group located in Krefeld but also to all other subsidiaries in Germany.

The energy management team is also politically involved via association work (e.g., the BDG = German federal foundry industry association, the VEA e.V. = energy consumer federation, the IHK = Chamber of Industry and Commerce).

The overall objective of these activities: integrated energy management which ensures Siempelkamp the efficient and effective use of energy and to open up the opportunity to not only react to new developments but to be proactive to new developments.

### Cogeneration systems & Co.: "networking"

Siempelkamp's Machine and Plant Engineering business unit is also following the idea of energy management: since November 2012 a combined heat and power plant covers the electricity needs of the machine factory. Therefore, Siempelkamp's need for gas has increased to approx. 55,000,000 kWh annually at the Krefeld location and the external electricity supply decreases by about 10,000,000 kWh per year.

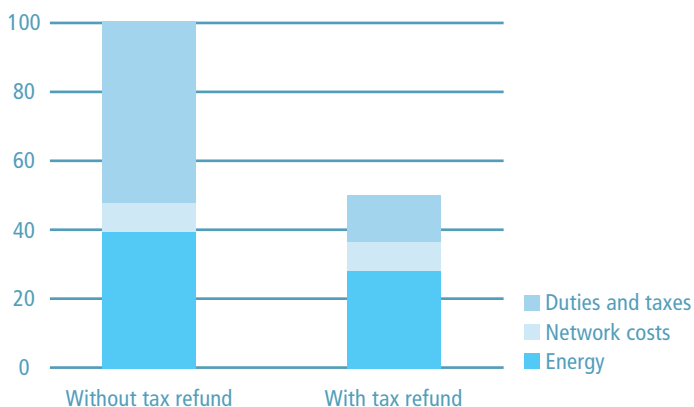
The operational mode of the plant was optimized at the beginning of October 2013: "By installing an automatic reference power controller, maximum benefits regarding the renewable energy sources act and the electricity tax become accessible. This controller always sets the quantity of electricity to be generated exactly to the amount of electricity which is needed by the machine factory," says Klaus Gartz, head of electrics and energy management of the Machine Factory who works well together with the energy management team of Siempelkamp Giesserei.

Currently, the focus is on two projects concerning the connection of the heating system of the Machine and Plant Engineering business unit to Krefeld's local heating network. Older boilers are replaced by local heating stations which cover the thermal energy demand of the respective buildings by using the heat energy from



(f.l.t.r.) Energy managers Benedikt Szukala and Sergej Rubzow during the performance review of the compressors for the drawing of conclusions regarding leaks

### Composition of the energy costs





the combined heat and power unit. With the help of sophisticated software the available energy is always supplied to the location where it will be most beneficial. However, the old concept is not totally done away with. One large boiler per building remains in operation to cover peak loads or as a backup.

The heat flows are recorded by heat meters and documented in a web portal so that basic data is readily available for internal calculations. The Stadtwerke Krefeld (public utility company) offer this service. Klaus Gartz summarizes: "The procedure has already proven itself in recording gas quantities from the combined heat and power unit as well as for the data compilation used in the monthly reports for the combined heat and power unit. These reports are mandatory by the Federal Office of Economics and Export Control.

### The overall concept – always at the forefront

At the same time, the Machine and Plant Engineering business unit tests the measurement technology for the power distribution: inadequate electricity meters are replaced with more precise instruments so that by November 2013 a complete compilation of all amounts of energy from different electricity producers (cogeneration unit, photovoltaic system, electricity suppliers, power supply companies) and electricity consumers of the Machine and Plant Engineering business unit becomes possible. This database-supported system makes the collection of significant energy consumers as well as the simplified accounting of the used energy possible at the same time.

"Energy is the reason for all changes in the world" – Werner Heisenberg was right for without energy the work of our department for energy management would not have been possible in the first place.



The complete cogeneration unit – plenty of power in a small space



The engine inside the cogeneration unit

## Siempelkamp Giesserei: from “full steam ahead” to energy management

From the perspective of the energy management, Siempelkamp Giesserei plays an important role within the Group. Like no other company in the Group, it had to adjust to different forms of energy through the decades because of new technology requirements. The Machine and Plant Engineering business unit was less impacted by such challenges because it used primarily energy and gas. At the foundry, on the other hand, everything was flowing...

### Energy Management System according to ISO 50001 introduced

Since April 23, 2012 the companies Siempelkamp Giesserei, Siempelkamp Giesserei Service and Siempelkamp Nukleartechnik have been certified in accordance with international standard ISO 50001:2011 for a qualified Energy Management System (EnMS).

With the introduction of the EnMS, the energy consumption is recorded and systematically analyzed. The result is the conscious handling of energy: continuous improvement processes lead to optimized and resource-saving energy consumption at Siempelkamp. Training for personnel supports this process and raises awareness for economical and efficient energy consumption.

1960

1964

1968

1972

1976

1980

1984

#### until 1963/1964:

In order to melt raw iron, a lot of energy is needed. Until the 1960s the foundry produced this energy with an oil-fueled crucible furnace. The concept: raw iron is melted in a fireproof crucible. The process was developed by a British clockmaker in the 18<sup>th</sup> century. Friedrich Krupp was the first German who succeeded in making high-quality mild steel in a crucible furnace in 1823.

#### 1964:

Siempelkamp Giesserei used two hot-blast cupola furnaces, a shaft furnace concept in which carbon-monoxide-rich exhaust gas is burned in a combustion chamber and the generated heat is used to preheat the air. These aggregates could melt 10 t of iron per hour.



Siempelkamp Giesserei in the 1960s: cupola furnaces were used (which can be seen behind the casting setup)

#### 1976:

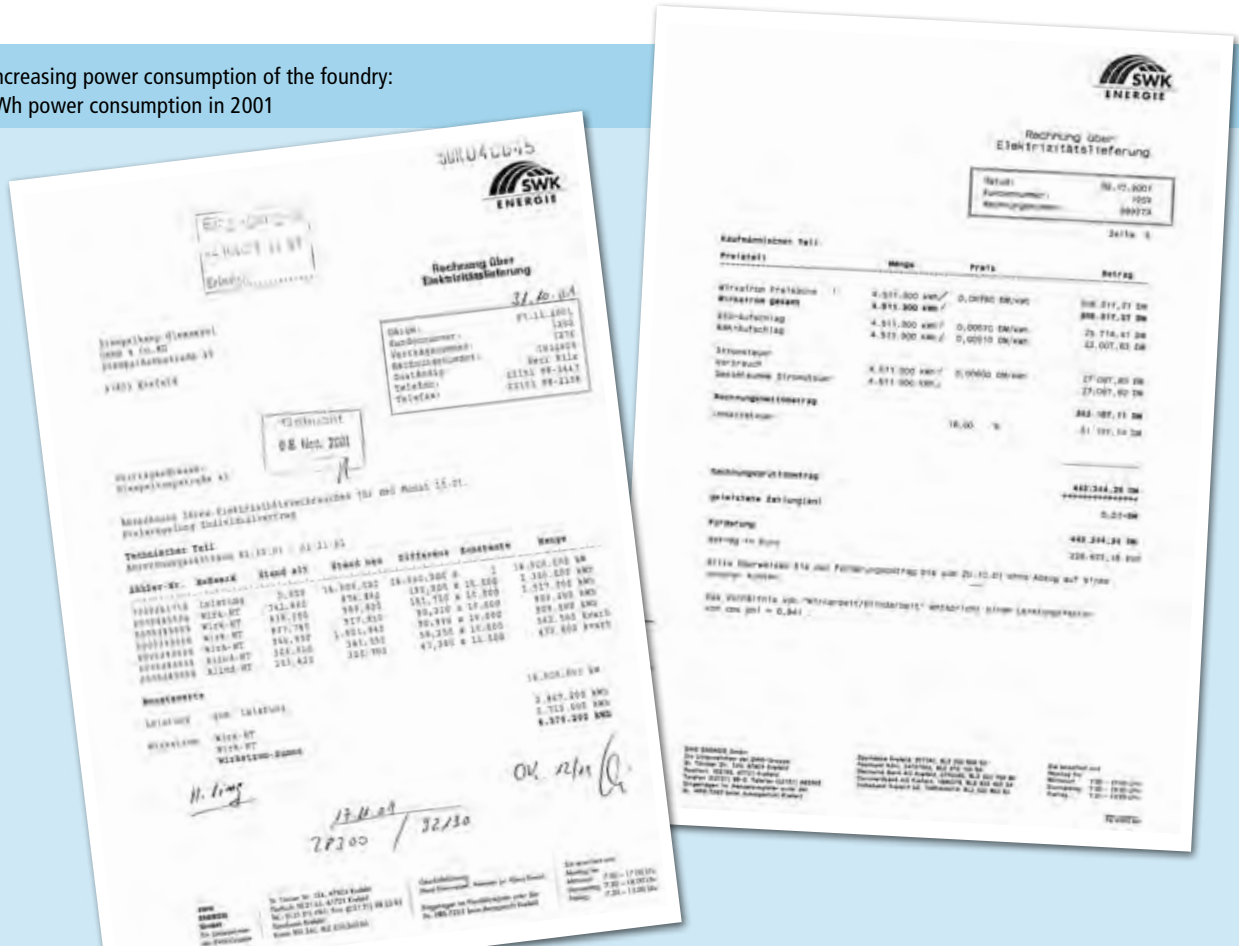
The era of electrical melting began at Siempelkamp Giesserei. An induction furnace replaced the cupola furnaces. Its capacity amounted to approx. 18 t.



Modern induction furnaces for the melting and holding of the molten iron are used in the melting shop



Constantly increasing power consumption of the foundry:  
4,511,300 kWh power consumption in 2001



1988                      1992                      1996                      2000                      2004                      2008                      2012

1978 – 1982:

More of it: the demand increased, two more induction furnaces were added. The electricity consumption also rose – the issue of “energy” started playing a completely new role at the foundry. For the first time, topics including supply security and supplier dependency came into play. The liberalized energy market of today was still a thing of the future back then. Changing suppliers and competition? Back then, impossible. However, energy costs back then were significantly lower than today.

from 1982:

As the production capacities at the Krefeld location were continuously expanded, the energy demand rose. The installation of additional production plants, for example, for used sand recycling, air compressors as well as extraction and filter systems, led to an energy demand for the foundry that seems difficult to believe. Siempelkamp had to find its way in a market environment which had become liberalized since 1998 and was increasingly controlled by politics. A few times Siempelkamp also had to experience what risks can arise in this environment.

2009:

The changed market also changed Siempelkamp: energy procurement is organized in such a way that the foundry uses the opportunities of the energy market and limits risks at the same time. Energy purchasing concentrates more on the topic of energy sourcing and takes the right path between current market conditions and the requirements of the corporate risk management.

This strategy has found followers within the Group: Siempelkamp Nukleartechnik, Siempelkamp Maschinen- und Anlagenbau in Krefeld and Siempelkamp Krantechnik in Moormerland were integrated into the procurement of energy in order to open up the found benefits to these companies. The result: the department for energy management.

Energy consumption at Siempelkamp

The electricity consumption of the business units Machine and Plant Engineering and Foundry Technology at Siempelkampstraße in Krefeld currently amounts to approx. 72,000,000 kWh per year. This much electricity could charge approx. 820,000 iPhones for 24 hours over 365 days. The annual gas consumption amounts to approx. 32,000,000 kWh. As a comparison, this amount could supply approx. 1,400 single family homes with four people for one year.

# Modernization of an MDF plant:

Result: 7% glue saving immediately

# Upgrading old to Generation 8

“Only Siempelkamp knows Siempelkamp plants inside out” – true to this motto a long-standing customer decided to have its 7' x 38.5 m MDF Siempelkamp line retrofitted. The field-proven press from 1998 was, within only a short time, upgraded to a Generation 8 ContiRoll® by the experts of Siempelkamp Logistics & Service GmbH (SLS) by installing pressure distribution plates. Furthermore, the upgrade of the electrical system from the forming line to the diagonal saw was on the agenda. This modernization package saves material and costs and also increases the plant availability. The package requires relatively small effort for a large impact.

by Michael Willemen and Armin Lingen

Raised hot plate with inserted pressure distribution plates



Connection for both hot plate segments

Up to the recent modernization, the MDF plant had a daily board capacity of 800 m<sup>2</sup>. The boards were finished by Siempelkamp short-cycle presses and processed to laminate flooring foremost. By upgrading the press to a ContiRoll® Generation 8 press by installing pressure distribution plates, Siempelkamp provided the long-standing customer a concept which promises advantages in the area of material savings while maintaining the same high product quality. The significantly higher precision during pressure distribution is reflected directly in the resin and wood consumption. High-quality boards can be manufactured using less resin and wood.

By installing new pressure distribution plates, pressure distribution in the press was improved. As a result, the adhesive bonds cure homogeneously. This, in turn, means that less resin is needed for the same result. To date Siempelkamp has

upgraded the pressure distribution plates for customers four different times: in this plant, in two plants of the Austrian plant operator Egger as well as at Kastamonu in Turkey – the latter as part of a press extension.

## All is well which installs well

Eight months after order placement, the retrofitting works started mid July 2013. Within only a short time, the upgrade was carried out smoothly and according to schedule. The excellent cooperation between the project team consisting of Siempelkamp and customer's employees from the areas of project planning, design and transport as well as the installation personnel made this possible. The installation personnel, provided by the customer, installed the pressure distribution plates in day and night shifts under the supervision of two Siempelkamp specialists; the electrical installation was carried out

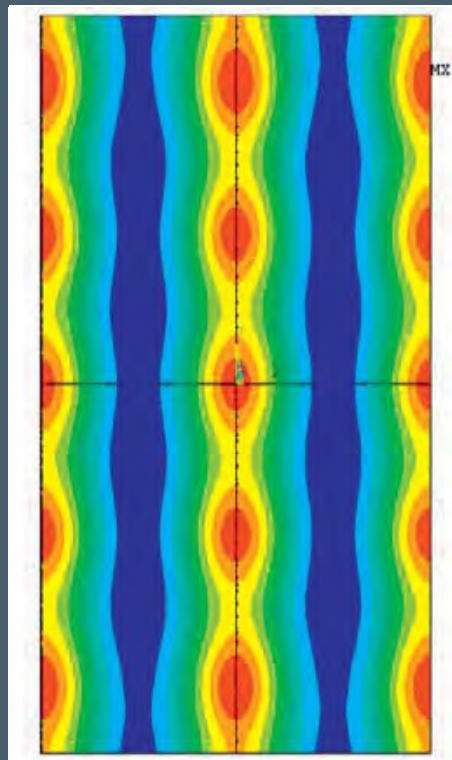


Integrated with pressure distribution plates

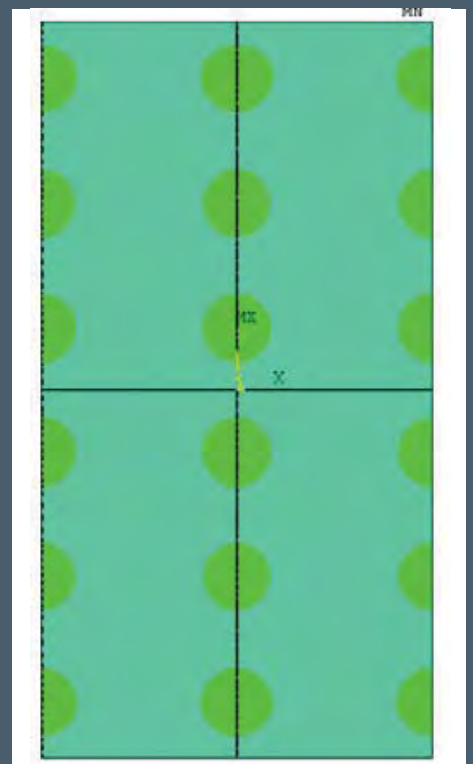


during the day shifts only. "We know each other. This makes good cooperation easier in any case," explains Michael Willemen, sales manager for modernizations and retrofits of the Siempelkamp subsidiary SLS.

A quick execution phase means short downtimes for the customer and therefore keeps costs to a minimum. The exact planning and good cooperation between customer and supplier are therefore absolutely necessary. For the installation of the pressure distribution plates, the roller rods were taken out of the press and a package consisting of upper and lower hotplatens as well as both steel belts was formed and then lifted via press cylinders. Afterwards, the pressure distribution plates were inserted in the press using special equipment and roller supports. Finally, the hotplatens were lowered into position.



Display of pressure distribution inside press without pressure distribution plates...



...and with pressure distribution plates

Feeding cart for pressure distribution plate segments



Connection of pressure distribution plates



### Upgrades and modernizations – the Siempelkamp “all-round carefree” package

Siempelkamp offers a comprehensive program of modernization packages through its subsidiary Siempelkamp Logistics & Service GmbH (SLS). This service is offered for all Siempelkamp plants as well as plants made by Küsters and Bison. In this way, the team dedicates itself to the largest installed base of machines and plants for the wood-based materials industry in the world. Siempelkamp can provide the appropriate service for each system, including modernization packages for ContiRoll® presses, multi-daylight presses, short-cycle presses, Küsters and ContiPress® plants or for finishing lines. For plant operators a modernization by Siempelkamp service personnel translates into optimized processes, productivity increases, increased plant availability but also the reduction of maintenance costs – all with short downtimes and low risks during the upgrade.

#### Upgrade of the electrical system by Siempelkamp

Since the available control, regulating and visualization systems were discontinued and the technical support on the part of Siempelkamp was only possible with restrictions, an upgrade of the electrical system between forming line and diagonal saw to up-to-date systems became necessary for the customer. One challenge for the entire modernization project was that the available plant functions, which are documented in circuit diagrams and programs, had to be copied one to one. In

the course of the modernization the following systems were upgraded:

- SPC (Siempelkamp Press Control ) to SPC Gen. II,
- S5 to S7,
- VME to S7,
- ATR-Visualization to InTouch
- Ferrocontrol saw control to Siemens.

With these upgrades to the latest control, regulating and visualization systems, the customer increases plant availability: Spare parts can be procured easily and quickly. When a part has to be replaced, the plant

experiences only minimum downtimes. Beside the PLC hardware, the complete program and local hardware of forming line, press and double diagonal saw as well as the visualization was replaced.

Switchgear cabinets used for modernizations, such as the one carried out at the customer, are prepared, built and tested by the Siempelkamp subsidiary ATR Industrie-Elektronik GmbH. The circuit diagrams are prepared by the electrical engineering department of the parent company; the software is also written and tested there.





SPC (Siempelkamp Press Control) System

Inspection of the retrofitting works by Siempelkamp employees



S7 control

Service plays an important role for Siempelkamp

Another reason for an upgrade: Electronic components which are stored and unused for a long time become old. If a plant component fails, it can take, under certain circumstances, up to three months before a new component can be delivered. Each component has to be constructed and adjusted according to customer requirements. In the worst-case scenario a longer plant shutdown results from this. During a scheduled upgrade, however, the plant can be started up again after a short

period of time. "Turn off, upgrade, turn on, the system runs again." summarizes Armin Lingen, sales manager for electrical upgrades and modernizations at SLS, in just a few words. "Through thorough planning, Siempelkamp can carry out upgrades quickly."

90 to 95% of all electrical upgrades are carried out due to outdated systems. This is a good reason for SLS's department for electrical upgrades and modernizations to approach customers actively. "Instead of waiting until parts can no longer be procured and letting unexpected shutdowns

happen, we actively offer customers our modernization packages," explains Lingen. Customers are in this way able to prevent unscheduled and longer plant shutdowns.

The measurements taken after the modernization at the customer's site was completed demonstrate: A plant upgrade pays off. The return on investment is estimated to be less than a year.

# Redesign of the soil conservation register BIS-BoKat: A “well-grounded” project thanks to Siempelkamp software

In May 2013 it was time for the “final acceptance” of a special Siempelkamp project in Rhineland-Palatinate: the Rhineland-Palatinate Landesamt für Umwelt, Wasserwirtschaft und Gewerbeaufsicht (short LUWG = State Office for the Environment, Water Management and Trade Supervision) commissioned NIS Ingenieurgesellschaft with the complete redesign of the BIS-BoKat soil conservation register. Through the use of modern technologies, an innovative online portal has been created that is functional, convenient and sustainable. How and why? This report reveals more...

by Winfried Vogt and Jörg Eckelmann

Land area used for military purposes in Rhineland-Palatinate with potential old deposits



One of the core tasks of the LUWG consists in recording old deposits and abandoned sites such as land used by the military, which might have to be classified as areas suspected to be contaminated – as stipulated by the State Soil Protection Act.

The Rhineland-Palatinate history involves one aspect which makes the use of the LUWG particularly important: this federal state is one of those in the whole of Germany which has the most military sites of various forces – e.g., the German armed forces (Bundeswehr), the US Army or the French forces.

There is a need for action here, since due to structural changes, increasing numbers of military bases are being closed. The consequence: land previously used for military purposes is being transferred – i.e., converted – to civilian use. “This is a considerable challenge for the local communities concerned. It has to be clarified whether the area to be converted is free of contamination, i.e., free of old oils from former fuel depots, workshop oils or former disposal sites containing various substances. Because only then the area can be quickly converted to civil use,” explains Winfried Vogt, head of the DP specialist applications division for waste management and soil protection in Rhineland-Palatinate.

## LUWG: broad-based search for evidence

This is where the LUWG comes into play: The authority records not only abandoned commercial and industrial sites, but also the military properties. The collected data relates to environmentally relevant forms of use and any applicable cases of damage.

In order to differentiate possible further risk research or redevelopment measures in the subsequent evaluation, the documentation of all collected data is stated in attribute and graphics data.



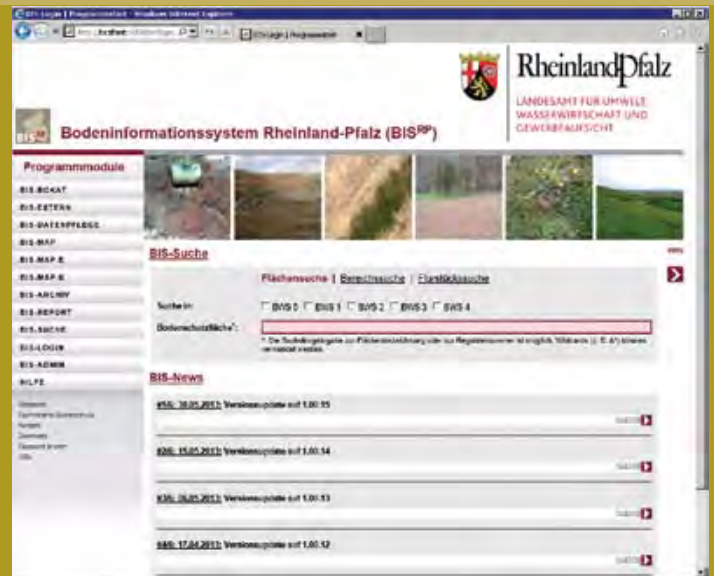
Civilian use of land previously used for military purposes



Demolition of former military buildings, e. g., residential buildings, fuel depots



Start screen BIS-BoKat



Each of these sites, old deposits or commercial areas concerned corresponds to a so-called data collection area, which covers the entire region under study. These data collection areas are divided up in turn into areas of use. The characteristic feature of these partial areas is that they have been subjected to standardized use over a specific period (e.g., as a gas station, workshop or blasting area).

#### Rhineland-Palatinate soil conservation register: getting to the point with Siempelkamp

Assistance with the complex task of recording and evaluating the suspected contaminated areas is provided by the electronic Bodeninformationssystem Rheinland-Pfalz (short BISRP = soil information system of Rhineland-Palatinate): this tool manages the datasets available within the state relating to soil protection. The system consists of six specialist modules defined in the State Soil Protection Act, including the soil conservation register module. This pools data, facts and findings about the suspected contaminated areas collected during the investigation, evaluation and remediation.

In November 2011 the LUWG commissioned Siempelkamp with the complete modernization of the BISRP soil conservation register, making use of competent and professional support for the redesign of the "BIS-BoKat" module: Siempelkamp NIS Ingenieurgesellschaft has been successfully established on the market for many years with services associated with the compilation and maintenance of database-driven information systems. "Our services include in particular high-performance process data systems for the nuclear and conventional power plant field, as well as highly specialized environmental information systems. This

profile matched the requirements associated with BIS-BoKat," says Holger Heidenbluth, BIS-BoKat project manager and software developer.

For one year a team of developers, occasionally seven-strong, worked on implementing the project. With the help of modern technologies, the Siempelkamp experts expanded the soil conservation register into a contemporary internet portal. One of the challenges was to harmonize the appearance of an internet application that is characterized by modern web pages with the structured working routines and high functional requirements during the collection and evaluation of data for suspected contaminated sites.

This was successfully implemented; the combination of a visually attractive program system and the high degree of technical and functional practicability has been achieved. The LUWG confirmed the final acceptance in May 2013. After a successful trial run over three months and a user training, the system was put into operation in the production process on September 24, 2013. "During the trial run, all of the data was recorded in parallel mode. Siempelkamp's performance impressed due to the time savings, convenience and ergonomics," states Winfried Vogt, divisional head of the state of Rhineland-Palatinate.

#### From the water to the soil...

With the BIS-BoKat soil conservation register, Siempelkamp has already successfully completed the second project for the Rhineland-Palatinate State Office for the Environment, Water Management and Trade Supervision. The compilation and maintenance of the drinking water information system TWIST (as reported in Bulletin 1/2011) has already been a milestone which allows Siempelkamp to look back on a successful long-term collaboration with the LUWG.



Nuclear Engineering Seibersdorf GmbH in Lower Austria

# Hot cell for Seibersdorf: A turnkey project of beneficial value to everyone

In 2010 Siempelkamp Nukleartechnik (SNT) was given the "Go!" as part of a public invitation to tender for the planning, design, installation, commissioning and equipping of a hot cell for Nuclear Engineering Seibersdorf (NES) in Austria. In this shielded area, radioactive waste is handled and stored. SNT project manager Wolfgang Huber illustrates the scope of delivery, status quo, functions and backgrounds of the project, which was completed in the middle of 2013 – and explains why this equipment is of benefit to everyone.

by Wolfgang Huber



At the Seibersdorf site in Lower Austria, NES operates a handling center for the treatment and conditioning of radioactive wastes (for the location and company, see also our interview with NES chief executive officer Roman Beyernecht on page 57 - 59). This is where the new hot cell is used. The all-round turnkey solution offered by Siempelkamp comprises components such as screening walls, radiation protection windows, steel lining, the remote-controlled handling technology as well as the plant control system with control consoles for operating the cell equipment.

Up to four Siempelkamp employees have been on site during the three-and-a-half-year project period that started in 2010 in order to get the hot cell ready for operation. The project manager is Wolfgang Huber, who has been on board at Siempelkamp since the foundation of SNT in 1998. His expertise in the field of nuclear facilities is considered to be an important foundation for the work on the hot cell.

**“Our flagship: high-level engineering technology and dismantling expertise”**

What unique selling point is Siempelkamp incorporating into the hot cell? “On the one hand there is our experience in the field of special machine construction and engineering technology. And on the other hand, in Seibersdorf we are taking advantage of our expertise in the field of dismantling, particularly with respect to delicate handling,” explains Wolfgang Huber.

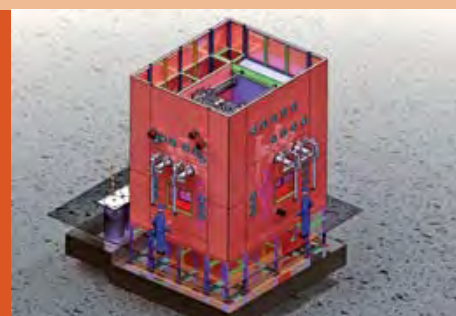
Reference projects and milestones in the history of SNT are the types of work involved in the construction of the sorting box at the Biblis nuclear power plant in Germany and the plans for the Gesellschaft für Schwerionenforschung (= society for heavy ion research) in Darmstadt, one of the large research institutions in the Federal Republic of Germany. For the vitrification plant on the site of the

Karlsruhe Institute of Technology (KIT), Siempelkamp was able to demonstrate its skills with the supply of stainless steel linings, shielding windows and doors – a range of services which the Verein für Kernverfahrenstechnik und Analytik (VKTA = association for nuclear engineering and analytics) in Dresden also used. A window in the field of hot cell technology is not the same as a conventional window, but rather a block of extremely thick and dense lead glass which must have a service life of 50 years.

Last but not least, the NES project is benefiting from the “everything from a single source” performance made in Krefeld. “The entire scope of services is the responsibility of Siempelkamp. Strength calculations, process engineering, ventilation technology and many other special tasks are carried out in-house,” says Wolfgang Huber. The shielding calculation for the 1-m-thick leaded windows is also carried out by Siempelkamp. From the concept and design, through the detailed planning, production and installation to the commissioning, operational support and testing, SNT stands for a supply chain which closes with the dismantling services for nuclear power plants.

**Challenge: “Everything has to be just right”**

One particular difficulty lies in the concept of the hot cell itself: All of the equipment located within the cell would be lost if a fault occurred. Due to the radiation in the interior, no repairs can be carried out. Project manager Huber: “For this reason we have mounted the gear motors of the cell crane outside the hot cell on consoles, which represented an extreme challenge. Via connecting shafts and bevel gears, the torques generated by the gear motors are transmitted to the power trains for the crane bridge, crane trolley and hoisting gear. The necessary advance motion of the crane bridge is supplied by two trapezoidal thread spindles. The bridge travel, trolley travel and hoisting gear can therefore be repaired if



The hot cell of NES made by Siempelkamp: from 3-D planning until commissioning

Radioactive waste resulting from medical diagnostics



necessary. As one can imagine, this design represents a meaningful investment as in the case of a defect, the repairs do not have to be carried out within the cell.”

#### Multifunctionality: sense and purpose of the hot cell

The installation of the hot cell was completed in June 2013. For the teams from NES and SNT, this project represents a cooperation based on mutual trust and high levels of reliability – in the knowledge that ensuring the safety of individuals and the environment places particular challenges on the work involved.

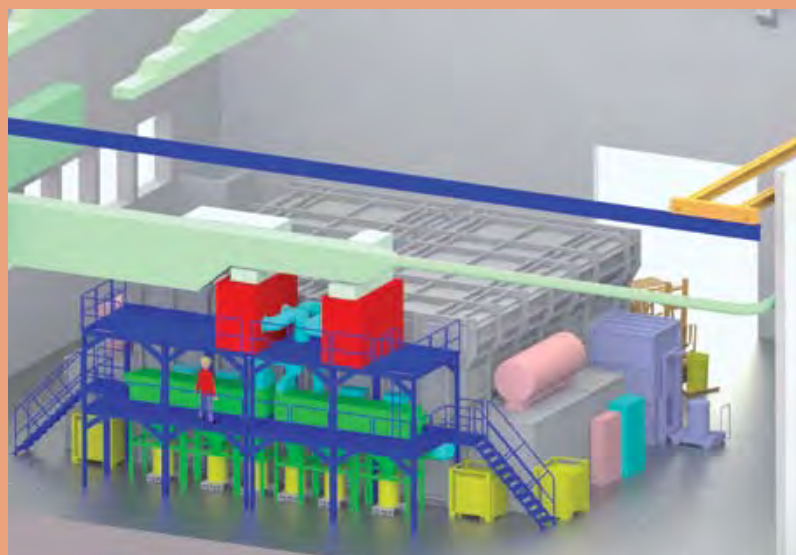
By the way, a hot cell is required for many reasons. On the one hand, NES in Seibersdorf conditions radioactive wastes from the dismantling of the former ASTRA (Adapted Swimming Pool Tank Reactor Austria) research reactor. However, the lion's share of the waste stems from the medical sector, e.g., from radiation and pain therapy, as well as pharmaceutical research. Here, nuclear technology will play an increasingly important role in the future – illustrating that radioactive wastes touch upon the lives of each and every one of us as a side-effect of medical services.

## Of value to people and industry: these radioactive materials are conditioned by NES

- Medicine:
  - Wastes from medical diagnostics (e.g., blood tests)
  - Material from medical and pharmaceutical research (development of treatment procedures, medications etc.)
  - Material from radiation therapy and nuclear medicine (cancer control, pain treatment etc.)
- Industry:
  - Sources of radiation from safety-related measurement and control devices in industrial plants (e.g., measuring devices for filling levels, flow rate)
  - Sources of radiation for quality assurance (e.g., for irradiating and checking safety-related welded seams such as district heating pipes etc.)
  - Material from basic scientific research and applied research

#### Seibersdorf reloaded...

By the way, it is still not time for the SNT team in Austria to say “Goodbye”. Currently, two stainless steel caissons for the dissection, sorting and processing of radioactive wastes are being planned and constructed – with Siempelkamp also succeeding in winning this invitation to tender.



The new order received “stainless steel caissons” for NES in 3-D planning



NES managing director Roman Beyerknecht

## “Zero Defects” for the hot cell: Interview with NES managing director Roman Beyerknecht

**What are the main tasks of a hot cell? And what are the resulting responsibilities for operators and cooperation partners such as Siempelkamp? We spoke to Roman Beyerknecht, who has been the managing director at NES since 2012 after previously working for five years as the head of the business segment “processing of radioactive substances”.**

**Bulletin:** Mr. Beyerknecht, it is very hot in Austria today at 32°C. This fits in with the occasion of our visit, Siempelkamp's supply and construction of the hot cell for Seibersdorf. Before we get round to speaking about the construction of the new hot cell: please provide our readers with a brief overview of Nuclear Engineering Seibersdorf.

**Roman Beyerknecht:** I will be glad to! In the late 1950s, the reactor center was erected on today's site in Seibersdorf – as a nuclear research center for the peaceful use of nuclear energy. In addition to institutes working in the field of electrical engineering, physics, chemistry, metallurgy and radiation protection, this was also the site of the first research reactor in Austria: The ASTRA – Adapted Swimming Pool Tank Reactor Austria.

**In the 1970s a referendum brought about a realignment with respect to the use of this reactor...**

**Roman Beyerknecht:** Indeed. The first nuclear power plant completed in Austria in 1978 – Zwentendorf – was never connected to the grid after the referendum on November 5, 1978. 50.5% of



the population voted against the peaceful use of nuclear energy at the time. The referendum led to the law banning the use of atomic energy – and therefore necessitated the realignment of the nuclear research center. The main priorities were transferred to conventional research fields. In 2003 we then divested the nuclear field and founded NES as a wholly owned subsidiary of the Austrian Institute of Technology (AIT).

**What have been the main tasks of NES since 2003?**

**Roman Beyerknecht:** The tasks were clearly defined. The focus was on the decommissioning and dismantling of nuclear plants based on 45 years of R&D in this field, with the greatest challenge being the complete dismantling of the ASTRA research reactor, which it was possible to complete in 2006 (see box). Today, only the reactor shell remains as a “landmark” on the Seibersdorf site – having been artistically enhanced by the attachment of a nuclide table. The other important task consists in all of the radioactive wastes produced in Austria being managed here in close collaboration with the Austrian state. There is a contractual agreement in existence that runs until 2030.

### Nuclear Engineering Seibersdorf: Profile

- Nuclear Engineering Seibersdorf (NES), a limited liability company according to Austrian corporate law
- Subsidiary of the AIT Austrian Institute of Technology GmbH
- Established: June 2003, after the spin-off of the nuclear installations and

facilities and the independent disposal of radioactive wastes became necessary

- Anniversary: 10 years of NES on June 12, 2013
- Location: Lower Austria, 48 km southeast of Vienna
- Main tasks: the collection, treatment, conditioning and storage of radioactive wastes on behalf of the Republic of Austria (represented by the Federal

Ministry of Agriculture and Forestry, Environment and Water Management)

- Additionally: operation of a hot cell laboratory and decontamination of equipment and laboratories from 45 years of research and development at the Seibersdorf site (on behalf of the Federal Ministry for Transport, Innovation and Technology)

Memorial stone: biological shield of the dismantled research reactor ASTRA in Lower Austria



Landmark: the shell of the research reactor ASTRA artistically enhanced by the attachment of a nuclide table



Austria does not operate any nuclear power plants. So where do the nuclear wastes come from which are conditioned by NES?

**Roman Beyerknecht:** On the one hand, we condition the radioactive wastes produced during the dismantling projects on the Seibersdorf site. However, the greatest share of the wastes comes from the medical field, as well as from research and industry (see box).

Mr. Beyerknecht, you mentioned that NES also conditions wastes from the dismantling of its own laboratories. So are the existing hot cell laboratories being demolished and replaced by new ones?

**Roman Beyerknecht:** Yes. The dismantling of the laboratories and facilities produces approximately 100 raw tons of waste every year. From about 2015 on, eight old hot cells will also be demolished – this will take approximately three to four years.

What are the differences between radioactive wastes from industry on the one hand and medicine on the other?

**Roman Beyerknecht:** Industry very often supplies enclosed radioactive substances or sources of radiation for conditioning. This means that the source of radiation is enclosed in a capsule; the radioactive substance itself does not escape. In the case of medical wastes – e.g., laboratory wastes such as protective gloves, gauze bandages, containers of contrast media – there is a danger of the substances spreading. This is where the highest levels of care are required.

## ASTRA = Adapted Swimming Pool Tank Reactor Austria

The Adapted Swimming Pool Tank Reactor Austria was a research reactor that was constructed on the site of the Austrian reactor center in Seibersdorf as part of today's Austrian Institute of Technology and operated from 1960 to 1999.

## What is conditioning of radioactive wastes?

As a result of the conditioning, the radioactive wastes are transformed into a chemically stable condition where they are not soluble or only slightly soluble in water and then packed in accordance with the transport and final storage requirements. Various processes are used, depending on the material: for example, crushing, incineration, evaporation, high-pressure compression, solidification such as segmentation, vitrification or inclusion in ceramics. The aim of conditioning is to create a material that can be transported and put into final storage while taking up as little space as possible.



The shielding shell with a thickness of 1.000 mm protects the operating staff against radiation



Was the construction of the new handling center and the associated setting-up of the hot cell supplied by Siempelkamp an expansion measure in order to manage the high levels of radioactive waste produced?

**Roman Beyerknecht:** The construction measures ensure the seamless transition from old to new equipment. The new handling center with the hot cell will go into operation in the middle of 2014. From the middle of 2015 the start of decommissioning (dismantling) of the old hot cell laboratories is planned, i.e., the old cells will be replaced over the long term by a new one. At the same time, we are commissioning not only our "normal" waste produced from medicine and industry, but also decommissioning wastes from our own dismantling. Furthermore, a large share of the old wastes which are already in our interim store will be reconditioned again in the next seven years. "Optimum conditioning for long-term storage stability and a reduction in the necessary final storage volume" is the task here.

Did NES work together with Siempelkamp before the hot cell project

**Roman Beyerknecht:** Our cooperation does indeed have a long tradition, because we were already using Siempelkamp support some years ago when the dismantling of the ASTRA reactor was about to be carried out. From 2005 to 2008, Siempelkamp processed and melted down approximately 100 t of metal in the CARLA melting plant in Krefeld, Germany, as part of this project. It was possible to release all of the metals after treatment and recycle them as secondary raw materials.



Interior view of the hot cell



The cell crane has gripped the tamping tool

### What were the metals involved?

**Roman Beyerknecht:** They were steel, aluminum and lead components. These metals were either packed in barrels in small pieces or supplied as entire components – e.g., heat exchangers. After recycling we received 6% radioactive waste back.

### How did the collaboration with the engineering experts at Siempelkamp come about within the framework of the hot cell project?

**Roman Beyerknecht:** The convincing aspects as part of the public tender were Siempelkamp's price and performance. What pleased us as a company was the opportunity to work with a proven team of experts which is able to provide many references in this environment where safety is extremely important. Furthermore, Siempelkamp has also won two further invitations to tender in the last two years: the modernization of a sorting box, as well as the planning and setting-up of two stainless steel caissons for the dissecting, sorting and treatment of radioactive wastes.

One cooperation was also carried out in addition to the advertised projects by resorting directly to Siempelkamp's expertise...

## Easier handling "thanks to Siempelkamp"

"For our work we need the right feeling and good hand-to-eye coordination. When the highly activated materials are handled, a steady hand is required.

Compared to our 40-year-old remote-controlled equipment, a lot has changed in terms of technology. Handling has become much easier."



Michael Gems, 40, radiation protection specialist / operator of the hot cell equipment at NES, with the company since September 2012





**Roman Beyerknecht:** That's right. This was associated with the removal of the lead and shielding windows from an old hot cell. After being in operation for more than 30 years, the cell had already been taken out of service; the windows were intact. We were able to reuse this valuable resource – here we are talking about a value of approximately a quarter of a million euros per window – in conjunction with the new hot cell.

**One final question for you personally: what exactly is the challenge in your job?**

**Roman Beyerknecht:** "Zero defects" is the top priority that we have to guarantee. In this, the interdisciplinary collaboration of all departments and participants is an important basis which we have to continue to ensure. Our field of work is of particular interest to the public, as the safety of people and the environment are involved at all times. Faults must not be allowed to happen – that is the greatest challenge of my job.

**Mr. Beyerknecht, we would like to thank you for this interview and wish you every success in your position of responsibility!**



The movable work tables give view to the storage floor and the locks

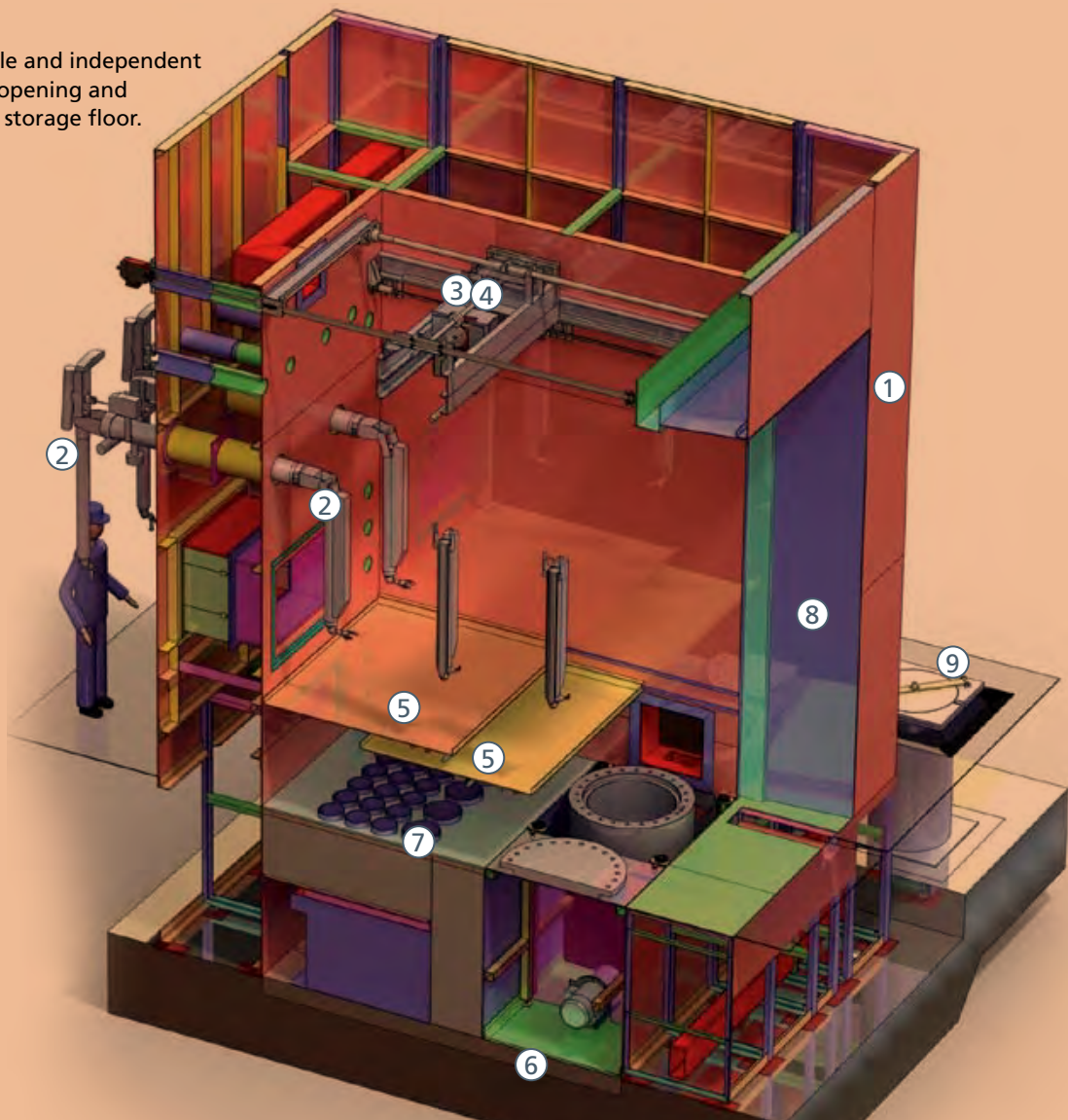


Easy handling: remote handling of the hot cell at the handling center of the NES



## Hot cell, cool plans: the components

- ① **Shielding shell:** Walls consisting of 1,000 mm barite concrete with a density of at least 3.2 t/m<sup>3</sup>. Formwork consisting of 10 mm carbon steel is added both internally and externally. Most important function: protection of the operating staff against radiation.
- ② **Manipulators:** Four pieces included: master slaves for gripping and handling the materials from the outside (up to 60kg)
- ③ **Cell crane:** Picks up the tamping tool by remote control with and without a load. Transports it horizontally and vertically, positioning it and putting it down. Transport and positioning of storage capsules, shielding plugs and covers of the shielding transport containers.
- ④ **Tamping tools:** Attached to the crane, are operated by remote control. Designed as a pneumatically operated gripping tool.
- ⑤ **Work tables:** Movable and independent of one another. For opening and closing access to the storage floor.
- ⑥ **Locks:** Safety component no. 1: During operation of the lock it must be ensured that no radiation escapes towards the outside. This is ensured by a high proportion of lead
- ⑦ **Internal storage floor:** The heart of the cell, consisting of a lead safe, manufactured from 50 t of lead. This includes 22 cooled storage tubes for putting highly radioactive, encapsulated radiation sources into storage.
- ⑧ **Shielding door:** Seals the cell with a heavy weight of 50 t. Has the same shielding effect as the cell wall.
- ⑨ **External store:** Designed as a drum store, consisting of six floor-level, concreted-in storage shafts made of stainless steel. Function: storage, interim storage, removal from storage of the radioactive material as tightly packed piece goods, externally free of contamination.

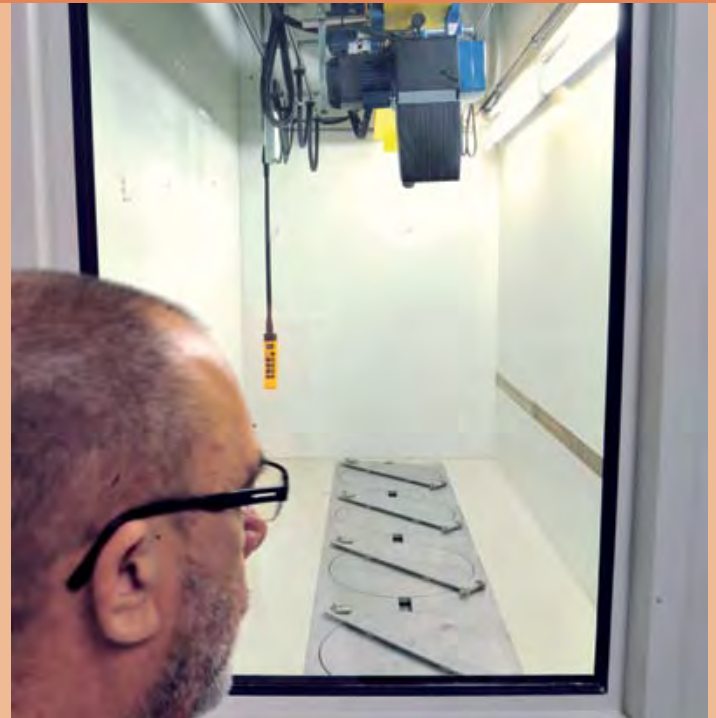




Shielding door



View through the shielding window into the external drum store



## Austrian crash course for business travelers

Siempelkamp sales personnel, technicians and engineers tour the world. Exciting impressions from different cultures are a nice side effect of the travels – so are language barriers. This not only applies to far-away countries, but also to our direct neighbors. Already in Austria – although a “German-speaking” country – our German employees need to learn...

Jänner (standard German = Januar) = January – already the names of the months are not the same. Particularly interesting however is eating out at a restaurant:

Erdapfel (stand. German = Kartoffel) = potato

Fisolen (stand. German = grüne Bohnen) = green beans

Marillen (stand. German = Aprikosen) = apricots, also very delicious as liquor or schnapps

Paradeiser (stand. German = Tomaten) = tomatoes ... “Paradeis” is the old form of paradise and red tomatoes look like a paradise apple from the Garden of Eden.

Schwammerl (stand. German = Pilz) = mushroom ... for Germans however, „Schwammerl” sounds like a belittlement for the German word „Schwamm” which means sponge.

In Austria, even a coffee is not just a coffee...a little coffee encyclopedia:

Schale Braun (literally translated: bowl brown) = half coffee, half milk

kleiner Brauner (literally translated: small brown) = a single mocha coffee served with milk or cream

großer Brauner (translated: big brown) = a double mocha coffee served with milk or cream

Einspänner (literally translated: sulky) = a little mocha coffee in a glass with cream topping

These phrases are useful for the cooperation with colleagues:

basst schu = that suits, everything’s all right. Work can be continued.

Is sich net ausgange = We have a problem. That means start again from the beginning or remedy.

Austrian coffeehouse culture: the “Einspänner” (= sulky)



# Thermal power station put to the test: Plant inspection with the Siempelkamp Prüf- und Gutachter- Gesellschaft in Chemnitz

According to the local press, the Siempelkamp Prüf- und Gutachter-Gesellschaft (SPG) in Saxony “took a critical look at the city’s furnace” in spring 2013: the Dresden-based Siempelkamp subsidiary inspected the entire pressurized plant in unit C of the Chemnitz thermal power station. Where otherwise hot fires of more than 1,000°C are blazing to provide the citizens of the city with heat and power, the inside and outside of pipes and turbines had to report for a check-up.

by Dr. Peter Seliger



The eins energie thermal power station at Chemnitz, Germany, provides heat and power to a large part of the city’s citizens on 365 days a year  
(photo: eins energie in Saxony)





Cutting works at the exhaust system  
(photo: Andreas Seidel, Chemnitz)

Scaffolded for inspection: the boiler house  
(photo: Andreas Seidel, Chemnitz)

The inspection taking place from the middle of May to the middle of June 2013 included the entire pressurized plant, i.e., the boiler and the pipe components of power plant unit C. According to the proverb: you must finish what you start, inspecting unit C means you also have to look at unit B and unit A: during the summer, the inspection of unit B was next, followed by the one of unit A in 2014.

Inspections usually take place between spring (March) and late fall (October). Following the slogan "one man's meat is another man's poison," during the winter, the power plant generates heat provided to the population, while during the inspection phase in the summer months, the inspection personnel sweats – since

then too, the temperatures within the power plant are considerable.

Inside the steam boiler in unit C, which is almost 60 m high, SPG employees inspected the condition of pipes and other components. Two weeks earlier, the fire in the boiler was extinguished for it to cool down so the scaffold could be threaded in through the opening of only about 1 m and then to be set up. In addition, pipes and claddings had to be sandblasted and ground to ensure the material testers' access to the blank metal.

"Using magnetic-particle and ultrasonic testing devices we determine if cracks have developed," Dr. Peter Seliger, head

of plant inspection at SPG, explained. The hardness of the material, the wall thickness and diameter are also measured. Furthermore, the SPG team takes samples to check the condition of the material's microstructure to determine changes caused by exposure to stress, and deriving from this the remaining useful time of the pipe components.

#### **Dresden goes Chemnitz: special knowledge trumps**

The connection between Chemnitz and Dresden is based on a long-standing tradition: employees of the SPG predecessor Kraftwerksanlagenbau Dresden had already been involved in the construction

View into the burner of a boiler  
(photo: Andreas Seidel, Chemnitz)



Siempelkamp's plant inspectors from Dresden in the power station

of the thermal power station in the 1980s. Today, the customer benefits from the development of the SPG, which evolved in the 1990s from a research institution into a service provider for testing and expert services recognized on the energy and power plant market. "At the time, it showed that in the area of lifetime monitoring of conventional power plants, there is an opportunity to retain customers permanently that started to reduce or outsource own capacities due to the liberalization of the energy market," Dr. Peter Seliger explained.

Since then, the SPG has established itself on the market as a specialist for the lifetime monitoring of power plants exposed to extreme stress. By founding an accredited inspection body of type A according to DIN EN ISO/IEC 17020 in 1999, and creating an independent department "plant inspection" in 2000, the objective was to respond more powerfully and specifically to the needs of the end customer. These end customers are the operators whose power plants are exposed to extreme thermal stress on the plant as well as chemical/petrochemical industry.

"During the past years, we successfully enhanced our assignment profile increasing the efficiency and quality of processing major testing and inspection programs in a more professional manner. Here, it proved to be a major advantage that due to the close connection of both other specialist departments 'material and component testing' and 'strength calculation' within SPG, we are provided with the competence to process the issues of our customers in a complex manner," according to the expert for inspection services Dr. Peter Seliger.

**Tested and approved**

On a scale of school grades from 1 to 5 (1 for "excellent" and 5 for "poor"), the SPG team awards the tested parts of the thermal power station, whose three units were put into operation between 1986 and 1990, a 2 – a satisfactory result for the power plant management. The evaluation implies that the plants can remain in operation in the years to come without major replacement investments. The checks also intend to enable the operator to determine and plan required long-term replacement needs.

SPG awards the tested parts of the thermal power station a 2- on level two there also is located the department plant inspection on the Siempelkamp premises at Dresden, Germany

f. r. t. l. Dr. Peter Seliger, head of plant inspection at Siempelkamp, with the head of the thermal power plant Silvia Trümper, the person responsible for service/maintenance Thomas Pöhler and chief machinist/coordinator Marco Gläser of the eins energie thermal power station (photo: Andreas Seidel, Chemnitz)

Siempelkamp PRÜF- UND GUTACHTER-GESELLSCHAFT			
Geschoss <b>3</b>	Seminarraum Leiter Berechnung	Anmeldung	Geschoss 2, Zimmer 201
Geschoss <b>2</b>	Geschäftsführung Leiter Werkstoff- und Bauteilprüfung Leiter Anlageninspektion	Anmeldung	Zimmer 201
Geschoss <b>1</b>	Prüflabors (Zutritt nur in Begleitung)		
Geschoss <b>0</b>	Prüflabors (Zutritt nur in Begleitung)		





Dr. Peter Seliger, the expert for plant inspections

## Inspection or total turnaround?

**Four questions for Dr. Peter Seliger, head of the specialist department plant inspection of Siempelkamp Prüf- und Gutachter-Gesellschaft in Dresden.**

**Bulletin:** Dr. Seliger, can you please describe how a power plant inspection is performed?

**Dr. Peter Seliger:** It is a very individual matter. The variation of the conventional power plants or the chemical or petrochemical plants with regard to size, type, age and operating mode requires that an inspection program is specifically tailored to the operator and adjusted to the duration of an inspection. Here, due to its long-standing experience, the SPG can



already be included in the preparation process and compile suggestions.

**How much time and how many employees are involved?**

**Dr. Peter Seliger:** The interval ranges from one workday to two months (see box on page 69). This requires careful assignment

and personnel planning. In part, up to 20 employees are involved, whereby for very comprehensive actions – for instance, shutdowns of refineries, the so-called turnarounds – we can and will fall back on certified subcontractors. For the performance of this shutdown program, constant contact to the customer or the approved surveillance bodies such as the

## Inspection activities – a job with attention to detail

### Basics of the inspection activities

Basically, the requirements on the commissioning, testing and monitoring of pressure vessels, boiler plants and pipes are regulated by the legislator in directives and regulations such as the German “Betriebssicherheitsverordnung” (ordinance on industrial safety and health). Here, detailed regulations regarding testing and monitoring activities during plant shutdowns are stipulated.

### Objectives

Whether inspection, plant deactivation, shutdown, turnaround or revision: The safe operation of these plants is always the primary focus. The idea of safety always exceeds other aspects such as profitability or availability.

### Qualifications of the executing personnel

In addition to the legal requirements, basic prerequisite for an inspection activity in plants exposed to extreme stress is the knowledge of the processes taking place, and the components

and materials used. The examination of individual plant sections during an inspection is performed by specially trained test engineers and test technicians. Their training is regulated by internationally applicable standards – e.g., the ISO 9712 “Qualification and certification of NDT personnel”. The employees are subject to the obligation to furnish proof of their constant activity and advanced training in the field of non-destructive testing to be able to optimally use special test equipment required for testing. The evaluation of the determined findings of the investigation and the assessment of the component integrity and remaining service life requires a comprehensive knowledge and long-standing experience in the field of damage kinetics of the mostly heat-resistant materials used. Here again, the know-how acquired by SPG in almost 60 years in the operation of its accredited long-term test laboratory takes effect.

### The conclusion

Each plant inspection is completed with a profound expertise of the plant condition, which the operator receives in the form of expert opinions or inspection reports. On this basis, the authority designated by the legislator (e.g., the regional council) is able to approve a plant restart.

Inspection box for ambulant component metallography



TÜV Süd responsible for Chemnitz is important to be able to control the inspection process and to ensure the exchange of information with regard to emerging issues.

How is the plant inspection market structured?

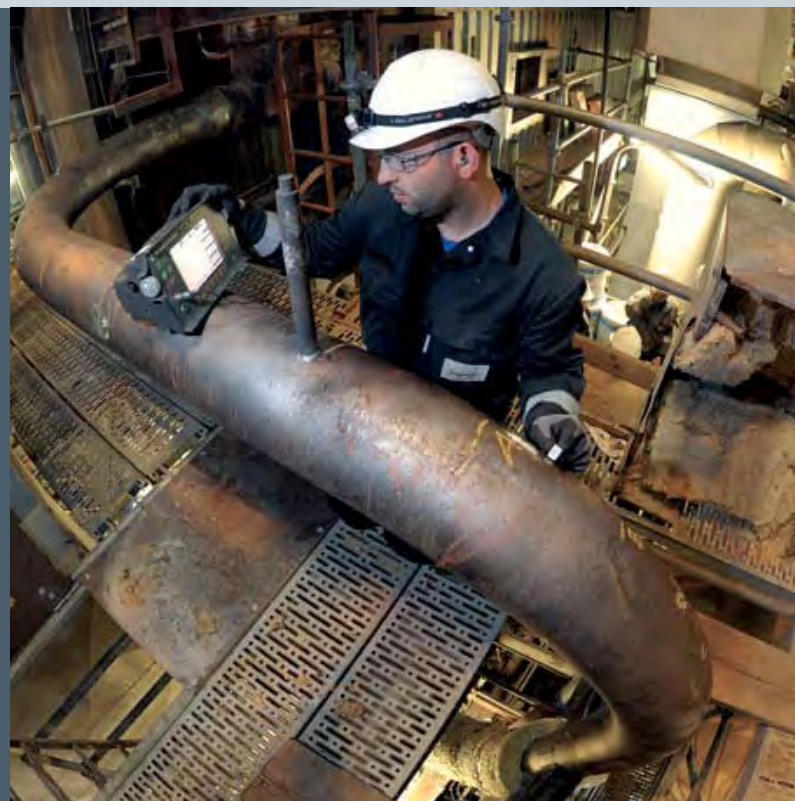
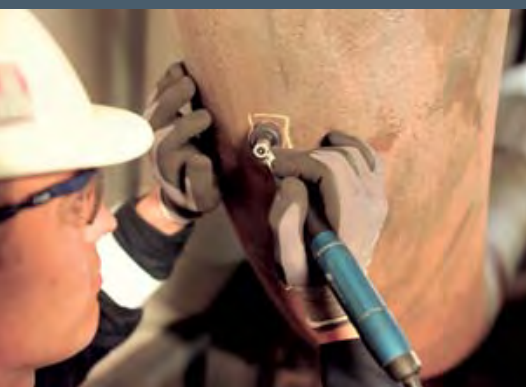
**Dr. Peter Seliger:** The area of plant inspection serves a limited and highly competitive market, which constantly changes due to the heavily subsidized development of renewable energies and phasing out nuclear energy. It is foreseeable that in the future the decentralization of the energy generation will increase even more. Minor power plant projects entail shorter inspections and minor inspection programs. Here, the SPG may have an advantage over major inspection companies. A start has already been made by the successful customer retention of minor combined heat and biomass power

stations. It is necessary to build on this successful development, so we are able to further develop and assert ourselves in this area with our special experience.

Which professional forums are relevant, in order to live up to the market requirements?

**Dr. Peter Seliger:** With the symposium TURNAROUND, we have found a platform where the topics "Best Practices – Community – Trends" are discussed. The first issue of a classified directory for turnarounds, plant shutdowns and inspections was published at the end of January 2013. Here, the SPG is represented with its services and products in a company profile, and a praxis report.

Preparatory measures for component metallography: sanding and polishing of a pre-defined measuring point



Measurement of wall thickness by ultrasound at a pipeline (photo: Andreas Seidel, Chemnitz)



Provision of power and heat for Chemnitz viewed from the chimney of the power plant (photo: eins energie in Saxony)



### From the inspection to the turnaround: duration and scope

Action (example)	Duration of the inspection	Number of assigned employees
Inspection of a pressure vessel	1 day	1
Revision of a small or medium-sized thermal power station	2 to 5 days	2 to 3
Main inspection of a major power plant	2 to 3 weeks	4 to 6
Turnaround of a refinery	6 to 8 weeks	up to 20

Complex inspection and assessment of remaining service life of high temperature components

# In-depth crane technology: Siempelkamp supplies floor conveyors for the Flensburger Schiffbau-Gesellschaft



For some years now, Flensburger Schiffbau-Gesellschaft has been a regular customer of Siempelkamp Krantechnik (SKT). The company has already ordered several typical shipyard cranes. In 2011 Siempelkamp supplemented its supply portfolio for the shipyard with general materials handling technology, which has been used successfully since the beginning of 2013 in the Flensburg Fjord. Materials handling technology for the fjord.

by Ute de Vries

Flensburger Schiffbau-Gesellschaft mbH & Co. KG (FSG) is a market-leading shipyard for the construction of modern ships which are particularly fast and economical, such as RoRo freight ferries or RoPax passenger ships.

The company currently has around 700 employees, of whom more than 500 work in production alone. The highest level of know-how at the shipyard lies in the field of research and development, predominantly in the simulation of cargo

handling, evacuation scenarios for ferries and harbor logistics concepts. Another important feature of the shipyard is its long-term experience in the construction of special ships with a very high vertical range of manufacture.

## SKT's main business: all types of cranes and load lifting devices

FSG is a discerning crane customer that regularly uses customized cranes for the ongoing optimization of its production.

The main focus here is to increase the productivity at the shipyard, taking into account the very cramped conditions. Furthermore, the maintenance department places great emphasis on the use of robust and durable products in order to ensure the high level of availability of the cranes. In 2009 Siempelkamp supplied a double-girder bridge crane of a special design. The crane is equipped with two sets of special hoisting gear, each of which contains four rope lead-offs. From the multiple reeving of the ropes it has been possible to produce slanted cable tensioning, which allows the low-sway transport of the elevated loads. The load is itself raised using a magnetic crossbeam attached to an intermediate crossbeam by means of a rotating mechanism.

Further features of the equipment: a crane cab with access, full accessibility to the crane and trolley, as well as frequency regulation for all travel, lifting and turning movements. Obstacle avoidance control

## A small shipping glossary:

RoRo ships (Roll-on/Roll-off) are vessels which transport movable goods by means of the ro-ro method.

This means in contrast to the LoLo ships (Lift-on/Lift-off) that the cargo is directly loaded onto the vessel.

ConRo ships are vessels designed to carry containers and RoRo cargoes simultaneously.

RoPax ferries, which are also called combi-ferries, are RoRo ships which are additionally fitted with passenger cabins. As a type of combi-ferry, they offer the option of accommodating both freight and passengers.





Siempelkamp Krantechnik in use at the shipbuilding company Flensburger Schiffbau-Gesellschaft close to the Danish border (photo: Flensburger Schiffbau-Gesellschaft)

systems or safety monitoring of the cross-beam position are also included in the concept. The advantage: depending on the rotary position, a collision with hall supports or other installations can be avoided. Besides the supply of additional new cranes, SKT is also the ideal partner for various conversions and modernizations to existing crane systems.

#### Transport trolleys and general conveyor technology

All types of cranes and load lifting devices for all sectors of industry form the main commercial field in which SKT operates. But the company has also been working for many years in the area of general conveyor technology such as transport trolleys. "Amongst other things, we have supplied transfer trolleys for big bag stations in the conventional field (= filling stations for flexible bulk goods containers), all types of transport trolleys for the concrete industry or crossbeam

transport vehicles for sinks in hot-galvanizing plants, specifically tailored in each case to different customer requirements," explains Thies Steffen, crane expert at SKT.

#### Robust crane technology for rough handling

In the middle of 2011, FSG submitted an inquiry concerning three trolley trains from Siempelkamp in Moormerland. With its experience of conveyor and crane construction technology, SKT was able to satisfy the customer's requirements and submit a convincing concept.

The three trolley trains consist of three trucks coupled together in each case with a total length of approximately 10 m. They are used for the lateral transport of up to 60 t of heavy ship panels between three ship construction bays. The trucks are passed under the large components, which they then lift and transport to a parallel ship construction bay in accordance with the desired material flow.

As is typical in shipyards, the system is subject to relatively rough handling. Collisions between the radio-controlled trucks and the large components of



A cargo ship on passage to the port



different shapes cannot always be avoided. The supporting structures of the trucks therefore had to be of a correspondingly sturdy design. Possible collisions with ship panels were also taken into consideration in the design of the traction drives. All trucks were provided with "four-wheel drive" across all four corners with two attachable flat gears, including frequency-controlled brake motors and central drive shafts.

The drives have been designed to ensure trouble-free movement on the existing rail system even without a load. Flanged running wheels ensure trouble-free passage over the existing rail crossovers. Hydraulic cylinders lift the ship components. The hydraulic systems are protected but easily accessible, being mounted together with the electric control cabinets on the coupling units of the transport trucks.

The systems were put into operation at the SKT works in Moormerland together with specialist employees of the FSG shipyard. The installation and commissioning on site was successfully performed by FSG itself during the shutdown of operations between Christmas and the New Year 2012/2013. As with the crane project, this contract was also overseen by the main contact persons at FSG from the maintenance department, namely Bernd Köhler, Arno Hentschke and Jörn Hoffmann-Timm (see our interview).

As a result of the very good collaboration based on the partnership between the two teams, this project was also completed successfully and the system put into operation on time for the start of production at the beginning of January 2013.



Bernd Köhler and Arno Hentschke were at Bulletin's disposal to answer questions



**Bulletin:** Good morning! The sound of the gulls here on the Baltic coast communicates a holiday feeling. Living and working where other people go on holiday. Does this feeling contribute towards the success of the Flensburger Schiffbau-Gesellschaft?

**Bernd Köhler:** Let's say – it doesn't do any harm. Our quality and functionality in shipbuilding is appreciated worldwide.

**Does that mean that your customers, the shipping companies, prefer Europe for the construction of their ships?**

“Can Siempelkamp make cranes which move along the floor?”

**A flying visit to the Flensburg shipyard. Our interview partners: Arno Hentschke (right), 57 years old, foreman of the maintenance section, employed at the shipyard for 42 years and Bernd Köhler (left), 44, graduate engineer, head of maintenance and environmental protection, at the company for 11 years.**

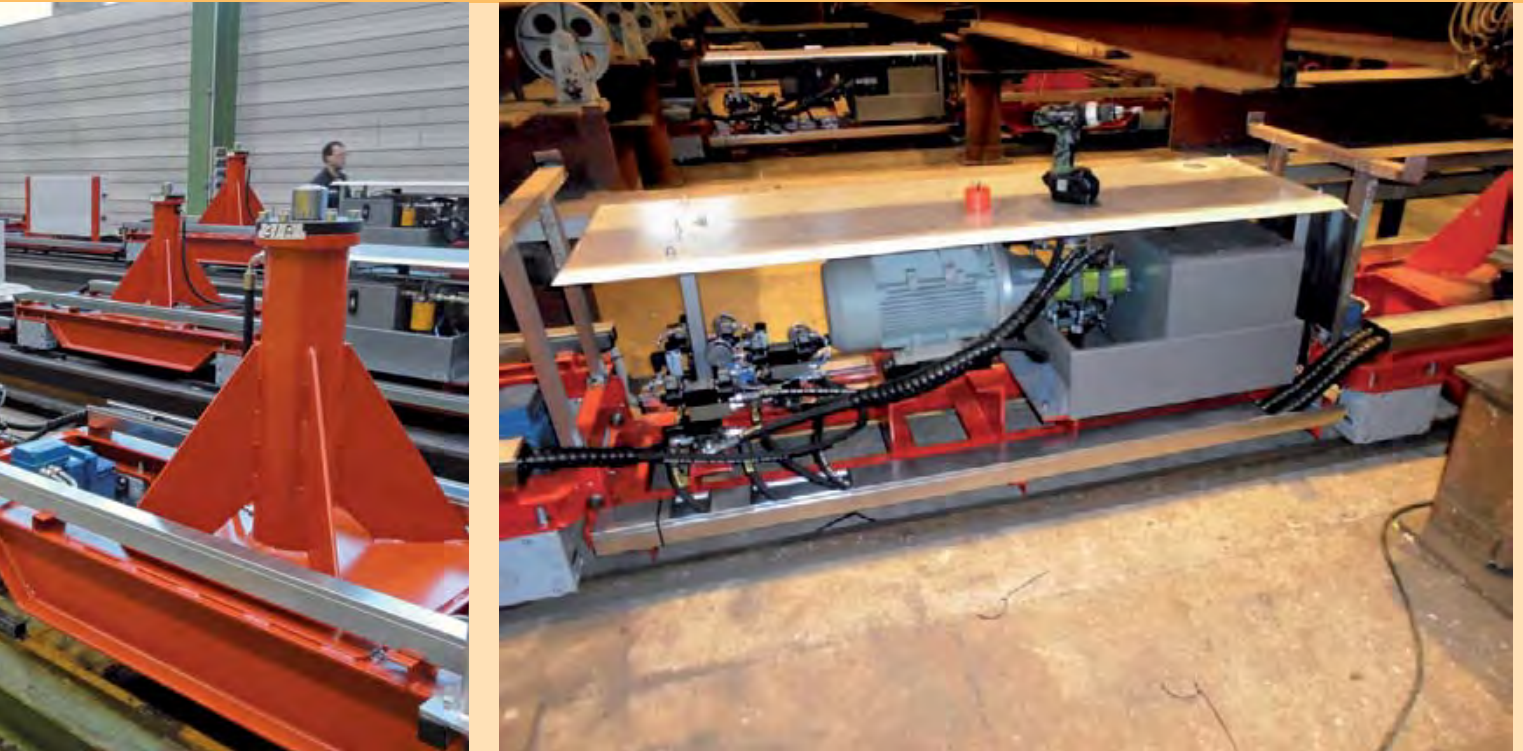
**Bernd Köhler:** Yes – and they particularly prefer a company such as our shipyard, which is able to produce very special ships. We concentrate on the production of special ships and manufacture tailor-made solutions for our customers.

**Which types of ships does the Flensburger Schiffbau-Gesellschaft construct?**

**Bernd Köhler:** We manufacture ships which transport movable goods. These goods are transported directly on to the ship or loaded in containers. Furthermore, we produce so-called



Robust transport trolley technology for FSG at Siempelkamp's crane production in Moormerland



combi-ferrys. These are ferrys which can accommodate both freight and passengers. This means: our shipyard delivers ships which are precisely coordinated with the route or application – or both.

**How can we imagine this customized work?**

**Bernd Köhler:** Let us take, for example, the seismic vessels for oil exploration, special offshore ships and military ships for deployment supplies. One particular challenge for us is the contract to construct two dock vessels. The ship is lowered to take receipt of the goods and then floats up to transport them.

**How many ships does your shipyard build every year?**

**Bernd Köhler:** Depending on the size and complexity of the ships, approximately four – we have increased the number somewhat, as eleven years ago we constructed only two and a half to three ships a year. On average the construction period lasts 18 months, including the design stage.

**What exactly distinguishes you in the eyes of your customers?**

**Bernd Köhler:** Our expertise in the construction of special productions, as well as the highest levels of reliability in terms of punctuality and quality. These properties are essential for shipping companies when one considers that very high charter rates are paid in this field of business.

**What approach do your customers take in practice when they award a contract and search for corresponding suppliers?**

**Bernd Köhler:** The inquiry from the customer is processed by project teams at our company. If interest has been aroused after the initial "close contact," the consultation phase begins for developing the construction specification. Here, support is provided by the simulation and research departments, which draw up the optimum ship design together with the potential customer. If the price and submission date are acceptable, the contract will be concluded. We also have customers who carry out a thorough examination not only of the offers, but also the

entire operations. Special auditors check the company, particularly the production department, down to the smallest detail. In this way the shipping companies ensure that the vessel is delivered on time.

**This means that the requirements imposed on the shipyard are also imposed by you on your suppliers?**

**Arno Hentschke:** Definitely – which is why we turned to Siempelkamp. Siempelkamp Krantechnik supplied us with the first special crane as long ago as 2008. This was a model with cable bracing; bracing the cables minimizes the swaying of the load. SKT fully met the requirements, so that further orders followed. For example, a crane with a magnetic crossbeam and replacement trolleys for a grinding hall crane.

**Bernd Köhler:** “Can you also make cranes which move along the floor?” was our inquiry to Thies Steffen at Siempelkamp.

**Arno Hentschke:** The answer came promptly: “We’ll have a look.”

**What exactly were the challenges?**

**Arno Hentschke:** There were a few sticking points. The transport trolleys had to be customized exactly to the cramped conditions. We also had to take into account the fact that we had to cope with enormous impact loads on the driving gear. Siempelkamp presented us with a corresponding solution and

stood out overall with its very individual customer care and support. They did not shy away from any new projects.

**Bernd Köhler:** And we should also mention our additional request: the renewal of the hydraulics on the old transport trolleys.

**Arno Hentschke:** That was not a problem for Siempelkamp either. The hydraulics of the trolley tracks are subjected to high stresses. The sectional manufacturing of the ship elements was carried out on parallel lines. The manufacturing process follows a sequence from small to large. The conveyor trucks have to withstand weights from 5 to 40 t. Ship parts that have already been manufactured are transported by cranes to the next section and placed on the conveyor trucks. Sometimes it is only 10 t which the truck has to transport within the section, but then again it can be 40 t – various impact loads for which the hydraulics have to be permanently designed.

**So Siempelkamp, the off-standard crane specialist, satisfied your requirements and those of your customers in full. Is there a follow-up project?**

**Arno Hentschke:** Yes, another crane with a magnetic crossbeam for lifting and vertically transporting profiles is about to be delivered.

**Then we wish you a good “finale” for this project as well and thank you for the interview!**





Thies Steffen (middle), Siempelkamp's man of all trades – even for "cranes" which move along the floor, together with Bernd Köhler and Arno Hentschke (FSG)



## Transport trolleys also in use in nuclear technology

Siempelkamp specializes not only in equipping its products in "harsh climates" for optimum use. The highest safety requirements – which are essential in nuclear technology – are also successfully implemented.

In the nuclear sector, between 2006 and 2009 Siempelkamp Krantechnik supplied a total of four transport trucks with a load capacity of 16 t each to a uranium enrichment plant, including accessory equipment such as container-receiving saddles, container racks and floor rails. These trucks are used to transport special containers for uranium hexafluoride (UF<sub>6</sub>).

Consisting of a lower trolley with lateral folding bridges which can be moved in the longitudinal direction, as well as an upper trolley which can be lowered and moved in the transverse direction, the transporter is able to pick up and put down containers at any of the stations located to the right and left of its track. The special product from Moormerland has proved its worth: in 2012 the company supplied an identical system for the same customer in the USA.

Siempelkamp double-girder bridge crane with magnetic crossbeam in use at Flensburger Schiffbau-Gesellschaft since 2009



## Key technical data of the Flensburg transport trolleys

Load capacity	12,000 kg per conveyor truck
Crab gauge	650 mm
Wheelbase	600 mm
Traveling speed	5 m/min, frequency controlled
Lifting speed	approx. 34 sec.
Lowering speed	approx. 16 sec.



Part of a ship manufactured in a section (photo: Flensburger Schiffbau-Gesellschaft)



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