



Siempelkamp

Issue 01 | 2014

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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:

Horizontal diversification – the expansion of our range of products – as well as the further development of our proven products are part of Siempelkamp's strategy for success. Our customers benefit from knowing that Siempelkamp products reflect state-of-the-art technology and an optimal cost-benefit ratio. In the long term Siempelkamp will broadly position itself in many different markets with this strategy in order to stay competitive in the future.

Successful product innovations make it possible to pursue this diversification strategy: In the area of machine and plant engineering our Bulletin reports on three customers that celebrated achieving their "First Board": Next to a particleboard line and an MDF line, an innovative LVL line for beech veneer, the first of its kind, started operation. Furthermore, we received a new order in our still relatively new business field of composite presses. With the new cable tensioning concept for our steel cord conveyor belt lines and the innovative EcoFormer SL, a new wind forming concept for surface layer particles, we have further developed proven technology.

To sustain the future of the company, the container production in the area of nuclear technology was further developed. With farsightedness, Siempelkamp has already successfully taken the initiative to strengthen the product range in the area of container production with stand-alone container designs which are in accordance to international disposal conditions. The orders for H₂-recombiners from Japan and the use of the PADE dosimetry system in a salt mine demonstrate that even proven products penetrate new markets. Our article on the production of engine blocks at Siempelkamp Giesserei proves that Siempelkamp projects are implemented through first-class teamwork.

I hope that you will enjoy reading this issue of Bulletin. I am sure that 2014 will bring us many more interesting orders and innovative product developments which we will report to you in our next issue.

With best regards from Krefeld

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

Dr.-Ing. Hans W. Fechner



The new MDF plant at AGT, Antalya, Turkey

First board at AGT:

The most modern and performance-strong MDF plant in Turkey – with ContiRoll® Generation 8 technology

On March 5, 2014, AGT Wood Ind. & Trd. Ltd. Co. successfully manufactured the first MDF board on the most modern and performance-strong MDF plant in Turkey. This line was made by Siempelkamp. Siempelkamp has expanded its installed base within Turkey with this high-end line that produces high-quality boards and features reduced production costs and high capacity. This is ensured by numerous innovative features including a 8' x 55.3 m Generation 8 ContiRoll® press, the innovative resin blending system Ecoresinator, an energy plant and a fiber dryer as well as the subsequent board handling system.

by Ulrich Kaiser

AGT is one of the world's largest manufacturers of PVC-coated MDF profiles for the furniture industry, wall panels, as well as interior doors. The products are exported worldwide in more than 60 countries. AGT profiles are used in kitchens, baths, furniture and interior decoration. The company was founded in 1984 and operates on an area of 400,000 m². Next to manufacturing, the company also maintains a showroom. Here, innovative furniture designs are developed and presented to customers. At its headquarters in Antalya, the regional offices in Istanbul and Anatolia as well as the national sales offices in Ankara, Izmir, Adana and Diyarbakir AGT employs 900 people. With the building of the new MDF plant, the number of employees rises up to 1,100.

Currently, AGT needs 500 – 600 m³ of raw MDF daily for its production. This amount was purchased from third parties prior to the new plant. Under this aspect, the new plant was a forward-looking investment because the "MDF newcomer" expanded its in-house production depth with it. When deciding for the investment, AGT put its trust in Turkey's market leading press supplier: Siempelkamp has sold 22 continuous production plants for wood-based products to the country on the Bosphorus in the last 20 years and also started them up.



Top: The complete production line in a row under one roof. Bottom: ContiRoll®



Siempelkamp plants in Turkey

Year	Customer	Product	Press	Size	Annual capacity
1994	Starwood	Particleboard	ContiRoll®	8' x 23.5 m	300,000 m ³
1996	Yıldız Sunta MDF	MDF	ContiRoll®	8' x 23.5 m	200,000 m ³
2001	Yıldız Entegre	MDF	ContiRoll®	7' x 55.3 m	330,000 m ³
2002	Kastamonu Entegre	MDF	ContiRoll®	7' x 20.5 m	180,000 m ³
2002	SFC	MDF	ContiRoll®	7' x 20.5 m	180,000 m ³
2002	Çamsan	MDF	ContiRoll®	8' x 27.1 m	250,000 m ³
2002	Teverpan	MDF	ContiRoll®	7' x 27.1 m	160,000 m ³
2003	Starwood	Particleboard	ContiRoll®	6' x 47.0 m	460,000 m ³
2004	Kastamonu Entegre	Particleboard	ContiRoll®	7' x 42.1 m	400,000 m ³
2004	Yıldız Entegre	MDF	ContiRoll®	7' x 55.3 m	330,000 m ³
2004	Yıldız Sunta MDF	MDF	ContiRoll®	7' x 55.3 m	330,000 m ³
2006	Yıldız Entegre	MDF	ContiRoll®	7' x 55.3 m	330,000 m ³
2006	Kastamonu Entegre	MDF	ContiRoll®	7' x 55.3 m	330,000 m ³
2007	Turanlar-Group	MDF	ContiRoll®	7' x 28.8 m	200,000 m ³
2007	Starwood	MDF	ContiRoll®	7' x 28.8 m	200,000 m ³
2008	Yıldız Sunta MDF	Particleboard	ContiRoll®	7' x 42.1 m	500,000 m ³
2009	Kastamonu Entegre	Particleboard	ContiRoll®	7' x 37.1 m	400,000 m ³
2009	Orma	Particleboard	ContiRoll®	7' x 37.1 m	400,000 m ³
2010	Yıldız Entegre	MDF	ContiRoll®	8' x 55.3 m	390,000 m ³
2010	Yıldız Entegre	Particleboard	ContiRoll®	7' x 42.1 m	500,000 m ³
2011	Yıldız Entegre	Particleboard	ContiRoll®	7' x 28.8 m	230,000 m ³
2012	AGT	MDF	ContiRoll®	8' x 55.3 m	450,000 m ³



Ecoresinator

Siempelkamp innovations

With the plant for AGT, Turkey's most modern continuous MDF production line with optimized cost-output ratio joins Siempelkamp's installed based in Turkey. Siempelkamp's subsidiary Sicoplan in Belgium carried out all the engineering and planning and the technological startup of the plant. Numerous innovations ensure that the customer can manufacture high-quality MDF most efficiently and at low production costs.

One of these features is the heart of the plant, the continuous 8' x 55.3 m ContiRoll® press. In its 8th generation, the proven Siempelkamp press has many advantages. By using pressure distribution plates over the entire press length and an additional row of cylinders, the new Generation 8 ContiRoll® press operates virtually isobaric. For the customer this translates into minimal tolerances and thus reduced material consumption. With mini-



Energy plant



Cooling turner

mal use of resin and wood, high quality boards can be consistently produced.

Siempelkamp’s guiding principle “Cut your cost!” plays an important role throughout AGT’s entire scope of supply. Next to the traditional resin preparation and resin dosing system, the innovative resin blending system, the Ecoresinator for fibers, is part of the performance range. Compared to the traditional blending

process in a blowline, with the Ecoresinator AGT will be able to reduce the resin consumption of its MDF production by 15–20%. Special nozzle technology by Schlick and the use of super-heated steam make this possible. To date, the Ecoresinator has been sold seven times within Turkey, 18 times worldwide. This means, meanwhile all large Turkish MDF manufacturers and many other convinced customers trust in the Siempelkamp blending technology – as a component of a new plant or as retrofit.

The Turkish market

For the German machine engineering industry, Turkey as a trade partner becomes increasingly important. The export of German machines and plants to Turkey grew by 12.4 % in the first part of 2013. Given the falling sales figures in other markets, this is a large success for the German machine and plant builders (source: German-Turkish Journal). Siempelkamp started selling the first continuous press lines to Turkish companies in 1994 and therefore played its part in the fact that Turkey’s production volume of wood-based materials more than tripled between 2001 and 2011. After all, with 9,650,000 m³ Turkey produced 6% of the world’s share of wood based materials in 2013. From this amount, approx. 500,000 m³ of wood-based materials were exported, the remaining amount sold to domestic markets. With its constant economic growth, Turkey started a building boom and experts predict ongoing potential for the market for wood-based materials.

With 22 sold ContiRoll® plants, Siempelkamp has the largest installed base of wood-based material production plants in Turkey. For the financing of many projects in Turkey, including the order from AGT, Siempelkamp cooperates with GIM EXPORT from Göttingen, Germany. For over 30 years, the GIM team has placed German machines and plants for the wood-based materials industry in the Turkish market. Next to financing, GIM’s main business activities include project planning, project handling, after-sales service, spare parts business and the supply of raw and additional materials. This provides the Turkish Siempelkamp customers with an all-round carefree package.



Intermediate storage



Energy plant and MDF dryer



A shipload of wood chips

Energy and dryer technology from Büttner

The scope of supply for AGT also includes a 76 MW energy plant as well as a flash tube dryer with a dry material throughput of 52 t/h made by the Siempelkamp subsidiary Büttner Energie- und Trocknungstechnik GmbH. The energy plant provides stable process heat, for example, to heat the thermal oil for the press or to provide the flue gases for the dryer and the steam for the refiner and the Ecoresinator. For this purpose, waste wood from the production such as bark, fine particles or sanding dust is burned. This not only ensures high plant efficiency but also protects the environment.

Board handling for high production speeds

The board handling equipment subsequent to the forming and press line is also supplied by Siempelkamp. This includes the double diagonal saw, a cooling and stacking line, an automatic high rack storage system as well as a sanding line with two-pass saw and finally, the connection to the laminating equipment. The cooling and stacking line for masterboards with a length of up to 8,500 mm and equipped with three cooling turners provides a very efficient cooling time of 40 minutes. Approximately 10,000 m³ of these boards can be stored in the automatic high rack storage system. Equipped with a storage management system and a material flow control, stacks of boards with a weight of up to 65 t and a height of 4 m can be transported and stored.

The finishing line which can be fed from two sides allows the changing of stacks without an interruption in production. The 12-head sanding machine provides high production speeds of 100 m/min; board cutting and sorting are integrated. Through

the supplying of the boards alternating from left to right prior to entering the sanding machine, the sanding belts wear evenly: The sanding results are optimal at any time. The following board stacking is carried out according to A/B quality with a cover board each on top and bottom of the stack to ensure safe transport. Following the sanding line, the fully-automatic transfer car transports the stacks of finished boards with speeds of 120 m/min to the laminating equipment; cost-intensive transports via a forklift are thus omitted.

All is well that ends well

The customer is highly satisfied with the performance of its new Siempelkamp MDF-plant. If production continues to go as well, AGT is thinking about investing in a second press line. The layout of the finishing line is already taking the capacities of a second production line into consideration; building measures in this regard have already been made.



Control room of the plant

An interview with the Söylemez family

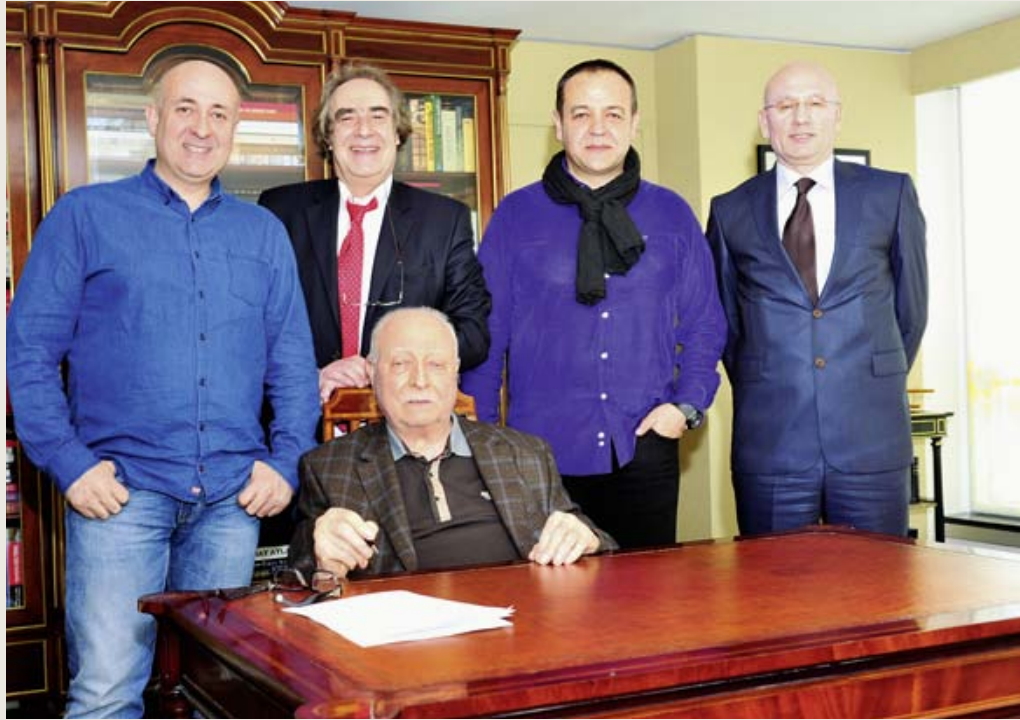
During a visit in Turkey, Bulletin talked with the Söylemez family, owners of "Wood Improved Technology" – in Turkish "Ahşabı Geliştiren Teknoloji" (AGT) – as well as with the Technical Operations Director Mr. Faruk Şişçi about the new MDF line and the future of the company.

Bulletin: AGT looks back at a 30-year company history. What were the beginnings of the company?

Mr. Mehmet Söylemez: In 1984 our father Ahmet Söylemez laid the foundation for AGT (Ahşabı Geliştiren Teknoloji) with his knowledge and experiences. On the one hand, he loved wood as a building material, on the other hand, he took seriously the idea of creating products independently. Together with my brother, Mr. Mustafa Söylemez, we are growing AGT toward a dynamic and modern structure dedicated to improving wood works. During the first few years, we only produced PVC-coated profiles which were sold to the furniture industry and the interior construction sector. Since our company's philosophy is based on innovation and quality, success was not long in coming. Today, we produce a broad spectrum of semi-finished and finished products and sell via 150 distributors throughout Turkey. 53 % of the production is exported to 60 countries worldwide.

Bulletin: What products do you manufacture and sell today?

Mr. Mustafa Söylemez: At AGT, our primary focus is to supply components for the furniture industry. As Mr. Mehmet Söylemez mentioned above, profiles were the first products produced by AGT. But now we have products which are appealing to both the construction and furniture industries, and with our new investment, AGT can provide all of the wood and composite solutions for residential or office needs. Our product range is comprised



The signed 'First Board'; sitting: Ahmet Söylemez, (FLTR): Mustafa Söylemez, Michael P. Krockner, Mehmet Söylemez, Faruk Şişçi

of MDF, melamine, high gloss, super mat, panels with different surfaces, special and standard profiles, wall panels with tongue and groove, sized and profiled panels covered with PVC, decorative doors, wood and composite decks and kitchen tables. Of course, our new investment will increase our product range.

Bulletin: In the past you purchased MDF from third parties. Why have you decided to start your own MDF production?

Mr. Faruk Şişçi: We need 500 m³ of MDF daily, which was supplied by domestic or foreign manufacturers in the past. The



Mehmet Söylemez during the signing of his book



Mustafa Söylemez, the ultimate racing driver



Faruk Şişçi, Director of Technical Operations

Söylemez Family decided to make MDF investment in order to guarantee the demand for their products. But the size of the investment was not clear. There were two ideas; either make an investment to meet the requirements of our existing product range which is 500 m³/per day or make an investment to expand the existing product range. So, it was decided to make an investment for 500 m³ of MDF daily, including a resin plant, impregnation

line, short cycle press line, as well as a laminate flooring and lacquering line.

Mr. Mustafa Söylemez: On the one hand, it was difficult to make a long term cost estimate on the existing market with variable MDF cost.

Mr. Mehmet Söylemez: At the same time, as long as we bought from different manufacturers, we had no influence on the quality.

Mr. Faruk Şişçi: And the other point, buying from third parties meant we were dependent on the MDF market. MDF is a strategic product for us; our complete production is dependent on it.

Mr. Mustafa Söylemez: Our main goals are to maintain as much independence as possible and to grow towards our company strategies. We can only be independent if we have 100% influence over the pre-product. This allows us to grow our product range based on AGT standards and is why we have decided to enter the laminated flooring market by the end of year. Because AGT Flooring is a B2C product it must be produced 100% in house.

Mr. Faruk Şişçi: Two short cycle presses which are needed for laminated flooring production are now under construction with startup in mid-July 2014. In addition to the lacquering line for melamine coated board, which will provide high gloss lacquering, we will establish our own resin production by the end of the year.

Mr. Mehmet Söylemez: Next, we will cover the MDF which we will produce on our new line. Our distribution system is designed to handle these tasks.

Mr. Mustafa Söylemez: Finally, we have control over our growth. We can provide new products with better service to our traditional market and open up new markets.

Bulletin: The MDF line will produce a daily amount of 1500 m³. Where do you source the wood?

Mr. Faruk Şişçi: Firstly, we will source the wood from forests in our own region. 50% of the wood will be from Turkey, the remaining 50% we will buy from other countries, for example, wood chips from Canada, hard-wood chips from Bulgaria (oak) and Rumania. We have an intelligent

mixing system for the types of wood used which helps us consistently achieve high quality.

Bulletin: How did you select the supplier for the new plant?

Mr. Faruk Şişçi: Our guiding principle is quality. So we asked ourselves: Which company has plant machines at what quality? And when it came to answering

this question, we couldn't get passed Siempelkamp, which built 95% of all wood-based material production plants in Turkey. That's why we ordered all the machine equipment from Siempelkamp, from the resin preparation system to board handling, including the energy plant and dryer. All remaining equipment was also ordered from first-class suppliers (wood-yard equipment from Metso, Refiner from Andritz, all conveying systems

from Trasmec, sanding machine from Steinemann)

A smooth production process is important for us. We have the longest plant in Turkey. Each line is arranged one after another, from the forming station to the finished board. We designed the layout and the Belgium Siempelkamp subsidiary Sicoplan implemented it. This worked very well for a greenfield project.

Over a joint lunch with members of the Söylemez family and Faruk Şişçi as well as Mr. Michael P. Krockner from GIM Export, who helped organize the financing for the customer, Bulletin was also able to talk to the head of the family Ahmet Söylemez, founder of AGT.

Bulletin: The largest investment in the history of the company will now start 3-shift operation, three weeks after the first board was pressed. Are you able to sleep again?

Mr. Ahmet Söylemez: I never lost sleep, because I knew that the project was in good hands. We have built an excellent team managed by Faruk Şişçi. Our suppliers conducted a very rigorous and fast study in this process and our customers were here, of course, in the position of the demanding party.

The further development of our own company has been an affair of the heart for us for many years. We are all glad that this development process is finally starting. And if everything goes very well, we are thinking about installing a second MDF line. The corresponding amount of space for the second MDF line has already been taken into consideration. How can such a situation be boring – how can I think of sleeping?



The new team at AGT MDF with honorary certificates for excellent work

Siempelkamp starts up third particleboard plant in the Republic of Belarus

The first board is made!

"Today is a special day. I am very happy that we, Belorussian and German colleagues, can attend this event together as a team," said Siempelkamp's installation manager Stefan Tippenhauer. Only twelve months after turning off the customer's old multi-daylight press, the new Siempelkamp particleboard line successfully manufactured the first board at OJSC Rechitsadrev on February 13, 2014. This is the third particleboard plant in the Republic of Belarus which Siempelkamp started up with two additional plants coming online by mid-2014, a MDF plant for Gomeldrev OJSC and a wood-fiber insulation board plant for Mozyrsky DOK.

by Ulrich Kaiser and Georg Coppers



Stefan Tippenhauer, Siempelkamp Construction Manager and General Manager Valery Tuleiko, Rechitsadrev

In February the management of OJSC Rechitsadrev with General Director Tuleiko, employees, Siempelkamp representatives and many other invited guests together celebrated the startup of the particleboard plant at the Rechitsa location in the Gomel region. As tradition has it, all guests signed the first board. One year ago the machines of the old multi-daylight press line were turned off and the installation engineers started their work in the new production halls. Next to the installation of the new line, a supply network and a corresponding infrastructure around the plant was established.

“To implement such a project in only 12 months is a good result,” explains Tippenhauer. “It is not always possible to complete the work in such a short time. I can, however, say that the cooperation in the Republic of Belarus and especially at Rechitsadrev was excellent and has significantly contributed to the success of the project.” Sergey Nikolajevitsch Bolatchkov, installation manager at Rechitsadrev: “The most difficult part of the installation was coordinating the work of planners, general contractors and subsuppliers in order to finish the installation by the deadline. We implemented this task successfully.”

Convincing Siempelkamp competence

In order to manufacture the preliminary products for its furniture production and to increase the vertical range of manufacture, Rechitsadrev first had in mind to overhaul the existing multi-daylight press line. The Siempelkamp sales team managed by Ulrich Kaiser was able to convince the customer of the ContiRoll® concept which Siempelkamp offered as an alternative when taking part in the public tender procedure for the modernization of the multi-daylight press line. The higher efficiency due to better board quality, a reduced sanding allowance of the boards, a wide range of products (board thickness ranging from 8 to 40 mm), high board size variations and reduced energy consump-

tion compared to the multi-daylight press line was convincing to the decision makers.

High-end components for economic production

Rechitsadrev ordered all components for particleboard production from the Krefeld machine and plant builder Siempelkamp – starting with the log preparation and wood chip storage including the chipping line with a drum chipper. The double-sided feed of logs into the chipping line allows the continuous operation of the upstream crane in the log yard. The wood chips are stored in two silos equipped with moving floor extracting systems. Wood chips from third parties can be supplied to the process separately.

The area of screening, crushing and flaking is equipped with a roller screen allowing separation into four fractions, secondary crushing equipment for coarse material as well as four knife-ring flakers. The drum dryer supplied by Büttner is designed for a dry material throughput of 26 t/h and is heated via a gas/dust combination burner which is also made by Büttner. The exhaust gases of the dryer are cleaned by means of the downstream wet electrostatic filter. The machine technology in the areas of dry material screening, sifting, resin blending and dosing was supplied by the Siempelkamp subsidiary CMC.

The production line of the new particleboard plant is equipped with a 6' x 23.8 m ContiRoll® press which is supplied with particles via a 3-layer forming machine. With it the customer can manufacture boards with lower densities and consequently less material while maintaining the same high quality. This is directly reflected in lower production costs. An annual total of 210,000 m³ of boards can be manufactured this way.

Next to the ContiRoll® press technology, Siempelkamp supplied a cooling and



Forming and press line with ContiRoll®



Knife ring flaker



Particle dryer and wet electric filter

stacking line with high-stack storage system. After leaving the cooling and stacking line, the non-sanded unfinished boards are stored in an automatic storage system and fed through an existing sanding line. All mechanical and pneumatic transport processes, the SicoScan measurement systems, the plant engineering as well as the automation of the complete machine technology are also part of the Siempelkamp scope of supply.

Siempelkamp – a complete solutions provider

The advantages of such a complete concept according to Siempelkamp's "all from a single source" principle are obvious. Machines and equipment are perfectly synchronized to one another. This not only increases the reliability of a plant but also provides the guarantee that spare parts supply and maintenance can be carried out quickly. Siempelkamp is able to design and manufacture almost every plant component. This assures special efficiency regarding the project management. In return, customers, such as Rechitsadrev, profit from carefully designed and built plants from one source.

All good things come in threes

Including the particleboard plant for Rechitsadrev, Siempelkamp has started up three plants of this kind in the Republic of Belarus to date. OAO Ivatsevichdrev started production in October 2012; at

VMG Industries Ltd. production started in May of 2013.

For OAO Ivatsevichdrev, one of the largest wood-processing companies in the Republic of Belarus, Siempelkamp also provided a complete package. For its Ivatsevichy location near Brest, this customer received all components ranging from the round log debarker to the dryer, to the forming and press line with a 7' x 28.8 m ContiRoll, to the energy plant and to the laminating line. The Ivatsevichdrev plant achieves a guaranteed daily capacity of 800 m³ which results in annual particleboard outputs of approximately 250,000 m³. The plant is designed for an annual capacity of 330,000 m³ (1,050 m³/daily). Currently, the ContiBooster[®] steam pre-heating system, newly developed by Siempelkamp, is started up at Ivatsevichdrev with the goal to further increase plant efficiency. First tests, resulting in an efficiency increase of approximately 10%, are promising.

Siempelkamp carried out another successful startup in Eastern Europe at VMG Industries Ltd. The particleboard line in the "Free Economic Zone Mogilev" in the northeast of the Republic of Belarus is the first of its kind which Siempelkamp has designed for the special demand of small capacities. The core component of this order is the 7' x 15.5 m ContiRoll[®] press. VMG will produce 2,100 x 2,800 mm particleboard with a thickness range of 8 to 40 mm on the new line. The line is de-

signed for an annual capacity of approximately 150,000 to 165,000 m³ of particleboard for the furniture industry. The Swedish home furnishings retailer IKEA will mainly buy these products which are already converted into furniture elements. Similar to the concept at the Rechitsadrev location, the concept at the Mogilev location also incorporates an integrated production concept ranging from raw particleboard to the finished furniture piece.

Complete solutions not only for particleboard plants

In addition to the three aforementioned particleboard plants, Siempelkamp achieved further sales successes on the Belarusian market. Gomeldrev OJSC ordered from Siempelkamp an MDF plant for its Rechitsa location – including a scope of supply ranging from the log feed to the energy plant, to the dryer, to the forming and press line with a 7' x 37.1 m ContiRoll[®], to the board handling and packing line, to the short-cycle laminating line all the way to the automatic paper pallet storage system. To Mozyrsky DOK, Siempelkamp supplied a complete wood-fiber insulation board plant for 2,580 x 2,850 mm boards which will be started up this spring.

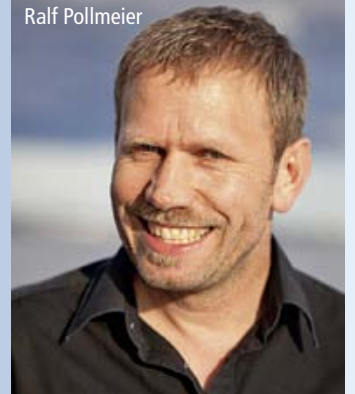
With Rechitsadrev Siempelkamp has, to date, successfully started up the third wood-based material production plant in the Republic of Belarus. The two other plants are expected to start operation by mid-2014. As a result Siempelkamp strengthened its status as a complete solutions provider and has become established in another important market. For machine engineering companies from Germany, especially for the wood-based materials industry, the Republic of Belarus has become an important export market in recent years. The Belarusian market will continue to offer growth potential in the future. Compared to Western Europe, the per capita consumption of wood-based materials of the almost 10 million inhabitants of the Republic of Belarus is not yet exhausted.



Cooling turner, intermediate storage and satellite vehicle

First board made of laminated beech veneer: New process for the manufacture of laminated beech veneer lumber starts up at Pollmeier

Ralf Pollmeier



After two years of development work, on March 3, 2014 Pollmeier Massivholz GmbH & Co. KG celebrated the production of the "First Board" manufactured on a new line for laminated beech veneer in Creuzburg near Eisenach, Germany. This event represents the completion of two years of development work with Siempelkamp. In close cooperation, both companies succeeded in developing an innovative continuous process for the manufacture of laminated beech veneer lumber.

by Dr. Silke Hahn



A section of the plant with steaming pits for beech wood

The Pollmeier Group operates Europe's most modern hardwood sawmills equipped with state-of-the-art technology. The company from Thuringia is well known for its Pollmeier beech lumber product and processes raw materials from regional and sustainably managed forests exclusively.

While up to now the processing of hardwood was considered too complicated and expensive, Pollmeier and Siempelkamp are now starting a new chapter in the processing of hardwood:

With scientific support, Pollmeier developed a new process technology which allows the economical production of high-quality laminated beech veneer lumber for load-bearing applications.

To do so, first a suitable press had to be developed: After a test period of two years, Pollmeier commissioned Siempelkamp to build a 6' x 60.3 m Generation 8 ContiRoll® press for the production of beech veneer. "With this first LVL press line for beech veneer we are setting a milestone. The special challenge was to

ContiRoll® with a length of 60 m



Multiple layers of veneer plies



Veneer lay-up



The finished product

find a way to process beech wood, a raw material which is known to be difficult to process, into a dimensionally stable, high-strength and attractive building material. In close cooperation with Pollmeier, market leader for beech lumber, we succeeded to do so," says Dr. Michael Schoeler, Director Research and Development at Siempelkamp.

Inside Europe's largest hardwood sawmill – located on 35 Hectare in Kreuzberg with 140,000 solid cubic meter of space available for beech wood – a product with special properties is manufactured. Up to 24 layers, each only 3.7 millimeters thick, are glued together and pressed to a laminated wooden panel with a thickness of up to 85 mm inside Siempelkamp's new press.

The final product is a new material with many advantages (see box) including, for example, the high strength of beech wood which allows leaner cross-sections of the end product and the product's appealing surface. The fine beech wood grain replaces the softwood look. Furthermore, beech veneer lumber can be used in furniture and stair construction.

From the log to laminated beech veneer lumber: strong, sophisticated and diverse

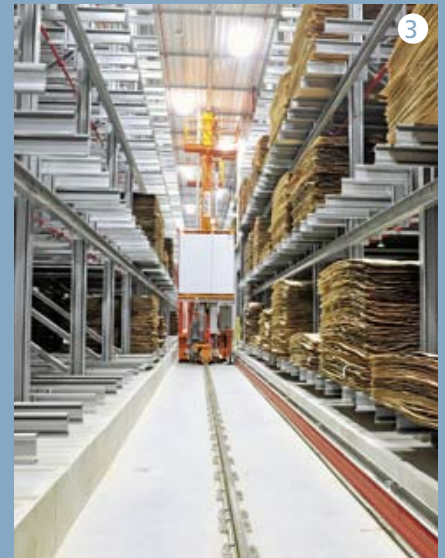
Laminated veneer lumber, LVL for short, consists of multiple layers of veneer plies glued together and primarily oriented in the lengthwise direction of the board.

"The high strength values of beech wood are fully utilized in our laminated veneer lumber. The bending strength is three times higher than that of laminated veneer lumber made of spruce wood," explains Ralf Pollmeier, Managing Partner of the Pollmeier Group of companies. The high surface quality appeals primarily to architects for which the product opens up new design opportunities.

Larger spans and architecturally demanding and sophisticated supporting structures with small cross sections can also be implemented in a technical proper way. "Thus, we open up new application areas for wooden construction and enter with the sustainable raw material wood increasingly stronger into competition with steel and concrete. We also see interesting application possibilities in the areas of flooring, stair and furniture construction," says Ralf Pollmeier.

The first press of this kind: key data and scope of supply

- 6' x 60.3 m Generation 8 ContiRoll® ①
- Annual output: 150,000 m³ LVL
- Trimming and cross cutting saw unit, specifically designed to handle a board thickness up to 85 mm (3.3 in) and process a maximum board length up to 32 m (105 ft) ②
- High-rack storage system for veneers ③
- Resin storage, preparation and dosing system ④
- 13 MW energy plant ⑤
- Measurement and control technology ⑥



Bulletin: Will the laminated beech veneer lumber produced on the new line revolutionize applications in the construction industry?

Pollmeier: I don't want to talk up the product too much at this time. Surely, our laminated beech veneer lumber will find applications in the construction and furniture industries. First and foremost in the construction industry. Due to its high strength the new product allows the same spans for smaller cross sections in roof areas compared to laminated veneer lumber made of softwood. Architects will love that.

Our new product could also be used in the construction of huge windmill towers as reported in Spiegel Magazine 14/2014. We were pleasantly surprised that Spiegel sent a science editor to our plant in order to report about our new product.

This article helped introduce our product to a large target group. For now we will concentrate on putting the plant into normal operation and then, we will see. We believe in our product!

Composite press for C.F. Maier: One press – two processes!

Siempelkamp Maschinen- und Anlagenbau GmbH & Co. KG expands its latest product line – plants for the production of composites – with another successfully completed order: C.F. Maier in Königsbronn, Germany, ordered in May 2013 a 2,000 t down-stroke press including the hydraulics, automation and tool shifting table for the production of plastic components. The special feature: The press can be changed from the Sheet Molding Compound process (SMC process) over to the Resin Transfer Molding process (RTM process) in only a few steps. This press has recently started production.

by Dr. Michael Schöler and Bernd Pfeiffer

For approximately 40 years, C.F. Maier has been specializing in processing fiber composite materials into components for the commercial vehicle, construction machinery and other industries. The company uses wet, SMC and RTM presses for the manufacture of its products and takes a leading position in all processes. Well-known development partners and customers include Audi, BMW, MAN or the Daimler AG.

With the new Siempelkamp press, C.F. Maier is manufacturing fiberglass reinforced plastic components for the automobile industry – mainly using the SMC process. The advantages of Siempelkamp's composite technology for this customer are obvious:

- 1. High flexibility:** With a simple modification, C.F. Maier can change the 2,000 t down-stroke press over from the SMC process to the RTM process. The double function of the new Siempelkamp composite press will allow the customer to react flexibly to future market requirements. The unique hydraulic control allows the use of many different tools – thus, also contributing to high product flexibility.
- 2. Material savings:** The new press has a highly precise single cylinder control which ensures high quality for different component shapes and geometries. With the SMC components manufactured on the new Siempelkamp press, C.F. Maier can

achieve smaller tolerances than in the past. This pays off: The customer saves considerable material per component part and with it significant production costs!

- 3. High-quality products:** Through the movement of the upper press table along the X and Y axes, stress-free closing of the tools and an efficient de-gasing are possible. Thus, the percentage of pores is significantly reduced and product quality improved. High-resolution sensor technology at the mold gap allows an adjustment in the 1/100 mm range.
- 4. High outputs:** The tilting of the table has another advantage: Due to the inclined position, for which the upper mold is first lowered near the sprue and then in the riser area to achieve the final shape, the resin can be more quickly and evenly distributed. Next to the improved quality of the impregnation, this also shortens the impregnating time. More parts can be produced in a shorter production period.
- 5. Safe production:** Next to the press, hydraulics and automation, C.F. Maier also ordered the complete visualization of all processes as well as of the associated peripheral devices such as the tool heating system and the injection system. In this way, the customer can continuously monitor the production. The process data management system DAHMOS, also part of the



Preparing the next press cycle – test run



Loading fiber composite mat – test run



Closing of the press



2,000 ton press

customer's scope of supply, allows the analysis, evaluation and optimizing of individual press cycles.

First tests were a success

C.F. Maier was more than satisfied with the first results from the press test runs. All offered functionalities were tested and accounted for during the startup of the press. The new Siempelkamp press is meanwhile available for the customer for regular production.

Siempelkamp plants for composites

Siempelkamp has played an important role in the composite market since 1993: The company had its first experiences with sandwich presses for EADS Elbe Flugzeugwerke GmbH in Dresden, Germany. In 2011 Advanced Composite Engineering

GmbH (ACE) in Immenstaad, Germany, ordered a RTM press including a modular tool changing and clamping system from the Krefeld mechanical engineering company.

In the area of fiber reinforced composites, the Siempelkamp name has stood for sound and precise technologies for more than 20 years. With the 2,000 t press for C.F. Maier, Siempelkamp reinforces this reputation. This success is the result of the close cooperation between Siempelkamp's research and development, design and electrical engineering departments and the customer. Siempelkamp and C.F. Maier will continue to work together in the future in order to expand the innovative machine technology and to jointly implement further projects.



Removing of the finished part – test run

SMC process vs. RTM process

With the SMC and RTM processes, the new Siempelkamp press for C.F. Maier is able to carry out two of the most important processes in the production of fiberglass reinforced plastic parts. What are the differences between both processes?

During the **SMC process**, available since the 1960s, a prefabricated mat made of fiberglass and thermosetting reaction resins (normally polyester and vinyl ester resins) are placed in a mold and then pressed under heat and pressure. Depending on the molding material and the

shape, the molding pressure varies: A high share of glass fibers and complex geometries require a higher pressure than flat components with little filler material. The typical fiber length is between 25 and 50 mm. Next to the pressing process, the feeding of the press, the molding of the product, the curing and de-molding as well as the cleaning of the finished part are part of the complete process. The SMC process allows the economical series production of exterior car body shell components for the automobile industry.

While with the SMC process all required components are available as pre-impregnated semi-finished product, during the

RTM process the matrix material (the resin) is injected at a later time. The non-impregnated semi-finished product is first positioned in the press. Then, the press is closed and the flat fiber material is de-gased by means of a vacuum pump. Following, the resin is injected into the tool mold via special dosing systems where it cures under heat and pressure. When injecting the resin, special attention must be paid to an exact distance control as to not damage the fiber mat and to ensure complete and uniform impregnation. The resulting smooth surfaces from the RTM process are suited for flat exterior components as well as for complex, three-dimensional structural parts.

Citaro bus



Front spoiler for bus



During a visit at C.F. Maier in Königsbronn, Germany, Bulletin interviewed plant manager Cornelius Frey as well as Andreas Mahler from strategic purchasing and found out why the company selected Siempelkamp as its press supplier.

Bulletin: C.F. Maier has manufactured fiber-reinforced composites for 40 years. Please tell us about the history of the company?

Cornelius Frey: Christian Maier established a metal foundry in Heidenheim in 1925. This event laid the foundation of the C.F. Maier Group. Gradually, the foundry became well-known for first-class aluminum casting, especially for difficult tasks. At the same time, we always kept an eye on the development of the markets. In 1964 we entered into plastics processing and perfected the processing of fiberglass-reinforced synthetic resins. Over the years we developed into a systems supplier. New companies were established in Germany and abroad and the

processing of plastics became one of our core businesses. The present-day C.F. Maier Leichtgusswerk and the C.F. Maier Foundry Scheef in Nersingen, acquired only a few months ago, represent the second supporting business leg. On the one hand, it is our goal to produce according to market demands. On the other hand, we want to ensure the future of the company. Therefore, we offer a broad product spectrum.

Bulletin: What production processes have you been using?

Cornelius Frey: In 1960 we started to process fiberglass, which was little known up to that point. We were considered a pioneer when it came to the production of fiber-reinforced composites. Today, we use different processes such as vacuum expansion technology, wet pressing and SMC pressing to produce our products. In 2008 we expanded this spectrum by introducing the high-pressure RTM process for the series production of carbon-fiber-reinforced plastics (CFRP) for the commercial vehicle industry.



Bernd Pfeiffer, Siempelkamp, C. Frey, A. Mahler and Ulrike Zeitler, all C.F. Maier

Bulletin: How do you define your product portfolio?

Andreas Mahler: C.F. Maier develops and manufactures complex and pre-finished assemblies. As systems supplier we provide a complete package ranging from the design idea to the engineering, to the model, to the prototype, to the tools and to the manufacturing equipment. We support new projects all the way to series production. We manufacture, for example, engine hoods for construction machines and tractors, external body parts for utility and railed vehicles and extinguishing agent tanks for fire trucks.

Bulletin: What dynamics do you see for fiber-reinforced composites at the moment?

Andreas Mahler: Due to the technical implementation of light-weight construction, especially in the area of electric and hybrid vehicles, the market for fiber-reinforced composites has become dynamic. The cutthroat competition with metal continues and plastic materials are gaining an increasing market share. For the construction of "Citaro" city busses, Daimler recently decided to go with fiberglass reinforced plastics. It is important to shorten the cycle time during processing. Fiberglass reinforced plastics remain relatively expensive. And the process itself has to become safer for large batch production.

Bulletin: What made you decide on Siempelkamp as the press and system manufacturer?

Cornelius Frey: We use presses from different well-known German press manufacturers and are very familiar with this area. At JEC Composites two years ago in Paris, we found out that

Siempelkamp now also offers presses for fiber-reinforced composites. We started talking and later visited Siempelkamp in Krefeld. There we met with specialists from the calculation, design and purchasing departments which designed new ideas for us. We were also convinced of the work of Siempelkamp's research and development center.

Bulletin: And what was convincing for you about the press concept?

Cornelius Frey: The entire bundle of advantages made us decide to buy from Siempelkamp. First, the high precision of the press in the 1/100 mm range. This ensures the production of very challenging surfaces. Furthermore, the press can carry out both, the SMC as well as the RTM process. We were also looking for a press with a pressure of 2,000 t – Siempelkamp technology accommodated us in this area as well. Our press concept also provides a very large clamping area for large products.

Andreas Mahler: Two more arguments speak for Siempelkamp: The press Siempelkamp built for us is tailor-made to meet our needs. Its height has a perfect fit for our production facility. We did not have to move the hall roof to install the equipment. Last but not least, the short delivery time was a factor that was very accommodating to us.

Cornelius Frey: The cooperation with Siempelkamp was excellent. Together we developed the control for the press – Siempelkamp as the mechanical engineering company and we as the experts for the process. We will further improve this cooperation in the future.

Successful startup in Russia: Water hydraulic systems? We have the necessary expertise!

Stupino is a tranquil town in western Russia, approximately 100 km south of Moscow. The 89 km² town is inhabited by approximately 67,000 people. The main employer of the region and most important production plant in the vicinity is JSC Stupino Metallurgical Company (SMK). The company, which had primarily produced semi-finished products and blanks for the aerospace industry, has significantly expanded its vertical range of manufacture during the last year. How was that possible? With the modernization of the company's water-hydraulic presses. The competent partner alongside the Russian company: Siempelkamp Maschinen- und Anlagenbau GmbH & Co. KG in Krefeld, Germany.

by Emilien Collard



Two upgraded presses



Stupino prior to the upgrade



Acceptance of components at Hauhinco

In April 2012 Siempelkamp received from SMK the order for the upgrading of the water hydraulic control system of a 100 MN closed-die forging press as well as for a new associated tool heating system. SMK also commissioned Siempelkamp for the retrofitting of the water hydraulic control system of a 46 MN closed-die forging press to a system for an open-die forging press. Both forging presses were started up by Siempelkamp experts in December 2013. With the successful completion of these orders, Siempelkamp demonstrated its special status as the only provider for complete solutions in the area of upgrading water hydraulic control systems.

High requirements on the product

For over 70 years SMK has manufactured components for the aerospace industry at the Stupino location – primarily for the Russian market. Now the company also wants to capture the US and European markets. So far SMK primarily produced semi-finished products and blanks made

of aluminum alloys, steel or special alloys, vacuum melted ingots and consumer goods made of nickel, titanium or cobalt alloys. In spring of 2012 the Russian metal processing company decided to expand its vertical range of manufacture and to offer its products for the aerospace industry on a worldwide scale. The components made of heat-resistant nickel alloys and special steels have to meet high requirements in this high-tech application area. Exceptional precision and repeat accuracy during production are essential. To achieve both and to significantly increase the production efficiency, SMK decided to modernize its existing presses: a 100 MN and a 46 MN closed-die forging press.

To reach its objective of becoming one of the most important manufacturers of components made of nickel and steel alloys for the aerospace industry, SMK placed its trust in Siempelkamp. Siempelkamp experts prepared a tailor-made concept comprising of different components.

1. Upgrading of the water hydraulic control system of a 100 MN closed-die forging press
2. Supply of a tool heating system for the closed-die forging press
3. Modification of the water hydraulic control system as well as the electrical controls from a 46 MN closed-die forging press to an open-die forging press
4. Development of a filter system for the central water hydraulic station

Due to the fact that SMK already had accumulators and a central water hydraulic station with 14 pumps in place, it made more sense for the company to upgrade its existing system. Next to the mechanics, electrics and automation technology, Siempelkamp's range of services also included the hydraulic controls for both presses.

Upgrading the water hydraulic control system of a 100 MN closed-die forging press

In the past, SMK controlled both water-hydraulically driven forging presses manually. This process always required several people. With Siempelkamp's new water hydraulic control system, SMK can control its forging presses automatically. This has a tremendous impact on the accuracy during the pressing operation. With the new Siempelkamp control, the customer can achieve tolerances of +/- 1 mm due to the exact positioning and parallelism of the moving beam to the press table during the pressing operation.

The control system has another advantage for the customer: Special graphs for speed and pressure of the press can be programmed prior to the forging process and stored afterwards for individual products. During forging, the customer receives a detailed report about the achieved values which are archived afterwards. This ensures high repeat accuracy and immediate adaptability of the production process. The maintenance effort is minimized due to the simple error detection with the new system.

The replacement of the hydraulic valve blocks with the associated valve technology was also part of the upgrading of the 100

MN closed-die forging press and was carried out in cooperation with Hauinco, our partner company of many years.

Supply of a mobile tool heating system for the closed-die forging press

Next to the new water hydraulic control system and valves, a state-of-the-art tool heating system is part of the modernization package for the 100 MN press. The tool heating system is completely integrated into the control and maintains the tools at a constant 850 °C between forging sequences. These high temperatures are indispensable for forging special materials

SIEMPELKAMP EXPERTS TALK

Erich Stelzhammer, Department for the upgrading of metal presses at Siempelkamp, on the subject

“Retrofitting with Siempelkamp”

“Siempelkamp is the competent partner regarding the upgrading and modification of metal forming presses in the areas of mechanics, electrics, automation technology and hydraulics. In the area of hydraulics, Siempelkamp offers reliable and safe drive systems for oil-hydraulic and water-hydraulic systems. The modernization scope includes, for example, the replacement of hydraulic valve blocks and their associated valve technology, pumps and battery-powered drives as well as complete controls including the area of servo drives. In the field of water hydraulic presses we are supported by our partner Hauinco Maschinenfabrik G. Hausherr, Jochums GmbH & Co. KG in Spockhövel.

Hauinco is one of the leading system providers for water hydraulic systems, high-pressure pumps, valves and industrial components. The specialist builds on 25 years of experience from more than 1,000 implemented projects when it comes to upgrading hydraulic controls. To name an example, the company carried out the upgrading of the water hydraulic system for the largest press in the USA, a 500 MN closed-die forging

press at Alcoa Forging & Extrusions in Cleveland in 2010. Back then, Siempelkamp put this super giant press back into operation (see article in Bulletin II/2010). Together with the experts of our own hydraulics department, our customers benefit from our mutual experiences in the area of water hydraulic systems.

When it comes to upgrading projects, mutual trust always plays an important role: The changeover from the previous production mode to the modern operation via a computer screen was a big step for the operating personnel at SMK. Therefore, it was important that through their knowledge and behavior, our installation and startup experts were increasingly more accepted by the customer as the installation work progressed. Through the established relationship of trust, the necessary information exchange between Siempelkamp, Hauinco and the customer during the startup and training could take place smoothly.”

SIEMPELKAMP EXPERTS TALK

Gregor Endberg, Director of the hydraulic department at Siempelkamp, on the subject

“Modernizations on water hydraulic systems”

“In the past, water hydraulic controls were designed in such a way that a number of plunger pumps filled large high-pressure storage accumulators with press water (emulsion) for the operation of one or several presses. In the forging shops that used such controls, long supply lines were installed from the pump house through the large production halls. The individual presses were connected to these lines like an electrical appliance to an electrical outlet. The valves of the water hydraulic system were operated either via a cam control or an oil-hydraulic inlet control.

The Siempelkamp objective for the modernization at SMK was to upgrade the technology from the 1950s to a level that will ensure the precision, repeat-accuracy and production speed requested by the customer and needed for the manufacture of

high-quality components for the aerospace industry. At the same time, all boundary conditions such as very long pipes, fluctuating pressure, available fixed displacement pumps and the water quality had to be considered.

To do that, the available hand lever valve control was replaced with modern water valve technology. The control valves developed by our partner Hauhinco are special valves made of high-quality stainless steel that have proven its worth in many water hydraulic controls. Here, the customer benefits from our experience of many years in the area of water hydraulic systems.”



Tool heating system

Press control prior to upgrade



Press control after upgrade



such as nickel alloys or special steels. When using different tools, the use of a tool heating system is not only important for the resulting product quality but also as a logistical measure: Between forging sequences or when using a different tool, the customer can maintain a constant temperature of the dies for many hours.

Retrofitting the water hydraulic control system and the electrical controls from a 46 MN closed-die forging press to an open-die forging press

SMK also commissioned Siempelkamp with the retrofitting of a 46 MN closed-die forging press. Not only was the water hydraulic control system upgraded, but also the electrical controls for the closed-die forging press retrofitted to a system for an open-die forging press. After the

modification, the new open-die forging press achieves 38 strokes per minute. The customer went from having two closed-die forging presses to having one closed-die forging press and one open-die forging press. This measure increases the vertical range of manufacture for the Russian manufacturer. With the open-die forging press, SMK can produce preliminary products for the closed-die forging press.

Development of a filter system for the central water hydraulic station

To ensure the customer the longest possible product life for the water hydraulic system, Siempelkamp developed a filter system for the central water hydraulic station. SMK already possessed the latter, as well as the pump system and the accumulators. Cavitation, corrosion,

erosion and bacterial contamination of the water-based emulsion can result in severe damage of the complete hydraulic system. Therefore, it is imperative to clean the press water after each use. To maintain the hydraulic system over a long period of time, Siempelkamp installed two special filter stations between the customer's three collection containers and three clean water tanks. Additionally, the press water is tested in regular intervals.

In December 2013 Siempelkamp, Hauhinco and SMK successfully completed the modernization project in Stupino, Russia. The plant now meets the high requirements of the aerospace industry and allows the customer to produce high-quality end products for international markets with a state-of-the-art water hydraulic system.

Inauguration of the new press



SIEMPELKAMP EXPERTS TALK

Gregor Endberg, Director of the hydraulic department at Siempelkamp, on the subject

“Press water care”

“Maintaining the press water has been given next to no consideration regarding traditional controls for water hydraulic systems. The old valve technology had to be able to cope with any solids inside the press water. To ensure the maintenance of the press water at SMK, filter stations with fully-automatic back-flush filters were installed. At the same time, SMK changed to a modern additive. The careful combination of different high-quality additives adapted to the requirements of water hydraulics as well as an emulsifying agent specially developed for this purpose are important pre-requisites for a properly functioning additive for press water with high emulsion persistence. A share of approx. 2% of the additive provides the necessary corrosion protection and lubricating film.”

SIEMPELKAMP EXPERTS TALK

Werner Schischkowski, Director of the department for automation technology at Siempelkamp, on the subject

“Modernizations in the area of automation”

“Siempelkamp’s automation technology connects control processes, control tasks, operation, visualization and system-wide control tasks to optimize the production processes of our customers. In this area, we offer systems with a high degree of standardization as well as concepts that are tailored to individual customer demands.

Upgrading electrical systems, as well as control and automation technology allows customers to get the most from their existing plants. To do so, we use the latest microprocessor and sensor technology. Visualizations provide improved, simple and safe control concepts. Furthermore, we offer machine monitoring and remote maintenance.”



ATR Industrie-Elektronik: Increasing number of new customers

The Siempelkamp Group is diverse: In the machine and plant engineering business unit alone, twelve companies and ten representative offices make a strong team. All of these individual units deliver what the Group promises. ATR Industrie-Elektronik GmbH has a solid position in this structure. The company's products not only connect the systems of the Siempelkamp Group but are also used by external customers. The latter happens increasingly more often.

by Timo Amels



Assembly of control cabinets



Switchgears by ATR are the “central nervous system” of a plant. They protect electric circuits, activate drives, connect machines to the Internet and, like junctions, they bundle all information that describe the current plant and process conditions.

Almost all branches of industry apply ATR competence: ATR switchgears not only put production plants for wood-based products in motion, but also production lines for pipeline-pipes and airplane wings. They control supermarket cooling systems and parking facility barriers. You can find

them anywhere where a machine or device has to be driven. Therefore, it is no surprise that the Krefeld company is one of the largest providers of switchgears in Germany.

2013: Successful year for ATR

In switchgear cabinet construction as well as in ATR's second competence area, the area of industrial electronics, the company set records regarding new customer business in 2013. “As a competent job order manufacturer for switchgears, we have further increased our level of awareness

and received positive feedback. This goes for our tried-and-tested environment within the Siempelkamp Group as well as for our business with external customers,” summarizes Timo Amels, Managing Director of ATR Industrie-Elektronik GmbH.

This is also confirmed by the number of orders received from new customers outside the Siempelkamp Group, which doubled for ATR in 2013. “The share in sales from our external business amounts to 37 percent of our total sales of 27.4 million euros – a record result for our company,” says Timo Amels.

Advantage 1: Specialization and expertise as a job order manufacturer

One reason for the success of ATR and its products can be found in the full-service spectrum of the Krefeld company. This range starts with the machining of the switchgear cabinet housings involving highly modern sheet-metal working processes and does not stop with the complete wiring, inspection and delivery of the control systems. Timo Amels: "On a floor area of 3,200 m² we manufacture switchgears in made-to-order and series production for different automation and control systems."

An increasing number of companies use the advantages of job order manufacturing for switchgears with ATR as a full service provider. From material procurement to switchgear construction to full inspection procedures, the customer can outsource whatever is desired.

Advantage 2: Up-to-date in the area of international standards and certifications

A vital requirement in switchgear cabinet construction is to comply with national and international standards. ATR scores in this area with production which takes into account all common standards, regulations and customer requirements. "We specialize in DIN, EN, ISO, NEC, UL, cUL, CSA and GOST. UL- and cUL installations for the North American market are certified by our in-house authorized



Timo Amels, Managing Director at ATR Industrie-Elektronik GmbH

personnel, describes Timo Amels. This is convincing to our customers. In this way they can outsource significant core tasks to be completed by a competent partner.

For this reason, Ulrich Hollenbenders, Managing Director EFA Experts for Automation GmbH & Co KG, falls back on ATR support. The company from Viersen, a medium-size engineering office for drive

and automation technology, plans and supplies electrical equipment for industrial production across many industries.

After several smaller orders, EFA now buys complex switchgears from ATR. One of many reasons for doing so is the fact that the Krefeld partner offers vital support regarding quality tests and acceptance tests (see interview).



Ulrich Hollenbenders, Managing Director EFA Experts for Automation GmbH & Co. KG:

"Concentrating on the essentials thanks to ATR support"

EfA services:

- Basic engineering
- Hardware planning
- SPS programming
- Preparation of HMI applications
- Drive technology
- Switchgear cabinet construction

Bulletin: Mr. Hollenbenders, how do you fit ATR's services into your processes?

Ulrich Hollenbenders: We carry out the planning of switchgears – for their production we take advantage of the knowhow and infrastructure of ATR. Here, we work with specialists which understand how to integrate our high quality requirements into their processes.

Bulletin: What requirements are groundbreaking for you?

Ulrich Hollenbenders: For example, the accompanying quality tests, test runs and acceptance tests during switchgear manufacturing. The EFA philosophy is: "With quality and competence we achieve efficiency." In this regard ATR sees eye to eye with us.

Bulletin: Where exactly do you see the benefit?

Ulrich Hollenbenders: For projects on the North American market, including USA and Canada, ATR is authorized to inspect, approve and label switchgears according to UL- or CSA standards. In this way, further inspections by inspecting authorities in the countries of destination are omitted. Thus, we are able to focus completely on our core competence areas.

Advantage 3: Be successful and talk about it

2013 was a successful year for ATR. The company owes this result to various communication channels, ranging from face-to-face to digital conversations, which were used intensively. In this area the company concentrates on regional, nationwide and cross-border activities.

In 2013 ATR was represented at Hannover Fair where it introduced "innovative mechanical engineering from the Lower Rhine region" to a diverse range of visitors. During "The long night of the industry" event, the Krefeld company demonstrated its close connection as a strong partner to the Rhine-Ruhr region. Furthermore, ATR is working on establishing business outside of Germany by initiating new contacts and sales potentials in the Netherlands and Austria.

Since the beginning of 2013 customers can order ATR products even quicker and more conveniently via the new web shop: At <http://shop.atr.de> the electronic assemblies for measurement and control technology, ATR's second core competence area next to switchgears, are available for sale online. ATR opens up another innovative distribution channel with the new online store that allows customers to buy a large number of standard components quickly.

What does ATR need to do in 2014 to maintain this successful trend? "On the one hand, we will continue to regard our new customer business as an important pillar of our business activities. On the other hand, we will continue to drive our core business to greater success by tailoring our processes and products even more to meet modern and efficient production," says Timo Amels.



Assembly hall at ATR



Automatic drilling machines for the mounting plates



Finished control cabinets



Multi-piston press for the vulcanization of conveyor belts

Cable tensioning concept made by Siempelkamp: Ideally equipped for the mining megatrend

Whether in quarries, port facilities or coal-fired power plants, heavy-duty steel cord and textile conveyor belts are in demand in numerous industries worldwide. Siempelkamp puts the corresponding service chain in motion – with presses for the rubber industry which produce a large part of all conveyor belts used worldwide. The new concept of the individually controlled steel cord tension distribution system is the latest improvement. Currently, such a system is started up at two Siempelkamp customers, one of them is Sempertrans Belchatów in Poland.

by Steffen Aumüller

At the end of 2013 Sempertrans Belchatów ordered a steel cord conveyor belt press line from Siempelkamp for the production of belts with a width of up to 2,700 mm. This line includes a 18,480 mm (8.9 x 61 ft) multi-piston press with optimized pressure distribution.

The subsidiary of the Semperit Group is Poland's most important manufacturer of conveyor belts and one of the largest in Europe. The company, founded in 1977, specializes in the manufacture of heavy-duty steel cord conveyor belts as well as textile conveyor belts. These are primarily used in lignite and iron ore mines as well as other mining operations, in the steel industry and in power plants (see box).

With its equipment, Siempelkamp contributes in expanding the strong technological position of the company in the area of high-quality conveyor belts. Until 2015, the Semperit Group will invest approx. 40 million Euros in its Polish Belchatow location to expand its conveyor belt production. This is Semperit's largest physical investment ever.

Semperit AG Holding:

- internationally oriented group of companies operating in the fields of industry and medicine
- develops, manufactures and sells highly-specialized products made of rubber and plastics (e.g., conveyor belts, hydraulic and industrial hoses, escalator handrails, sheave and bull-wheel liners for ropeways)
- headquarters: Vienna (since 1824)
- production locations: 22 worldwide
- employees: approx. 10,000

Sempertrans:

- member of the Semperit AG Holding
- one of the world's largest providers for technical conveyor belts
- production spectrum:
 - > steel cord conveyor belts (width: 500 mm to 3,200 mm)
 - > textile conveyor belts (width: 400 mm to 2,750 mm)
- yearly production capacity: 45,000 tons of conveyor belts
- production locations in Poland, France, India, China
- application areas: mining, iron and steel industry, cement industry, port facilities, thermal power stations, foundries, glassworks, quarries, sand pits

Sempertrans Belchatów:

- established in 1977
- in 2000 acquired by the Semperit Group
- Poland's most important manufacturer for conveyor belts and one of the largest in Europe
- specializing in the manufacture of heavy-duty steel cord and textile conveyor belts
- application areas: primarily lignite and iron ore mines, other mining operations, steel industry and power plants



100 % control over the entire steel cord tension distribution

The company made the decision to expand its production capacities in order to meet the rising demand for Sempertrans products caused by the mining megatrend. After all, the continuously increasing demand for energy and resources demands new mining concepts.

“In the last three years we have mainly increased our sales activities in South America and Asia and have opened up additional market segments. Therefore, Sempertrans was able to become established in new markets,” explains Thomas Fahnemann, Chairman of Semperit AG Holding. With this commitment and its expanded production capacities, the company safeguards a strong technological position in the segment for high-quality conveyor belts.

Strong partner thanks to innovative cable tensioning concept

Siempelkamp supports Sempertrans not only with its many years of experience in the area of plants for the rubber industry, but



New roller comb concept

also with an innovation for which Siempelkamp has recently filed a patent. A new cable direct tensioning concept replaces the traditional hydraulic cable tensioning device. The new line is equipped with an electromotive individually controlled tensioning system located directly in the creel including measuring and control functions. The measuring device allows the operator to measure and control the tension distribution up to 3,900 N.

This new concept opens up decisive advantages for the plant operator: “At any time our customers have 100% control over the actual steel cord tension distribution. This, in turn, provides exact reporting and a high quality level for the products,” explains Steffen Aumüller, Sales Director for rubber presses at Siempelkamp.

Technological advantage thanks to tension – the details at a glance

- electromotive individually controlled tensioning system including measuring and control functions
- since the cables are tensioned by a motor, the cables can be tensioned while static or in motion. The tension distribution can be controlled in either case.
- new roller comb concept: replaces fixed finger comb – the concept allows quick product changeovers, reduces friction, tension is applied over the production width
- no limits – cables with different diameters can be used and each motor can be controlled individually
- higher production safety
- optimized quality reporting
- increased plant availability



Electromotive individually controlled tensioning system



Creel

Field-tested!

As part of another project, Siempelkamp’s innovative individually controlled direct tensioning drives started operation for the first time for a customer in September 2013. This particular line includes a 2,600 mm x 18,480 mm press which manufactures belts with a width of 900 – 2,600 mm. For our division ‘Plants for the rubber industry’, 2013 was a positive year. We received one new order and successfully started up a prototype,” concludes Steffen Aumüller.

Siempelkamp presses for the rubber industry continue to be in high demand. This development is supported by the worldwide trend of “In Pit Crushing and Conveying” (IPCC, see box). In this field, still more companies will search for the best available concept for continuous conveyor technology on the market.

In-Pit Crushing and Conveying:
This is how the belt replaces the truck

Increasingly more often, conventional truck concepts are replaced with conveyor belt concepts when bulk goods need to be transported from the mines. IPCC – the short formula for this success concept opens up numerous advantages, both economically and ecologically.

- low operating expenses for the mine operator
- longer service life of conveyor belt systems compared to trucks
- shorter haulage distance
- variable location of overburden piles
- powered by electric energy instead of fuel
- low needs for spare parts
- low maintenance costs
- significantly reduced road preparation
- reduced downtimes
- significant environmental benefits, greater sustainability due to reduced emissions



RWE belt transfer point

Operated in Korea – called in for a pit stop by Siempelkamp
– back on track in Turkey:

MDF plant – reloaded

Service life of a production line

In 2013 the Turkish company Mehtap decided to buy a second-hand MDF production line made by Siempelkamp. Between 1990 and 2011 the line was operated by Dong Wha, a wood-based panel manufacturer from South Korea. Then the line made a “pit stop” and was put back on track by Siempelkamp for a new customer in 2013. This project illustrates: Siempelkamp not only supports customers with new plant concepts, but also puts used plants back into the market.

by Hans-Jürgen Busch und Stefan Frisch



Forming and press line during installation



Outfeed area of ContiRoll®



Installation of the frames for the ContiRoll®

Supplied in 1990, returned Siempelkamp's ownership for a short time early in 2012 and currently ready to start value-adding processing of wood-based panels in Turkey:

this story of an MDF line, which was made and then overhauled by Siempelkamp, is exciting and versatile (see timeline).

This production line was far from being obsolete after Dong Wha decided to upgrade its production site in Asan, South Korea, with a new MDF/HDF line in 2010. With a production capacity of approx. 300,000 m³, the new line was to open up completely new dimensions, tailored to the objectives of the company in the Asian market.

Siempelkamp bought the used line back, dismantled, documented, and packed it, then stored the components in Korea. At the same time, the Krefeld company started worldwide marketing and sales activities for this line – the number of interested parties was surprisingly high. Quickly, Siempelkamp's good networking paid off. Initial negotiations were opened

in 2012 with the Turkish company Mehtap. This company became the new owner upon signing the contract in March 2013.

In addition to the used plant, our customer ordered an update to the process control system for its forming and press line including a visualization system, the overhaul of the hot platens and a spare parts package. The field-proven MDF line will be operated at a new site in Kayseri, a centre of the Turkish furniture industry.

Ready for takeoff to a new market segment

Mehtap, a Turkish family-owned company, produces direct printed boards from MDF and particleboards and is also active in the furniture industry. The products are successfully sold under the Beypan brand name. The investment in MDF plant with the aim of positioning the company in the field of wood-based panel processing was a logical step within Mehtap's strategy.

The used Siempelkamp plant hit the mark because it exactly met the requirements of the new owner. "For a newcomer the

acquisition of such a field-proven plant is a good alternative, particularly, since the daily capacity of approx. 400 m³ for this plant corresponds exactly to Mehtap's requirements," says Hans-Jürgen Busch, responsible for all services regarding used plants at Siempelkamp.

For Mehtap it was important to have a reliable and experienced partner on its side throughout the project. Early on both companies established a joint project team including people from Kayseri and Krefeld. Kayseri and Krefeld happen to be partner towns so the auspices were good.

In March 2013 the preparations for the foundation work at Kayseri began. Five months later 70 containers and crates with plant components arrived – an impressive 1,000 tons of machine parts. As a result of careful joint planning, the project team carried out the handling of the parts within a short time. First measures for the re-assembly of the plant were made in September. Assembly of the mat former, pre-press and ContiRoll® press was therefore able to start in November.

Siempelkamp plant reloaded: Timeline at a glance

1990	2010	2011	January 2012	February 2012	Autumn 2012	2012/2013
delivery of the Siempelkamp plant components for the MDF production line to the Asan factory of the South Korean company Dong In Board Co. Ltd. in Seoul, which later became Hansol and then Dong Wha.	Dong Wha ordered a new MDF/HDF line from Siempelkamp	Siempelkamp buys back the old MDF line from Dong Wha	Siempelkamp acquires ownership of the line	disassembling, cleaning, documenting and packaging of the line components by Siempelkamp, afterwards intermediate storage in South Korea	initial negotiations with the Turkish company Mehtap	talks on planning and project schedules
startup of the plant						

The installation of machine parts for the board handling system followed. The cooling turners and the most important elements of the sanding line were installed, various conveyors were positioned. Unlike the first-time installation in Korea, the project team had agreed on a state-of-the-art concept for the board handling system, making full use of all the original plant components. This sounds simpler than it is. The adaptation of all the individual machines to a new concept placed high demands on Beypan's assembly team.

Continuous improvement – There are some prerequisites

Even a well functioning machine unit from the 1990s can always be improved. This might include just simple measures, which nonetheless will result in many benefits in the long run. Prerequisites for improvement are good joint planning, high flexibility of all partners and short-term implementation of joint proposals.

"These prerequisites have been met; besides, we identified some more plant areas, which we are changing and modifying on the fly while we are at it. We simply want to take the opportunity to get the best out of our assembly team. This team be available in the present form. Moreover, our efforts are fuelled by the support of Beypan's decision makers, providing us with a generous time schedule, which puts us in the position to focus even on the smallest aspects," says Stefan Frisch, responsible for coordinating the reassembly works on the part of Siempelkamp's project team.

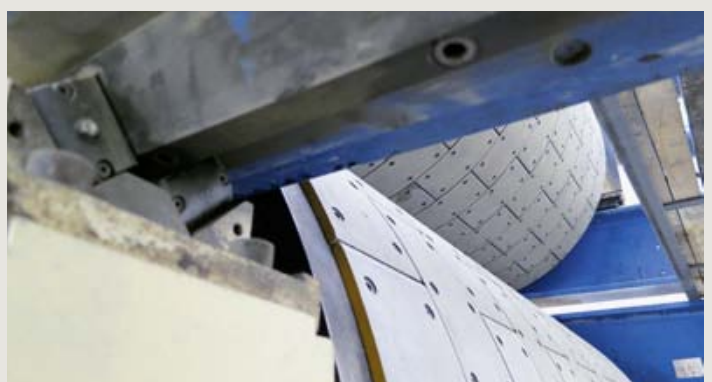
In January and February 2014 the electricians started their work at Kayseri, placing the switch cabinets and cable trays. The following weeks were dedicated to further installation work on the ContiRoll press and the forming line.

As Hans-Jürgen Busch and Stefan Frisch put it, "Exciting and interesting weeks and months, marked by hard work, are still ahead of us all. Everybody is pulling together toward one common goal. There is an important positive motivation: working together like a large family".

This project demonstrates that the resale of used plants including all associated services (see box) is established in the market. Both seller and buyer trust in Siempelkamp's expertise: "Anyone who intends to shut down a plant to sell it, will contact us in order to use our worldwide networking. Anyone who intends to buy a used plant, will know they can rely on our experience and equipment," says Hans-Jürgen Busch.



Frame opening of ContiRoll® press



ContiRoll® discharge drums with friction lining

March 2013

contract signing with Mehtap for the delivery of the used line to Kayseri site, immediate start of foundation work

August 2013

arrival of containers and crates with line components at Kayseri

September 2013

start of re-assembly works

November 2013

assembly of mat former, pre-press and ContiRoll®

December 2013

installation of machines for the board handling system

January/February 2014

installation of board handling systems continues and start of electrical installation work

Used = field-proven: Siempelkamp services

To support plant owners worldwide with tailor-made solutions, Siempelkamp offers five services. The "established classics" include:

- customers are supplied with **new plants** having all the features to guarantee uncompromising quality and outstanding economic efficiency
- plant owners have Siempelkamp **update** their **existing plants**, thus further strengthening their market standing

Since 2011 Siempelkamp has extended its field of competences:

- customers are supplied with **used plants**, warranted functions included
- plant owners **sell used plants** to Siempelkamp thus making room for new investments
- plant owners commission Siempelkamp with the **resale of used plants** through its well-established network

The services regarding used plants in detail:

- project-specific planning of individual processes
- disassembly of the production units
- clear documenting and marking of the disassembled plant parts
- packaging according to HPE guidelines and preparation of packing lists
- all transports
- professional re-assembly of the plant including startup
- individual training of customer's operating and maintenance personnel

Customers' benefits:

- single-source solution – one reliable partner resulting in project security in regards to deadlines and costs
- support by an experienced project team throughout implementation
- expertise from one of the leading systems suppliers of integrated plants for the wood-based products industry
- detailed knowledge in the used-plant business
- detailed planning and realization of the individual processes all the way to the start of production at the new site



Pre-press



Cooling turner



Cyclone above mat-forming machine

The new track network provides for safe and quiet transport of the bodywork for the refuse collection vehicles

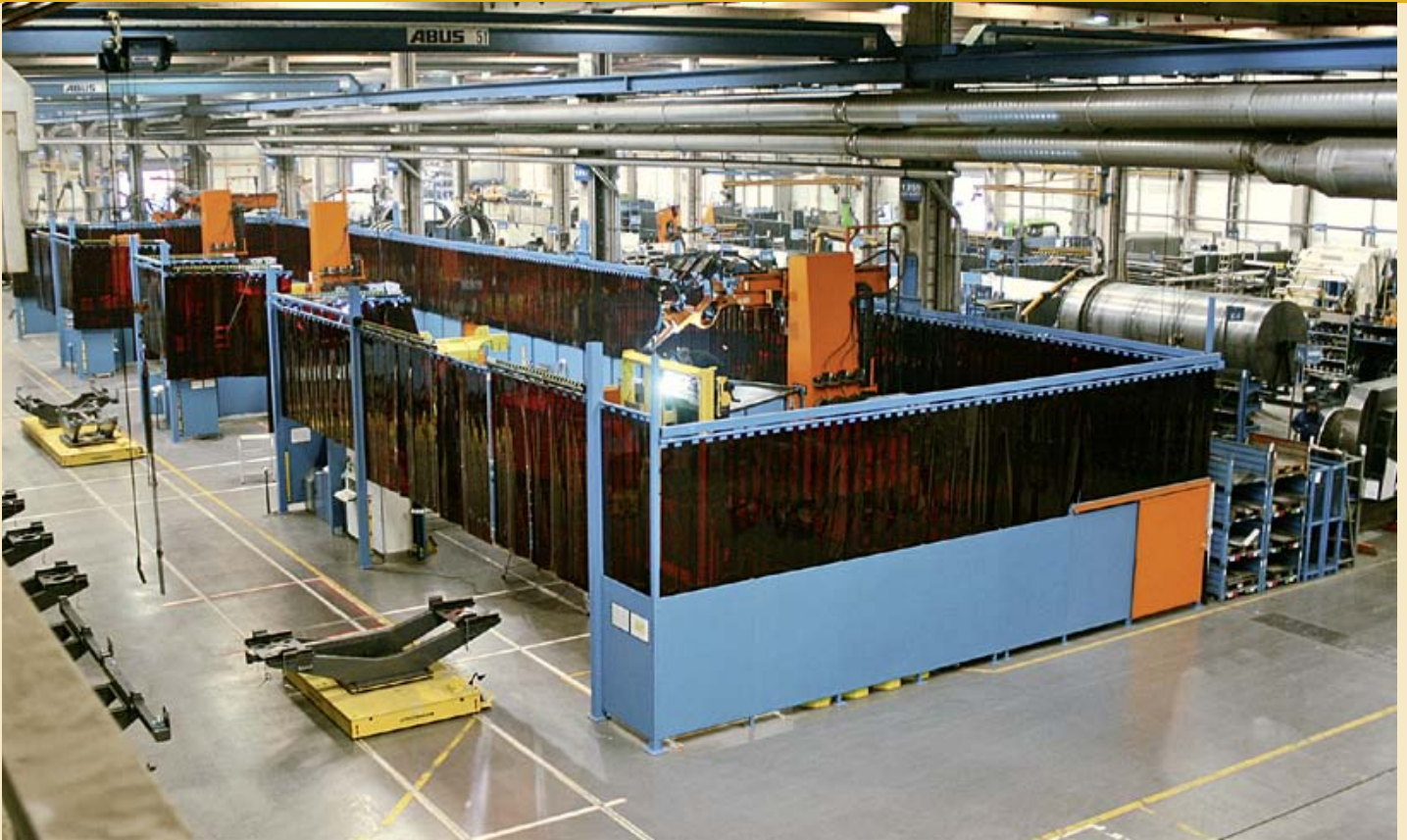


FAUN automates construction of refuse collection vehicles Strothmann equips new welding center with RoundTrack[®]-technology

The products of FAUN Umwelttechnik GmbH & Co.KG in Osterholz-Scharmbeck, Lower Saxony, Germany, ensure that an essential service to society is carried out reliably. Readers from Germany will most likely have seen the company's products before because the vehicle manufacturer is represented all over Germany. In Berlin, for example, FAUN vehicles are cleaning the city under the slogan "We kehr for you" where "kehr" sounds like the English word "care" but is actually a derivative of the German word "sweep". The company not only equips fleets for street cleaning but also entire fleets of different municipal vehicles. The plant in Osterholz-Scharmbeck manufactures 1,200 refuse collection vehicles yearly.

by Derek Clark

Old and new: The old transport solution including self-developed carts and forklifts was replaced with ergonomically and safe RoundTrack® technology



To ensure that, on the one hand, the waste collection is always on time and, on the other hand, the production flow at the plant does not stagnate, FAUN has transferred important transport tasks to take place on a Roundtrack® floor rail system from Strothmann. The logistics concept supports the automation measures at the production facility and also increases occupational safety because many transports on forklifts become obsolete. "Many of our vehicles are custom-made according to customer requirements," reports Herbert Begemann, Head of Technology at FAUN. "So far we lacked a continuous material flow which optimally integrates all tasks and stations." In this regard, FAUN has now taken a big step forward at its plant in Osterholz-Scharmbeck.

Ensure competitiveness

In only nine months FAUN built an automated welding center utilizing robots in

Osterholz-Scharmbeck in 2011. Four robots have been welding large assemblies, containers, rear sections and covers for refuse collection vehicles on the outside and the inside since fall 2011. A modern turbo sand-blast cleaning system, which completely removes rust, scale, welding residues and other contaminations from vehicle bodies, started operation a year before. Begemann explains: "Due to the partial automation we achieve a consistently high product quality which secures jobs in the long turn."

New logistics concept

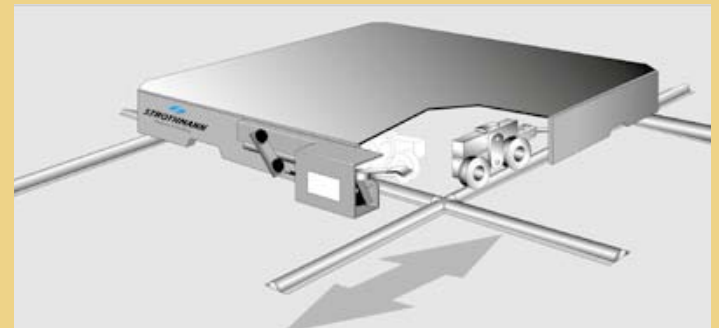
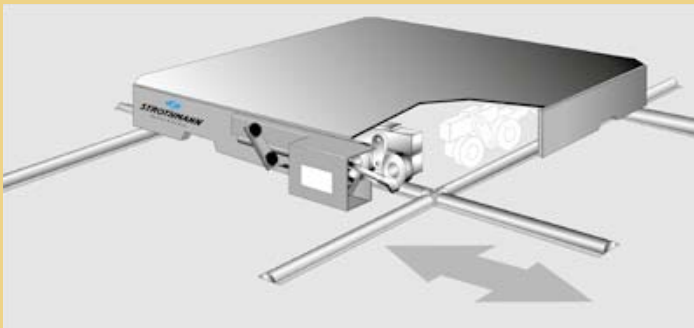
As the concept partner for the intralogistics, Strothmann installed 900 m of RoundTracks® and manufactured twelve transport carts. "The RoundTrack® floor rail system allows the perfect connection of all steel construction stations with the robotic welding center," explains Begemann. "Numerous handling steps are

FAUN

FAUN Umwelttechnik GmbH & Co.KG, a company of the KIRCHHOFF Group, is the leading manufacturer of refuse collection vehicles and road sweepers. A 30,000 m² building constructed at the company's headquarters in Osterholz-Scharmbeck (Lower Saxony) in 2002, houses the world's most modern production plant for refuse collection vehicles. Four additional plants are located in Grimma (Saxony), France, Great Britain and Switzerland. The company employs approximately 1,000 employees and pursues a continuous growth strategy.



The carts always stay on track



If the cart needs to go around a corner, the crossover mechanism is operated via a foot pedal.

omitted." The transfer of the component parts to the robot welding stations takes place directly on the transport carts, ergonomically and without additional tools. With the help of the transport carts, the component parts are pushed into position where they are automatically clamped and lifted. The transport carts are removed during the welding process. After the welding process the carts are again positioned under the welded part and then pushed manually to the sand-blast cleaning system. In the past an in-house logistics team carried out the transport of the parts, mainly by using self-made transport carts and forklifts. Today the use of forklifts is reduced. The transport of welded parts can be carried out ergonomically by each employee. The carts run so smoothly that even extremely heavy loads can be easily moved manually. The time savings resulting from this are remarkable.

Without auxiliary power around the corners

Due to a selection of crossing elements, Strothmann carts can reach any position on the floor shop. Depending on the application, we offer turntables, Quadro turnstiles and carts with crossover and lever mechanisms. Turntables rotate the loaded cart and thus alter the orientation of the work piece. Quadro turnstiles are located at intersections and are equipped with swiveling wheel sets; the orientation of the cart does not change when turning. FAUN bought carts with hydraulic crossover mechanisms. An advantage of this solution is that the carts allow a change in direction without needing power or compressed air supply. The carts with crossover mechanisms are hydraulically lowered or lifted; the pressure for this process is supplied via a foot pedal. Furthermore, the

long containers can be turned on moving platforms mounted on the carts in such a way that the narrow side points in the direction of travel.

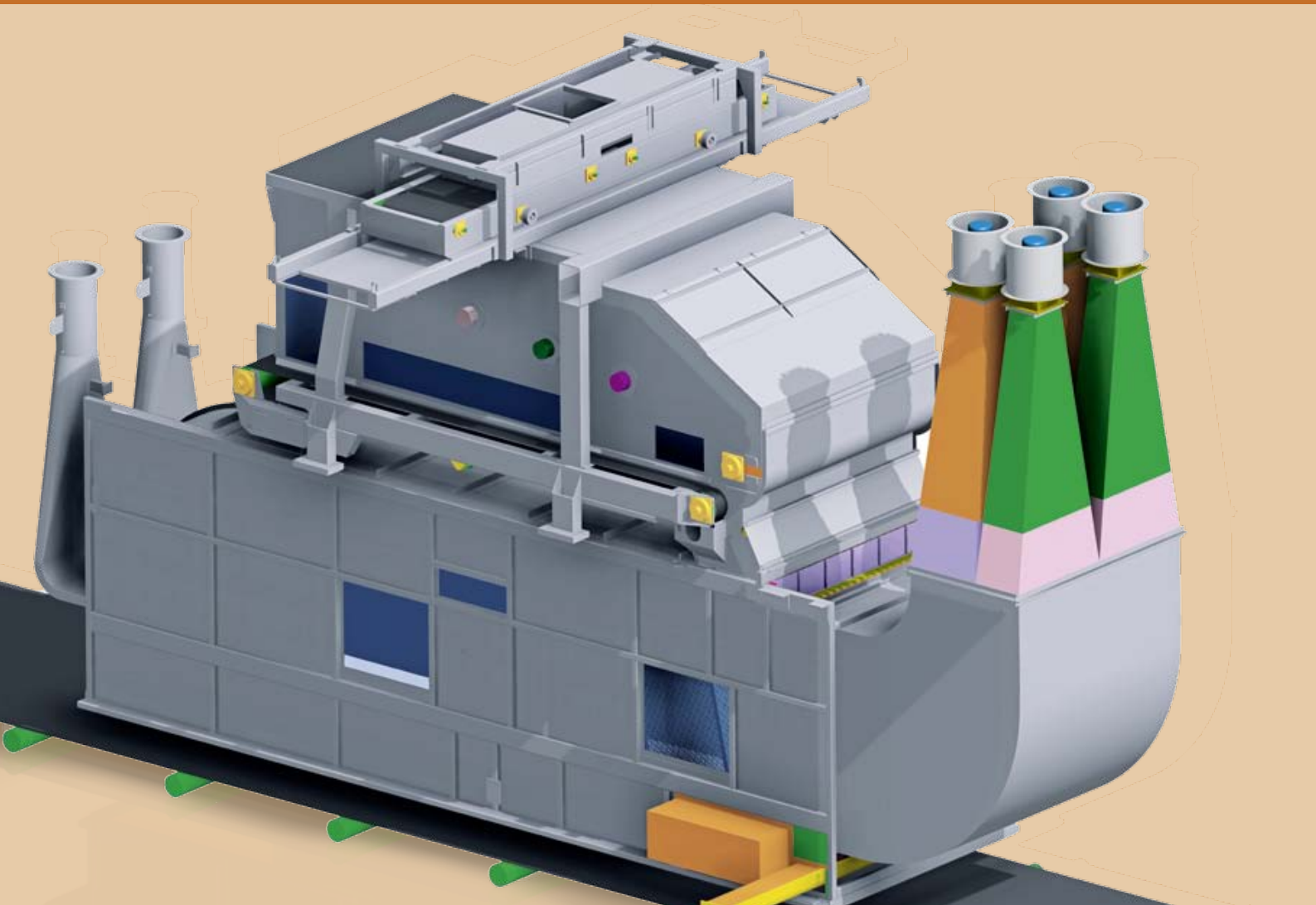
Conclusion: Efficient and safe processes

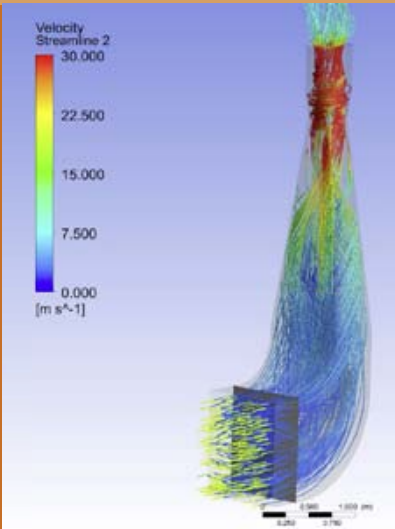
The shifting of transport tasks to RoundTracks® partly turned the logistics system upside down. One decisive factor was that the RoundTrack® technology opens up the possibility to move the heavy steel component groups manually from station to station. The new system works without auxiliary power which results in lower operating costs, increases occupational safety and lowers the noise level. Compared to the beginning situation, a true production flow was created. The new track-based logistics system supports optimizations in the production process and contributes significantly to improved productivity.

EcoFormer SL from CMC Texpan: From now on the wind blows in a different way!

For many years the name CMC Texpan has represented high-quality mat forming systems and the best particle preparation for wood-based material production plants. Plant operators from all over the world contact the Siempelkamp subsidiary in Colzate, Italy, to equip their plants with first-class technology. The results: increased plant capacity, cost savings during production and higher quality of the finished boards. Corresponding to these customer benefits, CMC Texpan has further developed its proven wind mat forming system: The EcoFormer SL (Surface Layer) provides an even more uniform forming of the surface layer during particleboard production – all that with the lowest possible energy consumption.

by Paolo Gattesco





Drastic reduction of pressure loss with EcoFormer SL (CFD Simulation)



Functional principle EcoFormer SL

individual air nozzles. To engineer the most effective air flow, the design was researched via Computational Fluid Dynamics and lab-tested. Mechanically controllable baffles help control and adjust the air flow.

This principle provides a precise and controlled air distribution inside the entire wind chamber and as a result of this, an even more uniform forming of the surface layer. This allows the plant operator to save significant amounts of material and produce high-quality boards with low power consumption. All of this adds up to yearly savings of around 500,000 euros according to the plant size.



EcoFormer SL



Building of a prototype

Correct forming – saves energy

The EcoFormer SL also provides an advantage in the area of energy savings. Due to the innovative design, the pressure loss is reduced allowing the use of smaller blowers with lower energy consumption. Energy resources are used sustainably which leads to significant cost savings. Compared to the traditional mat forming process, further energy savings are possible by reducing the power consumption of the blowers. Furthermore, the new forming system is extremely maintenance-friendly due to the fact that it is easily accessible. The short and round air nozzles minimize possible dust deposits and simplify the cleaning of the system. Thus, shut-down times are decreased, availability and productivity of the plant increase.

In order to meet the growing challenges of the market, modernizations of existing plants are becoming more important. The EcoFormer SL can be installed as part of a new plant as well as used as a component of a modernization package. It is designed to fit exactly into the space that becomes available when replacing the traditional wind forming system.

The first customer is convinced

Our Russian customer Uvadrev-Holding OAO – an experienced particleboard manufacturer – purchased the EcoFormer SL for a new complete particleboard line made by Siempelkamp. The system is currently being installed and is scheduled to start operation in summer of 2014. “We expect excellent forming results,” explains Uwe Wagner, Siempelkamp’s site manager in Uva – approx. 1,200 km East of Moscow. Next to a 6’ x 30.4 m ContiRoll® press, the Siempelkamp scope of supply includes the complete plant engineering by Sicoplan, chipper, silos, flakers, dryers as well as screens, sifters, and the resin blending system. CMC Texpan is also supplying several components for this new line. Board storage and finishing systems including a sanding line will also be supplied by Siempelkamp. With this order, Uvadrev strengthened its position on the strongly growing Russian particleboard market on time with a competitive, continuous production line – which includes the new EcoFormer SL from CMC Texpan.



Paolo Gattesco, Managing Director at CMC Texpan, Italy

The right wind is important

Bulletin talked with Paolo Gattesco, Managing Director of CMC Texpan and responsible for R & D projects, about the further development of the wind forming technology, its benefits and the customer Uvadrev. He explains why an investment in the EcoFormer SL pays off in any case.

Bulletin: Why did you decide to revise your existing forming system?

Paolo Gattesco: CMC has a clear objective and a strong motivation to reach it. To us, future is the continuous search for perfection and innovation. The EcoFormer SL clearly demonstrates our vision: here, we have further enhanced the already excellent performance of an existing machine.

Bulletin: Why is a uniform forming of the surface layer crucial for the quality of the finished boards?

Paolo Gattesco: The surface layer of particleboard is very delicate. It is just like the skin on our face: it needs proper care and must always be smooth and nice to touch. There are several very important reasons why the surface layer is so important: Firstly, the continuous search for cost savings but also the evolution of the finished product have resulted in the use of low-weight decorative papers, or respectively of papers with very soft colours and delicate designs. Therefore, any possible flaws on the surface of the particleboard substrate would become enormously more visible after the application of the decorative papers themselves. Secondly, achieving a constant and homogeneous particleboard surface means less sanding allowance, i.e. less material to be removed during the sanding process. This not only leads to savings in wood material that otherwise would have to be burnt after a long and expensive preparation process, but it also provides for a longer life of the sanding belts. Last but not least, the electricity savings related to the sanding process have to be considered as well.

Bulletin: What influence does the distribution of the air speed inside the EcoFormer SL have in regards to the forming accuracy of the surface layer?

Paolo Gattesco: Surface layer particles are very tiny and light. Spreading them with high accuracy in a large wind forming chamber is a very delicate and difficult task. The smallest variation in the air speed raises these particles and makes them move. So, in order to obtain a consistent and uniform layer of particles, you must be able to define exactly where and how these "flying" particles shall fall.

Bulletin: How difficult is it to control the air flow inside the wind chamber?

Paolo Gattesco: This is not an easy job. The EcoFormer SL has been obtained by combining the huge, long-term experience of our skilled experts (developed on hundreds of machines subject to countless variables) with the design technology of our technical department, as well as using sophisticated calculation models and extremely accurate verification software programs. Thanks to this effort, we can supply our customers with machines characterized by high level technical competence, yet very simple and easy to operate.

Bulletin: Uvadrev in Russia is the first customer who purchased the new EcoFormer SL. What were the factors that were decisive in the end?

Paolo Gattesco: The results of different preliminary tests had amply demonstrated the potential and advantages of this solution. The agreement could be reached thanks to a perfect cooperation between the Uvadrev, Siempelkamp and CMC Texpan teams. Uvadrev was absolutely determined to build a state-of-the-art production plant and extremely responsive to energy saving solutions, so they promptly accepted our proposal. Of course, we are also delighted to contribute to the fulfilment of their objectives and goals.

Bulletin: Does the EcoFormer SL only make sense as an investment for a new plant?

Paolo Gattesco: Absolutely not! In regards to new plants, the EcoFormer SL undoubtedly represents a decisive and winning choice in order to provide the market with new particleboard panels of a higher quality. In these cases, the investment required is so little that it doesn't affect the project expectations at all. At existing plants that are already equipped with CMC Texpan forming machines, it is possible to replace only the blowers and air blowing nozzles section of the wind forming chambers, which is an affordable investment obtaining very important results on particleboard quality. For those existing plants that are not equipped with CMC Texpan forming machines, this solution needs to be evaluated by our specialists, who can work out a detailed definition of the possible benefits and advantages.

Bulletin: In other words, for particleboard production plants there is no alternative to the EcoFormer SL?

Paolo Gattesco: Well, if you wish to innovate and also to improve production quality in this section of the plant, the only solution is the EcoFormer SL!

Test area at EWS



Central modes of functioning were unknown for a long time:
Methodical research results in a new
generation of spark extinguishing
systems with higher efficiency

The process-integrated measurement system SicoScan has been an important module of modern Siempelkamp automation technology for the wood-based materials industry since 2007. While this modern sensor technology for blow detection as well as the continuous measurement of the moisture content, surface area weight and thickness was developed and is built by Electronic Wood Systems (EWS) in Hameln, Siempelkamp integrates the measurement data into the process. This results in simplified operation, higher informational content and, in combination with Prod-IQ®, increased production. The further-developed SicoScan spark extinguishing systems are now included in this modern automation strategy.

by Hans-Peter Kleinschmidt

Spark extinguishing systems detect and extinguish sparks in particle and fiber dryers as well as exhaust pipes. Today they are the ideal technical solution in preventing fire and dust explosions. The infrared heat radiation from sparks is detected by sensitive optical sensors, which are installed in exhaust pipes and material handling systems, and which trigger a brief spraying of water to put out the spark.

Electronic Wood Systems GmbH (EWS) offers a wide range of measurement systems for the wood-based materials industry worldwide. The company was established in 1996 by the inventor of the spark extinguishing systems (1973) Hans-Peter Kleinschmidt. The company, based in Hameln, Germany, is run by joint managing directors Matthias Fuchs and Hauke Kleinschmidt (son of the founder) today.

Siempelkamp in cooperation with EWS developed the process-integrated measuring system SicoScan in 2007. SicoScan has been used in over 80 projects to date. SicoScan measures the moisture content and weight of the mat as well as the mat thickness and the blow detection at the press outfeed. All measuring data is collected in a central data-base. At the same time, the measurement results are applied to the production process which makes immediate influence possible. Thus, safety margins and oversizing can be systematically reduced and the entire production process optimized.

At the end of 2012 the Siempelkamp subsidiary ATR Industrie Elektronik GmbH acquired a minority share in EWS.

Together with EWS, Siempelkamp has analyzed and evaluated spark extinguishing systems of all known makes over many decades. The existing systems were studied and the elimination of weak points became the number one goal for a new development. In a realistic test field in which EWS could generate an air flow of up to 36 m/s [7,200 ft/min.] the top brands available on the market were put thoroughly to the test. By constantly comparing the results from existing systems to a new development, technical progress was systematically achieved. The result is a significant increase in the efficiency during spark detection and extinguishing as well as the integration of alarm procedures into the complete production process.

By increasing the efficiency the amount of required extinguishing water is reduced by 30%, operational disruptions are minimized. The integration with the machine controls, the integration of alarm displays into the visualization of the central control room and the analysis of alarms will become part of the latest Siempelkamp process technology. The further-developed spark extinguishing systems by SicoScan represent a new generation of spark extinguishing systems.



Acceptance test of SicoScan spark extinguishing system as a protection measure for the particle dryer as part of the "Monza" project, Russia, on EWS testing equipment (from left): EWS Managing Director Hauke Kleinschmidt, from Büttner: Project Manager Jörg-Dietrich Krakow, Chief Designer Christoph Müsgen and Project Manager Jürgen Karsten, EWS Sales Manager Burkhard Engelen and EWS Managing Director Matthias Fuchs



Spark detector DL



Spark detector DH for dryers



Nozzle open/closed



Control unit

Coming together, keeping together, working together: SIA LatGran orders third drum dryer from Büttner

Henry Ford once said, "Coming together is a beginning; keeping together is progress; working together is success."

This quote fittingly describes the relationship between Büttner and SIA LatGran. The company from Latvia with Swedish and Finish roots (see info box) ordered its third Büttner drum dryer at LIGNA in 2013.

by Carsten Otto



High-performance cyclone group with dry material conveyor and drum dryer in the background

SIA LatGran: brief profile

Established	2004
Owners	BillerudKorsnäs (Sweden), Baltic Resources (Finland)
Headquarters	Jekabpils, Latvia
Pellet plants	since 2005: Jaunjelgava since 2008: Jekabpils since 2011: Kraslava starting 2014: Gulbene
Employees	approx. 120 in the four plants
Total capacity	430,000 metric tons of pellets per year in the first three plants. Approx. 340,000 metric tons of that number are produced with Büttner systems. Including Gulbene the yearly total will increase to 600,000 metric tons.

With this number, SIA LatGran is the largest manufacturer of industrial grade wood pellets in Europe - according to the company's own report.



Installation in Gulbene: drum dryer discharge end, fan in the background

Since 2008 SIA LatGran has equipped its plants (Jekabpils and Kraslava) with Büttner drum dryers (see timeline for scope of supplies). For the new plant in Gulbene, the wood-pellet manufacturer ordered its third single-path drum dryer (type: 4.0 x 20 R) which is fired with flue gas from the company's grate furnace.

With this order, SIA LatGran falls back on Büttner's expertise in wood processing and drying and furthermore on the know-how to connect the dryer and the customer's energy system effectively. Büttner offers two core competencies: expertise in dryers on the one hand and energy plants on the other. After a merger took place in 2012 to form Büttner Energie- und Trocknungstechnik GmbH (see box), these two disciplines were better coordinated.

Operators of pellet plants and biomass power plants now have the assurance to work with a partner which knows about

the processing and thermal use of wood and annual plants and also has international experience in the area of large-scale plant construction.

The advantages for Büttner customers: processes are more precise, efficient, and economic; the expenses for engineering, transport, logistics, installation and startup can be significantly reduced.

Büttner provides customers with comprehensive knowledge: as a specialist for wood processing and drying and as an experienced partner in the construction of energy plants for the self-sufficient supply of process heat. A combination consisting of dryer and energy plant is more than just the sum of its individual components. After all, regarding the process technology and plant engineering competence, dryers and energy plants belong together.

1 + 1 = competence²

- 1874** August Büttner founded the Büttner company in Krefeld; since **1928** the company specializes in the manufacture of energy plants, dryers and fans; it became a subsidiary of the Siempelkamp Group in **1995**
- 2007** Acquisition of Metso Panelboard GmbH, Hannover, established in **1948**, by the Siempelkamp Group; this company continues to operate under the name Siempelkamp Energy Systems GmbH
- 2012** Büttner Gesellschaft für Trocknungs- und Umwelttechnik mbH and Siempelkamp Energy Systems GmbH merge to Büttner Energie- und Trocknungstechnik GmbH

Büttner for SIA LatGran: Orders at a glance

November 2006

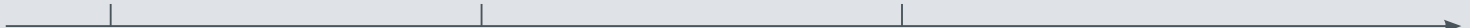
Order for a single-path drum dryer type 4.0 x 20 R for the plant in Jekabpils

May 2010

Order for a second single-path drum dryer type 4.0 x 20 R for the third LatGran plant in Kraslava

May 2013

Third order – another single-path drum dryer of the same design for the fourth LatGran plant in Gulbene. Production start in Gulbene is scheduled for August 2014.





Installation in Bulgene: High-performance cyclone group for dust removal, dryer fan on the right

Type 4.0 x 20 R particle dryer in Jekabpils with wet material conveyor in the foreground

Type 4.0 x 20 R particle dryer with discharge housing for Latgran plant No. 2 in Jekabpils

Bulletin interview with the CEO, Deputy CEO and project manager at LatGran:

Jarl Wallden, CEO SIA LatGran

Ilmars Kass, Project Manager SIA LatGran and owner of the engineering company SIA Icon based in Riga

Martins Zvejnieks, COO and Deputy CEO SIA LatGran

Bulletin: Mr. Wallden, three of your four wood-pellet plants in Latvia are equipped with Büttner dryers. Why did you decide to partner with our company?

Jarl Wallden: When we planned our first plant in 2004, we did not pay the necessary attention to the dryer. We ordered a dryer from a company that did not specialize in the drying of wood chips. After a few modifications, the dryer would work and up to date is still providing good capacity, however, it requires a high degree of maintenance and cleaning.

Against the background of this experience, we prepared a market study for the second plant in Jekabpils and finally, acquired a Büttner dryer. After a joint tour of two single path drum dryers in Scandinavian pellet plants, we were convinced of the high quality of Büttner dryers.

Bulletin: What technical features were convincing to you?

Martins Zvejnieks: The stability of the drying process with a constant target moisture is very important for pellet production. The Büttner dryers operate very reliably under all operating conditions. Their exact target moisture and high efficiency helped us increase the capacity of our plants continuously in the previous years.

Furthermore, we were impressed with the low maintenance requirements. The dryer is cleaned every four weeks as part of the general maintenance. This interval could be extended to eight weeks with no problems.

Ilmars Kass: Even after many years of operation, practically no repairs were needed.

Bulletin: How important is the dryer for the pellet production process?

Martins Zvejnieks: Very important! A constant target moisture, even at different initial moisture content levels, is very important for the smooth operation of pellet presses. Only in this way, we continuously increased the production capacity of our plants and achieved a much higher efficiency for our company than initially planned.

In the foreground hot gas line and above it the connecting flange to the energy plant



Installation of the drum rings



Type 4.0 x 20 R single path drum dryer, Installation of the drum rings





Bulletin: What experiences did you make with the order processing, the installation and startup of the dryers?

Jarl Wallden: From the distribution and planning phase to the on-time delivery to the acceptance test for the dryer, Büttner's attitude has always been very professional and accommodating. We have got to know Büttner as a very service-oriented company. With Carsten Otto (sales), Rickard Modling (planning and startup) and Dirk Wegener (installation) we had the right partners from the start.

Ilmars Kass: Our site manager in Jekabpils emphasized the high quality and accuracy of fit: "In plant engineering, adaptation work during the installation can be necessary. Only Büttner's equipment never had to be adapted!"

Bulletin: For this reason you ordered dryers with the same design three times?

Jarl Wallden: The last three plants have the same dryer model and for their locations in this country the right capacity. We plan with guaranteed capacities and are able to significantly increase the capacity at a later time due to our knowhow. To do so, we need conservatively dimensioned high quality equipment.

We like to share our experiences gained from our different plants with known and proven suppliers. We have not found any defects with the first two Büttner dryers, both systems operate to our

fullest satisfaction. That's why we decided to buy another Büttner dryer with the same design.

Martins Zvejnieks: In this way, we need to stock the most important spare parts only once at each location in Latvia. In case they are needed, we could quickly transport parts from one location to another within the country.

Bulletin: What customers acquire your products?

Jarl Wallden: Our customers are major electricity producers in Great-Britain, Denmark and Sweden. We supply wood pellets exclusively and have long-term contracts with our customers which allow us to plan new plants in the future.

Bulletin: How do you see the economic future of the market for wood pellets?

Jarl Wallden: Pellets are currently the most efficient and simplest way to transport energy. We expect a significant increase in pellet consumption for the foreseeable future. Primarily in Great-Britain, but also in other European countries, power plants are increasingly set up for the use of renewable fuels – pellets take first place.

Bulletin: Thank you for the interview. We wish you continued success in your market!

Type 4.0 x 20 R particle dryer



f. l. n. r. Carsten Otto, Dirk Wegener, Jarl Wallden, Rickard Modling and Ilmars Kass



f. l. n. r. Rickard Modling, Ilmars Kass, Jarl Wallden and Carsten Otto



Opening ceremony



Sicoplan – the Siempelkamp planning professionals: 40th birthday in renovated office

February 2014. Sicoplan, located in Belgium, celebrates its 40th birthday with the opening of its renovated office building at Koningin Astridlaan in Menen-Lauwe, Belgium

by Inga Bambitsch

Sicoplan employees, founding fathers and colleagues from Siempelkamp in Krefeld were present and happy about the successful facelift achieved with the renovation of the office building. With his speech, Dirk Traen, Managing Director of the company, let the history of Sicoplan come alive:

In the beginning of the 1970s, the former Managing Director of Siempelkamp Maschinen- und Anlagenbau in Krefeld, Germany, Dr. Dieter Siempelkamp, realized that for the future it was no

longer sufficient to only develop and sell machines. Also, the technology and planning expertise required for the erecting of turnkey production plants for wood-based materials was in demand. Therefore, Dieter Siempelkamp and Karl Lein joined forces and founded Sicoplan in Belgium in 1974. This was a wise decision from today's point of view because Sicoplan has developed into an indispensable part of the Siempelkamp service range over the years.

The new Sicoplan building



The service range of the planning professionals

As a 100% subsidiary, Sicoplan works exclusively for Siempelkamp Maschinen- und Anlagenbau in Krefeld. The planning domains for Sicoplan are wood-based material production plants (for particleboard, MDF, OSB and other specialties) which are built around the world. The service range includes the pre-engineering, the planning and the startup of partial and complete plants. The planning process starts with the design engineering: This includes the scope of work and the design parameters from the contracting entity Siempelkamp; the potential customer adds further requests such as the raw materials that are to be used and product specifications. With 40 years of experience based on hundreds of planned plants, Sicoplan prepares all required documents including the three-dimensional plant layout, flow diagram, machine lists and capacity calculations. These documents are the basis for substantial discussions with the potential customer.

This is followed by a review phase – the pre-engineering, including three-dimensional detailed layouts, the quantity structure of parts, building plans, consumption data, etc. With the help of



Excellent working conditions



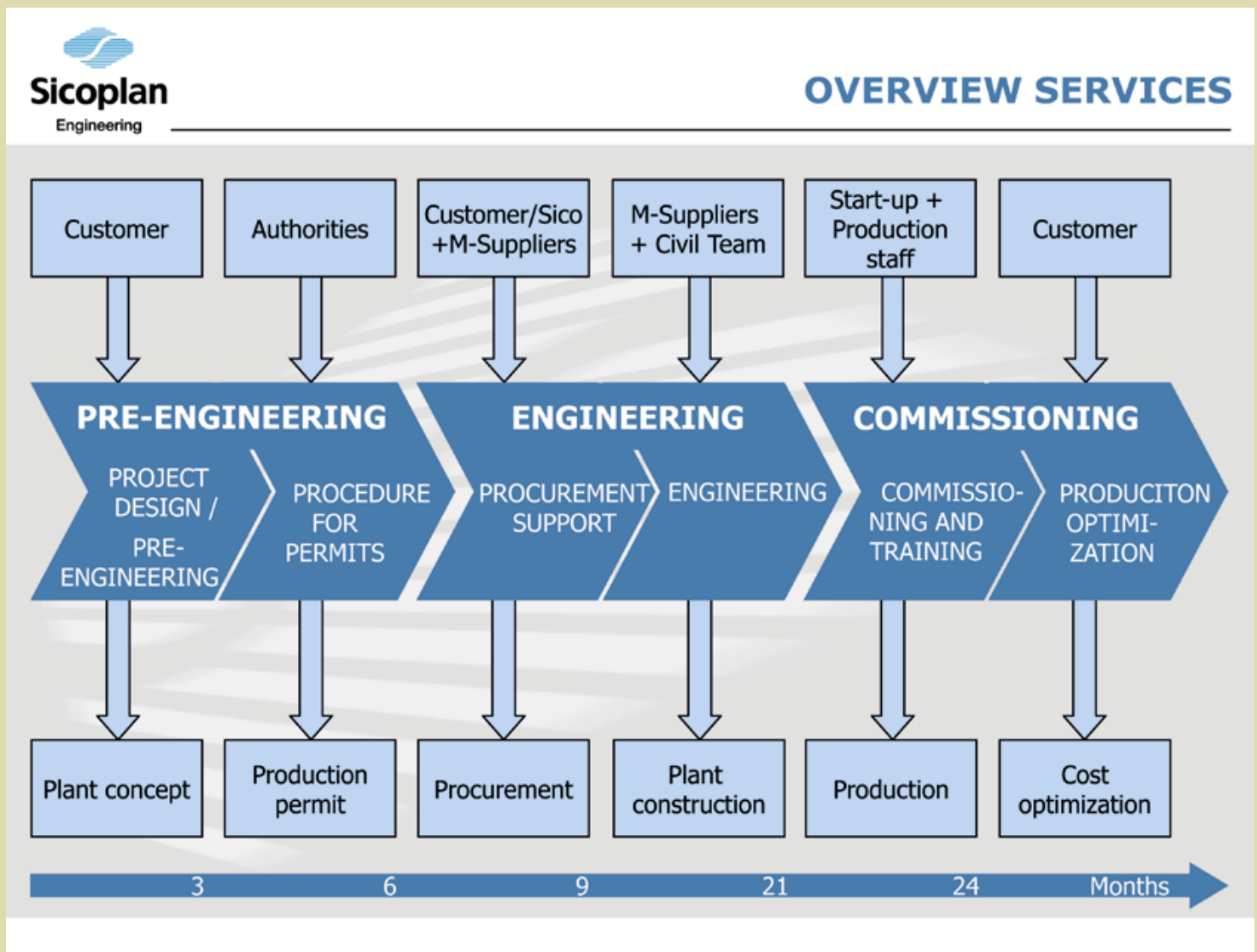
3D engineering

this data as well as further procedural process descriptions, Sicoplan supports upcoming approval procedures leading to the construction approval of a production plant for wood-based materials.

After these steps have been successfully completed, the potential customer could become a real customer by signing a contract with Siempelkamp for the construction of a plant and by making a down-payment. For Sicoplan, the second phase, the actual planning phase, now begins. This phase is divided into the com-

pilation and purchase of the individual machines as well as their installation on site. To do so, all previously compiled data is once more compared with the latest facts and the detail engineering is prepared.

For customers it is important to know that Sicoplan can plan plants for a green-field installation as well as replacements for existing plants. The latter is a significantly harder task because all plant components have to be installed in an existing space in a way that is optimally tailored to the process.

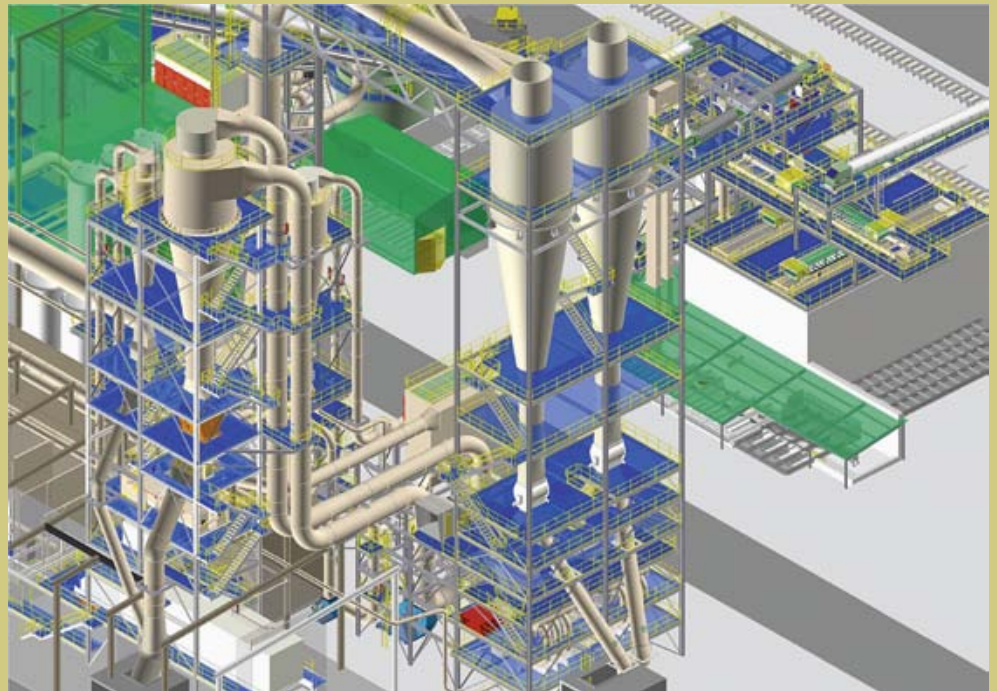


The completion of the installation work is followed by the startup of the plant, which represents the third phase in the Sicoplan service spectrum. In this area, the company supports the technological startup as well as the test runs for the final acceptance by the customer and successfully completes both tasks. With a further performance optimization of the plant, Sicoplan completes the order.

With this brief description of the process which can in some cases last several years and include different demands on the planners, the complexity of the process tasks becomes clear. Sicoplan has a team consisting of 30 specialists handling complex tasks from beginning to end. Know-how, experience and creativity are the virtues necessary for the completion of the process and have been cultivated for many years by our planning office.

Three-dimensional digital prototyping

Sicoplan has been using Autodesk Inventor software since 2002 in order to provide Siempelkamp customers with a virtual model of their plant in color as early as during the planning phase. This is more than a nice gimmick: Using the software, it is possible to generate a virtual representation of the future product on the basis of a single digital model with integrated AutoCAD® and three-dimensional data. On screen an exact digital prototype is created which can be used to analyze and optimize the design of the plant. This means that the plant can be checked for proper operation before it is built.



3D engineering as virtual tour

One of the advantages: since a simulation for the installation and maintenance tasks is carried out on a digital model, this type of pre-engineering significantly reduces the timeframe and budget. This provides invaluable support for bringing all partners involved in a plant project together. Interfaces become visible by means of visualization before the actual work starts. This identifies possible critical points, eliminates friction losses and guarantees completeness.

The responsiveness with which modifications and additions can be integrated into the digital prototype, can likewise not be dismissed. As soon as the detail engineering from the machine suppliers becomes available, Sicoplan adapts the three-dimensional model to the new data in a minimum of time. Furthermore, Sicoplan's focus is on the entirety instead of individual components: "Since all drawings for the subsequent production are developed from one model, the risk that certain drawings are no longer coordinated after various revisions is low," says Dirk Traen. With the help of three-dimensional planning, the layout and steel structures can also be optimized better. Simulating, visualizing and analyzing of plants in many different what-if scenarios is no longer a dream of the future with this technology!

Highest score for Siempelkamp: Container development on the international road to success

Until a few years ago, Siempelkamp produced casks and cask bodies for the transport and storage of radioactive wastes exclusively for the German market, thereby securing the necessary volume for the reliable management of radioactive wastes and spent fuel elements in Germany.

by Dr. Wolfgang Steinwarz



"Drop test" for most secure storage and transportation containers for radioactive materials

Production steps BlueBox®



Raw cast iron body BlueBox®

Optical 3D measurement of the new container type

Chipremoving processing at the Siempelkamp manufacturing center in Mülheim an der Ruhr/ Germany

left:
BlueBox® after the final finishing grinding

right:
Coating



More and more international markets are asking about these services – a consequence of Siempelkamp’s strategic realignment. Concepts such as BlueBox®, Blue-Barrel and TUK illustrate the customization of container designs for customers in the United Kingdom and Russia, for example.

By no later than 2020, the German nuclear phase-out will lead to reduced demand for nuclear waste disposal containers within Germany. With foresight, Siempelkamp has already successfully taken the initiative to strengthen its international scope in the container field. Independent container designs which are consistently aligned with international waste management conditions in terms of their technology have been developed. At the same time approval steps have been introduced and collaborative partnerships for the manufacturing of casks and containers were built up.

Containers are not all the same – packaging is also different from country to country

There is a wide range of containers of different types available for the safe handling of radioactive wastes during transport and storage, with varying levels of shielding effectiveness, as well as different shapes and sizes. Depending on the requirements, various materials are used – e.g. steel/sheet steel, concrete or cast iron.

A number of laws form the framework conditions for container production: traffic law, the Atomic Energy Act and the Radiation Protection Ordinance, as well as the storage conditions of the interim and final storage facilities each have their requirements. Therefore, the containers must ensure the required radiation shielding and tightness, e.g. depending on the radioactivity inventory. They also have to satisfy certain integrity criteria, taking into account the use of defined transport conditions and accident scenarios.

Although these criteria are defined worldwide by mutual agreement under the auspices of the International Atomic Energy Agency (IAEA), they are ultimately only recommendations. “Since nuclear law is a

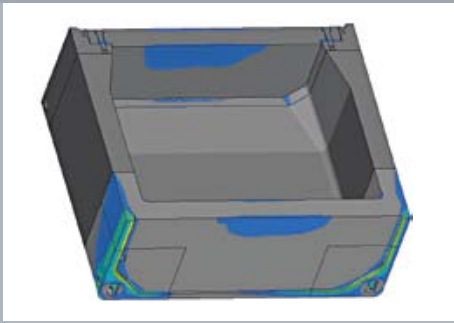
national issue of the community of states, the legal requirements for authorization often differ significantly. This can be explained mainly by political, infrastructural, geological and technological framework conditions. This complex framework infers that we need to tailor our products accordingly”, says Dr. Inga-Maren Tragsdorf, head of container technology.

New markets – different preconditions

The starting point for the development of new container designs was the market situation in the UK about three to five years ago. Concrete and steel containers were mainly used there for the interim storage of radioactive wastes. This solution caused problems with a view to a long-term disposal solution at a future geological permanent disposal site.

Magnox Ltd., as one of the major UK nuclear power plant operators, showed itself to be open to alternatives. Here, Siempelkamp succeeded in introducing the material-specific advantages of ductile cast iron in a convincing manner.

Drop test BlueBox®



Calculation of the 5.20 m drop test



Attachment of strain gauges and acceleration sensors before testing for data acquisition and following evaluation



Mounting of the lifting device for the transport at a height of 5.20 m



Preparations for the drop test



Drop test: dropping from a height of 5.20 m

BlueBox®, the new development – very British!

The aim was to realize a recognized solution with approval periods which were as short as possible for the British market. Therefore, the focus was initially on the commissioning of the cast iron containers which are well established on the German market and customized to the disposal conditions at the German KONRAD permanent disposal site. These have been and are currently manufactured by Siempelkamp and delivered to the UK through the strategic partnership with the German Gesellschaft für Nuklear-Service mbH (GNS) in Essen.

After this initial phase, Siempelkamp and Magnox agreed to pursue another, now specifically British approach. Within an extremely short time, a new container concept was developed for the transport

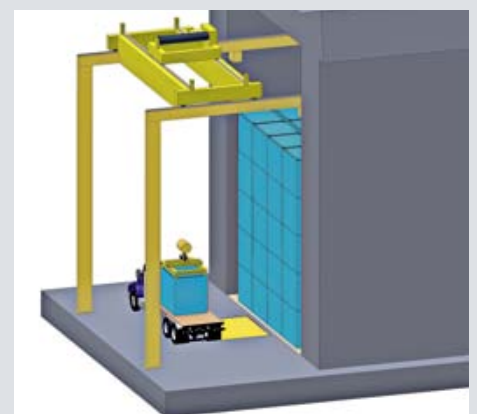
and storage of radioactive wastes which was successfully approved in the UK. The concept with the product name BlueBox® offers a design – patented since December 2013 – which is tailored to the specific conditions of use and optimized in comparison to similar container versions. And also – since the beginning of 2014, the BlueBox® is a registered trademark.

Sophisticated safety tests for safe storage and transport

After extensive development and preparatory work, as well as the casting and mechanical processing of the BlueBox® prototype, a probation test was on the agenda: The British licensing authorities demanded evidence – in accordance with nuclear law regulations – of the resilience of the new container type in aggressive accident scenarios.

Special design calculations and simulations of case scenarios or fire events demonstrated the high levels of safety redundancy. In accordance with the requirements and according to the concept status of a future national permanent disposal site in the United Kingdom, two real drop tests with a height of 0.45 m and 5.20 m were defined.

These tests took place in England, in January 2013. The main elements of the test equipment were a 150-tonne crane system and a large-volume 700-tonne concrete structure



Storage concept for the BlueBox® on the UK market

Everything from a single source: ductile cast iron as container material

The disposal concept in many countries with nuclear facilities is based on container designs which have to meet complex requirements for transport and storage. This gives rise to special qualification features for the material – and the comprehensive solution is “cast iron with spheroidal graphite (ductile cast iron)”.

The special properties of the material lie in its ferritic microstructure with embedded, ball-shaped graphite particles. This structure ensures ductile and therefore cushioning behavior with respect to external influences.

The feature which is responsible for this in particular is the relatively high carbon content at around 3.6% and a sophisticated and detailed chemical analysis with special trace elements for the casting process.

In addition, the technical casting process provides a monolithic container structure. Under the motto “everything from one source”, this covers diverse requirements: safe containment, shielding without additional seams (e.g. welds) with a highly flexible design concept, reproducibly narrow tolerances.

Magnox Ltd.

Magnox Ltd an EnergySolutions company and is responsible for ten nuclear power plant sites in the UK. Companies with a site license – like Magnox Ltd – operate the NDA (Nuclear Decommissioning Authority) sites within the framework of a contract. They are responsible for the daily operation of the site and the implementation of the site programs.

with a 75 mm-thick steel cover plate – the so-called unyielding foundation. As a result, the impact momentum inside the container was more or less fully reproduced. A large range of measuring and recording technology determined all the necessary data. All follow-up analyses confirmed the high quality of the new Siempelkamp product. The approval process was completed successfully in the summer of 2013.

BlueBox® successfully tested – framework agreement with Magnox

Magnox included the successfully qualified Siempelkamp product in its assessment for the official international invitation to tender for the supply of waste containers. Siempelkamp was selected with the highest rating level (“highest score”) for a long-term framework supply agreement, together with two other national manufacturers. This agreement was signed in November 2013.



Signing of the framework contract: Dr. Wolfgang Steinwarz, Neil Baldwin – Managing Director Magnox Ltd. and Benedikt Szukala (sitting from left to right)



Magnox interim storage facility in Berkeley, with a storage capacity of up to 1,004 containers



Casting of a TUK-141 container



New development BlueBarrel – the cylindrical brother of the BlueBox®

At the same time as the development of a cubic disposal container, Siempelkamp pushed ahead with the design work on a cylindrical container solution. The experience with the BlueBox® approval was a good example here. Here too, the concept certification was successful: With the BlueBarrel, a further suitable Siempelkamp container type is therefore now available.

TUK – a German-Russian coproduction

Siempelkamp is also changing things in Eastern Europe and Asia: Here it was about finding appropriate alternatives to the established steel containers which are used for the transport and storage of spent fuel elements. In order to be able to provide appropriate large cast containers, Siempelkamp established a cooperation with a Russian partner with an appropriate design license. This company has a wide

range of designs under the product name TUK, which addresses the requirements of the Russian market.

Very quickly, both partners sounded out their chances for a joint market presence: Russian design plus casting production with subsequent mechanical processing of the raw casting cask body at Siempelkamp – a winning combination!



Preparation for the drop test: equipping the TUK-141 with shock absorbers at the warehouse of Siempelkamp's cooperation partner (on the right)

The Krefeld container team supporting the container expert Dr. Wolfgang Steinwarz (left), in the foreground a model of the TUK-141 container



A long drop down for maximum safety

As a “starter pack” of the collaboration, the TUK-141 version was chosen and introduced as a prototype into the Russian approval process. Again, drop tests such as from a height of 9 m were of central significance: they had already been successfully carried out in the fall of 2012 near St. Petersburg – precisely in accordance with the IAEA requirements with large-scale participation of the state authorities and licensing institutions! The

new large cast iron container received its nuclear regulatory certification at the end of 2012. The assessment of the related TUK versions then led to the approval of the complete “TUK family”.

The international consequences were positive: Because at the successful qualification of the TUK-141 and its family members, Siempelkamp also qualified for the Asian container market. Our proposal successfully impressed the Chinese!



9 m drop test: crashing fall – for maximum safety



Accident scenario: impact on a steel punch of 15 cm in diameter, from a height of 1 m for subsequent leakage testing

Manufacturing of the TUK-153 transportation and storage container for spent fuel elements for the delivery to the Chinese nuclear power plant Tianwan



At the beginning of 2013, Siempelkamp – together with a Russian general contractor – saw off strong international competition. The task comprised of six transport/storage containers for spent fuel elements for the Chinese nuclear power plant in Tianwan. As part of this major project, the Russian production company is responsible for project management, provision of the fuel element carrying baskets, corrosion coating and the overall assembly.

Since then, the project has progressed according to plan: The last TUK container

of type TUK-153, with a raw casting weight of 127 t, left the Siempelkamp site of Mülheim after casting and mechanical processing at the end of March 2014 in the direction of Kursk for final handling, with the ultimate destination of China.

Siempelkamp: the “winning team” for international container construction

Conclusion: Supply interest in the new Siempelkamp BlueBox® product has now been aroused in Russia and Japan. “We are now dealing with various inquiries and tenders for the TUK containers, especially

for projects with Russian nuclear power plant types. Appropriate decisions are still pending”, says Dr. Wolfgang Steinwarz.

“Of particular interest is the first step towards entry into the Japanese market. We are taking this step within the context of a feasibility study financed by Japan, which will open up new paths for forged steel container technology in the face of strong domestic competition: the alternative links Siempelkamp ductile cast iron and Russian container design with a Japanese engineering company as a partner.”



Successful approval: the Chinese end customer is convinced of the heavy casting container quality “made by Siempelkamp”

Unfamiliar terrain, professionally entered

Bulletin in an interview with the long-standing container expert and CEO of Siempelkamp Nukleartechnik, Dr. Wolfgang Steinwarz.

Bulletin: So far Siempelkamp has almost exclusively made containers for the German market. What challenges does Siempelkamp see itself confronted with in the international market place?

Dr. Wolfgang Steinwarz: For the project in the United Kingdom, we had to react extremely short time – an unfamiliar terrain and new framework conditions awaited us. We resorted to known solutions in container construction, which we adapted to the requirements. In addition, it was necessary to take into account different permanent disposal site concepts and geological conditions.

How many Siempelkamp employees formed the container team?

Dr. Wolfgang Steinwarz: In the initial phase, it consisted of two employees. It went very quickly over to the implementation phase, whereby we were able to benefit greatly from the synergies in the Siempelkamp Group. Design calculations were performed by colleagues from Siempelkamp Prüf- und Gutachter-Gesellschaft mbH, who also supervised the drop tests in England. Meanwhile, the container team in Krefeld is ten men strong – and well prepared for the demands of the international market.

What makes Siempelkamp interesting to the international container market?

Dr. Wolfgang Steinwarz: For one thing, certainly our knowledge of the international market. Our networks are correspondingly strong – and our successfully completed projects open doors for us. Another important foundation is our long-standing know-how in dealing with ductile cast iron materials and their possible flexible applications.



Dr. Wolfgang Steinwarz, Managing Director of Siempelkamp Nukleartechnik – the container technology specialist

What's next?

Dr. Wolfgang Steinwarz: In the United Kingdom we have seen a successful market entry and have asserted ourselves against established, strong international competition. The Asian market with its newly built nuclear power plants has a high demand for waste containers. The good name of "Siempelkamp" is encouraging customers to send enquiries to Krefeld. Offers have already been submitted. In particular, we are experiencing great interest in Japan in the container product "made by Siempelkamp".

Dr. Steinwarz, thank you for the interview and please wish the Siempelkamp container team continued success for the internationalization of its products.

Siempelkamp NIS Ingenieurgesellschaft: Safe and reliable monitoring from start to finish – from doctor's appointment to access control



How is it that a product designed for use in a nuclear power plant comes to be used in a salt mine? Our report on PADE, an NIS Ingenieurgesellschaft system, reveals more...

by Jörg Eckelmann

The former "Asse" salt mine in the German district of Wolfenbüttel in the eastern part of Lower Saxony (Photo: Asse-GmbH)

From the salt mine to a disposal site for nuclear waste: 490 m deep inside the pit – the clearance measuring station of the radiation protection specialists (Photo: Asse-GmbH)



Mining in the Asse pit (Photos: Asse-GmbH)



In 2012 NIS received an order to introduce their dosimetry system PADE at the firm Asse-GmbH in the former German salt mine Asse – the first use of the Siempelkamp PADE system outside a nuclear power plant!

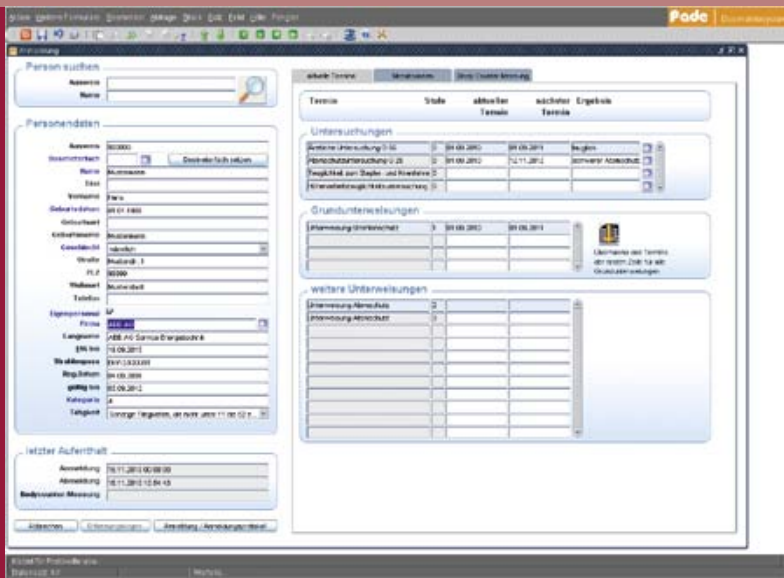
“The friendly shout of ‘Glück auf!’ (the greeting of miners in German - meaning ‘good luck’) which we were wished at the entrance indicated that the focus of the work here is not only on the operation of a nuclear facility, but more on the management of a mine”, reports Dr. Aldo Weber, head of process data processing. The installed system has been going through the authorities’ approval process, for example TÜV Nord, since 2013.

Background to this unusual project: In 2009 the decision was taken that in the future the processes at the Asse II mine shaft would be similar to those used at a permanent disposal site. This required the installation of the proven Siempelkamp system. Since then, the Federal Office for Radiation Protection has subjected Asse to the provisions of nuclear law. This imposes more stringent requirements than mining law in respect of the operation, decommissioning and radiation protection of the plant. Thus, the system had to be adapted during the course of the project from the requirements of a nuclear power plant to the dosimetry needs of a permanent disposal site.

Asse – the salt mine for the nuclear storage site

- 1900: Start of salt mining in the Asse Heeseberg ridge north of the Harz Mountains.
- 1909 – 1964: Excavation of potash (up to 1925) and rock salt (1916 – 1964) in the Asse II mine shaft.
- 1964: The mining of salt is stopped.
- 1965: The disused shaft is purchased by the federal government. Similarly, in 1965 the Federal Ministry of Scientific Research and Technology (today: the Federal Ministry of Education and Research) commissioned the Association for Radiation Research (now : Helmholtz Center Munich) with research into placing radioactive wastes into final storage in the disused mine.
- 1967: After corresponding building alterations, the trial deposition of radioactive waste begins. By 1978 a total of 125,787 drums and containers with low- and intermediate-level radioactive waste are stored in Asse II.
- 1978: End of the storage after the Atomic Energy Act was amended in 1976. As a prerequisite for the final storage of radioactive wastes, a planning approval process under nuclear law was now mandatory. Mining law remains the legal basis for the operation of the mining shaft at Asse II.
- 2009: The BfS – Bundesamt für Strahlenschutz (Federal Office for Radiation Protection) is the new operator of Asse. The decision is taken to treat Asse II as a permanent disposal site in the future with respect to its process engineering. Since then, the BfS has run Asse under nuclear law. This imposes more stringent requirements than mining law in respect of the operation, decommissioning and radiation protection of the plant.

"PADE" logon screen: registration of personal data for the dosimeter system



Personal alarm dosimeter: an alarm is triggered when predefined limits are exceeded



PADE, a process information system for personal- and order-related dose control at nuclear power plants

PADE dosimetry system: the services

The radiation protection ordinance imposes very high demands on the monitoring of the health of persons who work in areas where potentially increased radioactive emissions may occur. Even dose rates below the values that occur, for example, when traveling on vacation by plane mean a high level of costs and effort to protect staff. The safety of the work in the monitored areas must be made clear at all times without omissions to all parties concerned, as well as the competent authorities.

This is where PADE comes into play: The system manages the systems access control and monitors personal and job-related dose values for the restricted access area of nuclear facilities (see box). It takes into account and monitors compliance with the dose limits of the radiation protection ordinance and the validity of the required analyses and instructions.

The specifications for this are primarily laid down by the radiation protection ordinance. Also, the specific requirements of different systems are implemented, as well as the requirements of the respective competent authorities.

Services for Asse

As part of the project in the Asse salt mine, access to the various sections and chambers of the storage area were fitted with dosimeter readers. The personnel performing work underground always carry electronic dose measuring equipment (dosimeters) with them. In this way it is possible to assign a measured dose to the individual areas and prove that the work underground is not exposed to contamination.

Dose balancing takes into account operational and official gamma doses as well as officially determined incorporation doses from body counter measurements and excretion analyses. Monitoring can be carried out according to dose limits for the daily, monthly, annual and lifetime dose. The system also enables the monitoring of detection and requirement thresholds of doses resulting from the inhalation of tritium, radon or aerosols whilst working in subareas of the monitored area. To that end, the working hours in the pit areas, as well as the natural activity concentrations of radon measured in the areas are evaluated.

PADE: six safety features

Schedule monitoring: People who want to work in the monitoring areas of nuclear facilities must be physically fit. PADE helps to check and safeguard this fitness status by reminding them of important appointments – e.g. instructional and medical examination appointments. The system generates reminder messages when a date has passed and denies access to the restricted area if necessary.

PADE in profile: in use for 25 years

Siempelkamp NIS Ingenieurgesellschaft mbH has supplied dosimetric systems for nuclear power plants in Germany since 1999. Background: a wealth of experience developed over many years in the fields of radiation protection and information technology, as well as in the processing of licensing procedures. The Siempelkamp PADE product currently supports the dosimetric personnel at twelve German nuclear plants in their daily work. The database system manages the access control system and monitors the personal and contract-related dose values for the restricted access area. The conceptual development of the system was carried out in close cooperation with the nuclear power plant operators in Germany.



Entry/exit to the control area of Biblis NPP in Germany: left in the background is the incorporation monitor



Dosimeter-counter outside the entrance to the control area inside the NPP



Dosimeter reader (left) at the 750 m level inside the Asse pit at the entrance of the monitoring area (Photo: Asse-GmbH)

Evaluations: PADE includes a powerful reporting system. It creates not only evaluations for daily work, but also finished compilations for corporate or official monthly and annual reports.

Electronic dosimeters and dosimeter readers: For the management of access to the monitored areas and the receipt of the inspection data, PADE has interfaces with all types of electronic personal dosimeters approved in Germany. A "life-cycle file" records all calibrations, test results and problems. In this way, PADE can prevent the use of dosimeters that perform poorly, if necessary.

Official measuring point: An interface is implemented in PADE that provides access to the electronic exchange of data with the official evaluation bodies in Germany. These bodies are important because they determine "official doses" that are incorporated into the monitoring of the lifetime dose of employees – a long-term, external protection.

Incorporation and contamination monitors: These help to prevent the spread of radioactive particles. PADE uses an import interface for the acquisition of the measurement data – and warns of or imposes access blocks when thresholds are exceeded.

Dosimetry – what is it?

Dosimetry refers to the measurement of radiation, which is relevant for the assessment of radiation risks. Measurements are carried out, for example, using whole-body dosimeters or extremity dosimeters.

For persons exposed to radiation occupationally, the radiation exposure must be determined individually according to the dosimetry regulations = personal dosimetry. A distinction is made between external and internal radiation exposure:

- External radiation exposure: caused by devices such as X-ray equipment, computer tomography devices or by closed and open radiation sources. A dosimeter measures the radiation occurring on the body surface.

- Internal radiation exposure: caused by absorption through the mouth or skin or by the inhalation of radioactive nuclides into the body. This process is called "incorporation". The radioactivity stored in the body is measured with a thyroid monitor or whole-body counter, and the excreted radioactivity in the stool and/or urine.

The dosimeter is a device for measuring the radiation dose which is carried in the personal dosimetry system on the body. Whole-body and finger ring dosimetry are used for this.

Info terminal: With the help of this PADE function, employees can view the data stored about them – e.g. current dose values, the validity of analyses and instructions, as well as access blocks. The devices can be set up at any desired locations in the plant.

Siempelkamp system: national and international in demand

PADE, the strong and versatile dosimetry system, is currently making waves. "In

2013 we received a commission for the installation of our system for the final storage site for radioactive wastes in Morsleben, and currently we are introducing PADE at the firm Urenco Deutschland GmbH in Gronau", says Dr. Weber. Currently, extensive discussions are taking place with customers in Germany and other European countries. "For example, we are working to establish our product outside of the German nuclear power plants and to develop new markets!"

NIS-PAR modules by Siempelkamp NIS Ingenieurgesellschaft: Added safety worldwide in nuclear power plants

Siempelkamp NIS Ingenieurgesellschaft's performance in Asia was impressive in 2013: NIS-PAR modules are now also beginning to be used in Japanese nuclear power plants as safety devices for hydrogen depletion in hypothetical incidents. The customer therefore uses a highly proven Siempelkamp product to control the release of hydrogen during an imputed core melt accident.

by Martin Giegerich



H₂-recombiners in various sizes and designs, custom made in accordance with design calculations of the reactor buildings



NIS-PAR modules or also H₂-recombiners are considered to be extremely important safety devices in power plants. This has also been recognized by the power plant operator TEPCO: After intense contractual negotiations, the Mitsui trading house signed the contract in November 2012 for its customer TEPCO for the delivery of NIS-PAR modules to the units 1 and 7 of the Kashiwazaki-Kariwa power plant site in Japan.

In January 2013, NIS representatives traveled to Tokyo to demonstrate the merits of the Siempelkamp H₂-recombiners to TEPCO and Mitsui. In return, they invited their Asian partners to Germany: At the Grundremmingen and Biblis nuclear power plants, the main focus was on exchanging experience with the operators – e.g. concerning installation locations as well as testing and maintenance measures. It was possible to implement this transfer of knowledge to our Japanese customer in a practical manner by end of February 2013, on the basis of the NIS-PAR modules installed in the German NPPs.

In March 2013 – after only five months of project time – delivery to Mitsui was on the agenda. NIS-PAR modules are now also used in Japanese nuclear power plants as safety devices for hydrogen depletion in hypothetical incidents. As a result it was possible to convince a particularly critical customer of the advantages of the safety system, which works reliably and in a highly efficient manner in all specified operating modes.

Development for the highest safety levels in nuclear power plants

This safety system is based on years of experience, research and development. Siempelkamp NIS Ingenieurgesellschaft began to explore methods by which the hydrogen concentration can be controlled in the containment of nuclear power plants over 20 years ago. The result of this research was the NIS-PAR module, a Passive Autocatalytic Recombiner which transforms hydrogen together with oxygen in the ambient air into water and heat.

How does the effectiveness of the module prove its worth? “In an incident at a nuclear power plant, hydrogen can be released through chemical interactions. This hydrogen, in conjunction with oxygen in the air, can be ignited by a spark even in

small quantities. Previous concepts for controlling hydrogen provided for the deliberately induced combustion of hydrogen through targeted ignition. This process is now being questioned and solved differently by the NIS-PAR module”, says Berthold Racky, plant construction manager/consulting and expert on the NIS H₂-recombiners.

The advantages of this concept are impressive in view of the Fukushima accident. Since then, public authorities have made it a requirement for many nuclear power plant operators to improve their measures for controlling the hydrogen concentration so that a hydrogen explosion is not caused, but rather prevented. “The installation here of H₂-recombiners in the containment of nuclear power plants is an effective and low-maintenance solution that is easy to implement”, says engineer Racky.

Images of the installed NIS-PAR modules in Kashiwazaki-Kariwa NPP 1 and 7 on the Tokyo Electric Power Corporation's website (TEPCO)



“Chimney Effect” – how the NIS-PAR module works

The NIS-PAR module works according to the “chimney effect”, a physical phenomenon that describes an airflow which is usually vertical. Upon entry of the gas mixture into the H₂-recombiner, hydrogen is depleted and thereby the NIS-PAR module heated. The resulting heated air at the bottom of the module has a lower density than the cold air above it. The light air rises and flows out of the housing. At the same time, fresh air in the room is sucked from below through the lower opening of the recombiner, also heated up and drawn up. As a result, the chimney effect is completely self-sustaining.

The NIS-PAR principle: once installed – always ready for use

The NIS-PAR module works passively, i.e. without any active intervention by the team of operators. It all starts with the catalyst material being filled into cassettes. These cassettes are inserted into a stainless steel housing. The catalyst used here – similar to that in a motor vehicle engine – is the noble metal palladium, which is applied to small catalyst pellets.

The housings are available – depending on customer requirements and the space available on site – in numerous sizes and designs. They all work on the same principle: Housings and cassettes form flow channels as a result of the heat produced, through which the hydrogen-enriched air passes. When the air passes through the catalyst cassettes there is a catalytic reaction: Even with a low hydrogen concentration, hydrogen in the air is broken down – with the reaction starting and being maintained fully automatically. Every wood stove works in the same way, by the so-called “chimney effect.”

NIS-PAR on course for international success

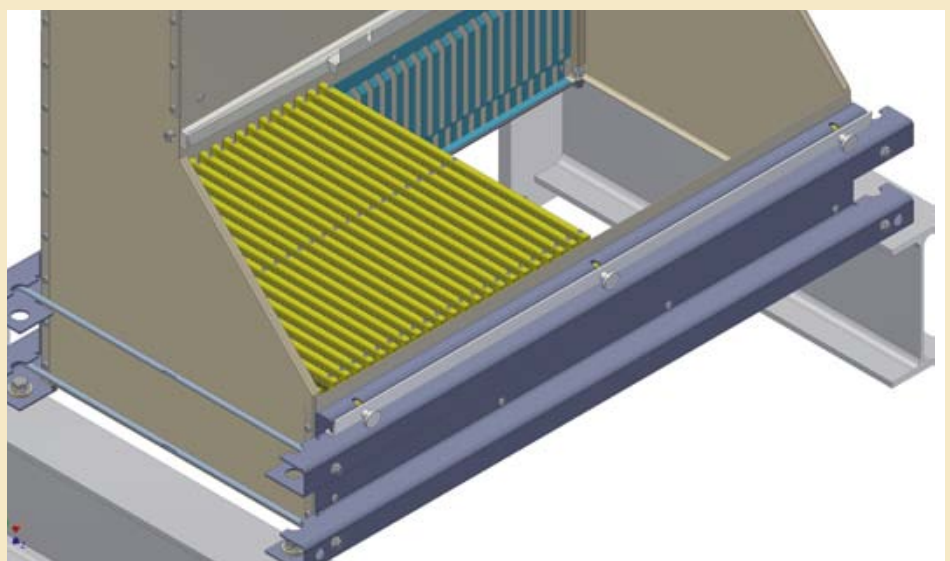
Between the pioneering years of the concept and the current sales success, there were about 20 years in which the internationalization steadily progressed. In the 1990s, German nuclear power plants ordered the first NIS-PAR modules.

Initial international experience was gained in the Hungarian town of Paks – then the demand from other countries increased continuously. Siempelkamp has been cooperating with the American Westing-

house Electric Company since 2012. As a result of the framework agreement with this partner, the Krško/Slovenia, Kashiwazaki-Kariwa/Japan and Angra/Brazil nuclear power plants followed as additional customers who ordered the modules.

Further projects for the coming years are already taking shape in collaboration with Westinghouse. More projects with the Japanese company Mitsui are planned for 2014 in Japan, including the nuclear power plants at Shika and Onagawa. In 2015, NIS-PAR modules will be installed in the Czech Temelin nuclear power plant. In 2016, a further Japanese customer is planned in the shape of Higashidori.

The greatest emphasis is placed on cooperation in the Japanese market in particular. For Asian customers, mutual trust in the cooperation is of the utmost importance. So it is not only important for NIS to be properly supported by their partner Mitsui when translating and interpreting. Also, cross-cultural exchange, the knowledge of different norms, values and communication styles belongs to the ‘must haves’ in order to successfully bring the representatives of two nations to the table.



NIS-PAR modul with opened inspection flap and view to the catalytic cassettes: the smallest recombiner can house 11 cassettes, the biggest up to 88 pieces

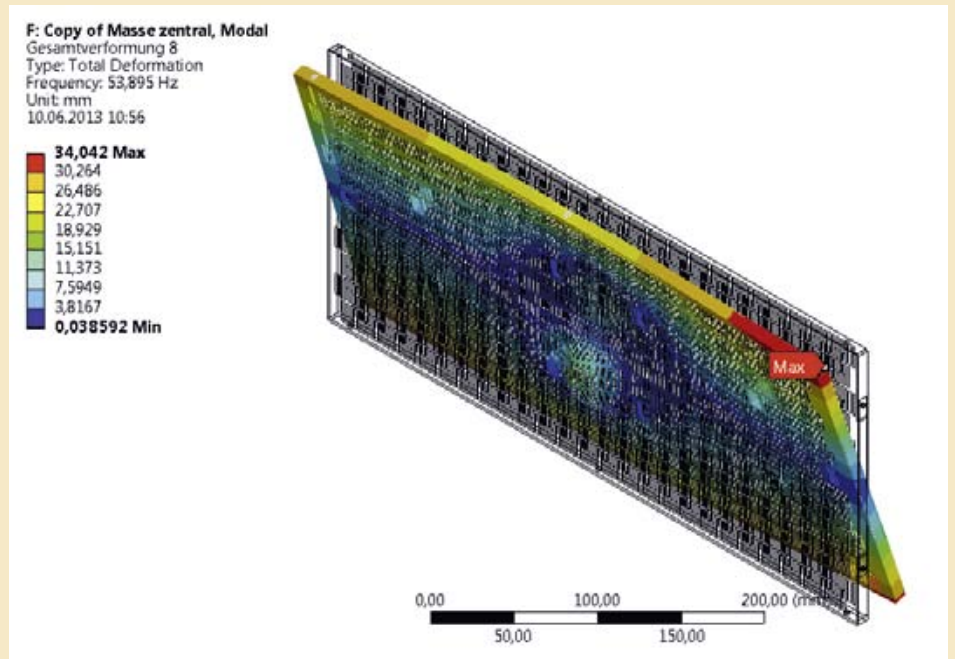
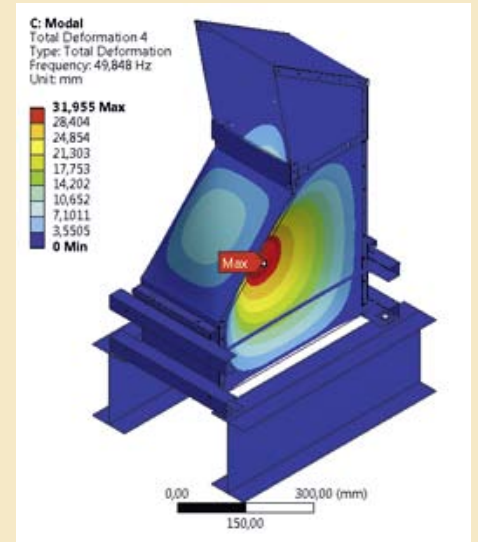
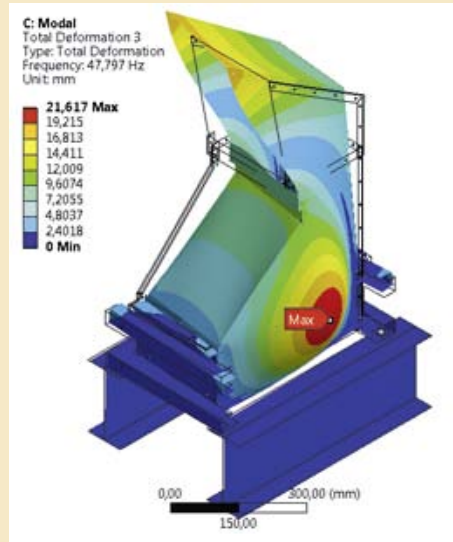
**Function optimization:
always a decisive step better**

The Siempelkamp concept for controlling hydrogen has been successfully tested worldwide, so that the homework has been done. The research and further development of the NIS-PAR modules does not stop there.

The NIS' own Technical Center in Alzenau serves as a nerve center where new catalyst materials are currently being tested. The team also explores the potentials of depleting other gases in addition to hydrogen.

In addition, the utmost attention is devoted to the centerpiece of the NIS-PAR module, the cassettes filled with catalyst pellets. A new filling station has been specially created on the premises of the technical center. There, with the help of vibrating equipment, the cassettes are filled with the catalyst pellets, the cassettes closed and securely packed. This ensures that this important step in production takes place under the eyes of the Siempelkamp quality inspectors at all times.

In addition, every H₂-recombiner and every cassette is put to rigorous test in the NIS technical center before delivery. "Nothing leaves our firm which does not conform to our quality standards and corresponds to the wishes of our customers", guarantees Berthold Racky.



Calculation of natural frequencies and deformations of recombiners and catalytic cassettes



Catalytic cassette



Palladium-coated catalyst material



Earthquake simulation in the NIS Technical Center: fixed on a vibrating table, the reliability check of the H2-recombiners takes place

Customized and personalized

Since each customer has different wishes and requirements for “their” product, each NIS-PAR module is designed a little differently. To meet this demand, many hands work on the final product.

On the one hand, these are the sub-contractors for the housings and empty cassettes located in the region around Alzenau, and on the other hand the synergy effects within the group come to fruition. The Siempelkamp Prüf- und Gutachter-Gesellschaft (SPG), for example, creates seismic analyses for the individual interpretation of the recombiners that are tailored to the earthquake requirements applicable at the installation site.

The earthquake requirements for use in Japanese nuclear power plants, for example, turned out to be several times

higher than was required for other installation sites. As a consequence, it was necessary to redesign the holding and stabilizing structures of the housing. Within three weeks, SPG created a finite element model of the KKH11 NIS-PAR module and carried out the stress analysis. The basis: Load assumptions of an earthquake with peak acceleration values corresponding to 9 times the acceleration due to gravity!

These exemplary studies are regularly backed up by actual seismic testing. For this purpose, a NIS-PAR module is clamped to a table and “thoroughly shaken” with a force and for a duration which is several times greater than even the strongest anticipated earthquake. This ensures that each customer receives a totally reliable safety product, individually tailored to them.

NIS-PAR modules reinforce the safety of Japanese nuclear power plants

In 2013 alone, Siempelkamp supplied more than 280 recombiners worldwide. “A sign that our product is internationally recognized and valued.

In the next few months, we expect that the use of NIS-PAR modules will also come under consideration in other Japanese nuclear power plants, and in the new edition of the revised regulations in Japan, the use of hydrogen recombiners will be made mandatory”, says Siempelkamp expert Racky, glimpsing into the future. At the present time, out of 54 nuclear power plants in Japan in 2012, only two have been put back into operation after the accident in Fukushima (March 2011). After the completion of safety checks and the installation of additional systems to improve incident safety, further plants will be returning to the network.



The Japanese end customer TEPCO convinced itself of the quality of the NIS-PAR modules at the German Biblis NPP



Filling station for the cassettes filled with catalyst pellets on the premises of NIS in Alzenau



The NIS-PAR modules convinced the Japanese energy supplier TEPCO

12 steps to zero-defect strategy: How Siempelkamp teamwork makes powerful engines



The process begins with sales contacts and incoming orders, and ends with quality control: In between there are further steps, performed by different departments of the Siempelkamp Giesserei, which pass on the "engine contract" baton – and never let it fall. As teamwork, accuracy and good communication are the top priorities on any order docket. In "Bulletin" eleven Siempelkamp employees report on the contribution they make to the "finished engine block".

by Dr. Silke Hahn and Martina Glücks

The corporate "rooftop"



Jens Wenzel, 44 years old

Plant manager of Siempelkamp Giesserei

With the company since 2004

Diploma in Foundry Engineering

Responsible for 300 employees

"As a pace setter and motivator, I am responsible for ensuring effective teamwork, safety, quality and adherence to delivery dates. But I am also known for the 'three Ts': tonnes, tonnes, tonnes of castings!"

01 Sales



Dirk Howe, 43 years old

Sales manager

Training as a machine and plant engineer, mechanical engineer and business administrator

Working for the foundry since 2005

Sales team: 6 employees

“Our customers from the engines sector feel well looked after. Since the end of the 1980s they have been practically part of the family.”

Sales is the driving force...

... for valuable and long-term customer relationships. For example, the Finnish Wärtsilä Group has been an important and continuous cooperation partner since 1987, ordering a large number of crank cylinder housings from Siempelkamp every year. The large cylinder housings are cast in Krefeld and used by the engine builders on cruise ships, for example. Siempelkamp also receives contracts for casting smaller engine housings, for example those used in decentralized power plants.



Marine diesel engine ready for the “great voyage”
(Photo: Wärtsilä)

We are continually coordinating new projects with our partners. “Engines are always needed. The only question is whether oil, gas, biogas or other resources are used as fuel”, says Dirk Howe, looking into the future. “Engines will still be needed in the next 50 years – but which fuels will be used to operate them?” One trend that is clearly becoming apparent is that finite resources will be replaced by regenerative ones, e.g. hydrogen.

Unique selling point: changeover “at the push of a button”

What is currently the least expensive medium on the market? Some engine builders are achieving success with the added value for their clients by offering dual-fuel engines. At the push of a button the engine changes over from diesel to gas, for example. Optionally, it can also be operated with both types of fuel. The decision which fuel type to use on the high seas is made under the aspect of optimized consumption or in accordance with the guidelines for the route. In the latter case, the environmental zone of the sea specifies which fuel may be used. This flexibility is supported by Siempelkamp with their services in the field of engine



Engine blocks in operation on oil platforms

construction, which the company has been able to establish since the 1970s.

Demand?

... is secured in many ways. Engine housings made by Siempelkamp are used not only in shipbuilding, but also on oil platforms. In decentralized power plants, for example in Siberia or remote areas in the mining industry which do not have their own source of energy, the castings are also in demand. But also nuclear power stations or hospitals must never be disconnected from the grid – and this is

guaranteed by Siempelkamp with its crankcases for the construction of emergency generators.

“Ei kysyvä tieltä eksy”

What challenges does the Siempelkamp sales department have to take into account with respect to engine construction? In the 1970s, when Siempelkamp began to produce crankcases, the focus was on compliance with the dimensions of complex

geometries. Engine blocks with weights between six and twelve tonnes with six to fourteen cylinders were the starting point for today's mass production. “Many factors had to be taken into account – e.g. the coming together of different wall thicknesses and an exact analysis of the cooling, stress and cracking behavior derived from them. As the sales department, our task was to keep our finger continuously on the customer's ‘pulse’ in order to coordinate the requirements and solutions with all internal

and external participants”, explains Dirk Howe. Even today this dialog is important, although the tasks and challenges have changed. Today it is important to guarantee the dimensions and accuracy of the engine blocks for mass production. We at Siempelkamp maintain a permanent dialog with our customers from the field of engine construction. In this context we could use a saying of our Finnish customer as our motto: “Ei kysyvä tieltä eksy” – or: He who asks does not get lost.

02 Commercial order processing: incoming orders / order processing / transport



Mascha Jaspers, 35 years old

Industrial business management assistant

At Siempelkamp since 2000, started at the subsidiary ATR

At the foundry since 2008

Team: 4 employees

*“We are the interface for the company.
We deal with the topic of engines every day.”*

From sales to order processing

As soon as sales receives an order, order processing goes into action. The department

- issues a project number for the current contract,
- communicates the project number to other departments involved (e.g. pattern shop, fettling shop, manufacturing, quality control),
- induces the other departments to schedule the contract.

Engines are series products and are ordered regularly, i.e. monthly. For this reason, certain tasks which arise in the case of individual orders – e.g. a check of



Engine block

delivery and payment arrangements – are not required.

Casting number: the engine's "passport"

Every engine is provided with a casting number, which can subsequently be seen on the casting itself (year of production + number of the casting). The manufacturing number is issued after consultation with work preparation and the production management. The casting dates are also specified.



Passport of the engine

Order processing now releases the project – scheduling and material purchasing can now be carried out. In-house reconciliation of the schedules ensures that the casting and delivery dates are in line with one another. If not, these are coordinated accordingly. All of this is carried out within three to four days of receipt of the order. After 14 days the customer receives his order confirmation.

From "go" to "ready for dispatch": order processing is always on the ball

After giving the go-ahead for the production of the engine, order processing



Planning the route

remains in close contact with the process at all times: How will we deliver? Do we have to write to the forwarding agents? Is production on schedule? Is the engine block in line with the quality demands? Here, the department is closely involved with the other participating teams, e.g. the fettling shop and quality control. "Every day we deal with the topic of the engine that is to be produced. We are the ones who inform everyone involved of the incoming order, we start the product on its way through the internal system", explains Mascha Jaspers, who prefers dealing with the engines most of all among the Siempelkamp products. Every week Siempelkamp manufactures several crank cylinder cases for engine customers, so that there is no chance of the company getting out of practice.

Order processing is also involved in the acceptance test: In some cases customers carry out the acceptance test at the Siempelkamp Giesserei itself – this also has to be organized.

As soon as the quality department reports in the system that the "engine is ready!"

order processing issues the delivery note. Now comes the question of transport (see below) – and the invoice, as well as the performance guarantee if applicable, is issued.

Transportation and logistics: another job

Transportation of the finished casting is also the responsibility of Mascha Jaspers and her colleagues. Here there are various forms of standard delivery arrangements:

- the customer provides the forwarding agent itself and organizes the delivery from the factory gate,
- Siempelkamp coordinates transportation together with the forwarding agent of the customer,
- Siempelkamp carries out the transportation on behalf of the customer.

Furthermore, the mode of transport depends on the type of casting: smaller engines weighing between 16 and 25 tonnes or other cast components in this weight category are subject to different transportation conditions than crank cylinder housings for ships, which can weigh up to 85 tonnes.

03 Production planning, 3D model planning and simulation



Hans Küppers, 60 years old

Employee in the process planning department

At Siempelkamp since 1988

Apprenticeship as a pattern maker,
later training as a master craftsman

Team: 7 employees in the field of planning and simulation

“DIN standards are good – our refined instructions even better. We ensure continuous controls, from the first nail until delivery.”

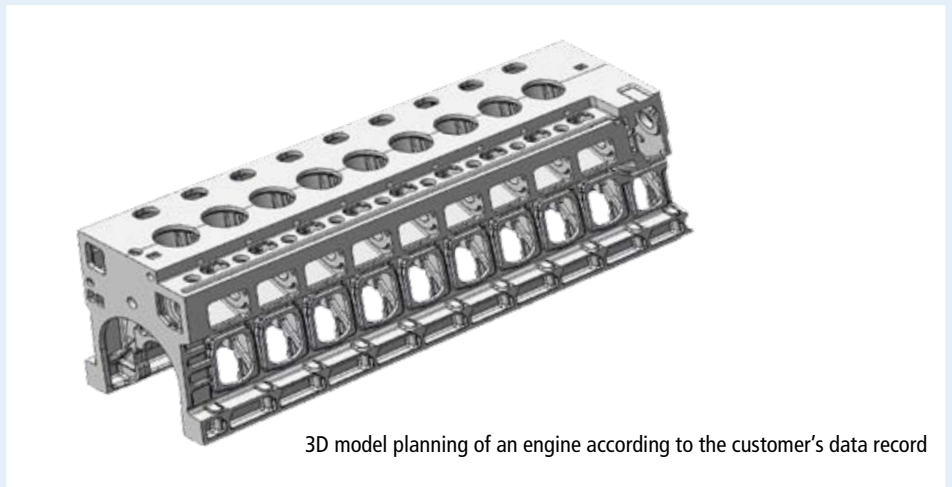
From the order to the model

The order has been received, as well as drawings or 3D files from the customer as a guide for the model planners and builders. Now it is time for Work Preparation to take an active role: They draw up the preliminary plans, which are discussed with all of the specialist departments involved – e.g.

- molding shop,
- core shop,
- purchasing, by submitting a “contract proposal” (parts list with all of the required parts),
- supply companies if accessories have to be bought in (e.g. series components).

Early warning system

One clear rule is close communication with sales in order to determine which challenges a project harbors. “We work in close collaboration with sales so that problems cannot arise in the first place. In the case of new projects we travel together with the sales team so that we can advise the client. With the ‘early warning system’ we ensure that our future course of action



3D model planning of an engine according to the customer's data record

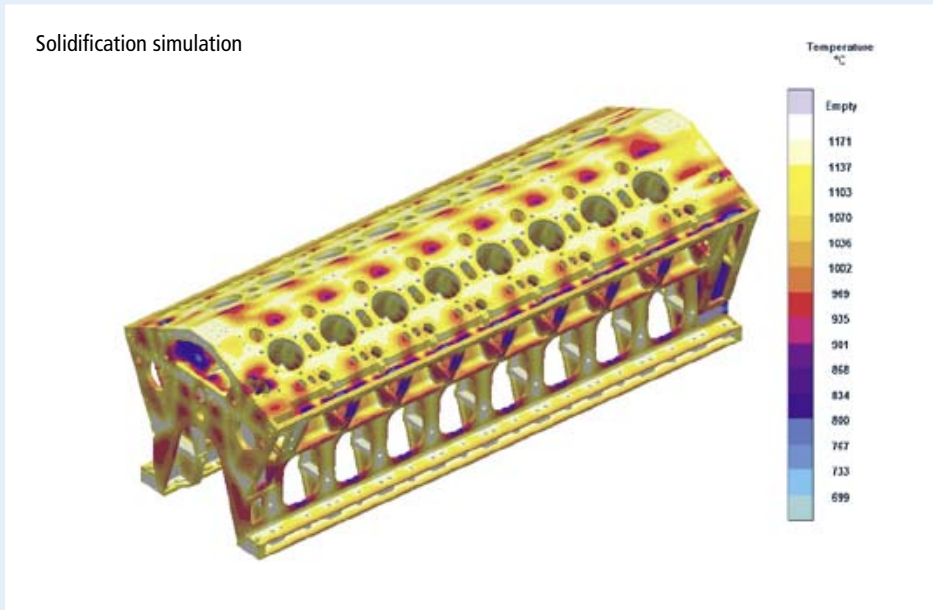
is correctly set from the beginning”, is how Hans Küppers describes the situation.

Planning and building the model – and one standard more than usual

The actual work on the model is performed by the Siempelkamp model planners in the team of Hans Küppers and the external model-makers. “Quality + durability” is the specification for both groups. The basis for this is European standard DIN EN 12890. However, the orders of magnitude used at

Siempelkamp demand special requirements, which have resulted in the company's own model-making specification.

During the 3D planning of the model, the team works strictly in accordance with the dataset provided by the customer – here, CAD-CAM technology sets new milestones in comparison to previous manual work as far as deviations are concerned. Consideration is also given to the machining allowance which is sometimes included in the customer's dataset. According to the material



depending on the project sometimes up to six or seven months. “During this time we keep our eye on the process at all times”, explains Hans Küppers. Processes and problems are discussed, proposed solutions are developed – and the whole procedure documented with photographs for the customer. In some cases the customers visit the supplier every 14 days in order to get an idea of the progress that has been made. This is a welcome, productive exchange.

Solidification simulation: the moment of truth

The solidification simulation is also part of the team’s job. The casting model is virtually cooled down to 300°C in order to bring to light any material faults or leaks. The simulation provides information, for example, on whether molds need to be created so that the material will solidify evenly.

used, this is a “must”. After the model has been planned, the process continues with its construction – here, the external supplier creates a model (for the external shape) and a core box (for the inner section).

Network with three partners

Planning of the models takes approximately two weeks, whereas its construction requires between three and four months, or

04 Pattern shop: pattern modification, maintenance, control



Olaf Busche, 45 years old
 Head of model-making/pattern shop
 At the company since 1986, apprenticeship at Siempelkamp as a pattern carpenter
 2001 qualified industrial foreman in the field of foundry work
 2001 work preparation / schedule tracking
 Since 2005 head foreman in the pattern shop
 Team: 32 employees

“Each casting is unique – we are permanently working under new conditions.”

The pattern is created: three options

Patterns for engines and other Siempelkamp products are created in three ways:

1. Siempelkamp plans the pattern, but it is manufactured externally (by patternmakers from the customer’s network or long-term Siempelkamp partners).
2. An existing pattern stored at Siempelkamp is used – such patterns are ready for use within 24 hours.

3. Siempelkamp manufactures a new pattern – this is rare, as this work ties up too much capacity.

...and another three options: which outfit is the right one?

Which material is used for the casting model depends on the frequency of use. Models which are only to be used for a single casting are manufactured from foam, others from plastics or hardwood.

By agreement with the customer, there are three quality categories available:

- H3 model for approximately two to three castings,
- H2 model for approximately 20 to 30 castings,
- H1 model for over 100 castings.

Here the Siempelkamp team provides detailed advice over the long term, because the decision in favor of the right model means that the customer can save budgeted costs.

Incoming goods inspection

For Olaf Busche and his colleagues, work on the model starts with the 100 percent incoming goods inspection, when a customer's model is delivered, for example. Major faults are then rectified by the external patternmaker, while smaller corrections are carried out by the Siempelkamp team. Five inspectors are specifically deployed to determine sources of error and take countermeasures in good time.

From the inspection to the meeting – and: "The model is approved!"

The next step is the pattern discussion, which places on the agenda everything that is of relevance to the casting technology – e.g. the casting runner, time and temperature. "Every part is customized", says Olaf Busche.

Storage

If a model is put into storage at Siempelkamp for later use, there are a few special aspects that have to be taken into account – e.g. correct stacking in order to protect the valuable product. This is also the responsibility of this department.



View into the storage hall: in the foreground a model of an engine block

05 Core shop



Marco Tobae, 44 years old

Trained patternmaker from the steel foundry

Head of the core shop since 2001

Industrial foreman for all metal employees

Manages 24 core makers

"I manufacture the cores in advance to ensure the highest quality and adherence to delivery dates."

The core of the matter...

...is the job of the team under Marco Tobae. Every week the work preparation "list" provides information on the upcoming orders. The next step depends on the type of order:

1. In the case of **current orders** the cores for engine production are specified. Can existing components be used, or is reworking a good idea? What needs to be purchased?
2. For **new orders** the production technology is discussed, the construction of new manufacturing boxes initiated. Core boxes are ordered, the components are made available.



Filling quartz sand into the core box

Quartz sand: it is the mixture that counts

After the appropriate quartz sand mixture has been determined, the sand is filled into the core using sand mixers – "almost like filling a sand mold in the playground", is Marc Tobae's comparison. In order to stabilize the core, the sand is compressed

by hand with construction steel or self-made gratings.

Depending on the sand mixture, the "mold filling" now has to harden for 24 hours; then the core box is opened and emptied. The core now dries, is deburred and finished, i.e. provided with a fireproof coating. This is again followed by a

24-hour drying phase. Subsequently, the core is accessible to the molding shop, which in most cases is waiting to take over the baton. "We are in continuous contact – once a week for the rough planning, several times a day for the detailed planning. Ultimately, these are more than just sand molds for us", adds Marco Tobae.



The core of the engine: finished coated cores



Inspection of the core box

06 Melting, analysis requirements



Karin Bulmann, 50 years old

Team member in the melting shop

Materials engineer

At Siempelkamp since 1992

(started in the laboratory)

Team: approx. 30 employees

“The correct recipe and good communication are important for preventing quality-related problems.”



The work process slip – the “go” for the team in the melting shop

From the casting ticket to the recipe

Work on the product begins for Karin Bulmann and her team when they receive a work ticket reading: “Tomorrow, engine XY will be ready for casting!”. Thus they know which projects are on the melting agenda. Now it is time to draw up the melting schedule.

Several departments are again in close communication with one another: the quality department specifies the analytics, while important characteristic values are provided by metallurgy.

The “recipe” for the optimum composition of the molten material is then composed in the melting shop. Deep-drawing scrap, pig iron, siliconizing and recarburizing agents are collected and the crane operator instructed to load them.

Checked and approved: the base melt

The sample which is drawn from the base melt is a type of test run: This sample is

analyzed. Everything ok? Or are additives needed?

The casting ladle also has to be prepared and the bottom of the label etc. treated with magnesium inoculant. Only then can the actual treatment follow by moving the casting ladle under the furnace.

In this department, many aspects revolve around the right temperature and analysis: “An engine is a temperature-critical part – someone from our team always keeps an eye on the temperature to ensure that it is correct for the casting and above all that it is not too cold”, explains Karin Bulmann. Round about 1,350°C is considered to be the right temperature. Something to be avoided is “misrun”, which can result in long flow paths and overlapping of the material. This means that the material has to be rejected – a situation which would be the subject of a complaint by the quality department during a subsequent step.



Combination of ingredients for melting

Bringing everything together!

Similar to a cooking recipe, the important aspect for Karin Bulmann and her team of colleagues is that the right ingredients are in the right place at the right time. The feedstock is selected, sample deliveries of steel scrap or pig iron checked, for example. The material planning department is also placed on the schedule of tasks.

Unlike in the kitchen, however, too many cooks do not spoil the broth here: “Coordination with departments such as the Quality Department is important to ensure that quality-related problems do not arise in the first place”, Karin Bulmann goes on. Close contacts with the supplier are also essential in order to guarantee that good material is delivered. Here, the parties work hand in hand: the Siempelkamp team audits the suppliers itself. Quality assurance of the material to be melted is the key to a successful process.



Control of the base melt

07 Large castings section of the molding shop



Gerd Rösberg, 51 years old
Model shaper in the foundry
Employed at Siempelkamp since 1996
Trained model maker

“Every shape is unique, even if it is a series production model. I do my work only once – and then I would like to deliver quality.”

Good preparation is everything

As soon as work preparation, i.e. the process planning team, issues the order to shape a crankcase, the “large castings” molding shop section springs into action. The model is delivered from the pattern making shop, the stamping surface cleaned.

As soon as the model has been placed down on this surface, preparation of the gating system starts. The next step is to insert pipes so that the liquid iron can flow into the mold – comparable with a slag channel. As soon as the piping system is ready, the department begins to take samples for the customer. Here too, assured quality is the order of the day: three samples measuring approximately 20 x 20 mm are taken.

Molding box – not built on sand

The next step is to place the molding box in position such that the mold that is filled with quartz sand lies securely and straight in the bed. After a 24-hour hardening period, the molding box is lifted off the model and the mold cleaned. This is followed by the coating of the mold: here, the team ensures that the metal does not form any reaction with the sand. The employees then insert water channels and the resin cores for the engine.

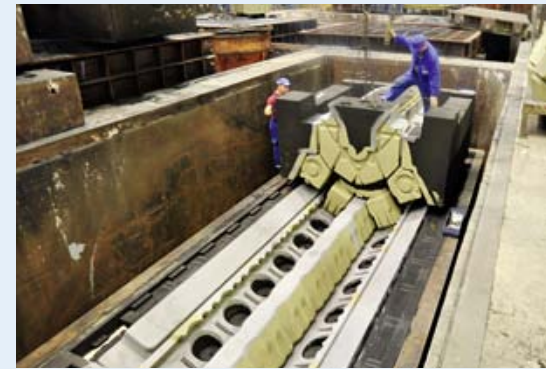
To the core of the matter

It is now time to order the cores from the core shop. At the same time, a sand bed is drawn in order to create a level base. “This is an important basis for processing with the laser in the truest sense of the word”, says Gerd Rösberg.

Approximately 50 cores are needed for a 20-cylinder crankcase. As soon as two cores have been placed in position, the quality assurance department at Siempelkamp checks whether everything is going “according to plan” – e.g. the angularity of the engine.

After the last core has been placed in position, quality assurance springs into action again and checks that the overall length is exact.

The mold is then provided with a frame and a cope box; the entire unit is filled with quartz sand. The team sets up the tundish which will subsequently receive the iron. The mold is weighed down in order to prevent it from lifting or leaking. Rule of thumb: approx. 200 t of “weights” to prevent the lifting of a 20-cylinder engine block. Now the message is sent to the melting shop: “The mold is ready for casting!”



Setting of the engine cores



The engine block set in sand: filling of frame and cope box with quartz sand

08 Delivery of the liquid iron from the melting shop / casting process



Sebastian Brodziak, 33 years old

Caster – industrial foreman in the field of foundry work

At Siempelkamp since 1998

(start: apprenticeship as a foundry mechanic)

Team: approx. 30 colleagues

“Meanwhile, the hot iron has become part of everyday life. But it still remains fascinating.”

Everyone standing in position of attention

“Molten iron on its way!” – this is the message from the melting shop which Sebastian Brodziak and his colleagues are waiting for. The caster is instructed immediately to discharge the molten iron into the casting ladle. Sebastian Brodziak’s job also includes informing the crane drivers who are responsible for transporting the casting ladles. For one of the crane drivers the next step is to: get quickly onto the crane runway, while the other one: put on the protective clothing.

Things then move quickly in the “large castings” section at Siempelkamp: more assistants are instructed to put on “fire-proof” clothing. The driver of the furnace crane places the casting ladle containing the molten iron on the iron transport trolley. The caster takes receipt of the iron.

The next crane driver is already waiting to drive the iron to the deslagging stand, where in addition to the deslagging process, the temperature is also measured several times. The exact calculation of the cooling rate is important: when the temperature is correct, the ladle moves to the mold.

Pull the plug – and “cast”!

This is always a special moment: the caster stands on the casting stool and guides the crane driver to the correct position for the ladle. An air hose is attached to the ladle for pneumatic operation. By moving a lever, the caster lets the iron flow into the casting jaws. Once the iron has reached a certain level, he gives the signal to “pull the plug!” – then the red-hot and sparking iron flows into the mold.

Emptying and “freezing”

After one to two days in the mold, the iron has taken shape. Now it is necessary to “aerate” the engine block – the men charged with emptying the mold lift the engine block completely out of the pit together with its molding flasks. On a trailer it is now taken for four to five days to spend time in the fresh air in the parking area. After this cooling-down phase, some of the flasks are drawn in the emptying hall - and again the instruction is: take them outside. 24 hours later, still wrapped up warm and tight in the drag together with the sand coat, the emptying procedure is again on the agenda. Still at a temperature of 200 degrees, the engine block is emptied out and loses its sandy coat. After a further two to three days in the “cold”, the casting is ready for cleaning.



The great moment: the liquid iron for the future engine block flows into the mold



The engine block with its molding box on the cooling yard

09 Fettingling / finishing grinding



Dieter van den Brand, 54 years old
 Master/head of the fettling shop
 At Siempelkamp since 1998
 (at first an industrial clerk, then an industrial foreman specializing in metal)
 Team: approx. 90 employees

“Here you can get things moving – which I like to do!”



Deburring

“For us, everything is urgent...”

In the fettling shop, up to 10 engines are being worked on at the same time – the fundamental requirement here is good timing, because in principle all of the parts have to be processed quickly.

After an engine has been allowed to cool down for approximately 10 days, the casting is transferred to the fettling shop. Here the throughput time is approximately 10 to 14 days. The core iron and core clamps are removed; in the shot blasting house the part is treated with steel shot in various positions for three to four hours.

Fine tuning in the fettling shop

The subsequent “cleaning process” then includes the fine-tuning: During two-shift operation the engine is deburred and ground with a compressed air grinding machine and chipping hammer. “Our fettlers are experienced and point out anything that is not clear – anyone who has processed 40 engines knows what is not right with the 41st”, explains Dieter van den Brand.

The part is then sent to an external annealing shop for annealing. “During casting, thin and thick walls collide with

one another; the result is tension. Annealing removes these structural stresses from the engine”, says Dieter van den Brand. Then the components are returned to the fettling shop – here the work is carried out shoulder to shoulder with the transportation management department (Mascha Jaspers and colleagues).

The same procedure ...

As a result of the annealing process, the engine is scaled and has to be shot blasted again. Depending on the design, the engines also contain oil or water channels which are up to six meters in length. These are now freed of any adhesive particles from the casting process, as the fettling specialists ensure that the interior of the



Completely machined and ready for the annealing process

engine is “swept clean” with special equipment.

Finished!

The engine is finished when the quality department has no further objections. This department uses ultrasound and visual checks to determine whether the part has been correctly fettled in line with the Siempelkamp standard. Further blasting ensures that all of the undercuts and recessed areas are clean, i.e. that their metal is bare. The area subjected to the

ultrasonic testing must also be free of residues and glisten. Wherever this is not the case, further blasting is carried out by hand.

“This thorough blasting and control process uncovers small defects before the engine undergoes final cleaning”, Dieter van den Brand sums up. The checking and cleaning processes always alternate with one another. This requires precise planning and documentation of the working steps in order to ensure that none of the finishing processes are forgotten.



Checking the work steps already performed in the fettling shop

10 Quality department



Anika Krämer, 37 years old

Deputy manager of the quality department

At Siempelkamp since 2009

Mechanical engineer and specialist foundry engineer

Team: approximately 25 to 30 employees working in final inspection and the laboratory

“Everyone working on the product is very dedicated and takes a great deal of care. In the final analysis, this becomes apparent during quality control.”

Always close to the process

On the way to producing the engine, the quality department is the tenth step – and is nevertheless always on the ball. “Even at the time the offer is commissioned we are involved; then, in cooperation with the metallurgy department, the melting shop and fettling shop we are in top form”, says Anika Krämer.

The team uses two test methods:

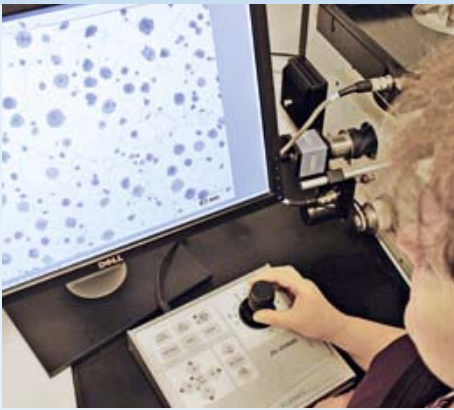
1. Destructive testing: tension tests, micro-section or hardness testing on the sample,
2. Non-destructive testing (see final inspection).

Aim: zero defects!

The quality department and quality management team are not only close to one another at Siempelkamp in terms of their location. They also work together hand-in-hand. The quality modules for the zero-defect strategy known from the automotive field are also standard practice in the Siempelkamp foundry. For a few years now, the company has been working with the quality program CAQ System BABTEC (computer-aided quality) and therefore with modules from the automotive industry. This is unique all over

the world for a foundry that produces single parts. All quality-related processes are subject to continuous improvement in this system. Any possible weaknesses are promptly detected and dealt with. The company’s own quality concepts complement this system.

The stations along the zero-defect “quality roadmap” for processing a casting range from “questioning everything”, through the risk assessment and auditing of all process steps to the continually checked end product. And one thing is clear: “Every participating team is



Microstructure analysis: the quality of the material must be right

involved in this process as experts at all times! A lot of work and care is put into the product – this is reflected in the final quality control”, says Anika Krämer.



The engine block: each work step under control for highest quality

11 Final inspection



Paul-Werner Huber, 65 years old

Certified tester for non-destructive testing

Master metalworker

At Siempelkamp since 2000, responsible for the final inspection and release for dispatch

“Nothing escapes my watchful eyes. Only if the quality is right, the engine will be sent to the shipping department.”

Non-destructive testing – and release!

Paul-Werner Huber has the last word before an engine is dispatched. His job is non-destructive testing before the casting starts out on its journey to the customer. This includes hardness tests, ultrasound or a check of the dimensions.

While the engine is being cleaned once more, the visual check is carried out in order to detect any scabs (= deeper imperfections attached to the surface of a sand casting) and metal penetration. With telescopic mirrors Paul-Werner Huber checks the channels of the engine, so that even in the corners nothing that has to be removed can remain undiscovered.

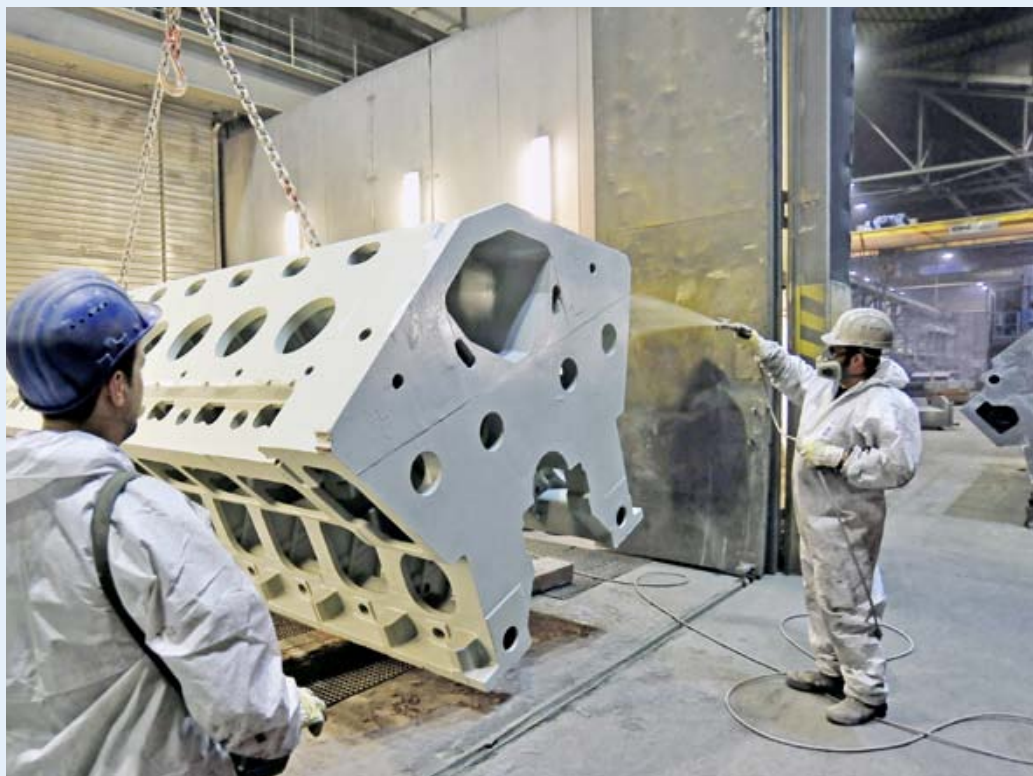
Finally, the product is released for priming. An external company provides the engine with its two coatings – first red, then gray. This is followed by a further visual check at Siempelkamp which closely examines the new coating with a mirror and flashlight.

Then the procedure has come full circle: After all of the processing steps and test



Here everything must be correct to a millimeter:
dimensional inspection

sequences, the engine is ready for dispatch and is released in the Siempelkamp BABTEC system so that anyone can see the current status. Paul-Werner Huber also gives the signal for this – and returns the baton to Mascha Jaspers and her colleagues from the transportation management department!



The second paint coating is being applied

12 Customer

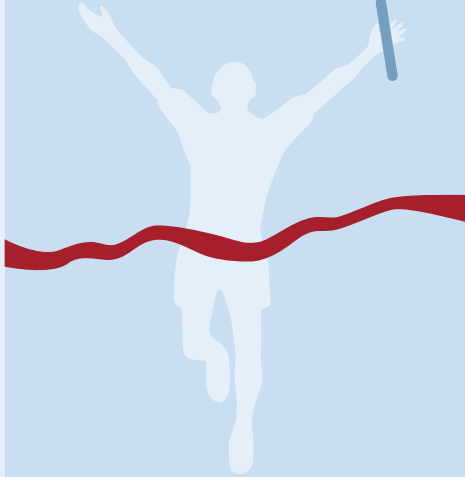


Photo: Torsten Bohlen

Queen Mary 2:
Engine block "made by Siempelkamp"

"Siempelkamp casting competence – a guarantor for high-performance components"

Various types of customers order the engine blocks "made by Siempelkamp": from six to 20 cylinders weighing from 3,000 to 84,000 kg they provide reliable service in the navy, on board of merchant

fleets, as drive assemblies or in energy supply. Further areas of application are energy conversion, power plants, hospitals and shopping malls that may never be taken from the grid.



Ready for transport!



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