Siempelkamp

bulletin

THE SIEMPELKAMP MAGAZINE **02_2018**

Symposium in Istanbul
Constructive exchange with 100 guests

Lesdrevmash 2018
Siempelkamp Highlights

Prod-IQ® Next
State-of-the-art process control at a glance

„THE AVERAGE GIVES
THE WORLD ITS SUBSTANCE,
THE EXCEPTIONAL
GIVES IT ITS VALUE.“

Dr.-Ing. Hans W. Fechner, Spokesman of the Management of G. Siempelkamp GmbH & Co. KG

Dear Readers,

The leading motto of our second Bulletin edition in 2018 is "values" – a term, used in versatile ways, which is rooted both economically and culturally as well as materially and immaterially. What enterprise value is represented by a business? How large is the share that products and services contribute to added value for customers? How do we define and live core values within our teams? Key figures or cultural concept: Without stable and clearly communicated sets of values, companies are incapable of action; values provide structure and motivation and set goals.

In the 135th year of our company's history we are more aware than ever of the "value of values". Long-term customer relations, the synergies of our subsidiaries within the Siempelkamp Group, the positive feedback from plant operators: All this illustrates that we value outstanding achievements. In equal measure, these achievements are both established in and lead to reliability, honesty, and trust as Dr. Dieter Siempelkamp pointed out on the occasion of our company's anniversary.

How we live and achieve values in cooperation with you, dear customers and partners, is reported in this Bulletin.

With best regards from Krefeld, we wish you a pleasant time reading this edition

Dr.-Ing. Hans W. Fechner

: People

: Markets

: Machines

6

The Siempelkamp customer symposium in Istanbul brought together Turkish wood-based material manufacturers and the teams of several Siempelkamp subsidiaries in October. Bottom line: 100 satisfied participants, a constructive exchange of information about the latest technologies, and a good atmosphere!

> Read more about this event on page 8.

34

Siempelkamp has been represented at Lesdrevmash, the international trade fair for the wood-processing and furniture industry in Moscow, for many years. Once again in 2018 our employees welcomed numerous customers and interested parties at the Siempelkamp booth.

> Our trade fair report on page 36 reveals more.

56

The road to the self-optimizing production plant for wood-based materials includes innovative process control technology. With "Prod-IQ® Next" Siempelkamp opens up completely new options for intelligent production.

> Our report on page 58 focuses on the details of this concept.

PEOPLE

Reliability, honesty, and trust – these are the values that Dr. rer. nat. h. c. Dieter Siempelkamp focused on in summer of 2018 on the occasion of our company's anniversary "135 years of Siempelkamp". These values are not just shared by our management, but by the entire team. Only in this way could we lay the foundation for long-lasting collaborations and expand our leadership in so many different sectors.

Siempelkamp customer symposium in Istanbul: **“Öğrenmenin yaşı yoktur.“**

➜ By Ulrich Kaiser and Nilgün Binbay

The Turkish saying “Öğrenmenin yaşı yoktur” translates to “You are never too old to learn”. So plant operators and their teams from the wood-based materials industry met in October to find out during the Siempelkamp customer symposium what new technologies by the Siempelkamp Group could further advance their companies. The result – 100 satisfied participants!

After the large success of the first symposium on the Bosporus seven years ago, an extended remake of the customer eve nt followed in Istanbul in October 2018. The inviting party was the Siempelkamp office in Istanbul, whose eight employees work right at the pulse of the market. The agenda for the meeting was developed by the German and Turkish Siempelkamp team including the subsidiaries SLS (Service) and Pallmann (size-reduction technology). “Within the last 15 years, Turkey has developed from a small wood-based material community to the leading driver of innovation in Europe through continuing new investments. That is why it was an honor for us to carry out an active and extensive exchange of information with our customers and partners, many of them for many years,” says Ulrich Kaiser, sales manager wood division at Siempelkamp.

Siempelkamp customer symposium 2018 in Istanbul: guests and Siempelkamp team

Registration – and ready to start!

Wide range of participants

Well-attended plenary session

Approximately 100 attendees from ten companies in Turkey accepted the invitation and participated in the symposium of the German Partner at the Green Park Pendik Convention Center. The participants came from diversified backgrounds: site managers, production and investment teams of Turkish wood-based manufacturers focused on the inputs for two days from their specific perspective. They were welcomed by Ulrich Kaiser, Faruk Sisci (managing director Siempelkamp Istanbul), Stefan Wissing (managing director of the Siempelkamp subsidiaries SLS and Pallmann), and Dr. Stephan Niggeschmidt (managing director SLS).

Team AGT and Kastamonu

Team Orma

The symposium focused on new developments such as in the area of hybrid particleboard as well as the Eco-innovations made by Siempelkamp – for example, the EcoFormer for particleboard, Eco Pilot, and EcoScan NEO. Siempelkamp's partner Electronic Wood Systems (EWS) also participated in order to emphasize the advantages of the newly developed EcoScan NEO, one of the technical modules of the SicoScan family that stands for the "factory of tomorrow".

Ulrich Kaiser started the symposium with a speech about the generations of the Conti-Roll® press technology, the heart of each wood-based material production plant ranging from the 1st generation to today's Generation 9 and 9 NEO. The speech emphasized the systematic development of Siempelkamp's continuous press technology over almost 3.5 decades to meet the constantly changing market requirements of the wood-based material customers. A speech outlining 3-dimensional engineering, applied by Siempelkamp's Belgium subsidiary Sicoplan, focused on the topic of cutting-edge planning of wood-based material production plants. Scanning techniques, the use of lasers and drone flights on site and above the customer's premises provide the engineering experts with the exact electronic data that is needed when it comes to perfectly tailoring a plant to the requirements provided by the customer.

Dr. Stephan Niggeschmidt: "You request. We deliver"

Fascinating plant setup with the help of 3-dimensional scans

"Marketing is when a company is able to say good things about itself, public relations is when others say good things about the company." According to this motto Ulrich Kaiser and Işik Zorcu, employee from the investment team at AGT, gave a speech on 3-dimensional technology together. The title: "At the pulse of the time and always one step ahead." Işik Zorcu from AGT demonstrated how in 2018/2019 a second MDF plant is integrated into an existing MDF plant from 2012 with the help of 3-dimensional technology. This process not only saves time, but optimizes the setup of both plants. These are advantages that made the symposium participants from among the investment departments sit up and take notice. In another speech Dr. Stephan Niggeschmidt then demonstrated how 24/7 remote service and Service 4.0 of SLS promote the digital transformation in the wood-based materials industry. In his presentation, Stefan Wissing, on the other hand, pointed out that the perfect wood-based panel starts with material that has been reduced to the correct size – keyword: "Pallmann – size-reduction technology" which is now a 100% subsidiary of Siempelkamp, thus, adding the area of front-end technology to the portfolio. With the help of the inline board measurement system SicoCam, Dr. Stephan Niggeschmidt demonstrated that manual measurement of raw boards is a thing of the past. SicoCam's high-performing cameras provide measured values and as a result increase quality, reduce rejects, and improve workplace safety.

3-dimensional engineering:
Işik Zorcu, AGT, demonstrates the 3-dimensional process and its advantages with the help of his own plant

"Learning and sharing"

Questions, answers, and discussions aiming at strengthening the wood-based materials industry became part of the agenda in Istanbul for two days. This approach has proven very effective: "At the Siempelkamp symposium seven years ago I learned a lot helping with our investment decision in 2014. Today, after two years of production, we see what the advantages of Siempelkamp's further development from the ContiRoll® Generation 6 to the ContiRoll® Generation 8 are. This also goes for developments regarding the mat forming technology, the board handling, fully integrated dryer and energy plants, the resin blending technology with the Ecoresinator, and the higher-level planning of Sicoplan. It is important for us that all Siempelkamp innovations be compatible with our existing technology." – the positive feedback we received from symposium participant Metinay Topkaya, technical manager at Camsan Entegre.

And even the most experienced Siempelkamp expert knows that you are never too old to learn: "Without the exchange of information with plant operators and their teams, any advantage in knowledge and technology is wasted. It is all the more gratifying to us that our customers see "learning and sharing" together with us as a welcome opportunity. The fact that Sabbathin Yaz who is 75 years of age and still active as an advisor for the Kastamonu Group accepted our invitation and joined the presentations and discussions was especially pleasing to me. Together with him, as the longtime head of the Kastamonu investment team, we have advanced and implemented many trendsetting developments in our projects for our industry," says Ulrich Kaiser. Next to all the learning that took place, the symposium included a magic show which invited guests to join in and loosen up. Talks, discussions, and joint meals rounded off the event and created the right atmosphere between all participants.

The entire Siempelkamp team says "teşekkürler" (thank you) and "yakında görüşmek üzere" (see you soon)!

Curious and concentrated

Applause

A magic trick to join in

Team Siempelkamp with customers

Audience with Faruk Şişci (front right), General Manager Siempelkamp Istanbul

Dr. Stephan Niggeschmidt with SLS service technician Mevlüt Basoda

Close relationship: Ulrich Kaiser (left) and Faruk Şişci (right) with Fikret Erdogan, AGT

INTERVIEW

DR. FECHNER HANDS OVER A WELL ORDERED HOUSE FOR FURTHER GROWTH!

Interview with Dr.-Ing. Hans W. Fechner

By Ralf Peters

On December 31, 2018, after 16 years, Dr.-Ing. Hans W. Fechner is leaving Siempelkamp to go into retirement. On this occasion we would like to draw a picture of his time with the company.

Visiting the Berneck plant in Curitibanos, Santa Catarina, Brazil. From left to right: Bernd Hauers (Siempelkamp), Daniel Berneck (Director Industrial Berneck S.A.Paneis e Serrados), Dr.-Ing. Hans W. Fechner (Siempelkamp), Walter Schigel (Board of Directors, Egger), Gilson Berneck, Fernando C. Gnoatto (Berneck), Manfredo Krapp (Berneck)

Siempelkamp headquarters during the anniversary year 2018 (135 years of Siempelkamp)

Bulletin: Dr. Fechner, after 16 years you are going into retirement at the end of this year. 16 years is a long time, right?

Dr.-Ing. Hans W. Fechner: Yes, that is correct, but 16 years is a short time when considering that Siempelkamp had its 135th anniversary this year. Siempelkamp has been developing very positively in recent years. Today we achieve worldwide sales of more than 700 million Euros with about 3,000 employees. We hold market-leading positions in all our business areas. In short, Siempelkamp is a fantastic company – technology-driven and highly innovative. We are proud of our excellent employees.

Bulletin: How will Siempelkamp continue to develop?

Dr.-Ing. Hans W. Fechner: First of all, we want to achieve sustainable and profitable growth. This is possible, even in a global economic environment that is definitely changing. We can accomplish this goal with our diversified positioning and by staying flexible because, as we know, each opportunity requires new solutions.

Bulletin: Siempelkamp will adhere to its high standards in regards to technology though?

Dr.-Ing. Hans W. Fechner: Yes, definitely. Under "Leadership in Technology" we understand that we strive to be the best in the world with all our technologies and services. Siempelkamp will continue to invest in the future and will allocate considerable expenditures for research and development.

We are a market leader in many areas, provide the highest product quality and excellent services at competitive prices. We want to further develop this position. With our innovative strength we will continue to provide the solutions for the challenges of tomorrow.

Leadership in Technology means that even in times of global economic transformation we will develop the right solutions for our customers and open up new business for us.

Dr.-Ing. Hans W. Fechner with Dr. rer. nat. h. c. Dieter Siempelkamp at LIGNA 2017

Bulletin: When you talk about innovations, the topic "Industry 4.0" comes to mind. Has Siempelkamp accepted this challenge?

Dr.-Ing. Hans W. Fechner: Definitely. The digital transformation has long since reached us. This pertains to our value creation and our products. The starting point here is the question of how we can lower production costs while increasing quality in order to provide our customers

with advantages. A groundbreaking concept is, for example, the digital plant twin, that is, the digital image of a real plant which will still have to be built at the construction site. The 3-dimensional machine models help shorten startup times and therefore lower costs.

Bulletin: How do you approach the topic of internationalization?

Dr.-Ing. Hans W. Fechner: This is indeed an important topic that has accompanied us for many years. Already in the 1970s Dr. Dieter Siempelkamp had embraced increased exports overseas. Before my time he was responsible for the development of important locations abroad which generated new customers and business for us. In the 2000s we focused on a stronger internationalization of our products to take better control of the proximity to our sales markets and the costs. This is of great relevance when you look at the costs for transports towards East Asia. We currently invest in expanding our plants in other European countries and Asia, for example, in East China where we are significantly lowering our costs through progressing localization.

Bulletin: How will things go on in Krefeld? Has your successor been appointed?

Dr.-Ing. Hans W. Fechner: Yes. Dipl.-Ing. Christoph Michel will succeed me as the spokesperson of the man-agement of G. Siempelkamp GmbH & Co. KG starting January 1, 2019. The Siempelkamp group of companies is very technical in nature. With technical premium products it has for 135 years offered solutions which have contributed to improving the living environments of people in various ways. Mr. Michel is an engineer like me and therefore stands for the continuation of our company-wide innovation concept.

Bulletin: How will you ensure that customers will continue to feel well looked after?

Dr.-Ing. Hans W. Fechner: Our customers and their successes have been the focus of our business activities for a long time. We see our customers as partners. Our thinking and actions are characterized by reliability, credibility, but also flexibility. This is not just my attitude, but characterizes the actions in all levels at Siempelkamp.

Bulletin: What means change to you?

Dr.-Ing. Hans W. Fechner: The most dramatic change of our time is caused by the visible effects of climate change, but also by the fundamentally changed attitude of many people regarding the issue of conserving resources and sustainability. This creates new challenges for industrialized countries, but also for emerging countries. There is, for example, a fundamental change ahead in the area of the electrical energy supply.

Bulletin: o you mean the nuclear power phase-out?

Dr.-Ing. Hans W. Fechner: Yes. In 1973 I started my studies in electrical engineering, specializing later on in reactor technology. At that time, Germany was the world leader in all aspects regarding the peaceful use of nuclear energy. Next to the traditional pressurized and boiling water reactors, we were leading the market in the development of high-temperature reactors and had, from the perspective of the time, a future-oriented concept for a quick breeder reactor for the production of plutonium because back then it was believed that there wasn't enough natural uranium available. This was a big mistake as it later transpired. During that time nobody really thought about the consequences of,

Dipl.-Ing. Christoph Michel, Spokesman of the Management starting January 1, 2019

Siempelkamp Giesserei (foundry): high performance for gigantic projects

for example, the radioactive waste that results from nuclear technology. The nuclear reactor accidents of Three Miles Island, Chernobyl, and Fukushima were not imaginable in those times. For the sake of completeness, I must point out that German nuclear power plants are still the safest ones in the world today.

In the 1960s Siempelkamp developed the shielding technology for the German nuclear ship "Otto Hahn". Today Siempelkamp contributes considerably to the dismantling of decommissioned nuclear power plants in the United States, and also in Germany.

With our storage casks we offer support when it comes to safely storing nuclear waste. The consequence of Germany's nuclear power phase-out, however, is that we produce even more CO_2 which, in light of the impact of climate change, we simply can no longer afford.

Annual plants are the trend in the wood-based materials industry and Siempelkamp leads the way

Bulletin: What are the consequences for Siempelkamp from this development?

Dr.-Ing. Hans W. Fechner: Sooner or later the coal-fired power generation in Germany has to come to an end. Since lignite is a much too precious raw material we cannot afford to use this raw material as fuel in power plants. Wind and solar energy will have to fill the gap, and also completely reengineered technologies for decentralized energy supply, consumption control, and energy storage. Our foundry, for example, sees great potential in the area of multi-megawatt wind turbines. Today wind turbines with nominal powers of 10 MW and more are no longer a utopian idea. These machines require heavy-weight, high-quality components made of special cast-iron. However, the best energy is the one that is conserved, and I know, especially for the wood-based materials industry we have trend-setting solutions available that can help reduce one of the main cost factors in the production of panel-type wood-based materials.

Bulletin: Dr. Fechner, at the end of 2018 you are retiring. What will you do with your time after Siempelkamp?

Dr.-Ing. Hans W. Fechner: I am looking forward to having time for my many hobbies, such as traveling and music. Furthermore, I will continue to be available for Siempelkamp in an advisory role.

Bulletin: Thank you for the interview – and best wishes to you for your retirement!

SICOCAM: SAFE, EFFICIENT, SMART

Fully automated inline board measurement eliminates need to reject boards for measurements of geometry

→ By Dr. Frank Otto, Markus Gropp, Fa. SICK

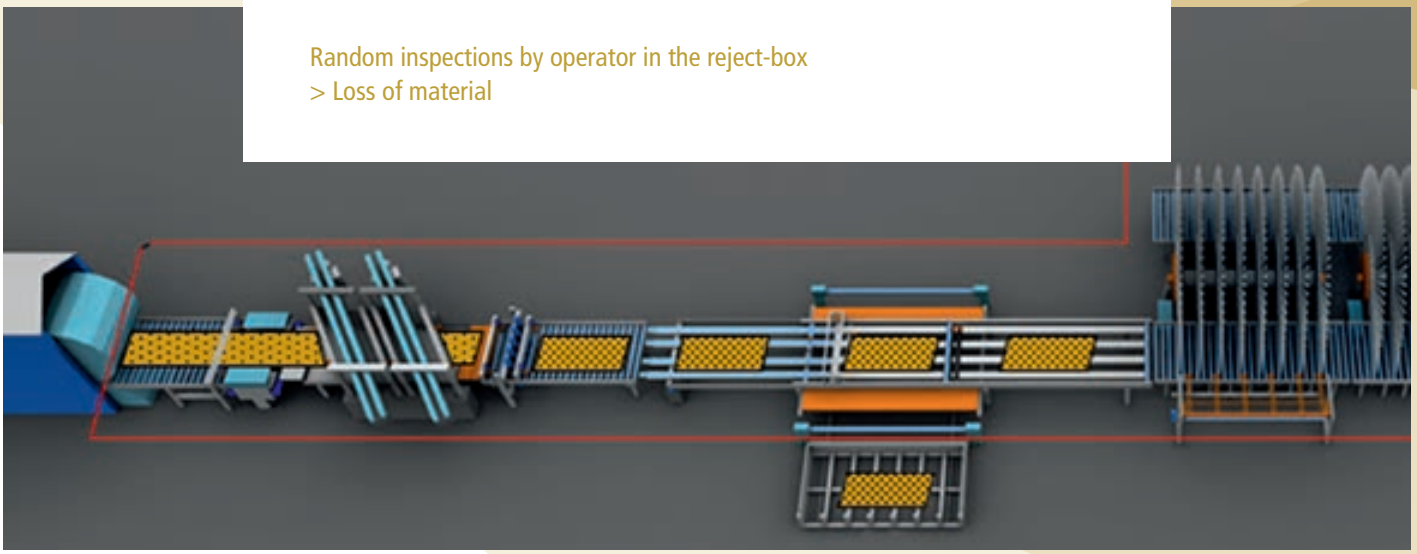
Costly manual measurement of raw particleboard is a thing of the past. The SicoCam inline board measurement system from Siempelkamp Logistics & Service now measures wooden composite boards in a continuous cycle. It includes four programmable high-performance cameras from SICK. They supply measured values for calculating the board size and adjusting the saws. This increases the quality of the manufactured boards, decreases the amount of rejects, boosts productivity, and improves workplace safety.

MEASUREMENT TODAY

Random, manual, unreliable

Random inspections by operator in the line
> Safety issue

Random inspections by operator in the reject-box
> Loss of material



Section transfer cart

Each year, at the Fritz EGGER GmbH & Co. OG particleboard factory in the Austrian town of St.-Pölten-Unterradlberg, around three million cubic meters of wood are turned into 40 million square meters of laminated particleboard. That is enough to cover half the earth's circumference when lined up end-to-end. The company's particleboard is supplied to industrial businesses and specialist stores.

EGGER's list of clients contains many well-known European furniture manufacturer. Raw boards are produced by pressing the endless board-strand and then making the necessary cuts with multi-diagonal saws. Typically, these steps are followed by a measurement of individual boards in order to correct any possible dimensional deviations. Until now this task was performed manually by removing "acceptable boards" from the production line randomly or by measuring boards in the plant, e.g., in the star cooler.

Safety solution needed, greater automation gained

For a long time, both Siempelkamp (plant engineer and equipment installer) and EGGER wanted to find a technical solution that would eliminate the safety drawbacks inherent in the existing approach.

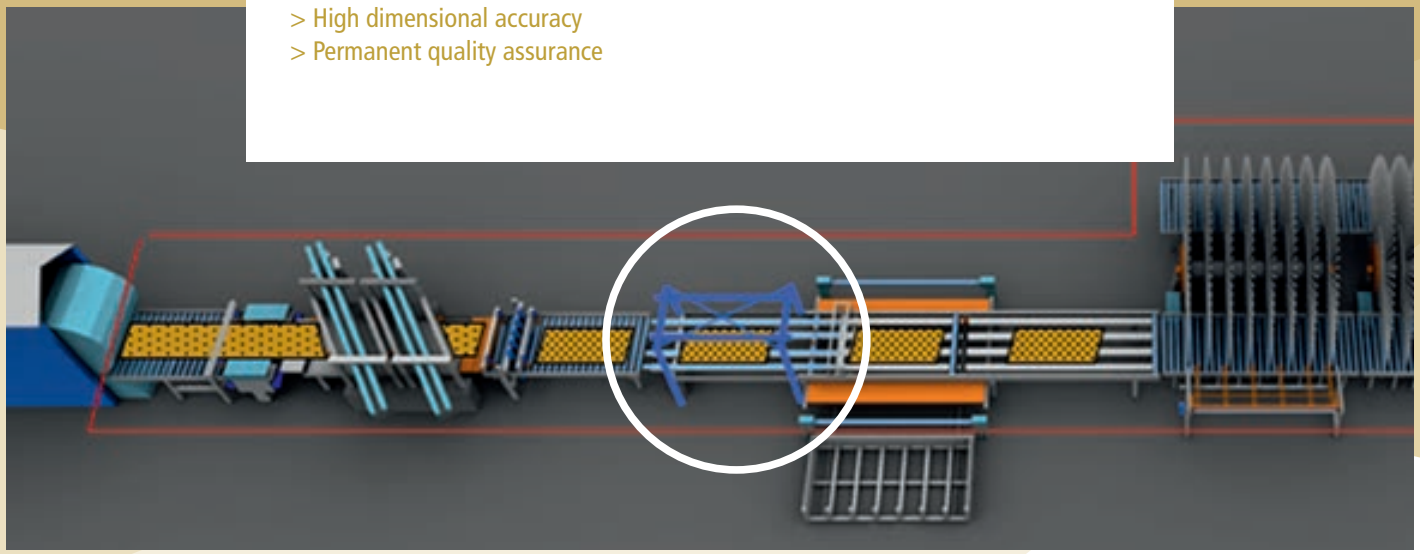
When starting the development of a fully automated optical measuring system – called "Sico-Cam" – the existing technical solution for measuring the boards after the multi-diagonal saw was not consistent with the latest technology. To verify the dimensions of raw boards (parti-cleboard, MDF, and OSB) in the cooling and stacking line, it has been common practice to randomly extract boards or manually measure them in the cooling turner. This method results in a lot of waste and a high error rate. Furthermore, the previous manual measurements represented a possible risk of injury to the employees. With the new concept this risk has been eliminated.

To make matters worse, the multi-diagonal saw in Siempelkamp high-performance systems has been doing more of its cutting in tandem, triple or quadruple mode, in other words with two or more saw units. Combined with the manual correction of cutting parameters where dimensional deviations are found, the manual board measurement process has proven too complex and too long for the plant operators, not to mention the safety shortcomings involved. Previously, the randomly rejected boards were checked by hand using a tape measure and moved to the reject pile. If deviations were found in the measured values, the operator on

MEASUREMENT WITH SICOCAM

Continuous, automated, accurate

Continuous measuring of each panel
> Safety at work
> High dimensional accuracy
> Permanent quality assurance



the saw had to enter and confirm the necessary correction parameters. By this time, a number of boards with incorrect dimensions would have already made their way into the plant. No soon-er had the saw been adjusted than the operator would have had to manually remove another board and measure it to determine whether or not the desired results had been achieved. If the board failed to meet the specifications, the operator had to adjust the saw yet again. This process could take anywhere from fifteen minutes to half an hour.

SicoCam = Safety Cam!

The newly developed SicoCam changes this in a revolutionary way: With this intelligent, fully-automated, and highly accurate inline board measurement device Siempelkamp provides the answer to all the above mentioned problems. SicoCam stands for a safer working environment, guaranteed quality, and significantly reduced waste.

"Now that the board-measuring system is located within the machinery, the saw can be corrected immediately after any dimensional deviations are found. For example, if the diagonal saw had to switch into tandem mode, sometimes the board length is alternating depending on the saw carriage that performed the cut. Because of SicoCam now we are able to correct the different lengths immediately. SicoCam has been operating properly for more than two years in the particleboard line and our operators are very satisfied," notes Martin Hinterhofer, Technology Manager at Fritz EGGER GmbH & Co. OG. "With the new system, we can also respond quickly to process changes in order to stabilize our processes and ensure consistent quality of the finished product."

Measuring the board geometry

In particleboard manufacturing, the forming and press line constitutes the most process-critical system unit within the entire plant. As the centerpiece of the plant, it plays a major role in determining the plant's capacity and the quality of the products. For this reason, the output of the machines located downstream should be coordinated with the line to avoid bottlenecks.

For example, a system for measuring the board geometry should ideally be positioned inline and after the saw, if possible. The SicoCam inline board-measuring system from Siempelkamp measures the board length and width, and also calculates the diagonals and the angles at each corner. This allows trimming and cross-cutting to be optimized and helps minimize waste. Measuring board geometries requires height compensation at board transport speeds of up to four meters per second. "The board is tensioned when it leaves the press and sometimes slightly bulges downwards or upwards a little. That has to be taken into account. The only way we can compensate for this is by positioning lasers at each board corner and calculating the vertical position using the triangulation method. The entire system doesn't just include four cameras that simply detect an edge. Anybody could do that. There's a lot more know-how involved," says Markus Gropp, Branch Office Manager at Siempelkamp Logistics & Service GmbH, in describing the challenges faced in this process.

"The heart of the system is the camera with its hard- and software. Not every camera is capable of the performance necessary for this task. We now have the ability to measure boards traveling at speeds of up to four meters per second. When it comes to exposure time, we need to be

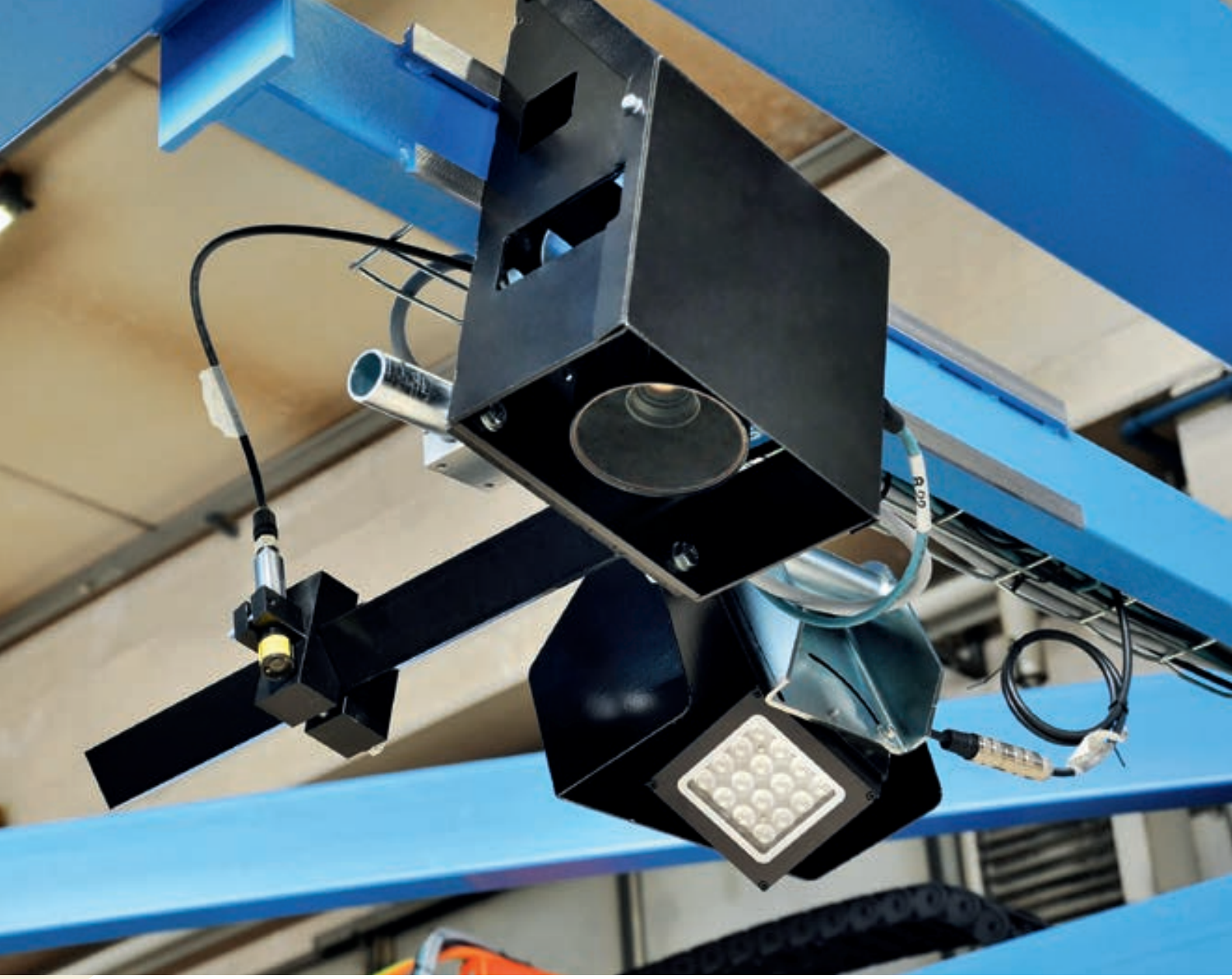
Siempelkamp Logistics & Service GmbH: Profile

Complete after-sales service for all Siempelkamp plants:

- Upgrades & field service
- Specialist for spare parts service and initial spare parts stocking
- Service 4.0 / control technology

Services and objectives:

- We provide spare parts and services at competitive prices
- We provide technical solutions and innovations at the highest level
- We operate within a global network and thus ensure a high and reliable quality of our services
- More than 150 employees look after more than 1,000 plants worldwide



Camera setup SicoCam

working in the microsecond range. And that's where the camera performs very well," he adds enthusiastically. The technology and tools by SICK tackle complex image processing tasks at the highest level, always tailored to specific customer requirements.

Siempelkamp adds (another) cherry on top

After being cut to length from an endless strand, the individual boards are measured on a conveyor track as they pass through the system. Above this track, four programmable 2-D cameras are mounted on a gantry, with the cameras mounted on a movable carriage positioned in the rear of the passage in the direction of transport. With the aid of the carriage, the camera system is adjusted to the different board lengths. Its setting accuracy is on the 0.01 millimeter scale. A small photoelectric sensor provides front-side detection and activates the capture function (triggers the cameras).

The boards will be transported on a belt or roller conveyor, the SicoCam gantry is positioned above it and each board is measured during movement up to a maximum speed of four meters per second. There is no mechanical connection to the existing conveyors.

Setting accuracy of the system is on the

0,01

MILLIMETER SCALE

Screenshot
operator control display

Everything is completely decoupled, and there is no need to make any modifications to the existing machinery, including functional modifications or decelerating of the boards.

"The complete installation can be done during normal operation with only a brief stoppage, since we just have to position the mechanical system above the conveyor," confirms Mathias Köhl, Production Manager Raw Particleboard at Fritz EGGER GmbH & Co. OG.

Connectivity

The measured coordinates from each individual camera are transmitted via Ethernet to the programmable PLC that performs the evaluation. The PLC handles the overall evaluation of the measurement result (and factors in the position of the camera carriage). Data connection to the higher-level plant PLC is possible. The processed measurement data are stored in a data block. Evaluations can take place in a cycle of one second.

A screen on the equipment and in the press control center visualizes the measurement results, which are archived for four weeks. The measured values can (after adjustment of the main PLC) also be used for automatic correction of the diagonal saw (length and diagonal correction). The order data supplied by the higher-level plant PLC are available to the measuring system for automatic adaptation to the relevant product geometry.

Every board will be checked by SicoCam – potential savings with no end in sight

"It's difficult to put an exact number on the potential savings. It depends partly on the number of order changes and the accompanying allowance for material and cuttings required to ensure that the format produced will work in final production. For systems used in MDF production, we expect to see significant savings in euros per year for the annual production. These savings are easily possible for the sole reason that we're able to easily reduce the material allowance by only a few millimeters," says Markus Gropp.

Savings are achieved not only by reducing the cutting allowance, but also by producing a higher percentage of A-grade boards. Because the measuring system immediately reports any deviations from the specified size, the saw setting can be adjusted without delay. The result is a lower percentage of B-grade products. And although it does not offset the full material price, it does explain the difference in price between A-grade and B-grade quality.

And finally, it is no longer necessary to remove so many boards from the line for manual measurement, since the boards can now be measured inline. This means that significantly fewer boards are rejected per year. "We could fully automate the plant with this system," says Markus Gropp in regard to the enhancements. "Currently, we have a stand-alone measuring system. The saw is only adjusted when the operator decides it should be. The operator is right there to see how the saw responds and if any correction is necessary. The values needed to correct the saw are fully calculated and available on the saw screen in front of the operator."

Conclusion and prospects

SicoCam is a fully automated measuring system for dimensional inline board measurement.

Four cameras capture the corners of every board that passes by during production. The measurement data undergo software-supported processing in the form of width, length, and diagonal dimensions and can be evaluated immediately. The result is an optimized production line and reliable product quality. Because of customers' feedback it becomes more and more apparent, that the installation of SicoCam is not limited to cooling and stacking lines behind presses, but also particularly for finished boards in sanding and cut-to-size lines. SicoCam can be operated as a stand-alone measuring system or can detect and, if necessary, correct format changes in fully automated fashion when used within a control circuit.

SicoCam is an addition to the SicoScan device family from Siempelkamp, which is used to provide quality measurement and fully auto-

SICOCAM AT A GLANCE

Technical data

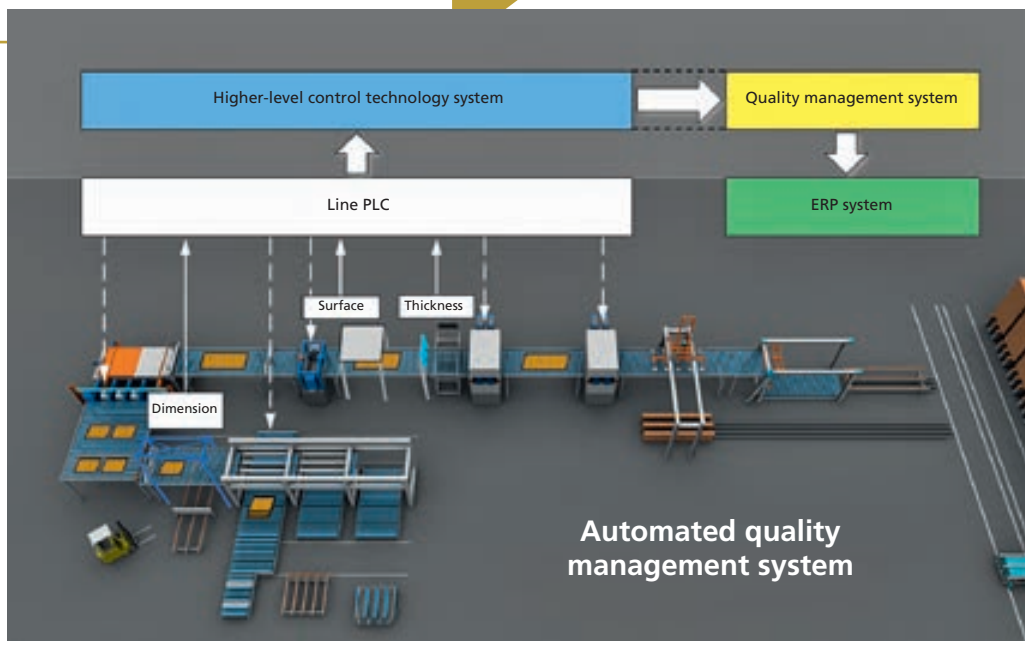
Possible board dimensions:	
Length	1,200–8,800 mm
Width	950–3,200 mm
Thickness	3-60 mm
	Board surface unsanded or sanded
Accuracy	of ± 0,3 mm
Lateral misalignment	max ± 30 mm
Up to the conveying speed of 4 m/sec and a board cycle time of 1.1 sec	
Camera system	SICK

FURTHER BENEFITS

Features

- **No measuring faults** due to slipping boards or acceleration during the measuring process
- **Individual configuration** for almost all applications possible
- Connection to superordinated control systems for **data-transfer as required**
- Optical system characterized by extreme **low maintenance**
- Can also be used in the sanding and cut-to-size-line to measure board dimensions
- **No wear** due to contact-free measurement

mated process control in the production of wood-based panels. The next step in the near future will be the integration of SicoCam into the super-ordinated production and quality management system to provide higher profitability.



SicoCam Future – QM-System

Strothmann Machines & Handling GmbH:
Location expansion generates additional capacity

From left to right: Andreas Schlick (Site Manager), Fred Holmer (Managing Director Ventapp), Elisabeth Bienbeck-Ketelhohn, Christoph Michel, Dr.-Ing. Hans W. Fechner (Siempelkamp Management), Henning Seffers, Dr. Volker Middelmann (Management Strothmann), Elmar Wöstenkötter (Management RRR Stahlbau GmbH)

➜ By Christina Beckhoff

Strothmann, the handling and automation specialist within the Siempelkamp Group, sets new milestones by expanding its location. In August of 2018 a symbolic groundbreaking ceremony started the construction of a new factory building which will open more space for ambitious projects.

August 2018

Strothmann is investing approximately 3 million euros in what is meanwhile the third location expansion following an extension phase each in 2010 and 2013. The company of the Siempelkamp Group is growing with its tasks; the orders and with it the requirements for the building height and width are pushing into new dimensions. Even the existing crane system has reached the limits of its capacities – an expansion has become necessary.

The construction work for the new assembly plant including office and social wings started with a symbolic groundbreaking ceremony at the new construction site across from the existing company's premises in August 2018. Part of the new equipment is a crane system with a capacity to lift up to 25 metric tons as well as a 10 ton crane system. Furthermore, the new building is intended to include a test stand for the RoundTrack® system, Strothmann's top selling product.

This expansion will shortly create new capacities: "Plants for press automation have a width of up to 26 m. We can build them completely in the new building," says Henning Seffers, Managing Director at Strothmann. A mobile guard system between individual work areas will contribute to creating a flexible assembly area. Thus, depending on the need, less space-intensive or many small products can be assembled in the new building simultaneously.

Location expansion
Schloß Holte-Stukenbrock

New assembly plant at Strothmann in Schloß Holte-Stukenbrock: visualization

Strothmann team: more space for creative ideas

The extension opens up 1,300 m² of additional assembly space with a width of 30 m. Furthermore, 20 to 25 office workstations, conference and break rooms will create more space for the Strothmann teams. The new building is scheduled to be completed in May 2019.

Strothmann Management: Henning Seffers and
Dr. Volker Middelmann

INNOVATION NETWORK OWL MASCHINENBAU

Strothmann is also advancing education and locational strengths

Strothmann not only moves loads and machines of all types, but also drives innovations. "Education, research, and innovations are indispensable for a modern industrialized country such as Germany to maintain its position in the competitive international market. It is our company philosophy to contribute to these endeavors," says Henning Seffers, Managing Director Strothmann.

Strothmann is a member of the innovation network OWL MASCHINENBAU – which has the objective to strengthen the economic and technological performance capacities of the mechanical engineering region OstWestfalenLippe in international competition. With 272 companies and more than 42,000 employees, mechanical engineering is a historically-grown core competence in the region. The projects make an important contribution for the long-term stabilization of Germany as a high-tech industry location. The leading-edge cluster has been awarded by the Federal Ministry of Education and Research.

The most important goals of the network are:

- Strengthening the economic and technological potential of the regional, medium-sized, mechanical engineering industry
- Development of location advantages for companies competing in the global market
- Preservation of companies for a long-term stabilization of the employment market

In 45 projects, world market leaders, such as Strothmann and others, develop along with research institutes intelligent products and production systems in this innovation network.

Siempelkamp Logistics & Service GmbH: **Three locations, one service promise**

➔ By Dr. Stephan Niggeschmidt

More than 1,000 supported plants worldwide, three locations, one service promise: Siempelkamp Logistics & Service GmbH (SLS) contributes important services to the core values of the Siempelkamp Group according to the motto "You request – we deliver". After all, the chronology of a customer project does not end with the customer's acceptance of the plant.

"A customer is the most important visitor on our premises. He is not dependent on us. We are dependent on him. He is not an interruption of our work. He is the purpose of it. We are not doing him a favor by serving him. He is doing us a favor by giving us the opportunity to do so." This is not a quote from our present, customer-focused, time, but from 1890. It is not a quote from an entrepreneur, but from the Indian pacifist and freedom fighter Mahatma Gandhi. Nevertheless, it fits the claim of the Siempelkamp subsidiary SLS perfectly: If customers give their supplier the opportunity to support a plant over its entire life cycle, then that is the biggest compliment for the supplier.

20.000

different spare parts are requested from SLS each year.

The worldwide support of Siempelkamp's machines and plants throughout their life cycles is the core business of Siempelkamp Logistics & Service GmbH. The portfolio includes upgrades and field service, spare parts service, as well as the innovative Service 4.0 products, for example, from the area of control technology. More than 150 SLS employees support more than 1,000 plants worldwide; spare parts service and other services at competitive prices are guaranteed to Siempelkamp customers.

Bad Kreuznach, Germany – left: SLS building, right: building of Siempelkamp's subsidiary Hombak

Service assignment at Finsa, Brazil

New service and logistics center in Bad Kreuznach, Germany

SLS milestone 2018: new service and logistics center

In 2018 SLS celebrated the completion of the new service and logistics center at the Bad Kreuznach location. With the new building the company ensures the high availability and quick supply of spare parts due to considerably higher inventories of standard spare parts. The claim is: to serve as many customer orders as possible in one day directly from stock, so that the replacement part is at the customer's site as quickly as possible.

The logistics chain itself also contributes to this. Due to the close proximity of SLS to the highway and to the international hub of Frankfurt Airport, the logistics chain is kept short. The goods are leaving the SLS location as secured cargo which saves customers the costly and time-consuming security checks of the cargo at the airport. Furthermore, the new building has a closed safety area which protects identifiable air cargo from unauthorized interference.

Inauguration of the new SLS service and logistics center in February 2018 – Management team from left to right: Dr. Stephan Niggeschmidt, Carmen Lorch, Stefan Wissing, Thomas Dahmen

SLS management: Stefan Wissing, Dr. Stephan Niggeschmidt, Thomas Dahmen

How fast is fast?

The understanding of what is fast has changed significantly in recent years, especially when a spare part is required and production threatens to fail. "Manufacturers expect minimal reaction times from us as spare parts specialist. Today they might be satisfied if we respond within 24 hours to their request, later they expect a response within 12 hours, and finally within the hour. That is why we have to provide our 24/7 remote service to remedy plant downtimes and to further optimize our spare parts service. That is the future," says Thomas Dahmen, SLS managing director.

With regard to the future, not only the increased pace, but also the timely monitoring of maintenance reasons sets a new course. "We are currently in the midst of a learning process: We are transferring our experiences with industries such as the automobile industry, which has a higher service requirement than the wood industry, to customers in the wood sector. The motorists say: You cannot deliver within 24 hours? Then you are not our supplier. If excellent service is possible for such industries, then it is also possible for the wood industry," explains Stefan Wissing, managing director at SLS.

From Service 4.0 to Logistics 4.0

Smart, digitalized, networked – this is how SLS links Service 4.0 with Logistics 4.0 and advances the networking in the supply chain. By building a new logistics center in Bad Kreuznach, SLS has further optimized and expanded the service for spare parts. "With the newly introduced warehouse management system we plan and control our entire material and information flow. Thus, we have laid the foundation today to make our logistics fit for a networked future," describes Dr. Stephan Niggeschmidt, also member of the SLS management.

This also includes the digitalization of the sales channels, that is, the networking of customer processes with those of Siempelkamp. Thus, spare parts lists and prices can be directly connected with the ERP system of the customer or order data can be exchanged via a portal. Consequently, transaction costs are reduced and quicker and more intense coordination is realized. With the help of automated processes, SLS is once more able to increase its efficiency as well as the efficiency of its partners.
With this approach SLS has arrived in the future and stands, entirely in line with Gandhi, for innovations which are developed together with the most important partners.

SLS range of services

Modifications and upgrades

- needs-based packages of measure for sustainable modifications or plant expansions (electrical and mechanical)
- upon request turnkey modifications
- Service 4.0 plant components

Maintenance and repair

- needs analyses
- planning and implementation of maintenance shutdowns
- troubleshooting
- consulting and supervision

Spare parts

- original Siempelkamp spare parts
- plant-specific consultation
- spare parts starter kits and spare parts catalog
- expand SLS product portfolio with spare parts for plants by third-party manufacturers
- Service 4.0: efficiency through automated networked processes

Siempelkamp
Logistics & Service

Control technology

- Prod-IQ.basics for reliable and up-to-date on-demand data for the management
- Prod-IQ.business for shift, day, and month evaluations
- Prod-IQ.quality for online quality forecasts
- Prod-IQ.maintenance for optimized maintenance and repair processes

Support

- 24/7 remote service
- online analyses and support for optimizations
- support during troubleshooting

3-dimensional model generator for VENTAPP products: **How 3-dimensional technology gives new drive to fans**

→ By Fred Holmer and Holger Grebbin

What provides VENTAPP fans with particular drive? It is not their motors alone, but starts with their models. 3-dimensional technology provides the core product of this Siempelkamp subsidiary with wings in terms of speed and efficiency.

3-dimensional modeling: on the PC Kai Altmann, deputy technical manager at VENTAPP, center: Holger Grebbin, VENTAPP sales manager, right: Fred Holmer, VENTAPP managing director

In this day and age companies are under enormous pressure to develop new products at low cost and decreasing time-to-market cycles and, at the same time, react flexibly to customer requests. In close cooperation with customers, VENTAPP, the specialist for fans within the Siempelkamp Group, came up with an idea that tackles this requirement. Why not generate true-to-size and binding 3-dimensional models of VENTAPP fans which customers can then include into their digital plant design without any drawing efforts on their part, so to speak via drag-and-drop.

SOLIDWORKS was Ventapp's software of choice. It was quickly installed and included training for the Ventapp design engineers. "With the software, volume models of all our fans became possible and usable," says Fred Holmer, managing director VENTAPP GmbH.

In 2017 VENTAPP led this technology to the next stage in development: So far 3-dimensional models were generated individually with great effort – in 2013 the team had the idea to develop an automated model generator. Together with the sales and technology team, a SOLIDWORKS programmer went to work to transfer several man-years of work into a concentrated program. The parametric standardization of the products was the decisive measure here.

The 3-dimensional generator currently includes the basic product range of the industrial fans. Only models of a special type or size are still designed by hand. For several years now VENTAPP customers have been provided with automatically generated 3-dimensional representations. "The logical step to provide binding 3-dimensional models already during the proposal stage was carried out by implementing the fan generator in our new offer program in 2018. The program automatically adds 3-dimensional volume models to each offer in common formats (e.g., STEP, IGS). Thus, detailed fan models that can be useful early on in the project for further plant planning can be generated at a high speed (approx. 5min/model). Our customers aren't the only ones that reap these benefits, but also Sicoplan, the Belgium planning and engineering specialist within the Siempelkamp Group," explains Fred Holmer. Through system-internal material mapping of the individual component parts, the weight or the center of gravity of the machines can also be determined.

With the 3-dimensional generator VENTAPP is one of a few leading fan manufacturers that can offer customers this type of service that

goes along with this availability and quality. Sales Manager Holger Grebbin points out that "regarding the progressive customer demand, to require 3-dimensional fan models as a prerequisite when submitting an offer, the company has acquired a competitive advantage here."

The success supports the idea to program and finish this self-developed software, that cannot be obtained on the free market, to its operational readiness. Customer requests for 3-dimensional models are continuously rising. Additional options, for example, a comprehensive storage management and FEM calculations are also part of the system and will be used in the medium term.

"The acceptance among our customers is extremely high, feedback is exclusively positive. In general our customers are honestly surprised about the performance of the 3-dimensional generator, its complexity, level of detail, and speed," says Holger Grebbin.
The 3-dimensional fan models are also optimally used during the further production process. For the technical implementation in the design at a later time, the VENTAPP team turns individual design-intensive assemblies from the volume models into 2-dimensional manufacturing drawings, including all cuts and parts lists.

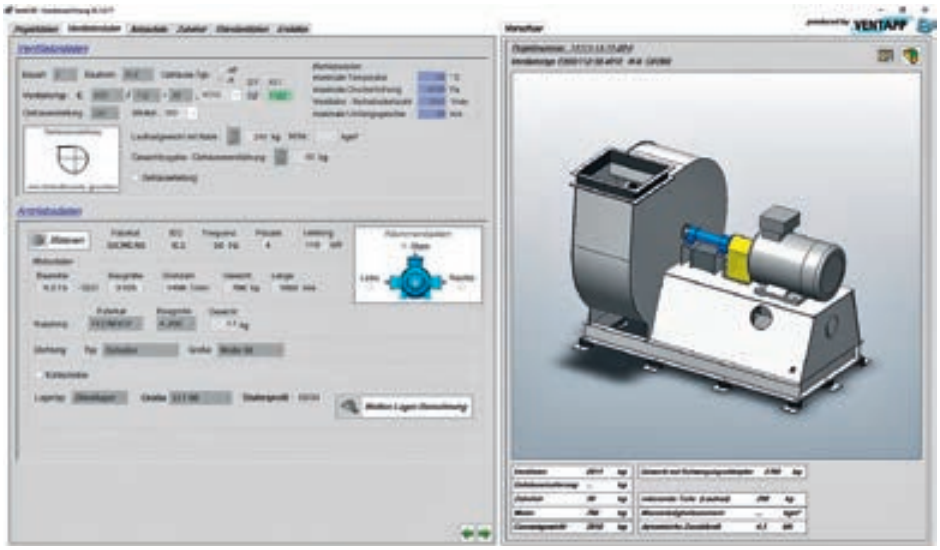
From 16 hours to 5 minutes

The program is constantly being enhanced and updated. The next big step is a web interface which enables customers to design their own fan to a large extent themselves and generate a corresponding 3-dimensional model. The continuously increasing demand for 3-dimensional models can be satisfied quickly and with little effort – in approx. 5 min per fan. Until now a technician needed up to 16 hours per 3-dimensional fan model. Some VENTAPP customers explicitly demand a 3-dimensional model as a criterion for the offer or the awarding of the order. Additionally, the tool is a graphic and impressive tool for the VENTAPP sales department that helps to depict the fan in a 3-dimensional way during meetings with customers. As a result of this efficiency increase, the design team can handle a much larger design load with the same number of employees.

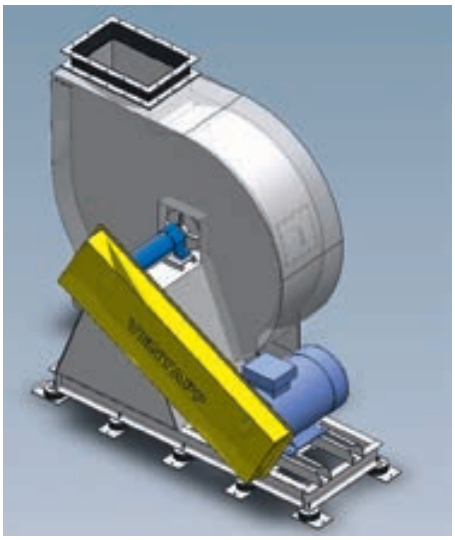
Last but not least, the new 3-dimensional concept minimizes interface losses between project planning, design, purchasing, and manufacturing by networking the software systems. The amount it takes to create technical documentations is also significantly reduced. Dimensions and models of VENTAPP products are consistently available and thus easy to reproduce.

3-dimensional concept: value in use for VENTAPP customers at a glance

- 3-dimensional models as true-to-size models of the finished product (fan including attachment parts)
- Visual representation of the fan: 3-dimensional model is vivid and tangible, 2-dimensional drawings with different views are useful for manufacturing, but not for sales
- Models can be integrated into the customer's plant planning with no effort on the customer's part
- The space requirement at the customer's site can be exactly determined
- Necessary pipelines can be sized and planned
- Foundation dimensions can be planned
- Weights and centers of gravity for foundation planning and building design are automatically calculated.
- Consistency and reproducibility of dimensions and models of VENTAPP products



Fan and drive data in the model



3-dimensional modeling of a VENTAPP fan


Siempelkamp
Siempelkamp
DRIVEN BY
PERFECTION

MARKETS

The constant courage to rethink and challenge the established is Siempelkamp's core value. To develop new technologies, to expand areas of application, to advance the diversification into new industries and markets – this all is based on the entrepreneurial spirit of our managements which gave the right impetus at the right times.

Siempelkamp wood-based materials expertise 2018: **Lesdrevmash in Moscow**

➜ By Hans-Joachim Galinski and Bernice Neves

At the Lesdrevmash 2018 in Moscow Siempelkamp was on site again with a competent team. From October 22nd to 25th Siempelkamp presented its innovations to the Russian wood-based products industry, welcomed many new interested parties and nurtured old contacts. The exhibition booth was well attended, with a surface area of 120 m². Its successful design attracted attention like a magnet.

The renowned international exhibition opened its doors for the 17th time. Mechanical engineers from all over the world showed more than 10,000 visitors their newest technologies, machines and tools for wood working and wood processing. this year 350 companies from 28 countries participated at Lesdrevmash. In addition to Russian companies, companies from China, Finland, Germany, Italy, Japan and Spain also showed their products in national pavilions.

Siempelkamp booth at the Lesdrevmash

Siempelkamp booth:
"eye-catcher and multimedia"

At the entrance of Lesdrevmash

Siempelkamp has participated in this exhibition since the 1970s, in order to maintain the contact with its customers and to meet new interested parties. Today Siempelkamp is a fixed component of this exhibition, which takes place in alternation with the Woodex every two years in Moscow. 130 out of the 350 exhibitors are Russian companies. It pulls professional visitors from all regions in Russia and neighboring CIS countries. Many long-standing contacts are rekindled, maintained and strengthened here.

This year the Siempelkamp team had again much news. The main focus was the 9th generation of the continuous press ContiRoll®. But also the digitalized future of the wood-based materials industry, especially the 3D engineering of Sicoplan, was discussed. Another central topic: cost reduction by compliance with all quality requirements. Herewith Siempelkamp demonstrated many optimizing process concepts. From Ecoblender and Ecoformer to ContiRoll Ecodrive and Ecoscan, to SPU to ProdIQ® – names, which stand for highly efficient, self-optimizing wood processing plants and which were inquired about by knowledgeable visitors.

Entrance
German pavilion

Of particular interest was the newly developed OSB^{ADVANCED} technology by Siempelkamp. This is an economical substitute to the classical OSB panel, which is free of formaldehyde and has excellent characteristics. It is a panel that will be used increasingly in interior construction as well as in the furniture industry. This new technology is currently implemented at Siempelkamp's customer MUROM in the Russian region Vladimir.

The exhibition booth displayed a night-time aerial view of VMG's particle boardplant in Mogilev, Belarus, which should underline Siempelkamp's competence in complete systems. This competence has gained a positive image in Russia. Like no other company, the Siempelkamp group of companies is able to provide the complete technology chain for wood-processing plants from a single source.

"Lesdrevmash has been on Siempelkamp's agenda for more than three decades and is an anticipated event for us and our customers. It is an essential component of our sales concept and enables a regular exchange of ideas with the Russian wood-based materials industry."

HANS-JOACHIM GALINSKI, SALES MANAGER FOR SIEMPELKAMP CIS

Siempelkamp and the Russian wood-based materials industry:

- As early as the times of tsars, Siempelkamp delivered plywood presses to Russia
- After the collapse of the Russian wood-based materials industry in the 1990s, Siempelkamp has contributed significantly to the reconstruction of this industry
- 27 modern Siempelkamp plants for wood-based materials are already operating in the CIS countries or are currently being built
- Thereby Siempelkamp has a market share of 65% in the CIS
- Until 2022 a growth in demand of 8 million m^3 of wood-based materials is expected for Eastern Europe alone
- In order to cover this additional capacity, three to four new plants for wood-based materials must be built each year
- Russia is the most densely wooded country on earth, from which 80% of the forest is east of the Urals
- No country in the world can produce wood-based materials as cheap as Russia
- Due to the geographical proximity to the Asian neighboring states, new and interesting cooperation possibilities arise

"Five friends"
From left to right: Hans-Joachim Galinski, André Romanov (an institution in the wood-based materials industry), Ulrich Kaiser, Konstantin Putintsev and Roman Billinger

"A team that makes a difference"
From left to right: Konstantin Putintsev, Ulrich Kaiser, Hans-Joachim Galinski, A.E. Federov (Investor for Murom OSB advanced), Mikhail Kostjuschkin (Minto), Carsten Otto and Roman Billinger

"The Lesdrevmash plays a significant role for us in the area of customer care. We support more than 20 plants in the CIS. The Russian market is of great importance for us, as the timber industry continues to develop positively. "

KONSTANTIN PUTINTSEV, SALES AND SERVICE MANAGER, DIRECTOR OF THE OFFICE RUSSIA AND BELARUS

The 3D engineering of Siempelkamp's Belgian subsidiary Sicoplan is a significant pillar for Siempelkamp. The relatively young technology (drone-based) enables a precisely fitting, conflict-free projecting and planning of new plants, particularly when dealing with existing infrastructure.

Many subsidiaries of the company were represented at the exhibition, such as the company Pallmann as technology leader for size-reduction technology, the company Büttner as drying and energy plant specialist, CMC Texpan as specialist for screening and mat-forming technology and Siempelkamp Logistics & Service as the specialist for spare parts and modernization.

Due to the political atmosphere, the number of potential projects was limited, nevertheless the exhibition was very favorable and the company's expectations were met. As expected there were several conversations with long-time and new customers, which were about current and new projects. Additional plants are to be supplied in the coming year. Corresponding project and planning contracts were concluded. One thing is certain: Siempelkamp will be present at the next Lesdrevmash in 2020.

▼ Roman Billinger in a conversation with Sergey Ostanin (Uvadrev) and Juri G. Kraev (CEO Ugratimber)

Konstantin Putintsev in a conversation with customers ▲

Russian students at Siempelkamp: knowledge transfer to a younger generation
During the second exhibition day Siempelkamp welcomed 40 students from the Bauman Moscow State Technical University (BMSTU), department of wood technology, to their exhibition booth. They were accompanied by the Executive Director of the Association of Furniture & Woodworking Enterprises of Russia, Oleg Numerov, who supports the newcomers of the Russian wood industry with extraordinary dedication. Hans-Joachim Galinski, as the Sales Manager for Russia, welcomed the group. Together with Mikhail Kostjuschkin (Minto) the students were provided first insights into the Siempelkamp company.

In order to meet the expected strong demand, Siempelkamp relies on newcomers and lateral entrants from the country who already know Siempelkamp. Mr. Galinski emphasized the importance of the Russian market for Siempelkamp, described Siempelkamp's role in the modernization of Russia's wood-based materials industry, as well as the company's perspectives and projects. In addition he encouraged the students to not only focus on their theoretical studies, but gain practical experiences, and if possible international experiences also. "Companies such as Siempelkamp need well qualified, curious and motivated newcomers. In times of globalization it is important to know at least one foreign language. Therefore you should learn at least one foreign language, this will be an immense advantage in your professional career," Hans-Joachim Galinski's appeal to the newcomers.

"Siempelkamp in dialogue with the furniture industry" – Mikhail Kostjuschkin, Hans-Joachim Galinski and Tatyana Henske in a conversation with the executive Director of Association of Furniture & Woodworking Enterprises of Russia

"Focusing on newcomers" – MSTU's students at Siempelkamp's exhibition stand

From left to right: Valery Kalesnikovich (Siempelkamp) with the management team VMG, Belarus: Andrei Kovalenko, Denis Sivakow, Sadovnikov Dmitriy, Wyborny Kiril, Sergey Fedoseev and Roman Billinger Siempelkamp, in front of their particle board plant in Mogilev

The booth staff at the end of a successful exhibition

Customers and interested parties at our booth

INTERVIEW

CUSTOMER FOCUS

Interview with Mikhail Kostjuschkin, founder and owner of Minto GmbH in Cologne

Bulletin: Mr. Kostjuschkin, how are you connected with Siempelkamp?
Mikhail Kostjuschkin: Since 2005 we cooperate with Siempelkamp. During this time twelve successful projects were concluded, of which seven were in Russia and five in Belarus, Particleboard, MDF and OSB plants were sold.

Bulletin: What exactly have you learned to appreciate the most about Siempelkamp over time?
Mikhail Kostjuschkin: First of all I would like to emphasize that my contact with Siempelkamp started in the 1980s. At that time I was active as representative of the Soviet wood ministry in Germany. This started a long-standing relationship between the German and Russian wood industry, thus also to Siempelkamp, as the leading supplier in this industry. I'm very satisfied with Siempelkamp's plants, as they are equipped with the most innovative technology available worldwide. The "Made in Germany" factor guarantees plants of the highest quality. The high reliability of the plants is the basis for our customers' success. In case something goes wrong, there is Siempelkamp's 24/7 service, a service which is available round the clock. I'm impressed.

Bulletin: Mr. Kostjuschkin, this year you are celebrating a quarter of a century with Minto. What does this anniversary mean to you?
Mikhail Kostjuschkin: The founding of Minto Handels GmbH in 1993 was the logical continuation of my long-standing commitment for the Russian wood industry after the collapse of the Soviet Union. Today I have many close relationships with many European companies of the wood processing and supply industry. The wood industry in the CIS countries has enormous potential. We at Minto want to continue to support our customers for many more years in finding suitable partners in a competition-oriented world.

Mikhail Kostjuschkin

Energy made in Thailand:
The heart of the biomass power station is by Büttner

→ By Andreas Klug and Jörg Melin

Renewable power generation plays an ever greater role in Thailand. When Bangkok Industrial Boilers is implementing biomass power stations, the expertise of the Siempelkamp subsidiary Büttner Energie- und Trocknungstechnik GmbH also comes into play.

The generation of electricity from renewable sources is becoming increasingly important worldwide. While in Germany approximately one third of the gross electricity consumption is from renewable energy sources, the share in the neighboring country of Austria is even greater at around three fourth. As a comparison, the average value in the European Union comes to around 30 percent.

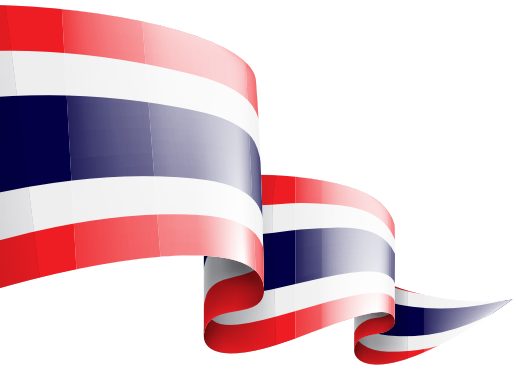
Even in non-European countries renewable power generation plays an increasingly larger role. For example, in Thailand 15 percent of the gross electricity consumption was generated from renewable energy sources in 2014.

In the course of a long-term plan to further increase this share, the Thai government decided to make accessing the public electricity grid easier for very small power producers (VSPP). VSPP produce electricity with a capacity of less than 10 MW. Currently, there are approximately 910 providers in this category in Thailand. They use the sun, wind, water, and biomass to produce energy.

A major supplier of such biomass power plants is Bangkok Industrial Boilers (BIB), founded in 1965, which has delivered systems with a total combined capacity of 313 MW in recent years.

The heart of these systems is the moving grate by Siempelkamp's subsidiary Büttner. "This functional unit, which is optimally designed

Panel Plus plant in Hai Yai (Source: BIB)



Thailand and the promotion of renewable energy sources: biomass

In Southeast Asia, Thailand is considered an exemplary country regarding the promotion of renewable energy sources. The energy demand of the country increased tremendously with the rapid economic growth during the last two decades. A large part of the economic output is based on agriculture and the processing of agricultural products. Accordingly, the potential for energy production from biomass and biogas is enormous. Next to using waste from the rice, palm oil, natural rubber, starch, paper, and sugar industries, the sector of solid biomass has started to place more emphasis on community projects as well as the cultivation of energy crops.

To counteract import dependence, the government developed a strategy that safeguards the country's energy supply by using the largest possible percentage of energy from its own sources. According to this strategy, aka Alternative Energy Development Plan (AEDP), 25 percent of the final energy consumption shall be provided by renewable energy sources until 2021.

(Sources: German Energy Agency (DENA), Country Profile Thailand / Foreign Trade Portal Bavaria)

for biomass burning, has proven itself over decades in the wood-based materials industry. Thus, Büttner became the ideal partner for Bangkok Industrial Boilers," says Rainer Jordan, technical director of the company.

Jörg Melin (Sales Engineer Büttner), Andreas Klug (Managing Director Büttner)

In intensive talks, a joint concept was developed for biomass power plants with a maximum capacity of 9.9 MW of electrical power. Essentially, these plants consist of a grate furnace by Büttner, a steam generator by Bangkok Industrial Boilers as well as a steam turbine and a generator.

The first joint system was contractually concluded in 2015 and supplied to Panel Plus Biopower (PPB) in May of 2016. Just as the wood-based panel manufacturer Panel Plus, which already operates two Büttner energy plants for the generation of process heat, PPB also belongs to the Mitr Phol Group.

Another plant went into operation in Kokchareon, 200 km northeast of Bangkok, in July 2018 – and a new project is already under way: The next plant will be installed in Mae Krathing in Northern Thailand.

"We anticipate additional interesting and promising projects in cooperation with Bangkok Industrial Boilers," says Jörg Melin, Büttner's sales engineer for Southeast Asia. "The generation of energy from wood has a long tradition for Büttner. To use this energy not only for the generation of process heat in the wood-based materials industry, but also for the generation of electricity, is a logical step in the further development of our company," adds Andreas Klug, managing director Büttner.

Büttner and biomass: technical solutions with many variations

Büttner's drying and energy systems are excellently suited for drying biomass. The technical solutions are as varied as the materials. Depending on the raw material, application, and water content involved, Büttner designs, builds, and supplies the right dryer for the job and combines with it a precisely coordinated energy system with robust burners.

In addition to a precisely controlled drying process, another important factor for drying biomass is a system's cost-effectiveness – making use of free waste heat. The materials, often very inhomogeneous, require specific dryer internals and special handling. Büttner's biomass drying systems are designed to be robust and easy to control, so that chocking is avoided. They can be retrofitted in many different ways – even if the fuel's water content varies from that of the system's original design.

Thanks to the proven combination of drying and energy systems, Büttner's systems make an important contribution to efficiency along the entire production process. This allows for a highly feasible and cost-effective utilization of biomass fuels.

Plant in Kokchareon (Source: BIB)

CMC TEXPAN:
"Foot in the past, head in the present, eyes to the future"

→ By Paolo Gattesco

"Always keep one foot in the past, your head in the present, and your eyes to the future" – with this mission the Italian Siempelkamp subsidiary CMC TEXPAN is actively involved in its markets. Where lies the strength of the connection to the parent company? What is the "eye to the future" focused on? We report.

CMC Location in Colzate/Italy

CMC TEXPAN, founded in 1962, has been cooperating with the Siempelkamp Group since 1980. The focus of the cooperation is on the aspects of front-end technology for the wood-based panel industry. In 2010 CMC TEXPAN, located in Colzate, Italy, became a 100% subsidiary of the Siempelkamp Group.

The cooperation between CMC TEXPAN and its parent company is very close and friendly. At the same time, CMC TEXPAN is also strengthening its role as a direct supplier of its own portfolio. Although it might seem paradoxical at first sight, entering the market as a direct supplier contributes to the success of the entire Siempelkamp Group. This is especially true with regard to the machines and equipment for particle preparation. In this sector competition is very strong: the possibility of direct sales allows CMC TEXPAN to pass on price advantages to its customers. In this way, customers can benefit from the competence and first-class technology of Siempelkamp under the motto "Everything from one source" while, at the same time, avoiding negative consequences for their investment budget.

Project "Green River": direct contact with the customer

A prime example of the positive aspects of this strategy is represented by the "Green River" project. At the end of November 2017, the Thai company Green River Panels placed an order with Siempelkamp for the supply and installation of the largest particleboard factory in Asia (see box). Together with Siempelkamp, CMC TEXPAN took an active part both in the preliminary meetings for the definition of the scope of supply and of the technical execution, and in the negotiations for the signature of the purchase order. In this way, any technical questions from the customer could be

clarified at the very same moment in which they arose, at an early stage in the project.

With this project, a significant part of the equipment for the primary processing of wood chips will be supplied by CMC TEXPAN as a direct supplier. This includes systems for the extraction of material from storage bins, roller separators, gravimetric separators, oscillating screens for chips and for dry particles, glue

CMC TEXPAN
Ecoformer SL

Green River Panels project: king-size capacities

Green River Panels, one of the leading wood-based materials suppliers in Asia, supplies next to sawed timber from over-mature rubber-wood plantations also particleboard made from the same type of wood.

The new plant, ordered from Siempelkamp in 2017, will be built close to Trang in South Thailand, the center of the Thai latex production with extensive rubber-wood plantations. Green River Panels is scheduled to commence operation in the third quarter of 2019. The plant is designed for a daily capacity of 2,800 m³ of particleboard. With the new production site Green River Panels will double its production capacity for particleboard in order to meet the constantly growing demand of the Asian market.

Shaking hands at the contract signing: Jürgen Philipps (Spokesperson Siempelkamp Management), David Huang (CEO Green River Panels)

blenders and related particle metering bins, as well as the glue kitchen.

With specific regard to forming systems for particleboard, CMC TEXPAN plays a foreground role in the design of this core component of wood-based panel plants. "One foot in the past," represents a quality measure: CMC TEXPAN can boast an experience of more than five decades, which represents a solid and extremely valuable knowledge base for the entire Siempelkamp Group.

Paolo Gattesco,
Sprecher der Geschäftsführung
CMC TEXPAN

With this type of expertise, CMC TEXPAN also has a very important function in coordinating Siempelkamp production sites located in different parts of the world. The company also makes use of synergies with other Siempelkamp subsidiaries, such as SICOPLAN, the expert for design and planning activities within the Group. Sicoplan provides services in the areas of pre-engineering, planning and commissioning, performance increases, and production optimizations.

CMC TEXPAN's production units are characterized by extreme skill and accuracy: they are fully capable of manufacturing machinery and components even if designed externally or not belonging to the traditional product range of the company. This flexibility undoubtedly offers a significant help to the whole Group whenever other manufacturing resources are operated to full capacity and a potential shortcoming might turn out to be definitely detrimental.

"Head in the present"

At CMC TEXPAN, great attention is given to the topics and needs stressed by today's industrial world: safety, reliability, availability and maintenance friendliness of the machines, as well as sustainability, saving raw materials, improving energy efficiency, and (last but not least!) the top quality of the finished product.

CMC TEXPAN also has a very solid competence in designing and manufacturing machinery and equipment dedicated to sectors other

Gravimetric separator

enable smoother and easier installation of these machines especially in indoor applications.

Great attention is given to the creation and training of young staff members. CMC TEXPAN is in constant contact with local universities and specialized higher education institutions. Paolo Gattesco, Chairman of the Board of Directors at CMC TEXPAN: "They put forward the names of particularly talented students and we welcome them as interns and trainees. They are supported by our skilled technical professionals and can get important experience on the ground. Irrespective of whether they will remain with us or take other directions, this will ease their entry onto the job market. Needless to say, investing on young people also means to bring fresh ideas and innovation into the everyday life of the company: undoubtedly, a priceless advantage!"

than the wood-based panel industry sometimes even very different from this latter application: oil & gas projects, machinery for cement plants, underwater vessels for inspection of dams and so on.

Thus, CMC TEXPAN is an extremely versatile company, capable of proposing and developing innovative, customized engineering solutions.

"Eyes to the future"

"Eyes to the future" currently means: With particular reference to safety, CMC TEXPAN is developing "EX-PROTECTOR", a system for flameless explosion venting on screening machines featuring REMBE®'s "Q-Box". This system has been conceived with the specific purpose of reducing the safety distance to be kept around screening machines. This will

Silo discharge system

Pallmann Maschinenfabrik:
Proven quality for material that's small in size and fine in quality

→ By Stefan Wissing

Pallmann Maschinenfabrik has been part of the Siempelkamp Group since 2012; in 2017 Pallmann became a 100% Siempelkamp subsidiary. The core competence of the Zweibrücken-based company is "top performance in size reduction". This Siempelkamp subsidiary offers tailor-made size reduction technology in proven quality not only in the area of wood preparation, but also for many other applications – supplying complete systems for a wide variety of materials.

Recycling: The size reduction of valuable materials opens up added value

Recycling means more than just the size reduction of valuable materials. In order to transfer valuable waste materials into reusable materials, which can be reclaimed as secondary raw materials, a perfectly functioning, robust technology with specified material preparation, designed for continuous operation, and proven logistical concepts is needed. From shredders to pulverizing systems, Pallmann provides efficient and economical size reduction technology which is geared towards a broad range of recyclable materials – used tires and rubber, waste paper, biopolymer, film waste, PET bottles, carpets, and many others.

Recycling plant

Pallmann location in Zweibrücken

To provide the appropriate technology for the desired material, the Pallmann team conducts research in the in-house research and development center, one of the most efficient ones in the world. "We are constantly researching and developing new projects for the recycling of valuable materials and have achieved many innovations this way. Pallmann was the first company to reduce the size of and pulverize PVC waste at normal temperature and the first company that could recycle biopolymers," says Stefan Wissing, managing director at Pallmann.

By means of economic size reduction systems, we provide a chance for waste and residual materials to be reused, exploit new sources of raw materials, reduce contaminants and greenhouse gases and protect natural resources.

Size reduction and preparation of plastics: optimal flowability and high bulk density

As a pioneer of size reduction technology, Pallmann offers single machines and complete systems for the size reduction and preparation of thermoplastics, plastic waste and rubber. Pallmann knife mills reduce sprues, plastic profiles, plastic pipes and purgings into first class granules.

Plastic waste

Pallmann size-reduction technology: high-performing machines and service teams

Efficient pulverizers, grinding mills and disc mills produce high quality plastic powders for rotational molding, the production of masterbatch* and for coating. Our systems for the size reduction of plastics ensure the necessary powder quality in accordance with DIN 53492. Plastic powders, produced with Pallmann pulverizing systems, meet the criteria with regards to controlled fineness, optimum flowability and high bulk density.

For the preparation of thermoplastic waste such as plastic film and straps, PET bottles as well as insulating materials from XPS and composite materials such as carpets into granules, Pallmann offers the Plast-Agglomerator. Due to a special preparation process the granules are barely thermally damaged and can be directly reintroduced into production.

*Masterbatch = plastic additives in the form of granules containing pigments and/or additives whose concentration is higher than in the final application. They are used to color plastics or impart other properties to plastics. Compared to pastes, powders or liquid additives, masterbatch increases the process safety and is easy to handle.

Pulverizing system for the production of masterbatch

Pallmann research and technology center

3 QUESTIONS FOR …

… Stefan Wissing, Pallmann, managing director

Bulletin: Wood chips, gelatin, plastics, spices – these are very different materials which are prepared and reduced in size by Pallmann. Is there a common denominator in the process technology? Are the machine concepts for the different industries standardized or are they very different?
Stefan Wissing: Each material places specific demands on the size reduction task. Fibrous materials require different technologies than materials that are brittle. Pallmann tailors each machine exactly to the corresponding size reduction task. For applications in the food industry it is absolutely essential that our machines are designed in a way that allows customers to easily remove and completely clean any part of the machine. Some materials require machines and systems that have explosion-proof construction because the finely ground powders can be explosive under certain conditions.

Stefan Wissing, Uwe Wagner: Pallmann management

Bulletin: For further and new developments of products and trials with customer-supplied material, Pallmann runs one of the world's most efficient research and technology centers for size reduction technology. Which projects are Pallmann experts currently working on here?
Stefan Wissing: The new development of a refiner plant for the fiberizing of rice straw represented a particular challenge in the last few months. In some aspects the refiners for all annual plants require configurations that are significantly different from refiners used to fiberize wood. Furthermore, our specialists are currently developing an improved and significantly different configuration of our agglomerator. Soon we will have completed the first prototype of this agglomerator and will start testing it in-depth in our technology center.

Bulletin: The largest connections between Pallmann and the Siempelkamp Group can be found in the wood-based materials industry. Are there also synergies within the Group in other competence areas?
Stefan Wissing: I don't see machine and plant engineering and the expertise as Pallmann's only strength. As an independent machinery and plant manufacturer, embedded in the structure of the Siempelkamp Group with its worldwide distribution, manufacturing, and service network as well as an independent service company, Pallmann distinguishes itself clearly from its competitors. Pallmann is working closely with other companies in the Group and benefits from this cooperation. Control cabinets, for example, are built by ATR Industrie-Elektronik GmbH. For projects regarding the recycling of waste wood we work together with Siempelkamp's Italian subsidiary CMC, specialist for screening and separator technology. For the planning of entire plants, we cooperate with Siempelkamp's Belgium subsidiary Sicoplan.

More than 100 machines for cutting, pulverizing, agglomerating, fiberizing, breaking, separating and recycling of different materials are available for use at the research and technology center

3 QUESTIONS FOR …

… Uwe Wagner, starting in 2019 as managing director at Pallmann together with existing manager Stefan Wissing

Bulletin: Herr Wagner, as new managing director you have a fresh look at Pallmann's portfolio. Where do you see the greatest strengths?
Uwe Wagner: I see Pallmann in a good market position. A research and technology center with over 100 machines and a sales team that continuously accepts new requirements from the market and works hard on implementing those represent innovation at Pallmann. The examples listed by Stefan Wissing such as the size reduction of PVC waste at normal temperature and the recycling of biopolymers are, next to other examples as well as the numerous patents (over 150 active patents) which Pallmann holds, clear evidence for the company's market position. I am convinced that the total package comprised of innovative and reliable technology, worldwide presence and comprehensive as well as quick service is what customers require to ensure trouble-free production.

Bulletin: From a sales perspective which arguments are the most important ones when it comes to the decision of purchasing a Pallmann machine?
Uwe Wagner: Reliability and quality! Here I not only mean that our equipment functions reliably, but also that the commitments that our employees made during the offer phase are kept. I am well aware that this is a constant challenge for the entire company. However, successful long-term customer loyalty can only be obtained through such reliability.

I see Pallmann in a good position to offer such reliability. Commitments regarding the process engineering can (and must) be secured through documented data and / or trials in the technical center. Commitments regarding the time schedule must be achievable through transparent and consistent project management and schedule planning.

Customers that buy from Pallmann are deliberately buying the highest available quality in the design of every detail making up our machines and plants. Our customers know that during their operation, machines are subject to high requirements. The materials are reduced in size with high effort and energy input. Machines and plants by Pallmann are so robust that they can carry out this tasks over many decades and with the same precision of size reduction.

Like I said before, I am aware that this puts a constant demand on the Pallmann team, however, with satisfied customers, valuing Pallmann as a reliable and innovative partner, the course for future purchasing decisions is set in the correct way.

Bulletin: In your new position, you are contributing extraordinary national and international expertise in the sale of very complex machines and plants. How can the extraordinary variety and complexity of the Pallmann range be summarized?
Uwe Wagner: Currently, Pallmann has over 100,000 machines and plants in the market with more than 1,000 machine types. This certainly appears diverse and very complex. A large product range and complexity represents a high degree of different possible applications on the one hand, but it also bears the risk of missing experience values and incomplete service and spare parts supply on the other hand.

The variety of machines and their complexity should not confuse customers. It has to be clarified in advance which of Pallmann's plants or concepts will meet the customer's requirement. Offering too many options and alternatives is not conducive to reaching a goal. A clear upfront strategy on how to tackle the task is the key.

I look forward to working together with the entire Pallmann team in order to continue to find an optimal balance between product variety and complexity and "modular machine concepts" and "preferred model range". To put it in a nutshell, Pallmann always provides the right and suitable concept for the specific customer requirement.

Process technology: everything that pulverizes and granulates

In process technology the name Pallmann has stood for decades for the mechanical preparation of materials and bulk materials into powders and granules. Our broad machine spectrum ranges from the production of coarse and fine powders to breaking and cutting of basic materials into granules. At Pallmann we design, manufacture and sell machines and complete systems which are used in numerous industries and for diverse tasks. Raw materials for the chemical industry, the production of cellulose and cellulose ether are just as much part of it as are food products: here, it is also often about the correct shape when reducing the size – whether it is for spices, herbs, vegetables, or gelatin. The same goes for the production of animal feed, dry foods, and frozen meat.

The core of all competences: research and development

In light of such a range of applications, progress through experience is the foundation of Pallmann's strategy. "We not only build machines, but also supply our customers with complete systems including the application know-how. The fact that we test new technologies and processes in-house before they are passed on to the customers, contributes decisively to our competence profile," explains Stefan Wissing. Over 100 machines await customers at the Pallmann research and technology center. They can be used for cutting, pulverizing, agglomerating, fiberizing, breaking, separating and recycling of different materials.

Pallmann process technology for the chemical industry

▼ Many different samples of material that's small in size and fine in quality


VAHLE

MACHINES

What makes up the value of Siempelkamp machines and technologies? The first-class casting quality of Siempelkamp Giesserei, our outstanding achievements in the area of machine and plant engineering, our competence in dismantling nuclear installations are all based on the awareness that an innovation remains an innovation only for a limited time. Our advantage is the competence of the Siempelkamp subsidiaries. Within a strong network they ensure that the whole is always more than the sum of its parts and that the need for innovation is recognized early on.

State-of-the-art process control technology:
Siempelkamp's road to a self-optimizing production plant for wood-based materials with "Prod-IQ® Next"

→ By Gregor Bernardy and Dr. Andreas Steffen

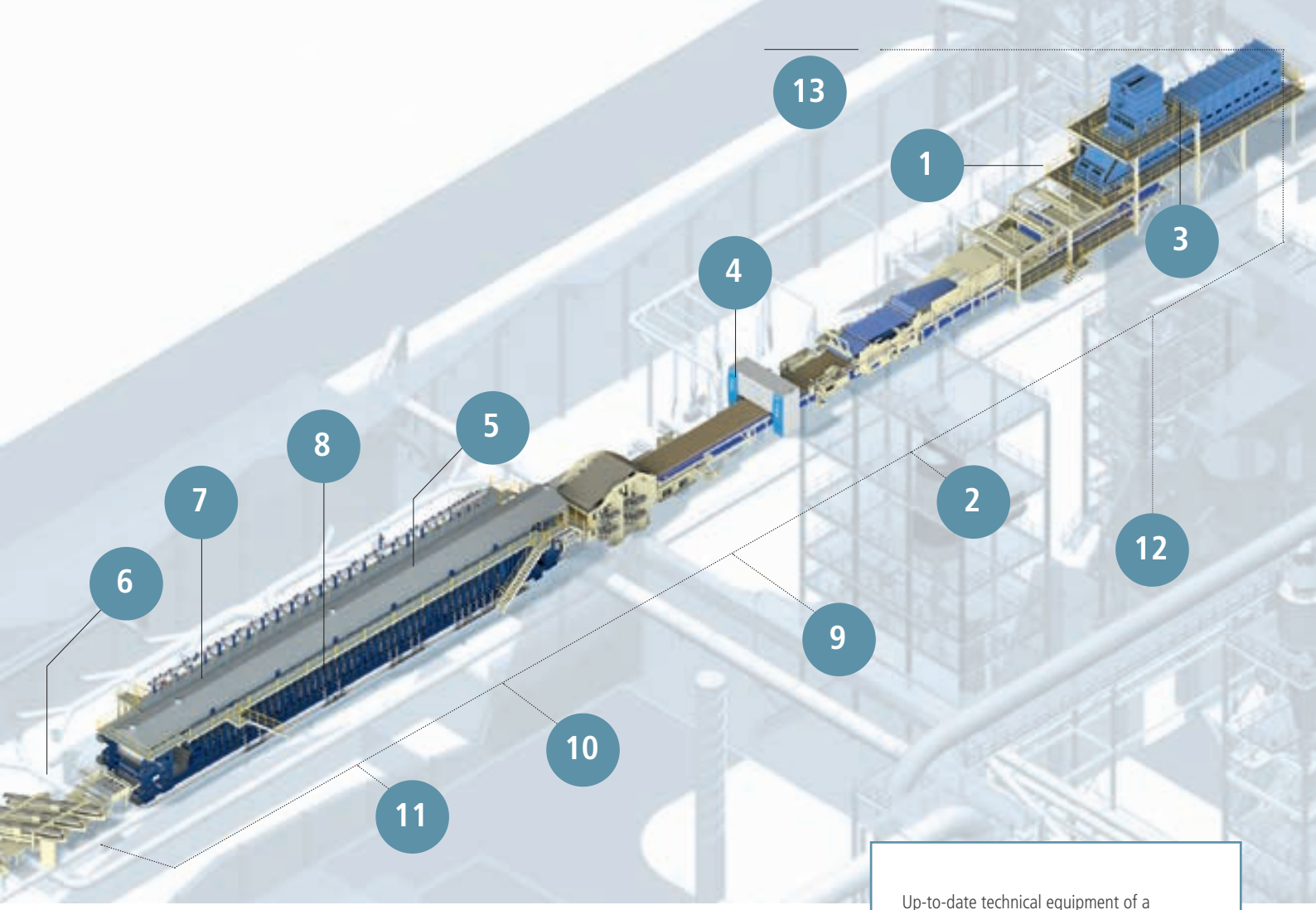
Intelligent production in the smart factory – opportunities for digital networking to increase product quality and resource-efficient use of material and energy have long been applied in the wood-based materials industry. In Siempelkamp's plants for wood-based materials all decisive factors for achieving the final product communicate and interact with one another. All interactions are traceable since each stacked board possesses a digital product memory along the entire value-added chain.

Modern control room of a forming and press line with ContiRoll®

The advantage for the operator of the self-optimizing plant: The operator only specifies the production order, everything else is handled by the plant itself. If, for example, 1,000 5,500 mm x 2,240 mm E1 panels with a thickness of 16 mm are to be produced with standard strength properties (bending strength and transverse tensile strength, swelling values), these specifications alone are sufficient to start the production of the batch. Everything else is taken care of by the plant; production changeovers are performed automatically. After precise completion of the production batch, guaranteed by online quality control, the system prompts a fully-automated sequential product changeover to the next product. At any time the process control system "Prod-IQ® Next" guarantees cost-effective, quality-assured production operation with as little use of material and energy as possible while, at the same time, maintaining high production speeds.

The status quo in wood-based material production

The development objective of each Siempelkamp plant for wood-based materials is the highly efficient production of particleboard, fiberboard, OSB, and LVL. The development takes place according to the process requirements for operational safety and strives for the possibility to produce the widest possible material thickness spectrum with high quality – while offering maximum ease of operation and highly economic use of resources. Through in-house developments and in-house production of all plant components, such as the complete hydraulics, Siempelkamp is able to equip all components with cutting-edge measurement and control technology and to visualize, collect, and document all process steps. This provides the plant operator a highly precise tool which can quickly and reliably analyze the current process settings and the currently produced product quality in the ongoing production process. The operator is supported



Up-to-date technical equipment of a forming and press line

1. Recipe management
2. Control system
3. Filling control
4. Weight-per-unitarea gauge
5. Pressure/position control and heater control
6. SicoScan
7. Thickness measurement feedback
8. ContiRoll Ecodrive
9. Prod-IQ
10. DAHMOS
11. SPC
12. Energy management
13. Digital plant likeness

by the process data trending system (Dahmos) which allows a comparison of the collected raw material and process data. With this information the experienced operator can manually intervene in the production process at any time, if necessary.

Status quo of the sequential product changeover and Prod-IQ®

After precise completion of a batch the product changeover takes place automatically during the ongoing production process in modern Siempelkamp wood-based material plants by means of the "sequential product changeover"-module and in most cases without opening the reject nose. The process parameters of all involved components from the blending system to the matformer station, from the forming line to the press with its downstream measuring components, to the cooling and stacking line adjust sequentially to the new process conditions triggered by the material flow, that is, when the new material reaches this section of the plant. The data necessary for the respective optimal settings are stored in a recipe database.

Siempelkamp's current process control system Prod-IQ® represents the information link between the management and the system operation levels. The data exchange with the production plant takes place via the connection to an ERP system. Prod-IQ® passes production orders from, for example, the SAP system to the plant and, in turn, submits the current production and consumption reports of the plant back to the ERP system. More comprehensive and detailed support of the plant management takes place via flexible production, raw material, and energy consumption reports (MS Excel files) which are automatically generated by specialized Prod-IQ® modules. With the Prod-IQ.quality module (formerly SPOC), process-related quality analyses can be generated which go far beyond a comparison by means of stored, historical process data.

Prod-IQ.quality recognizes board-type related, statistically relevant connections between raw material*, process**, as well as laboratory data*** and thus significantly simplifies their systematic analysis and documentation.

Operators have been using Prod-IQ.quality as a proven online board quality control system in more than 20 Siempelkamp wood-based material production plants worldwide. The self-learning system analyzes data records from laboratory samples, in other words, the associated raw material and process data, and presents the resulting board quality in a mathematical-statistical format. From the results constructive conclusions about the forecasted tensile strength, bending strength, surface soundness or thickness swelling, and raw density of the produced boards can be derived ("quality forecasting").

For this, the development histories of the boards, their raw material and process data along the material flow, are combined with archived laboratory data and evaluated by generating a statistical process model. As experience has shown, 30 to 100 laboratory samples are needed for a board quality model. The selection of process parameters and data sets needed for a precise process model is prepared by the person in charge of the product together with the Prod-IQ.quality recommendations.

With the help of this statistical model, the quality of the board at the moment it leaves the press can be calculated since all statistically significant raw material and process data are available. This quality calculation confirms with amazing precision the actual board quality, for example, strength values are calculated with 94 – 97 % accuracy and board raw densities with an accuracy of 99 %. At any time, the operator can determine, via a graphical visualization of the quality, if the current board quality meets the requirements or if optimization potential through a manual adjustment exists. In this way, material savings of up to 2.5 % and speed increases of up to 6 % can be realized in modern Siempelkamp plants.

Prod-IQ.quality today: immediate production optimization without laboratory results – Prod-IQ® Next: Siempelkamp's road to the self-optimizing wood-based material plant

The development goals for Siempelkamp's process control technology arise from prevalent customer needs and the desire to manufacture, under all predominating production conditions, a high-quality product resource-efficiently – automatically and self-controlled. "Prod-IQ® Next" is the higher-level control circuit which adjusts the production plant cost-efficiently and at the same time ensures the desired board properties – without necessary operator intervention. "Model-based Predictive process Control" (MPC) is the control concept behind it for which a time-discreet, dynamic model of the process to be controlled is used in order to calculate its future behavior depending on the input signals (raw material and process data). This allows the calculation of the optimal input signals, in terms of a power function, which will result in optimal output signals (board properties).

Model-based predictive process Control (MPC) for Siempelkamp plants

How does the self-optimizing Siempelkamp plant work? The dynamic process model is the core of the "Prod-IQ® Next" control circuit. For it, a combination of the statistical modellings (Prod-IQ.quality) and the physical/rheological simulation of the behavior of the material mat during the press process takes place whose usable result is primarily the raw density profile of the board, but also simulated press data such as pressures or distances. To completely simulate the production process, the statistical process modelling is combined with the physical/rheological simulation of the press process to a hybrid model. The physical/rheological simulation supplies the statistical process model with press data which is used to calculate the board quality.

MORE THAN

20 x

WORLDWIDE

The Prod-IQ.quality can already be used as an online board quality control system in Siempelkamp's wood-based material plants.

From the "Virtual Hot Press" simulation (VHP) to Prod-IQ.profile:

The core development from Prod-IQ.quality to the hybrid model is the physical/rheological simulation of the press process. Together with Professor Dr. Thömen and his team from the Berne University of Applied Sciences in Biel, Siempelkamp uses the "Virtual Hot Press" (VHP) software for the simulation. VHP was developed and linked with Prod-IQ® during a very productive cooperation between the Berne University of Applied Sciences and Siempelkamp. The software is now suitable for industrial use (module Prod-IQ.profile). During comprehensive tests at two MDF manufacturers, the precise calculations of raw density profiles, based on mat properties and press parameters measured online, could be confirmed. The basis of it is a newly developed calibration algorithm which determines the properties of

* Raw material data = automatically collected properties of wood, resin, and other chemicals in the production process, for example, densities, quantities, moisture content.

** Process data = automatically collected data from process machines, for example, speeds, pressures, distances, temperatures.

*** Laboratory data = product properties determined in the laboratory, for example, tensile strength, bending strength, thickness swelling, raw density

the material used in the plant with the help of two different raw density profiles measured in the laboratory in such a manner that the calculated raw density profiles agree with those measured in the laboratory. Thus, both components of the hybrid process model are available. Currently, additional industrial trials are taking place to further test Prod-IQ.profile. The benefits of hybrid modelling: With hybrid models process scenarios can be simulated and process parameters, which ensure the desired product quality within necessary safety margins thus allowing cost-optimized production, can be systematically determined. In this way for example the resin factors and the mat weight are reduced, the press speeds increased, and the energy consumption optimized.

Siempelkamp's next steps towards self-optimizing wood-based materials production

Plant operators that are already using the sequential product changeover and Prod-IQ.quality are already equipped with the foundation for a self-optimizing plant with "Prod-IQ® Next" and have optimum production. Combining both individual modules, Prod-IQ.quality and Prod-IQ.profile, to the hybrid process model and developing the cost-optimizing function as "model-based predictive process control" are Siempelkamp's logical last steps towards the self-optimizing wood-based material production plant which runs at the optimum – resource-efficiently under all process conditions, fully automated, and quality controlled. After the trials regarding the calibration of Prod-IQ.profile are completed, Siempelkamp will initially install this module in MDF plants and thus provide customers the opportunity to use "Prod-IQ® Next" for the technological safeguarding of their product quality and minimizing of their production costs.

Left: Online board quality monitoring and optimization with Prod-IQ.quality
red = online quality trending, calculated every 10 seconds
green = necessary safety margin to maintain the required quality safely
blue = minimum quality level that has to be safely maintained

Right: Raw material and process data visualization of the fiber spreading

JSC KMZ "Izhora-Metal": **A vision**

➔ By Aleksey Kerov and Christian Hassler

Nikolai Ponomarev, General Manager of JSC KMZ "Izhora-Metal" has a business vision. He wants to start up the largest and most cutting-edge open-die forging press line in Russia in order to be able to offer high-quality forged parts and semi-finished parts of all sizes for the Russian domestic market, but also for international export. This vision is the reason that KMZ is constantly upgrading its production facility. To achieve the ambitious goals precise production machinery is essential, such as the new Siempelkamp closed-die forging press, the most modern press line at KMZ with many fans among the personnel.

16-/20 MN open-die forging press by Siempelkamp and 10-metric-ton manipulator

The long-standing company KMZ "Izhora-Metal" is one of the leading companies for forged parts in Russia. Among other things, the manufacturer produces highly durable bucket teeth for the buckets of Liebherr mining excavators which can break even the hardest rocks. Just as the construction equipment manufacturer Liebherr, many other internationally reputable companies also swear by the material qualities of the products of the Russian forging specialist.

By decision of the interdisciplinary commission of the research centers KM Prometey and the Kurchatov Institute, KMZ "Izhora-Metal" is one of the few companies added to the list of qualified suppliers that can process the special alloy AB2PK required for shipbuilding. Together with both research institutes, KMZ "Izhora-Metal" developed new processes for the forging of different alloys and researches their metallurgical properties in regards to possible applications. Due to the know-how that has been accumulated since 1862, the available technical equipment, and the required technological conditions, the company is authorized, by decision of the Interministerial Commission for Ship Building and Energy Technology, to forge difficult-to-machine titanium

alloys such as PT-3B, 3M, and 5B for shipbuilding products and power plants. Currently, KMZ "Izhora-Metal" is developing new production processes and heat-treatment processes for the forging of high-strength hull structural steel for particularly highly stressed ship components such as used in icebreakers and highly stressed pressure vessels for the energy sector.

With Siempelkamp's help, Nikolai Ponomarev was able to take a huge step towards reaching his ambitious entrepreneurial goals: In addition to completing the new 280 m long and 34 m wide production hall, the new open-die forging press, designed by the Krefeld press specialist with pressing forces of 16-20 MN, was delivered and started production. In three hall sections, KMZ "Izhora-Metal" carries out different processing steps including the heat treatment such as the annealing of the forged blanks, and also the final heat treatment of the finished products to achieve certain material properties, the actual forging process, and in a separate area the machining of the forged parts.

KMZ "Izhora-Metal" supplies forged parts as semi-finished products or as completely finish-machined components for shipbuilding, the petrochemical industry, or such industries as the energy sector and the mining industry. The core business of the St. Petersburg-based forging specialist are highly-stressable components for energy conversion and the automobile industry, but also for special applications. On open-die and closed-die forging presses, the manufacturer forges, for example, corrosion and heat-resistant steels, titanium and copper alloys, as well as special alloys provided by customers for special applications. The final heat treatment of the forged parts or their material testing by means of mechanical tests are also part of the company's scope of supply, as well as the finish-machining of the forged parts to the final product.

Originally, KMZ "Izhora-Metal" contacted Siempelkamp in October 2015 with the request to upgrade an outdated 1,250-metric-ton open-die forging press and to increase this machine's pressing force to 16 MN. After close examination and calculations by the Siempelkamp upgrade specialists, it was quickly determined that the existing 4-column design would not be able to withstand the mechanical stresses resulting from pressing forces of 16 MN. There was only one solution – a new press line was needed, a 16 MN open-die forging press from Siempelkamp! Siempelkamp supplied the complete open-die forging press, a two-column design, including the hydraulics, electrics, as well as the press control with forging software. For fire protection reasons, the press was designed as water-hydraulically driven press. With a forging frequency of up to 66 strokes per minute and

View into the production hall of KMZ with the new Siempelkamp open-die forging press during square forging of an ingot

Forging and elongating of the blank guided by the manipulator

an exceptionally precise repeat accuracy, the machine operates very efficiently. The high cycle rate leads to a significant reduction of the necessary forging times because the blank is heated by the continuously applied energy and thus an optimal forging temperature during the entire forging process is ensured. Particularly noteworthy is the turntable mounted on a sliding table which is used, for example, to straighten forged rings. Another noteworthy detail regarding the order for KMZ "Izhora-Metal" is the fact that the customer, a world-renowned forging specialist, decided to contribute the main press cylinder and the sliding table construction to the forging line itself.

In November 2017 it finally happened – Nikolai Ponomarev started production with his cutting-edge open-die forging press. KMZ "Ishora-Metal" uses the press to manufacture heavy semi-finished products, for example, for the construction machinery industry. Bulletin visited KMZ in St. Petersburg and interviewed General Manager Nikolai Ponomarev about his experiences regarding the complete project.

Round forging by turning the blank between press strokes

INTERVIEW

KMZ "IZHORA METAL" – HIGH-QUALITY FORGINGS FOR FUTURE MARKETS

Interview with Nikolai Ponomarev

The Russian forging specialist JSC KMZ "Izhora-Metal" is one of the leading providers of forged components and semi-finished products on the international market. Bulletin talked with General Manager Nikolai Ponomarev and asked what the company's sustained success is based on and why a Siempelkamp open-die forging press, in particular, strengthens this basis.

Nikolai Ponomarev, General Manager of JSC KMZ "Izhora-Metal"

Bulletin: Mr. Ponomarev, what led to the decision to order a new forging press?

Nikolai Ponomarev: We had an outdated forging press from 1954 with a pressing force of 1250 metric tons. The market, however, increasingly demands forged parts in higher weight categories which are required to have a high forging accuracy and are needed in large quantities. After thorough examination of our existing plant the decision to acquire a new machine was quickly made.

On the old press we are processing parts with weights up to 3.5 metric tons. The new press forges parts with weights up to 8 metric tons. Due to its performance and the associated production capacity, the new forging press has increased our profits significantly and has rung in the modernization of our company.

Bulletin: To what extend did you analyze the market for manufacturers of open-die forging presses in the desired capacity range before making the investment decision? How many suppliers did you consider for KMZ and how did the selection process take place?

Nikolai Ponomarev: It was a relatively long decision process. We had shortlisted as potential suppliers one manufacturer from the Czech Republic, one from Italy, one from China, and two from Germany.

Bulletin: That means you took the time to visit the worldwide leading manufacturers?

Nikolai Ponomarev: Yes, we visited almost all manufacturers to gain an impression of their know-how. Siempelkamp, in particular, had impressed us with its production possibilities and technical capabilities. However, the key factor that motivated us to award the contract to Krefeld was the good price, quality, and performance ratio of the offer. Furthermore, complete order monitoring during all phases of production, installation, and startup was contractually agreed upon in advance. This reinforced our confidence lastingly.

Bulletin: Did you decide in-house about the press design and the technical implementation during the planning phase or did you use the help of external experts to do so?

Nikolai Ponomarev: We know which technical requirements the new forging press had to meet. This is based on our long-time wealth of experience in the forging of precision parts. That's why we made concrete specifications regarding the required capacity, the forging force, the parts handling, and other important parameters. Furthermore, we specified the frame design and the height of the sliding table and requested an automated tool changer, so we wouldn't have to change the required tools manually.

We did not use any consulting services from external engineers; all decisions were made with in-house specialists.

For how long has this plant manufactured forgings?

Nikolai Ponomarev: Our factory has existed since 1862. The last major modernization took place in 1954. We have employed many generations of working-class families. Mothers and fathers work together with grandmothers and grandfathers and some families already have their grandchildren working here as well. We see our workforce as the large KMZ family; our know-how is transferred from one generation to the next.

Bulletin: So, the wealth of experience of the collective body made it possible to define the concrete specifications for the new forging press?

Nikolai Ponomarev: Yes, the wealth of experience of the collective body is very comprehensive. Of course, in view of the high investment costs, decisions on specifications are not made quickly.

We do not only discuss the press and forging technology, but also the heating process in the furnaces, and the forging of different alloys, in particular titanium alloys. Then we decide which equipment is necessary and, since we know our market, we also develop our own market strategies.

Bulletin: As you know Siempelkamp celebrated its 135th anniversary in 2018. For more than 120 years Siempelkamp has manufactured presses for the metal industry. How well did you know Siempelkamp before you travelled to Krefeld to visit the company?

Nikolai Ponomarev: We first found out about Siempelkamp from our Czech partner ALTA, a technology and equipment supplier for the forging industry among other industries. In connection with a building project for a new metallurgy plant for KMZ several technology suppliers were invited. Among them, Siempelkamp. The most financially demanding decision at that time involved the acquisition of a large and highly productive open-die forging press.

> WITH THE ACCEPTANCE OF THE NEW PRESS WE HAVE STRENGTHENED THE RELIABILITY IN OUR PRODUCTION AND ALSO FURTHER ENHANCED OUR COMPANY'S REPUTATION.
>
> Nikolai Ponomarev

Bulletin: Since the signing of the contract for the new forging press in 2015 until start of production of the machine – what aspects of the cooperation with Siempelkamp were new to you or made a lasting impression?

Nikolai Ponomarev: I visited Siempelkamp several times and took a close look at the production in Krefeld. All components of the presses are manufactured there, including the casting of the structural components. Structural components made of cast iron are more robust and reliable than welded constructions. The in-house production of hydraulic components such as cylinders and plungers impressed me. So have the in-house engineering offices as well as the specialized departments for hydraulics and automation.

During the installation of our press in St. Petersburg, the clever approach of Siempelkamp's experienced installation team left a lasting impression with me. With each complex installation of such large machines unplanned challenges arise. Each problem on site was immediately rectified, if necessary, by Siempelkamp specialists. Working in this manner is very valuable for us as well as for Siempelkamp. With the acceptance of the new press we have strengthened the reliability in our production and also further enhanced our company's reputation.

We still see many innovations that want to come into the world. For the realization of these tasks we wish to have the cooperation of Siempelkamp again to support us with future planning, building, and production projects involving new equipment.

Bulletin: To come back to what you said earlier – Siempelkamp is one of a few manufacturers that offers, from a single source, the complete production cycle ranging from project planning to design, the making of castings in the in-house foundry as well as the production of all hydraulic components and the automation technology. Do you see this as an advantage for yourself, even if such sophisticated products might mean higher investment costs?

Nikolai Ponomarev: The fact that all specialists and departments involved in the manufacture are part of one company is very valuable. Of course this sometimes means that the acquisition costs are higher, however, over the course of the machines' life cycle this has a very short return on investment because reliability and durability pay off quickly for the investor.

> THE FACT THAT ALL SPECIALISTS AND DEPARTMENTS INVOLVED IN THE MANUFACTURE ARE PART OF ONE COMPANY IS VERY VALUABLE.

Nikolai Ponomarev

Now and then wear parts have to be replaced during the course of maintenance work, otherwise nothing will happen – that alone is a reassuring feeling. If a spare part is needed, the help of specialists is available immediately and without encountering any language barriers due to the direct Internet connection. The replacement part is quickly ordered, is reliably and quickly supplied as well as installed, and work can resume in no time. This can only be accomplished by a manufacturer that does not have to work together with too many suppliers in order to procure relevant parts.

Siempelkamp has implemented innovations based on our design requirements for the new machine. It is the modern software that makes this press so strong. Such fully-developed and sophisticated control software is not customary in the market.

1862
FOUNDING OF IZHORSKIYE ZAVODY PLANT

1866
PRODUCTION OF THE FIRST ARMOR PLATE FOR ICEBREAKERS

1922
MANUFACTURE OF STEAM BOILERS FOR SHIPS

1942
Production of armored trains for the multiple rocket launcher "Katyusha"

1953
MANUFACTURE OF FORGINGS FOR THE EXCAVATOR ECG-8

This, of course, also presented a convincing argument for our buying decision.

In production the operator is given visualizations of all running processes and also all abnormalities which presents enormous production reliability. A second, separate workplace is available for the maintenance personnel. Thus, service routines can be carried out parallel to the production process without interrupting the workflows of the press. This is very convenient.

After we introduced the new press, we discovered that the young workers especially like working with this machine. Many of our employees let us know that they want to work on the press. The decisive reasons for it are the high press speeds and the exceptional forging accuracy. Such forging accuracy cannot be obtained with our old open-die forging press.

The forging speeds, the power development, and the forging accuracy of the new machine are absolutely brilliant. Thanks to the convenient operation we can now also process titanium and other hard alloys. Siempelkamp machines are the most cutting-edge in the world; there are no other comparable innovative machines anywhere else in the world.

We will order additional presses from Siempelkamp.

Refurbishment of the Refueling Machine at NPP Goesgen: **Siempelkamp NIS completes project with successful acceptance and final documentation**

→ By Dipl.-Ing. Hermann-Josef Igelmund and Dr.-Ing. Carmen Isabella Krau

In 2014, Siempelkamp NIS Ingenieurgesellschaft mbH won a public tender and was contracted by the Swiss NPP Goesgen (KKG) to upgrade the existing refueling machine to the current state of the art. The contract included planning and design of new components as well as disassembly of the components to be replaced and assembly and commissioning of the refurbished refueling machine. The final acceptance was conducted during the 2017 outage, and the final documentation was compiled in 2018.

The reactor is shut down during the outage and the refueling. In order to minimize production downtimes it is essential to conduct the refueling as fast as possible.

The original refueling machine at NPP Goesgen was manufactured in 1974 by Weserhuette and was put into operation during the commissioning of the plant in 1978. Other than the installation of an anchoring device for reduction of deflections of the refueling machine's bridge no major components were replaced or modified – not taking into account any standard wear and tear parts.

The refurbishment included the replacement of the main lifting unit (KTA design, see info box), the refurbishment of the steel construction according to the seismic stability proof, replacement of the traction drives and brakes of the bridge and the trolley, replacement of the complete electrical and control system (incl. programming of operating software), replacement of all operation and visualization equipment, installation of a position measuring system and under-water lighting as well as delivery of a training simulator.

The main lifting unit was manufactured after submission and approval of the design documents, tested together with the electrical and control system during the FAT at the manufacturer's workshop and then accepted by the regulator (represented by TÜV SÜD) and the customer.

Refueling machine before refurbishment

What is a refueling machine?

In principle, a refueling machine is a crane-like lifting device that mainly consists of a bridge and a trolley that can be moved on guide rails above the fuel storage pool and the reactor pool.

The refueling machine is used in nuclear power plants during regular outage inspections to transport fuel elements between the reactor and the fuel storage pool. It is also used to reposi-tion fuel elements inside the reactor or the fuel storage pool.

A lifting mechanism and intertwining telescope elements with integrated grippers allow for handling of the fuel elements and other internal reactor components, such as control elements.

Refueling machine in operation above the reactor pool

Refueling machine after completed refurbishment

The standard bearer in highly-sophisticated engineering and refurbishment

What are Siempelkamp NIS' unique characteristics in refueling machine refurbishment? Siempelkamp NIS has been in the nuclear industry for over four decades. It was in particular the experience in the field of retrofitting existing componentns in nuclear power plants that came into play in this project. Former references in refurbishment of refueling machines include projects at NPP Biblis (Germany) and NPP Borssele (Netherlands).

"Everything must add up," was the basis for the works: A unique challenge at NPP Goesgen was the design of the hoisting chain and the new installation of the electrical and control system. Another remarkable challange was the new implementation of the refueling machine operating software, which now also allows diagonal runs when handling the fuel and control elements in the reactor pool and the fuel storage pool.

The new components were transfered into the reactor building during a fixed and limited transfer period, which meant that all large components needed to have passed the Swiss border in due time, transported to the site and then transfered into the plant at the predetermined time.

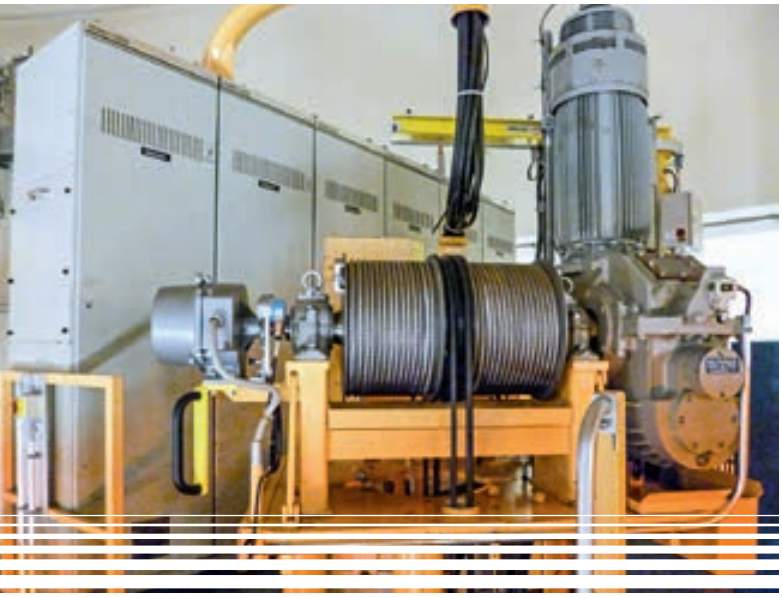
Since the refueling machine is required for conduction of the annual outages the refurbishment works (disassembly of existing

KTA and stability proof – the details

The abbreviation KTA means "Kerntechnischer Ausschuss" (German Nuclear Safety Standards Commission) and is also used for the standards issued by the commission, which specify safety-related requirements for nuclear facilities. KTA rules are a part of the nuclear regulations. They prescribe actions that operators of nuclear facilities must take in order to prevent damages to the plant.

Stability proof:
The stability proof serves as evidence that a component (in this case the steel construction of the refueling machine) can withstand the loads that occur during operation without failure. For this purpose, safety factors against various kinds of failure (for example bending or tilting) are calculated. In addition it may be necessary to provide further evidence for stability during an earthquake.

Old lifting unit on the refueling machine platform



New installation of the lifting unit on the platform, with integrated access

components and assembly of new components) were executed between outages in the years 2016 to 2017. Cold commissioning and acceptance of the refurbished refueling device with the customer and the regulator (represented by TÜV SÜD) were initially conducted using fuel dummies in the fuel storage pool.

Hot commissioning and acceptance of the refueling machine followed during the 2017 outage. For this purpose, the refueling machine was used to transport spent fuels from the reactor into the storage pool and then to reload the reactor with fresh fuels.

Mission accomplished, "Everything's fine"!

All project objectives were achieved, not least thanks to a close cooperation with the customer and sub-suppliers:

- Refurbishment of the refueling machine to the current state of the art
- Earthquake-resistant design
- Accessibility of previously inaccessible positions in the fuel storage pool
- Ease of operation for staff thanks to semi-automatic operation
- Safe execution of all handling processes with software-supported control and monitoring

In addition, the handling times for loading and unloading of the reactor were shortened.

Old design of the operating platform

Operating platform after refurbishment of the refueling machine

During plant operation it is possible that fuel elements become minimally deformed, which may lead to damages to the fuel element during refueling. Thanks to the newly-implemented load measuring on the main hoisting chain such damages can be largely avoided when the fuel ele-ments are removed from the core.

Refueling Machine: Detailed Overview

The **lifting unit** of the refueling machine is equipped with four independent brakes. During regular operation, the **operational brake and the additional brake** work primarily as stop brakes, while operational stoppages are effected by the drive motor. Only in case of an incident or an emergency stop the lifting unit will be mechanically stopped with the operational and the addi-tional brake. In that case, the drive motor has no momentum.

The **safety brake** remains open during operation of the lifting unit. When the lifting unit is switched off the safety brake will only be applied after the lifting unit has come to a stop (also in case of an emergency stop). In case of an incident detected by the implemented transmission break monitoring the safety brake will be applied immediately.

A **holding/lowering brake** on the transmission input shaft can be used for safe lifting and lowering of the gripper (with or without load) in case of a power outage. The brake is operated with a plug-on hand-operated lever that disconnects the electric drive from the power supply by means of an end switch. The operational, additional and safety brakes can be ventilated in a controlled manner with a hand-operated lever.

Transmission break monitoring: The actual values of the position sensors on the motor side and on the hoisting drum are continuously compared. Any deviation between the motor and the drum sensors that exceeds a defined tolerance is interpreted as a transmission break. As a result, the motor drive will be switched off and the safety brake as well as the operational and the additional brake will be applied.

Load measuring: The load is measured in a redundant manner via two tension links that are screwed into the fork heads of the balance beam. The hoist ropes are connected to the rope thimbles on the tension links. Load measuring directly at the rope allows for detection of even the smallest load discrepancies. Any one-sided loads are immediately detected by the control system. The load measuring system also serves for slack rope detection (meaning that the load is smaller than the minimum load).

Lifting unit position monitoring: Monitoring occurs in a redundant manner via two measuring wires with safety-related wire-actuated encoders that are attached directly to the gripper. Any changes in rope length due to different loads hence become irrelevant.

All parts that come into contact with pool water or that are immersed into the pool water are made from stainless steel. These include, for example, hoist ropes, measuring wires for lifting unit position monitoring, under water plug connections and under water lighting.

Dismantling expertise for US nuclear power plant: **“Simply the best”**

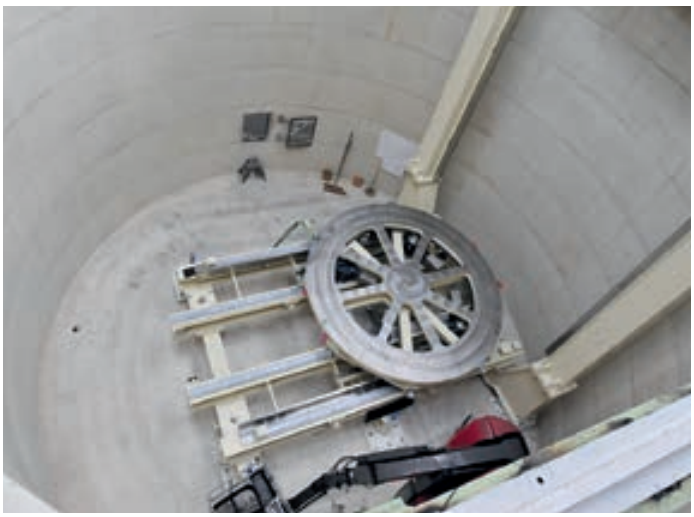
➞ By Christian Jurianz, Dr. Aldo Weber, Michael Seel and Helmut Schmitz

The preparations for a dismantling project for a US-American nuclear power plant operator were in full swing in the Siempelkamp Group in 2018. The customer requested “Simply the best” – dismantling expertise made in Germany = made by Siempelkamp. The synergy potential within the Group opened up entirely new dimensions for this project.

Everything revolves around the subject of “cutting and disassembling”: from left to right. Pedro Robles-Malagrino (Siempelkamp Automation and Control Technology), Helmut Schmitz (Project Engineer Siempelkamp NIS), Werner Schischkowski (Head of Siempelkamp Automation and Control Technology), Timo Amels (Managing Director ATR Industrie-Elektronik GmbH)

The order involved the disassembly of the reactor pressure vessels of a US nuclear power plant including the core internals of two units. Both units with an electrical capacity of 1,070 MW were decommissioned in 2013 for economic reasons. With an order volume of 4.4 billion US Dollars this decommissioning project is the largest of its kind to date. Over a period of 10 years the dismantling work and the re-cultivation of the site will be carried out, and the radiation levels will be reduced to a level that allows the unrestricted subsequent use of the location. Approximately 600 jobs will be created over the entire time period of the project.

In addition to providing the required special machines and tools, Siempelkamp NIS Ingenieurgesellschaft mbH supports the American customer as supervising entity during the mechanical disassembly of the core internals and the subsequent thermal dismantling of the reactor pressure vessels for both units. Due to the radioactive contamination in this



View into the water tank onto the turntable of the volume reduction station

Volume reduction station with saw head

part of the nuclear power plant, the complete dismantling takes place remotely and under water. Decisive for the awarding of the order was the fact that Siempelkamp NIS has the expertise to master such highly complex assignments in the area of nuclear dismantling. Siempelkamp NIS has proven its competencies in several projects in the past; most recently during the disassembly of the reactor pressure vessel including its core internals at the double-unit plant ZION, USA.

Siempelkamp subsidiaries as the "dream team"

When it comes to dismantling concepts for nuclear power plants, Siempelkamp NIS is considered the best: Siempelkamp NIS stands for complete concepts that exceed the status of an ordinary tool supplier. Together with partners within the Siempelkamp Group, Siempelkamp NIS coordinated a comprehensive concept.

The mechanical engineering as well as the electrical control and drive control technology were supplied by Siempelkamp Maschinen- und Anlagenbau; ATR Industrie-Elektronik GmbH was responsible for the control cabinet and the machine installation. The dismantling project put particular demands on this part of the service portfolio. The entire disassembly of the core internals takes place under water in the flooded reactor pool of the power plant in order to shield the work area against ionizing radiation and to safely prevent the contamination with radioactive substances. "This circumstance requires custom made motors which are designed to withstand the stresses under water and have high radiation resistance," explains Timo Amels, Managing Director ATR. The engine design was defined by Dortmunder Schöning GmbH, a "Siemens Approved Partner", which modifies Siemens motors according to specific requirements. A motor concept was developed that is comparable to one used in submarines.

"Team Siempelkamp NIS": Michael Seel (Project Manager), Helmut Schmitz (Project Engineer)

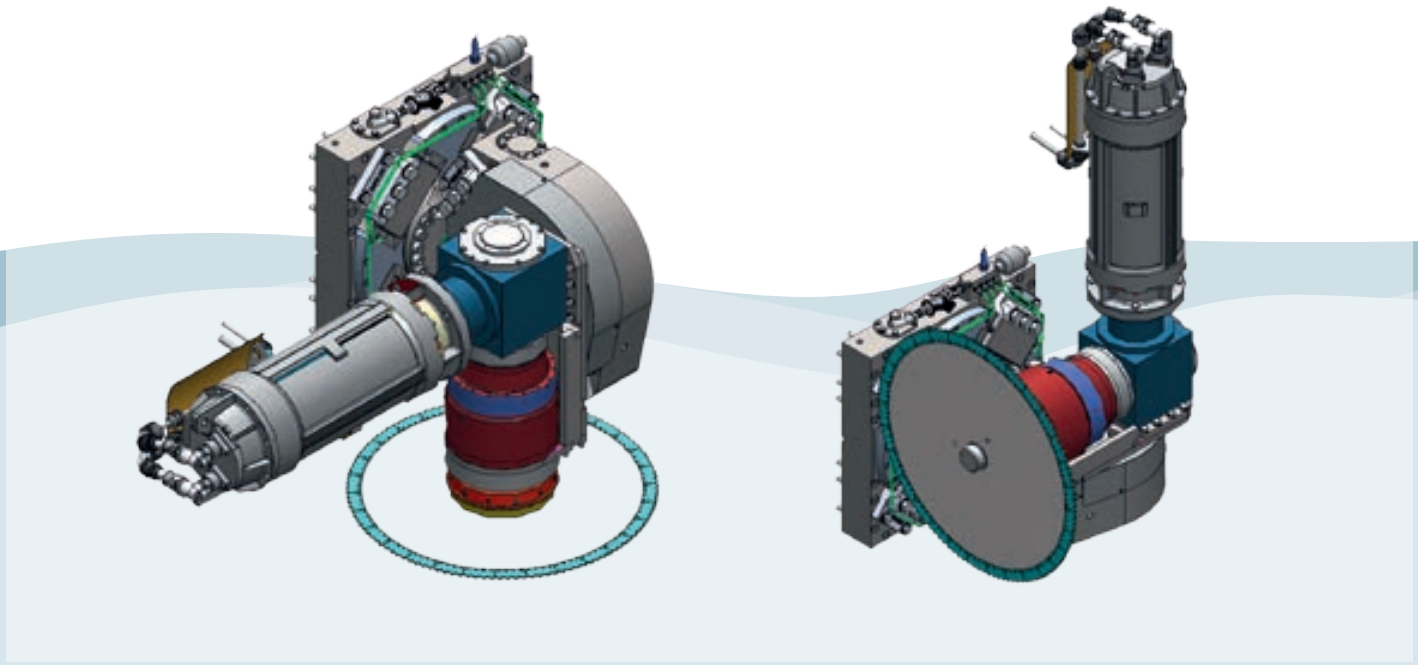
The third involved company of the Siempelkamp Group was Siempelkamp Maschinenfabrik (machine factory): it manufactured the turntable and the saw heads for the disassembly process. The saw heads, weighing around 2,500 kg, are also characterized by the "simply the best" approach: "Ordinary saw heads are normally manually removed and the complete saw head is newly fastened to the machine in order to ensure a new cutting direction of the saw head. This usually requires a considerable amount of time. The concept of Siempelkamp NIS involves an intelligent solution: With the "intelligent saw head" the position of the saw head can be quickly changed without having to remove the saw head from the machine. The manual removal as well as the turning and fastening of the entire saw head with a crane and consequently the head's time-consuming realignment are thus omitted. This is a considerable advantage given the fact that the work is done under water and, due to radioactive contamination, in a protective suit," explains Christian Jurianz, Managing Director Siempelkamp NIS Ingenieurgesellschaft mbH. The nuclear power plant operator ordered a total of four of these automated saw heads for the disassembly process in the USA.

The energy supply during the disassembly works is also subject to the specific restrictions set by the topic of "radiation resistance". The concept is self-contained, consists in its own control stand with radiation resistant video

Assembly of the movable saw head at the machine factory

Christian Jurianz, Managing Director Siempelkamp NIS

Working platform with pulleys, scope of supply Siempelkamp Crane Technology

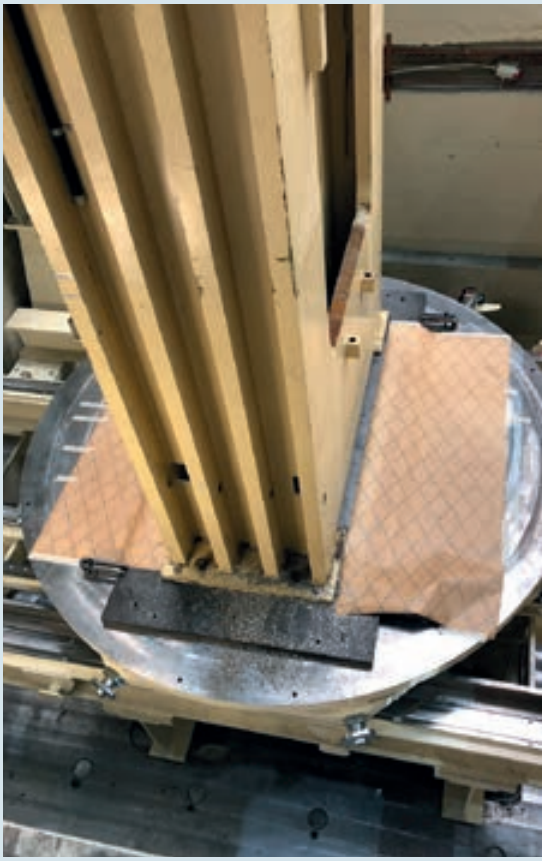


Design of the movable saw head as a 3-dimensional model

technology, was tested by Siempelkamp NIS in Alzenau, and also adapted to the specific requirements. The same goes for the power supply: With 480V/60Hz the power supply system in the USA has a higher voltage and frequency than the German power supply system with 400V/50 Hz. To exactly reflect real-life conditions during the tests in Germany, the US voltage and frequency was used.

Another key element in the overall concept is the water filtration and chip collection system. Here, a process, patented by Siempelkamp NIS, is used which aims at extracting the chips during the under water works immediately after they arise. The system was initially developed by Siempelkamp NIS for the segmentation of the multi-purpose research reactor Karlsruhe on the premises of the Karlsruhe research center.

Last but not least, Siempelkamp Krantechnik (crane technology) made an important contribution to the US project: the working platforms with integrated crane system. With combined competences the dismantling project is ready for its acceptance test in Krefeld: "In the new Krefeld production hall we will, in the presence of our customer, start the mock-up test when inside and above a huge water tank all systems such as machines, video technology, and the higher-level control system are merged on the test stand," says Michael Seel, Project Manager Siempelkamp NIS. Thanks to the strong synergies in the Siempelkamp Group, this event has been well prepared: "In close cooperation the engineering teams implemented their concepts for the dismantling machines in design and turned them over to production. The results of this cooperation of over one and a half years are very satisfying," says Helmut Schmitz, Project Engineer at Siempelkamp NIS who supervised the project on-site in Krefeld.



View into the volume reduction station, saw simulation

Imprint

Publisher: G. Siempelkamp GmbH & Co. KG, Marketing/Communication Department, Siempelkampstr. 75, 47803 Krefeld (Germany)
Executive Editor: (Officer responsible for compliance with German press law) Christian Hassler, Text: Dr. Silke Hahn, Christian Hassler, Bernice Neves und Ralf Peters
Typesetting and Layout: vE&K Werbeagentur GmbH & Co. KG, Printing: KARTEN Druck & Medien GmbH & Co. KG

This publication is published in German and English. Visit Siempelkamp on the Internet: www.siempelkamp.com

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G. Siempelkamp GmbH & Co. KG

Siempelkamp Maschinen- und Anlagenbau
Siempelkamp Maschinen- und Anlagenbau GmbH
Krefeld, Germany

Siempelkamp Maschinenfabrik
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12.2018 / 2.950 GB

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