



Siempelkamp

# bulletin

THE SIEMPELKAMP MAGAZINE 02\_2017



**PG Bison, South Africa**  
First board!

**Focus market Vietnam**  
Siempelkamp milestones and trends

**Digitalization in casting technology**  
Approaches and customer benefits

> BUY FROM SIEMPELKAMP,  
BUY THE FUTURE.



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

### **Dear Readers:**

For many of you and for Siempelkamp, 2017 was dominated by LIGNA. Like no other, this fair combines the trends and requirements that are trend-setting for our industry. "Buy from Siempelkamp, buy the future" – this summarizes the feedback we received from our customers and partners in Hannover. Investing with us means to set the course for success for your company and possibly for an entire region.

For us, future sustainability means the following: People whose drive it is to enter into new markets or revive established markets with coherent ideas and visions work for the Siempelkamp Group. Very often this happens together with you, our customers. Jointly we identify market opportunities that help us break new ground with innovative technologies and sustainable raw materials. We also implement the advantages opened up by digitalization in many application fields of mechanical and plant engineering as well as casting technology.

This Bulletin reports about trend-setting projects, technologies, and collaborations that currently shape our business. We would like to thank you for shaping your future with Siempelkamp support!

I wish you pleasant reading. With kind regards from Krefeld,

A handwritten signature in black ink that reads "Hans Fechner". The signature is written in a cursive, flowing style.

Dr.-Ing. Hans W. Fechner

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# 6

On April 30, 2017 the South African wood-based panel manufacturer PG Bison celebrated the event of the "First Board" produced with the company's new particleboard plant. For the third time already the company relied on the expertise of its German partner Siempelkamp!

> Read more about this project on page 8.



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A delegation from the wood-based panel manufacturer FSC Vietnam Corporation visited Siempelkamp in Krefeld in September 2017. The visit provided an opportunity to review the situation: What milestones and trends characterize the market in Vietnam?

> Read more about this project on page 30.



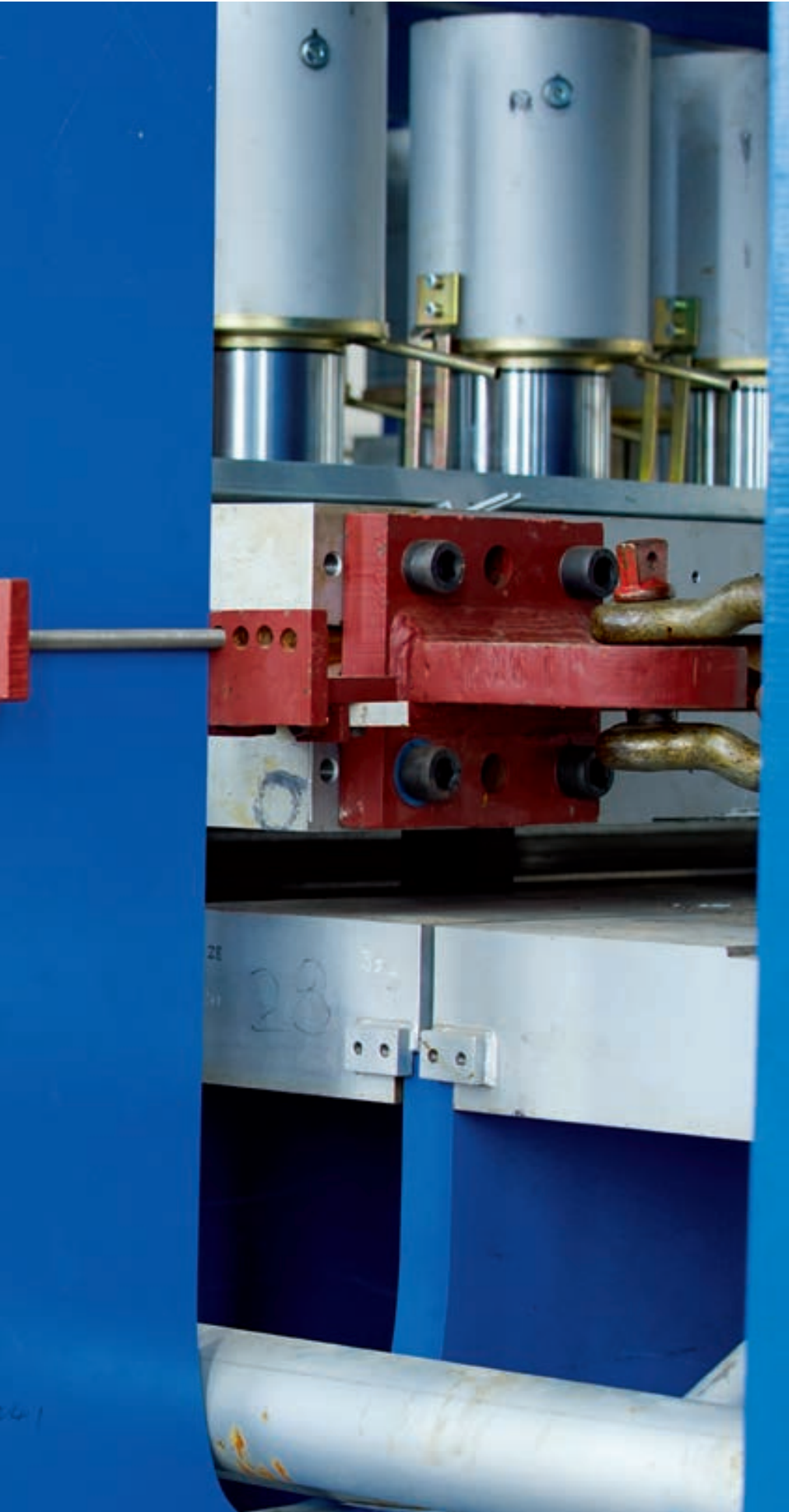
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How is the major topic of "Digitalization" applied to the processes and technologies at Siempelkamp Gieserei? What is the customer benefit? Our report shows how digital tools enhance the entire process.

> Read more about this project on page 70.







# PEOPLE

The future is shaped by our team: employees, whose innovative spirit and dedication support the visions and strategies of an enterprise. Teams that are setting tomorrow's benchmarks even today in close collaboration with the teams of our customers in all parts of the world.

# PG Bison: “Triple Siempelkamp”

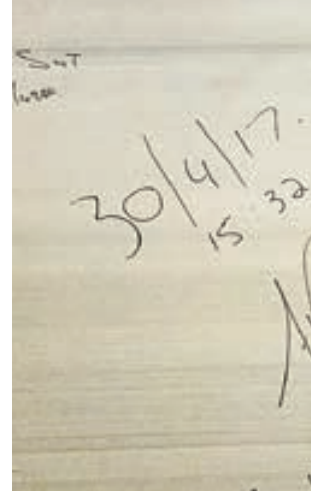
→ By Erwin Scholz and Roland Peltzer

In September 2015, PG Bison ordered a plant for the production of particleboard from Siempelkamp. On April 30, 2017, the South African producer of wood-based materials celebrated the production of the first board. This was the third time PG Bison realised its ambitious goals in close collaboration with Siempelkamp – to the utmost satisfaction!

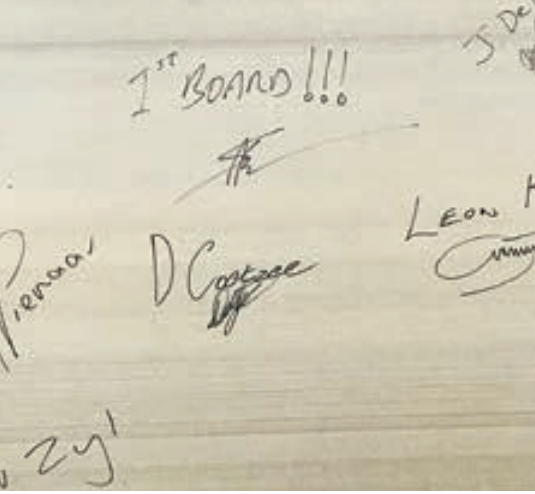
The new particleboard plant including a 6' x 32.1 m ContiRoll® replaces a 34-year old multi-opening plant at the PG Bison site in Piet Retief. All three production sites run by PG Bison in South Africa now operate with Siempelkamp machinery (see box).

The order volume comprises the forming and press line including a ContiRoll® as well as mat formers, a cooling and stacking system, pneumatic and mechanical conveyors, and handling systems. The plant has been designed for a board thickness range between 6 and 40 mm.

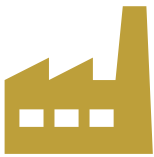
The change from the multi-opening press to a ContiRoll® press was the most important aspect of the order: PG Bison benefits from numerous advantages offered by the continuous press, our ContiRoll®, which include significant savings potentials (see box).







▲  
First board produced  
on April 30, 2017 in  
Piet Retief



## PIET RETIEF 2015



### PG Bison: History and profile

- 1967: The first Bisonbord factory was established in Piet Retief jointly by Suiderland Development Corporation Limited and Afcol.
- 1987 PG Bison Limited is founded by way of the merger of PG Wood Holdings and Bisonbord
- 1993: PG Bison acquires 100% interest in Laminate Industries. Integral to this transaction are the rights to the Formica Brand in defined Central and Southern African Territories.
- 1994: PG Wood, Laminate Industries and Bisonbord consolidate trading names and images to form one entity: PG Bison
- Since 2004: PG Bison becomes a member of the Steinhoff Group
- 2007: The first "Bisonbord" is produced on the Ugie particleboard line.
- 2012: PG Bison is acquired by KAP Industrial Holdings Ltd.
- 2014: PG Bison replaces a daylight MDF production line with ContiRoll® technology in Boksburg.
- 2016: PG Bison replaces its last daylight production line with ContiRoll® technology in Piet Retief.
- 3 wood-based panel production sites in South Africa, head office in Wynberg
- Sawmilling operations in Georgetown
- 1,370 employees
- Responsibility: Socio-Economic Development (SED) is inherent to the PG Bison culture. The company has invested, and will continue to invest, in programmes where its communities are empowered through their own development.



◀  
Foundation work  
in 2016, Piet Retief



### Continuous press vs multi-opening press: The benefits

- reduced sanding allowance, consequently:
- savings in costs for wood, glue, sanding belts, and power consumption
- significantly higher flexibility regarding the masterboard lengths, consequently:
- more favourable cutting patterns for the final sizes
- higher output of thin-board production, as there are no dead times, which means the designed particle throughput can be fully utilised
- better control of the density profiles
- improved board quality through optimised mat forming



ContiRoll® incl. forming  
line components

On April 30, 2017, the plant was started up in Piet Retief, a country town in the south-eastern tip of the Mpumalanga province. Apart from the wood-based panel production at this PG Bison site, paper production is the economic basis of the region, the town is surrounded by pine plantations.



Production OK!



Siempelkamp plant in  
Piet Retief

Assembly and startup of the facility with the multi-opening press still being in operation could never have been accomplished without diligent and thorough planning and fine-tuning. Though confined, the space available was utilised to the best possible extent, so that the new facility could be assembled without

interrupting the production of the existing plant. Startup was optimised and realised in two stages. Consequently, it was possible to switch production from the old to the new facility and to resume production within just 12 days!

## INTERVIEW



Gerhard Victor

# “VERY SATISFIED!”

## Interview with Mr Gerhard Victor, CEO PG Bison

**Bulletin:** In the past ten years, PG Bison ordered three plants for the production of wood-based boards from Siempelkamp. What were the pivotal motives for this cooperation?

**Gerhard Victor:** The equipment we used was long-lasting, but it became uneconomical compared to the new technology, which has been developed by the machine producer in the past years.

On the one hand, the market requests the best board quality at competitive prices, and we are not alone in our market, suppliers from abroad try to enter into our market, too. On the other hand, PG Bison today supplies boards, particle board and MDF to other countries in the world, too. We had to update our capacity and to modify our production lines.

**Bulletin:** In 2006 PG Bison decided to make a new particleboard project in Ugie. What were the characteristics of this project?

**Gerhard Victor:** This project was a greenfield project with a capacity of 1200 m<sup>3</sup>/day; this factory includes a short-cycle laminating line with an automatic paper storage system. The particleboard line as well as the short cycle press were supplied by Siempelkamp. As early as then we were convinced of Siempelkamp's performance. "Our aim was to set up a greenfield plant in an undeveloped area. For this purpose we required the support of a company that provides both technical expertise and excellent planning and engineering know-how. In this we especially relied on Siempelkamp Machines- and Anlagenbau." (Interview with Jörg Weeber, Executive Director Manufacturing & Projects PG Bison in Bulletin 01\_2008). This laid the foundation for a successful cooperation, which was to continue for the years to come.

**Bulletin:** In 2012, the second order followed for an MDF line in Boksburg. There, a special challenge had to be mastered ...

**Gerhard Victor:** In 2013, we installed a new MDF line including a new finishing line at our Boksburg site; this new line replaced an existing multi-opening line. The challenge for our team and Siempelkamp was to plan and build the new continuous line into an existing building, while the multi-opening line was still being operated. After we installed the new forming and press line with the ContiRoll®, we switched from the old line to the new line and were able to start the operation very fast.

**Bulletin:** In Piet Retief you had to face similar challenges, as an existing multi-opening line was to be replaced ...

**Gerhard Victor:** In Piet Retief there was also the challenge to install and incorporate the new production line, starting at the mat former to the stacking line, into an existing building beside the running PB line. We could not afford to stop the production for more than 28 days. It was the aim to get the new line running to full production within 42 days. Due to the good performance of the PG Bison and Siempelkamp teams, we were able to resume production within 21 days, which was earlier than we had planned.

**Bulletin:** What is your conclusion now, after an important milestone has been set concerning the joint project?

**Gerhard Victor:** With the performance of Siempelkamp we are very satisfied. It starts with a competent consultation of the sales team and a good project planning. The project manager was very competent and helpful; he always kept an

eye on the time schedule to make sure that we are on track with the project. Also the experienced start-up team worked well together, the run-up curve was very short: only 10 days after production of the first board we achieved the designed capacity, it took just 59 days from the first board on April 30, 2017 to the official acceptance on June 28, 2017.

> WE WERE  
ABLE TO  
RESUME PRO-  
DUCTION WITHIN  
21 DAYS!

Gerhard Victor

**1.**  
ORDER

## Ugie

In 2006, PG Pison ordered a particleboard plant, which was inaugurated in 2008. The scope of supply included the woodyard, the debarker, the chipper and the silo discharge systems. Siempelkamp was also commissioned to deliver screens, knife-ring flaker, the screens for the

surface-layer and core-layer fractioning as well as the glue/particle-blenders and the dry particle silos. The most important element of the plant was the forming and press line including the 6' x 42.1 m ContiRoll®. This order was amended by a short-cycle press including an integrated paper storage, the pertaining storage logistics and a fully automated strapping line – also made by Siempelkamp. When set up, it was the most productive state-of-the-art plant for the production of wood-based material on the African continent.



Team Ugie 2006





Signing a contract for the second Siempelkamp plant in Boksburg



## Boksburg

In 2012, PG Bison ordered a new MDF plant from Siempelkamp. The order comprised sifters, forming stations, a continuous press, a diagonal saw, a cooling and stacking line, a sanding and cut-to-size line, automation systems as well as engineering. The plant was put into service in 2014.



## Piet Retief

Order no. 3 in 2015, First board in April 2017: the new particleboard plant including a 6' x 32.1 m ContiRoll® press with pressure distribution plates!

A toast to a successful cooperation for the third time: (from left to right) Jürgen Philipps and Erwin Scholz (Siempelkamp) with Gerhard Victor (Chief Executive Officer PG Bison) and Francois Pienaar (Project Manager PG Bison) on the occasion of the signing of the contract in 2015



# Project “Barnwell”: Reliably on the cutting edge of the process with expediting

→ By Holger Zipser and Dr. Peter Seliger

On September 23, 2016 Swiss Krono SC, LLC (USA) and Siempelkamp signed the order for the extension of the MDF/HDF plant at the Barnwell location in South Carolina, USA. This order is not only the largest one in Siempelkamp’s history, its scope of supply includes the entire service spectrum of the Krefeld plant specialist. Such large projects generate complex supply chains which require close attention. The keyword here is expediting.



Individual part inspection

Large complex international supply chains oftentimes form in the scope of large projects for which large amounts of goods from suppliers from different countries are obtained. This can trigger undesired domino effects if, for example, one partner delays a delivery. Targeted monitoring of schedules, that is expediting à la Siempelkamp, means to take any necessary measure to make sure that deliveries are made on time, according to all specifications, and to the fullest satisfaction of the customer. Siempelkamp Prüf- und Gutachter-Gesellschaft mbH (SPG) in Dresden plays a central role here.

The Turkish company Atilla Makina, headquartered in Ankara, will be responsible for the steel structures for the Barnwell plant. The entire structure will have a total weight of 2,500 metric tons. Since July 2017 parts and component groups for the new plant have been manufactured at several production locations. Trucks carrying raw materials from different regions in Turkey and other countries arrive almost daily. According to the requirement, these materials are, in several steps, cut, bent, drilled, welded, and finally galvanized. Combined to assemblies, the component groups can have individual weights of up to one (1) metric ton.



Component transport to the welding area after successful geometry inspection

The finished component groups are combined to larger units, packed in sea containers and then shipped across the Aegean Sea, the Mediterranean Sea, and the Atlantic Ocean to the USA where they will arrive after approximately three weeks. To guarantee a smooth process, many thousand component drawings have to be inspected for correctness, work steps monitored, and arising problems quickly communicated and solved.



## Expediting – External activities with an impact

*Expediting stands for the external activities of a company, particularly the supplier's project and quality management. The objective is to secure the timely delivery of the machines and their components in the agreed quality and quantity at the agreed location and to monitor the physical integrity of the goods. Expediting also checks the order backlog of suppliers and secures projects with long lead times. The focus of expediting is to avoid delays that could jeopardize the project.*



Top: Component marking via die stamping

Center: Grinding of the weld seams

Bottom: Expeditors of SPG at work



## SPG in Dresden: Profile

- founded 1993 as BWS Prüf- und Gutachterstelle GmbH (testing, reviewing, and advising company) for component mechanics, material engineering, and sound insulation, since 1995 part of the Siempelkamp Group
- location: Dresden, Germany
- core competence: testing, technical calculations, and inspection of highly-stressed systems and their components
- strength calculations and lifespan assessments of machines, systems, and pressure equipment
- material and component testing
- operating and process data management, automatic and mobile operating data acquisition
- production monitoring during the entire process (constructional design, material optimization, final product testing, if needed subsequent specifications)

To carry out this process professionally and in a direct dialogue, Siempelkamp Prüf- und Gutachter-Gesellschaft mbH (SPG) in Dresden took the term “expediting” literally and sent employees to Kocaeli located approx. 80 km east of Istanbul, Turkey. They coordinate the production monitoring and the expediting on site. The employees work in alternating shifts, for a month at a time, from July to November 2017 in Kocaeli to assure quality and to be available whenever problems have to be solved or questions have to be answered in a timely manner.

### **Compliances: the basis for machine safety**

Compliances are especially important: This term describes the compliance of, for example, the safety properties of a machine with the specifications of the applicable technical guidelines. Regarding the current order, SPG addressed the issue concerning HPE-compliant pallets which include the necessary IPPC branding (see box). Wood, for example, has to be de-barked and treated against pests.





Visual control of galvanized steel components prior to loading



A conversation with quality engineer Dogutan about improving the storage of recently galvanized parts

A check of the wood and pallet storage quickly provided clarity. "Such short distance on site only takes a few minutes and allows for questions to be answered as soon as they arrive. Of course there are questions that cannot always be answered easily. However, employees at Atila Makina think and act solution-oriented. Time and again, I am amazed how problems are tackled quickly and in an uncomplicated manner," says Holger Zipser who has been on site in Turkey for SPG as computational engineer.

Via Siempelkamp's "extended arm", a weekly report about the production status of the individual units is provided. Next to the ordinary figures, the report documents important production steps visually. The loading of the 12 m long and 2.6 m high containers with the

loading equipment which was custom-built for this task was an exciting event. The truck and the loading equipment had to be aligned exactly to one another in order to let the pneumatically driven carriage move correctly and without bumping into anything in the



## HPE, IPPC: two quality standards

The Bundesverband Holzpackmittel, Paletten, Exportverpackung (HPE) e.V. (Federal Association of Wooden Packing Materials, Pallets, and Export Packaging) headquartered in Bonn, Germany, is a professional association comprising companies from all areas of the wooden packaging industry, including pallets, packaging materials, cable drums, as well as service providers from the areas of packaging, container stowing, and logistics. The Association and its members have initiated the label "HPE-certified custom packaging". The objective is to render in time an adequate, qualitative, and flawless packing service in accordance with the state-of-the-art.

IPPC stands for International Plant Protection Convention. The IPPC standard for wood packaging material determines phytosanitary treatment and monitoring measures to reduce the risk of spreading harmful pest organisms through wood packaging material in international trade. The wood has to be free of bark and insect infestation and has to undergo a heat treatment. The IPPC stamp labels the wood with information regarding the treatment methods, country of origin, and about the responsible plant protection service.



Assembly packages ready for loading

# 2,500 metric tons

the weight of the entire steel construction of the Barnwell plant

container. This process was a first, even for Atilla, so after the successful loading of the first container, employees patted each other on the back.

"After six week of expediting work, it was time to say goodbye for now to Atilla, to the Turkish sun, and to many of stray dogs which had crossed my paths during my stay. However, I will hear the sound of the eight o'clock factory siren soon again when I return!"

## Expediting: keeping an eye on the reliable adherence to schedules and the delivery quality

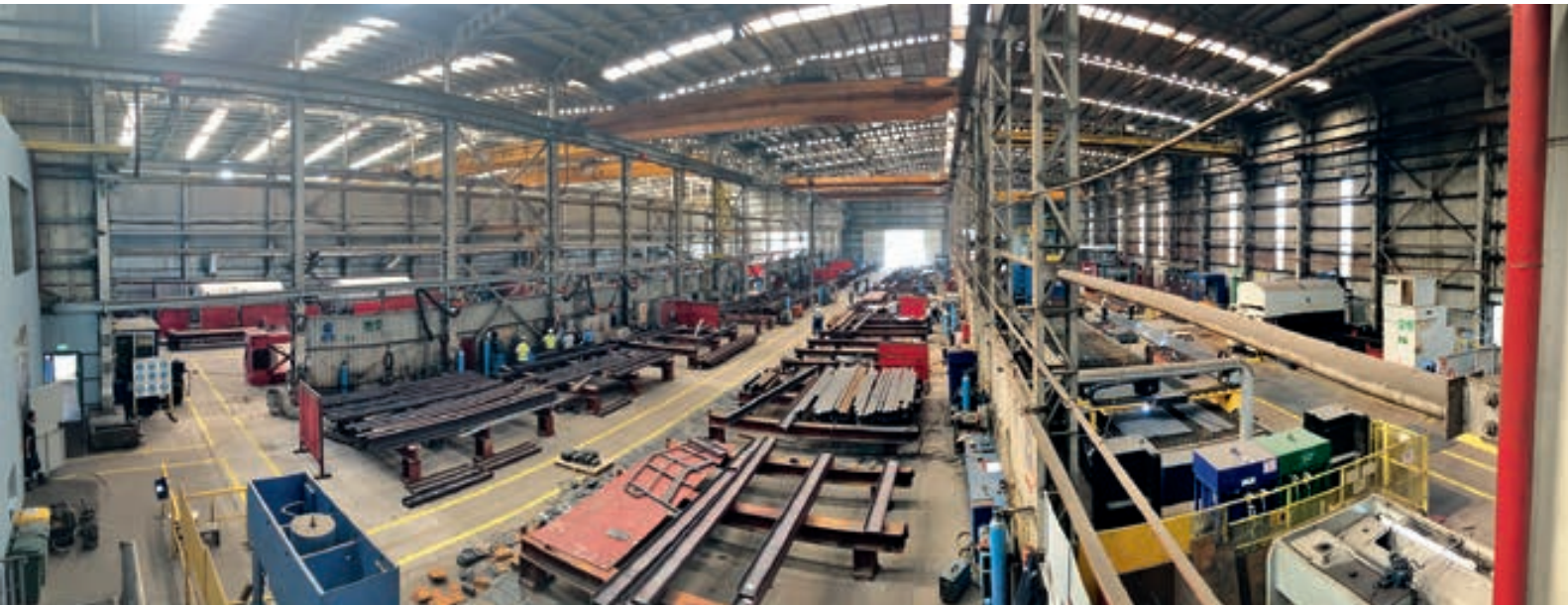
This SPG project and others demonstrate: With the help of professional expediting, purchasing, production, and delivery processes can be organized reliably and efficiently.

SPG rendered many other production and quality monitoring services in the past for different projects. For internal orders from Siempelkamp, SPG was sent to St. Petersburg, Dalian in China, to Skoda in Pilsen, to Lithuania or Italy. For SMS Meer and Babcock Borsig Steinmüller the company carried out expediting services in Taiyuan and Yangzhou, China. The main focus of these services was production control during pipe manufacturing, casting production, or during acceptance tests as well as component releases.

Conclusion: The globalization of the economy and the associated competitive and cost pressures have long resulted in decentralized production of components and plants. This makes it more difficult to assure continuous quality and consequently, the safety and reliability of finished plants.

Atilla workshop 1 Kocaeli: The design engineers, planners, and quality engineers (4th from left Bülent Ugur, Workshop Manager)





Atila's Workshop 1 in Kocaeli, left/center: assembly and welding; right: cutting, drilling, and bending stations

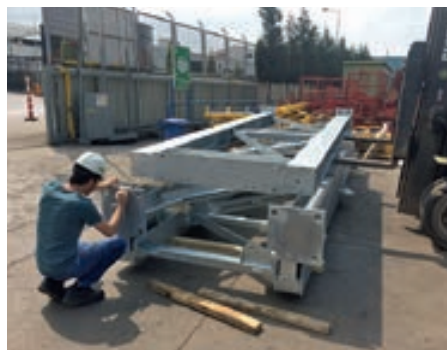


A 40ft high cube container (12 m long, 2.6 m high) ready for approx. 16 metric tons of new freight

Precision work during the movement of the loading carriage into the container



Cargo securing



Commissioning of the packed items

SPG's many decades of experience in testing and monitoring services, the consistent acquisition of knowledge and exchange of experiences, as well as the continuous presence on the service market are our customers' guarantee for successful production monitoring in Germany and abroad.

"As an independent inspection team with a view from the outside, we can ensure conscientious reviewing of the entire production process and can actively take part during deadline monitoring. This ranges from providing consulting services, to the constructional design and the material optimization during the preliminary stage, to the intermediate and final acceptances, to the delivery and includes possible subsequent specifications and reporting," explains Holger Zipser.

# „You request. We deliver“: With SLS optimally positioned for the future

→ By Carmen Lorch and Armin Lingen

High quality standards are set by Siempelkamp Logistics & Service GmbH (SLS) to meet its customers' requests for spare parts. Supported by SLS, plant owners need not worry about future challenges.



SLS location in Bad Kreuznach,  
Germany



“You request. We deliver”. Four words describing the highest standards of performance have become Siempelkamp Logistics & Service GmbH's policy: the customer has expectations, SLS has the solutions. Easier said. The complexity hiding behind this idea requires an adequate infrastructure in a globalised market as well as smooth processes, intelligent logistics, motivated employees and an above-average idea of how good service should look like.

## Availability, internationality, digitalisation: the features of the SLS standard

Speedy provision and supply: That is the main premise of spare parts business and a daily challenge on the spare parts specialists working for SLS. As many as 20,000 different spare parts are enquired every year by SLS customers. 20,000 parts for some 1800 plants installed in the wood-based material industry and other branches using presses for metal forming, fibre-cement board-, laminate- and rubber-products production. These plants are composed of hundreds of thousands of individual elements and installed all over the world. The oldest plants still in operation have been sold in the 60s of the past century.



Besides, the spare parts requirement is constantly changing. About half of the 20,000 parts enquired this year does not correspond to the requirements of the previous year. Nonetheless, these 50% must be handled as quickly by SLS as the customary requests, no matter whether a washer is required or a hot platen. Even though some parts still have to be identified or manufactured according to original drawings, a speedy support is usually necessary.

Unlike spare part retailers or external suppliers, SLS checks the specifications of the requested articles and compares them with the parts originally and actually installed in the plant. SLS is perfectly capable of acting this way because it has all the original delivery lists and drawings on hand most of them even at the touch of a button. Unless enquiry and plant BOM coincide, SLS will contact the customer for clarification on whether the part enquired shall really be delivered or whether it has just been a mistake. Expensive and time-consuming erroneous deliveries are therefore a matter of the past.



# 20,000

number of spare parts requested by SLS customers per year

Always complying with this high standard – not an easy task to accomplish. But a task successfully dealt with every day by SLS. To this end, the company employs a multi-track strategy.

#### Milestones for SLS: the new Service & Logistics Centre

The most evident – because conspicuous over a long distance – measure taken is the Service and Logistics Centre completed this year at the Bad Kreuznach site. The new building capacities enable SLS to uphold availability and a speedy delivery of spare parts. The reason is that considerably more standard spare parts are in stock. Our demand: to serve as many customer orders from our stock within one day as possible and to deliver the spare parts to the customer as quickly as possible.

This is supported by the short logistics chain, as our Centre is close to the motorway and Frankfurt/M International Airport. In combination with the certificate “Known Consignor” which has also been awarded to the new hall in Bad Kreuznach, the spare parts are forwarded to their destination on the quickest possible route – without being held by additional external checks. Another optimisation is being elaborated by SLS in the form of a 24/7 availability, which is due to be integrated into the existing processes in the near future. This

process chain will allow the plant owners to reduce their own stock capacities.

The IT, too, has a share in the overall SLS strategy: spare parts supplied more than three times within a period of 24 months will be classified “standard”. Modern IT-infrastructure enables an automatic identification and storage of these spare parts. The stock is therefore continuously adjusted to the real customers’ requirements. In addition, the customers may opt to have SLS stock those spare parts, which have to be replaced less frequently and which are therefore not classified “standard parts”.

As Managing Director Stefan Wissing put it on completion of the new hall, “The new logistics hall is of enormous importance for our customers, who are benefitting from our enhanced portfolio and efficiency, which renders another advantage that we gladly pass on to our customers: the larger storage capacity enables SLS to utilise efficient purchasing strategies to the best possible extent. That means, standard spare parts are available at reasonable prices. Moreover, the customers can purchase complete product groups from SLS and reduce the number of their sub-suppliers, which gives them a significant advantage over their global competitors.”



SLS warehouse:  
enormous capacities



Commissioning products for worldwide shipping



### **Global After-Sales Service: SLS is where its customers are**

To satisfy their customers' demands optimally, SLS Spare-parts Sales cooperates with Siempekkamp representatives and affiliates all over the world. There is always a contact available at the customer's site, while at the same time local circumstances and requirements are taken account of. The advantages are obvious: direct communication, individual support, faster logistics operations.

The service specialist also acts proactively: SLS offers customised spare-parts packages to provide direct help in case of component failures.

Subsequently, SLS service technicians keep optimising the plants in the course of their entire service lives. Customised counselling also ensures planning safety. Which parts are installed in the respective plant? Which parts are subject to major stress due to the specific

use? Which parts should be kept in stock? These are questions answered by the SLS sales person in the course of inspections of the respective plant. The plant owner can take for granted: higher plant uptime and lower costs.

### **On the company's agenda: continuous optimisation of its own performance**

Using Siempekkamp Logistics & Service means that plant owners can help ensure actively safe production and high uptimes. There are



Thomas Dahmen and Stefan Wissing, Managing Directors of SLS

many ways to achieve this with interlinked business processes forming the basis: they include, for example, the uploading of agreed spare parts lists containing the current delivery times from SLS direct into the customer-operated ERP-system.

The interlinking with the customer's processes represents an important module in SLS strategies towards future processes. In the

not too distant future, plant owners and SLS will design their purchasing and delivery processes automatically, requiring only few employees on the customers side.

**Starting today to shape the future**

SLS offers a continuously increasing spectrum of services to plant operators, who may use this to invest in their companies' future – for instance starting this year the professional

24/7 remote service. The market specifies the requirements, the schedule and the realisation will be SLS' responsibility.

"Here we underline our demand 'Driven by perfection'. That is what we want to achieve. We want to be in the position to promise our customers, 'Yes, consider it done perfectly.' We will have to work hard to live up to this policy. For nothing is perfect. This will be a never-ending process", as Stefan Wissing puts it in a nutshell.



Cargo safety assurance – thanks to close proximity of SLS to the international hub of Frankfurt Airport

Global after-sales-service, Siempelkamp technician



SLS: Powerful presence at LIGNA 2017

# ATR Industrie-Elektronik GmbH: 100% inspection for switchgear assemblies of the future

→ By Stephan Rabsch and Jan Schürmanns

Risks identified, impacts avoided – according to this motto ATR Industrie-Elektronik GmbH carries out thorough inspections during switchgear manufacturing starting as early as in the beginning stages of production. Which areas are first inspected? What are the benefits for customers? Our report provides details.

The core competence of Siempelkamp's subsidiary ATR Industrie-Elektronik GmbH is switch cabinet technology, also considered the "central nervous system" of each plant. "Modern switchgears are highly complex technical components that combine many

different functions – from protecting electric circuits, to activating drives, to connecting machines to the Internet. Our focus is to guide future switchgear tasks, early on, in the right direction with solid quality management," explains Timo Amels, Managing Director at

Timo Amels, Managing Director ATR Industrie-Elektronik GmbH







▲ Switch cabinet inspection during assembly

## TASKS OF MODERN SWITCHGEARS

Protect electric circuits



Control drives



Connect machines to the Internet



ATR. This makes sense especially because switchgears hold an important function in technical plants. Whenever the interaction between actuator and sensor technology is no longer guaranteed, the entire technical system can come to a standstill and no longer do its part in the process chain.

By carrying out a 100% inspection ATR implements a quality management instance early on. It first concentrates on the correct assembly: "The purpose of this is not only to recognize errors in the installation at an early stage. We also identify possible conceptual errors which can occur during the design process," explains Stephan Rabsch, Production Manager at ATR. The comprehensive and complete final inspections within the 100% inspection procedure reinforce a high quality standard and are the foundation for highest reliability of ATR switchgears.

## \*UL certification: background



UL certification – tested and approved!

**Underwriters Laboratories** (short **UL**) was established in 1894 and is an independent organization which examines and certifies products with regard to their safety.

ATR participates in the so called Panelshop Program by UL and because of the close exchange with UL, ATR is always up-to-date with the current status of the standards. Switchgear assemblies that were built, inspected, and accepted by ATR according to UL standards receive an official inspection tag (UL label) so that additional UL inspections at the final customer's site can be omitted or minimized.

This concept also pays off for Siempelkamp customers: "Due to the realistic simulation of the drive technology in the ATR test facility, the inverter technology, for example, can be equipped directly with the order-specific drive parameter data set and then tested," says Jan Schürmanns, Project Manager Automation at Siempelkamp. "The advantage is to fall back on a strong partner such as ATR which can guarantee that switchgear assemblies are supplied error-free to the final customer's site for later installation."

### 100% inspection for smooth processes – quicker, more reliable, less expensive

What benefits does the 100% inspection open up in detail? Acceptance procedures, for example additional UL inspections\* on site, can be omitted or can be minimized: ATR is authorized to accept and certify switchgear assemblies for the North American market.

This authorization was granted by Underwriters Laboratories (UL), an internationally operating company in safety science. "UL is an independent organization which examines and certifies products with regard to their safety. A UL expert audits us quarterly and examines our processes," says Stephan Rabsch.

The further an error moves undetected into the later stages of a process through to commissioning, the harder it is to correct it. The principle of the 100% inspection applies here and sets the course for smooth processes. All in all, this results in higher customer satisfaction.



Stephan Rabsch (Production Manager ATR) and Jan Schürmanns (Project Manager Automation, Siempelkamp)



## ATR'S 100% INSPECTION AT A GLANCE

- Inspection according to all applicable current standards and customer specifications
- Inspection of the control technology
- Testing of control, drive, and communication technology
- Functional tests of all installed devices, possible device errors are identified and rectified
- Specials: In-house certification of UL/cUL plants for the North American market by authorized ATR employees (UL/ cUL label)





# MARKETS

Markets and industries are in constant change. The machinery and plant engineering business is always challenged by new requirements. Dealing today with issues like resource efficiency, digitalisation, raw material quantities and utilisation is a projection into the future. Together with our customers we shall pursue these subjects.

# Focus market Vietnam: Đổi mới with Siempelkamp



→ By Marc Müller

A delegation from the wood-based panel manufacturer FSC Vietnam Corporation visited the Siempelkamp headquarters in Krefeld in September 2017. The reason: As part of a trip to Europe this Siempelkamp customer, which ordered an MDF plant made by Siempelkamp exactly one year ago, wanted to tour other Siempelkamp plants that are already up and running. This has been the last milestone in the long-standing business relationship between Vietnam and Krefeld!

Since the opening of the country to foreign investors, Vietnam has advanced to one of the fastest growing countries worldwide. Đổi mới (= renovation) is the name given to the

economic reforms initiated in Vietnam in 1986. The country, which was originally characterized by agriculture, experienced an economic boom until 2010. Vietnam has



## 06/2010

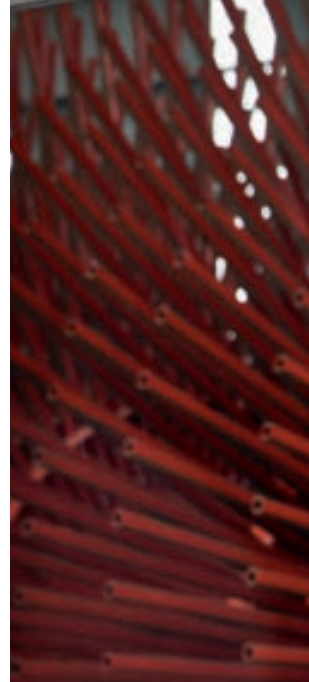
A good portion of the MDF production of the country is achieved with Siempelkamp support. Back in **June 2010** the Vietnamese joint venture company VRG DongWha Joint Stock Company with headquarters in Minh Hung signed a contract for an MDF/HDF plant for its location in the Binh Phuoc province. This plant incorporating an 8' x 47 m ContiRoll® press became the largest MDF plant in South East Asia. For the joint venture, VRG DongWha brought two Asian companies to the table: the rubber producer Vietnam Rubber Group (VRG) and the Korean DongWha Company, one of the largest manufacturers of MDF/HDF in Asia. The ContiRoll® included in the order was the first one of its kind installed in Vietnam and has been producing 30% above the contractually agreed guaranteed capacity (depending on the board thickness) since 2012.



## 04/2014

In **April 2014** the decision for another Siempelkamp plant for Vietnam, was made: Vietnam Rubber Group (VRG) ordered a complete MDF plant including a high-end 4' ContiRoll® from Siempelkamp. The 33.8 m long press line manufactures high-quality MDF cost-efficiently. The laying of the foundation stone was celebrated in the Thanh Loc industrial park in the Kien Giang province approximately 250 km from Saigon. Guests of honor included, for example, the former Vietnamese Prime Minister Nguyen Tan Dung.

Ceremonial inauguration of the VRG construction site: Prime Minister Nguyen Tan Dung presses the start button





View of cooling tower  
at FSC Vietnam  
Corporation

become a promising fast-growing emerging nation. Its most important export products include crude oil, textiles, shoes, electrical appliances, and agricultural products such as

wood, fish, rice, coffee, and pepper. Vietnam's geography is described as "a bamboo stick with two rice bowls". Two fertile river deltas used for rice cultivation are located in the

North and South of the country and are connected by a narrow strip dominated by woods and mountains.



ORDER

## 08/2015

The second order from VRG DongWha followed in **August 2015**: In order to economically manufacture the product range for the continuously growing Vietnamese wood-based panel market in the area of thin MDF, VRG DongWha decided to purchase a partially complete MDF plant with an 8' x 25.5m ContiRoll®. Again, VRG DongWha ordered this plant for the location in the Binh Phuoc province. Due to the good long-standing business relationship with Vietnam and the excellent production outputs achieved by the first investment from 2010, this supply contract was also given to the Krefeld press specialist. With the new investment, VRG Dongwha is aiming to meet the steadily growing demand for thin boards in the future. The new ContiRoll® for the Vietnamese market is able to produce thin MDF ranging from 2 to 25 mm. After an extremely steep ramp-up, this second Siempelkamp plant was successfully accepted in **June 2017**.



ORDER

## 07/2016

Another Vietnamese company placed a benchmark order with Siempelkamp in **July 2016**: FSC Vietnam Corporation decided to buy an MDF plant with an 8' x 47.0m ContiRoll®. One of the largest MDF plants in Asia will thus be built in the Bin Phuoc province. The plant will feature the exact same key data as the plant for VRG DongWha from 2010 (we reported in Bulletin 02\_2016). It is designed for a thickness ranging from 2.5 to 40 mm and a yearly capacity of 400,000 m³. The acceptance test is scheduled for **April 2018**. The four presses that Siempelkamp has so far placed in the Vietnamese market (including the order from July 2016) will produce a total of 4,000 m³ of boards per day – a volume that no other supplier has achieved to date.

Orders received from Vietnam:  
Chronology of trendsetting collaborations in the wood-based materials industry

## VIETNAM: THE ECONOMIC MIRACLE OF 1986 AND THE IMPACTS

The “Vietnamese economic miracle” began in 1986 when the country, war-torn and close to economic collapse, opened up its economy to the outside world and created with its “Đổi mới policy” a socialist-oriented market economy. In the following two and a half decades Vietnam experienced a rapid economic upswing with growth rates of 7 to 8%. The coastal country recovered relatively quickly from the worldwide economic and financial crisis of 2008/2009.

According to the German Foreign Office, Vietnam passed in 2009 the mark of US\$ 1,000 annual per capita income and has since then been considered a “middle income country”. The gross domestic product in 2016 amounted to US\$ 198 billion, which results in US\$ 2,215 per capita income. 60% of the population still lives in the country and only generates 20% of the national income. The annual inflation in 2016 was at 2.66% in Vietnam.

According to the German Foreign Office, Vietnam will remain a preferred destination for foreign direct investments. The largest investor in Vietnam in 2016 was South Korea with a newly registered investment amount of US\$ 5.518 billion. This corresponds to 36.3% of the entire investment volume. South Korea was followed by Singapore and Japan. **With approximately 300 companies active in Vietnam, Germany came in 21st place on the list of investors with a cumulative investment amount of US\$ 1.357 billion.**

Source: Basic information of the German Foreign Office in March 2017, [www.auswaertiges-amt.de](http://www.auswaertiges-amt.de)



VietnamWood – trade fair hotspot in Ho Chi Minh City



“Made in Germany”: Siempelkamp booth at VietnamWood, October 2017



## INTERVIEW

# SIEMPELKAMP IN VIETNAM: QUESTIONS AND ANSWERS

Bulletin: What regions of Vietnam have wood resources?

**Marc Müller:** Rubber wood can be found in large quantities particularly in South Vietnam, primarily on plantations around Ho Chi Minh City. The provinces of Binh Duong, Binh Phuoc, Dong Nai, and Dak Lak have the richest rubber wood resources. Other sources can be found in the central highlands of the Gia Lai province. DongWha, for example, uses rubber wood from these areas for the production on both of its Siempelkamp plants. Furthermore, wood from Melaleuca trees is available in the Mekong delta. Melaleuca trees are evergreens and their wood is used for boat and house building, but also for railway ties, flooring, or as fuel.

Bulletin: Where are the wood-based panel manufacturers located that use these wood resources with Siempelkamp plants?

**Marc Müller:** They are also primarily located in South Vietnam, within a radius of approximately 200 km around Ho Chi Minh City.

Bulletin: How can the market be characterized – in particular with regard to the sales of Siempelkamp plants?

**Marc Müller:** There are a few “Big Players” that are positioning themselves in the Vietnamese wood-based materials industry. In the socialist Vietnam the first one was the long-term Siempel-

kamp customer DongWha that placed investments together with its joint venture partner Vietnam Rubber Group and opened up a new market. The incorporated press had a length of 47 m. A second order was placed in 2014 by VRG Kien Giang, also a company of the Vietnam Rubber Group. FSC Vietnam Corporation has so far been the first private commercial investor that bought a Siempelkamp plant in 2016. Altogether, we are dealing with a market that has few players, however, these few have bought several plants to date.

Bulletin: Which performance features were convincing to those customers?

**Marc Müller:** DongWha has been ordering wood-based panel plants from Siempelkamp for several decades. The first investor of a country most of the time acts as a role model. Its buying decision is decisive for subsequent buyers. In 2016 FSC Vietnam Corporation decided to buy a plant with a layout that is close to being the same as the one from the DongWha order in 2010. This means that the plant for DongWha has a reference status which is considered a milestone in the Vietnamese wood-based materials industry. Speaking of milestones, the second plant DongWha ordered from Siempelkamp in 2015 was the plant that had one of the quickest ramp-up times in Siempelkamp’s company history. Siempelkamp projects in Vietnam reach their target smoothly, everything goes quickly and without friction.

This reliability factor is another strong selling point for new customers to order their wood-based panel plants from Krefeld.

Bulletin: Which future activities and projects can be expected?

**Marc Müller:** To date Siempelkamp installed MDF plants exclusively. We expect the new investment wave to focus on particle board plants – as we observe all over Asia. Up to a few years ago, the Chinese furniture industry concentrated exclusively on MDF. Now the production schedule changed in favor of particleboard. Because China has no corresponding raw material sources, a high need for imports is going to arise which will be primarily met by Thailand and Vietnam.

> THE RELIABILITY  
FACTOR IS A  
STRONG SELLING POINT  
FOR CUSTOMERS FROM  
VIETNAM TO ORDER A  
SIEMPELKAMP PLANT.

Marc Müller



Marc Müller, Area Sales Manager, Siempelkamp



On-site visit at FSC Vietnam Corporation: (from left to right): Ngo van Hoang (EuroAsiatic), Trinh Huu Dai, Hoang van Thuy (both FSC), Jürgen Philipps (Siempelkamp Management), Klaus Thürnau (Site Manager)

**Face-to-face contact “Vietnam – Krefeld”**

References and recommendations are a great thing, personal dialogue, however, is even better. A delegation from the FSC Vietnam Corporation, 100% subsidiary of the Kim Tin Group with its core business in the production

of welding electrodes, followed this motto. With the new Siempelkamp plant, the company puts its commitment to the wood-based materials industry on a solid foundation. The visit in Krefeld provided an opportunity for a personal exchange with the German partner.

FSC delegation visiting Siempelkamp in September 2017 (from left to right): Uwe Hetzert (EuroAsiatic, Siempelkamp Representative), Duong Hai Son (Project Secretary FSC Vietnam Corporation), Joerg Melin (Büttner), Trinh Huu Dai (General Director FSC Vietnam Corporation), Juergen Philipps (Siempelkamp Management), Nguyen Tien Hai (Chairman FSC Vietnam Corporation), Marc Mueller (Area Sales Manager Siempelkamp), Ngo Van Hoang (EuroAsiatic)





Shaking hands on the partnership in Vietnam with FSC Vietnam Corporation: Marc Müller (Area Sales Manager Siempelkamp) with Mr. Trinh Huu Dai By FSC. In the background, center right Henning Gloede (Head of Siempelkamp sales office in Singapore)



Furthermore, during several other visits at European customers of Siempelkamp, FSC Vietnam Corporation assured itself of the performance level of already operational wood-based panel plants made in Krefeld.

(from left to right): Shin Dong Man (General Manager Board Manufacturing Dongwha), Myung Sik Kim, (General Manager Dongwha), Erwin Scholz (Siempelkamp), Seo Jin Seok (General Director Dongwha), Uwe Hetzert (EuroAsiatic, Siempelkamp Representative), Yangil Kim (General Manager Production, Dongwha)



Installation of ContiRoll® at FSC



DongWha location in the Binh Phuoc province

# Siempelkamp in China: To live and produce quality

→ By Andreas Krott

In 2016 the overall worldwide production capacity for wood-based panels amounted to approximately 250 million m<sup>3</sup>. China alone accounted for 34% of this annual figure. How is Siempelkamp positioned in this important market? Which milestones have the relationships between the Chinese customers and the Krefeld partner reached? Our report goes into detail.



Li Tonghua, Chairman of the Treezo Group (3rd from right) with his team and the Siempelkamp team at the contract signing ceremony

As a technology supplier Siempelkamp has many decades of expertise in Asia. From plant concepts that are specifically tailored to this market to first-class equipped production sites, the Krefeld partner supplies its customers with all advantages that plant operators appreciate. Most recently the order of the Chinese OSBORNE Decoration Material Co., LTD documented the following: In September 2017 the company of the Treezo Group ordered a complete OSB plant with a 8.5' x 30.4 m ContiRoll® press –

a current milestone in the almost forty-year old cooperation between the Chinese wood-based materials industry and Siempelkamp.

**Advantage 1: Tailor-made plant concepts for differentiated market requirements**  
Siempelkamp has built an excellent reputation as an international systems supplier for the wood-based materials industry. Part of the company's corporate claim is to supply plant



Sales success for 4' presses at WoodMac in Peking 2010



Presence at Wood-Mac in 2015

concepts that are exactly tailored to the requirements and the plant operator even in differentiated markets. An example for it are Siempelkamp's 4-foot plants that are especially established in China.

In November 2007 Zhejiang Liren Wood Industry in Jiang Shan City, Zhejiang province, ordered the first "small" Siempelkamp 4' x 33.8 m ContiRoll® for MDF – many additional orders followed over the next years. The smallest press in the ContiRoll® family principally has all the features of the large 6' and 12' presses: best pressure distribution of all time, very low thickness tolerances, quick start-ups, stable ramp-up curves, and unsurpassed high availability. In addition to these general advantages of the ContiRoll®, the 4-foot version offers a large bandwidth of advantages for customers with special market requirements, such as in China: The 4-foot model is especially interesting for small and medium capacities when certain conditions have to be met, for example, if

there is a high demand for premium MDF, corresponding with the increasing quality awareness of the consumers, but a limited supply of wood. Steadily rising costs for the transports of raw materials and of products to the markets also demand short distances. The careful use of resources including wood and resin is an advantage as well. The small ContiRoll® is well suited as a greenfield investment as well as a replacement for an outdated multi-daylight press.

By adapting the ContiRoll® technology to the needs of the Chinese market, Siempelkamp was able to get established as a competent partner even for newcomers. The first large direct order which was placed with Siempelkamp's production location in Qingdao in 2016 includes, as expected, a 4-foot plant.



## China in figures

Population*:	1,379,302,771 (as of July 2017)
Population growth*:	0.4% (2017)
GDP composition, by sector of origin*:	Services 51.6%
	Industry 39.8%
	Agriculture 8.6%
GDP 1st half 2017, real growth rate**:	6.9%
Growth "machine manufacturing and plant construction" 1st half 2017**:	ca. 12%
Land use*:	Agricultural land: 54.7%
	Forest: 22.3%
	Other: 23.0%

Sources: \* CIA World Fact Book, [www.cia.gov](http://www.cia.gov), \*\* Mercator Institute of China Studies, Berlin, [www.merics.org](http://www.merics.org)



### Advantage 2: local facilities with highest quality standards

Another advantage: Siempelkamp is represented with two production locations in the Chinese market which were established in 2004 and 2015, respectively. The Wuxi Machinery Co. Ltd manufactures products in a fast and targeted manner as the first Siempelkamp location in China to meet the needs of Asian customers. This production facility is concentrating on components with a high degree of manual labor. Furthermore, Wuxi is responsible for the sourcing, quality control, and preliminary assemblies of parts for plants that are supplied to China.

In April 2015 the first employees started production at Siempelkamp's second Chinese location in the coastal city of Qingdao. This production location in the south of the Shandong province opens up best conditions to serve the Asian market with press components quickly and reliably according to Siempelkamp's quality standard.

Siempelkamp was the first German company that settled in the Sino-German eco-park Qingdao, which was established within a Chinese-German pilot project, and built a production location with an area of 7,000 m<sup>2</sup>, expandable by another 13,500 m<sup>2</sup>. Meanwhile,



Location expansion in Qingdao:  
precision work with 2 x 50 metric-ton crane

the park has become a magnet for other international companies from high-end industries and for different service sectors. The current production spectrum at this Siempelkamp location consists of components for the continuous ContiRoll® press. "Here in Qingdao we have put a great team into place. All employees work hard to achieve a mutual goal – that is – best quality and optimized costs for the products," says Dr. Jung-Ren Ni, General Manager Siempelkamp, China. Here as well, the focus is "To live and produce quality": The location cooperates with a workshop that trains specialists in Qingdao. Young employees are trained for the type of professional careers that are requested by Siempelkamp customers. "In this way, we can provide the usual high standard of our products at this location with skilled personnel," emphasizes Dr. Jung-Ren Ni.

Siempelkamp Qingdao Machinery Co. Ltd. recorded its first successful sale at the end of

2016 when the Chinese MDF manufacturer Lian Jiang Huasen Wood Industry ordered a forming and press line for a new particleboard plant. The scope of supply for this order includes a resin blending and dosing system for

particles, an Ecoformer SL mat forming station, a 4' x 33.8m ContiRoll® press, a cooling and stacking line including the automated storage system, as well as a SicoScan package. The Siempelkamp factory in Wuxi is also involved



Conclusion of a contract in China: Yao Jiaquan, General Manager Hua Sen (3rd from left); Yusheng Zhai, Siempelkamp (4th from left.); Andreas Krott, Siempelkamp (5th from left); Yu Jianlong, President Hua Sen (6th from left)



Production location Qingdao



Foundation work in Qingdao

in the order. Lian Jiang Huasen Wood Industry, which is currently manufacturing 100,000 m<sup>3</sup> of MDF annually, wants to enter particleboard production with this investment. At the present time, the Chinese furniture industry is switching from MDF to particleboard to use in production. "As a result, a massive expansion of particleboard capacities is under way. As an experienced and reliable partner, Siempelkamp supports its customers in this changeover process by

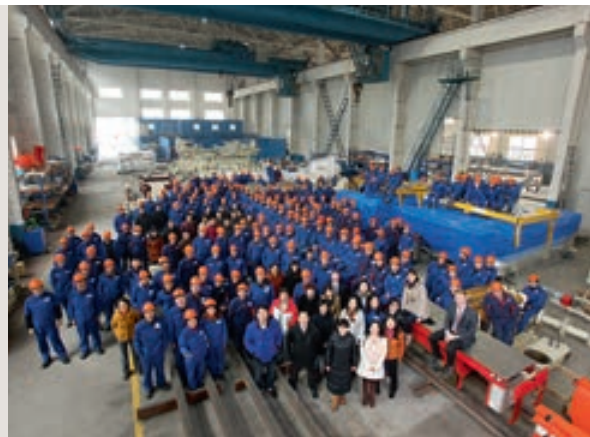
supplying modern plants," says Andreas Krott, Sales Manager Siempelkamp. "The recent direct order for a 4-foot particleboard line, placed by a Southeast Asian customer, demonstrates the competitiveness of our Chinese subsidiary."

### Advantage 3: "Leadership in technology"

During LIGNA 2017 Siempelkamp demonstrated once more that our customers throughout the



ContiRoll® for MDF at Huqian, started operation in 2009



Siempelkamp team in Wuxi 2012



## Siempelkamp in China: Milestones

- 1978 – 1996 Siempelkamp supplies 28 particleboard and MDF plants with cycle presses to the Chinese wood-based materials industry.
- 1988 For the first time a customer from China orders a ContiRoll® plant made by Siempelkamp. The 4' plant for the production of thin particleboard is sold to the Forest Bureau in Shaowu in the Fujian province.
- 1994: First order from China for a MDF plant with ContiRoll® press: Danyang Fremet Fiberboard in Danyang, Jiangsu province, places the order for a complete plant.
- 2004: Siempelkamp has been producing with Wuxi Machinery Co. Ltd since 2004 to meet the needs of Asian customers quickly and in a targeted manner on site. This manufacturing company primarily produces components with a high degree of manual labor.
- 2009: In March 2009 the first MDF line with 4' ContiRoll® produces its first board. This smart ContiRoll® press is working for Zhejiang Liren Wood Industry in Jiang Shan City in the Zhejiang province.
- 2014: Luoding Luyuan Wood Based Panel Co., Ltd., orders a MDF/HDF plant for thin boards. The company is a long-standing Siempelkamp customer and owns several Siempelkamp plants.



world put their trust in the bundled expertise of the Siempelkamp Group. With an ambitious concept, presented with numerous animations and simulations, the presence of the Krefeld systems supplier for the wood-based materials industry at LIGNA matched the pulse of the time and the needs of the operators, respectively. Under the motto “intelligent production” Siempelkamp’s trade fair presence displayed many innovations that met the interest of the international audience. Frequent product changes, increasingly individual recipes, the

desire for shorter changeover times, reduced downtimes due to production breakdowns, resource savings, high product quality – these framework conditions set the course for ground-breaking concepts and technologies that Siempelkamp developed.

A special advantage for the Chinese market: In hardly any other country has the use of data in daily life progressed as much as in China. To date, China has the only E-Commerce-Portal for wood-based panels. “Chinese customers



First board at Luoding Luyuan Wood Based Panel Co., Ltd.



Contract signing in China: Wang, Dong Tao (General Manager Nanning Shuixin Ketien, SciSky) with Andreas Krott (Sales Manager Siempelkamp)



Ling Dasheng, Chief Engineer of Treezo Group, and Andreas Krott (Sales Manager Siempelkamp) at contract signing in 2017

- 04/2015: The first employees start production at Siempelkamp’s new Chinese production site in the coastal city of Qingdao. This manufacturing site in the south of the Shandong province opens up optimal conditions to serve the Asian market with press components quickly and reliably according to Siempelkamp’s quality standard.
- 12/2016: The first direct order is placed with Siempelkamp Qingdao Machinery & Equipment Co. Ltd.: The Chinese plant operator Lian Jiang Huasen Wood Industry Co. Ltd. orders a press line for the production of particleboard for its manufacturing site in Lianjiang.
- 02/2017: Dare Group, the strongest brand name in China’s wood-based materials industry and five-time Siempelkamp customer of ContiRoll® presses places an order for the modernization and relocation of its particleboard plant, the largest plant in China with an annual capacity of 550,000 m<sup>3</sup>.
- 07/2017: Scisky, known as a manufacturer and provider of decorative interior products for “healthy living” orders its first Siempelkamp ContiRoll® particleboard plant for a new vertically integrated complex for the manufacture of furniture originating from industry waste wood and wood from thinnings.
- 09/2017: Order for a complete OSB plant. Customized to produce laminated OSB for the furniture industry, the plant is supplied to the Treezo Group and will be erected in the Shandong province.

are used to automating standard processes and expect optimal use of data in their work life as well. This goes across all professions ranging from skilled workers to engineers, to managers. Siempelkamp offers customers unique 'Production Intelligence' and allows for product quality forecasts. We are convinced that the first digital factories in the wood-based materials industry in China will be built with Siempelkamp support," says Andreas Krott with a look into the not-to-distant future.

Siempelkamp complements its state-of-the-art technology with intense customer dialogues. This starts with expert consulting services during the project phase, consulting services

regarding the design, and during the pre-engineering. A scan of the infrastructure at the plant operator's future site is produced. This 3-D scan displays the reality at the location; each detail can be checked and measured with an accuracy in the mm-range. This process makes sense during the collision check between existing and new plant equipment when a modification or an expansion of the plant is planned. The assembly sequence can also be planned in an optimal way, which in return reduces production downtimes.

▼ Production in China according to Siempelkamp's high standard



For a wood-based materials manufacturer it is also decisive to know which production depth at what level of professionalism a supplier can offer. In this area Siempelkamp scores with an end-to-end offer of all process technologies and the complete engineering consisting of determining which units and systems have to be installed.

A generally growing need for individuality offers the opportunity to develop new products. In connection with particularities of the Chinese market, plants for so called hybrid products are developed today, for example, plants for laminated OSB featuring surface layers similar to those in furniture panels

made from particleboard. With many decades of expertise in process technology and plant planning, Siempelkamp provides customers with the right concept that ensures successful production immediately after startup.

Last but not least, Siempelkamp supports plant operators in implementing ambitious visions regarding the use of new raw materials. In this area, the German partner breaks new ground with its research and development centers in Krefeld and Zweibrücken within the scope of joint development projects.

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## QUESTIONS AND ANSWERS

**Bulletin:** What are Siempelkamp's unique selling points that meet the exact needs of Chinese customers?

**Samiron Mondal (Management Siempelkamp Maschinen- und Anlagenbau GmbH):** The ContiRoll®-press technology is by far the most unique selling point that Siempelkamp offers Chinese plant operators. The plant technology in general, several process-related features, and the comprehensive equipment of our machines have contributed to the fact that Siempelkamp enjoys a first-class reputation in China. The high portion of supplies from Europe in connection with German engineering expertise is associated with top quality in China. This is also expected from Siempelkamp's Chinese manufacturing sites.

**Bulletin:** Which Chinese customers decide for Siempelkamp technology?  
**Andreas Krott (Sales Manager Siempelkamp):** These are customers with a high quality standard which are willing to pay the reasonable price for it. The experience that Siempelkamp has in the area of press technology is also very important.

**Bulletin:** What feedback do you get from satisfied customers? What is the proven benefit for customers when they pick Siempelkamp as a partner?

**Yusheng Zhai (Sales Manager Siempelkamp China):** We receive such feedback as "best equipment" and "competent consulting services". Last but not least, it is the high performance and long operating life of our machines that impress ...

**Ma Hangqing (Sales Manager Siempelkamp China):** ... and Siempelkamp stands for consistency and extremely reliable equipment!

**Bulletin:** In which direction is the Chinese wood-based materials market developing? What demand can be expected in the next years from China?

**Samiron Mondal:** An increased demand for the replacement of many smaller plants (e.g., multi-daylight press lines), which are being closed due to profitability and environmental reasons, is to be expected. This mainly concerns 4' plants and standard lines at low prices. Furthermore, it is to be expected that a few medium-sized plants with hybrid technology will be ordered, primarily OSB lines with additional function. MDF plants for the production of thin boards will also belong to the preferred future order spectrum.

# Strothmann equipment for the pilot hot-forming plant of Telos Global: Showcase of state-of-the-art technology in automotive lightweight construction

→ By Lutz Bussmann

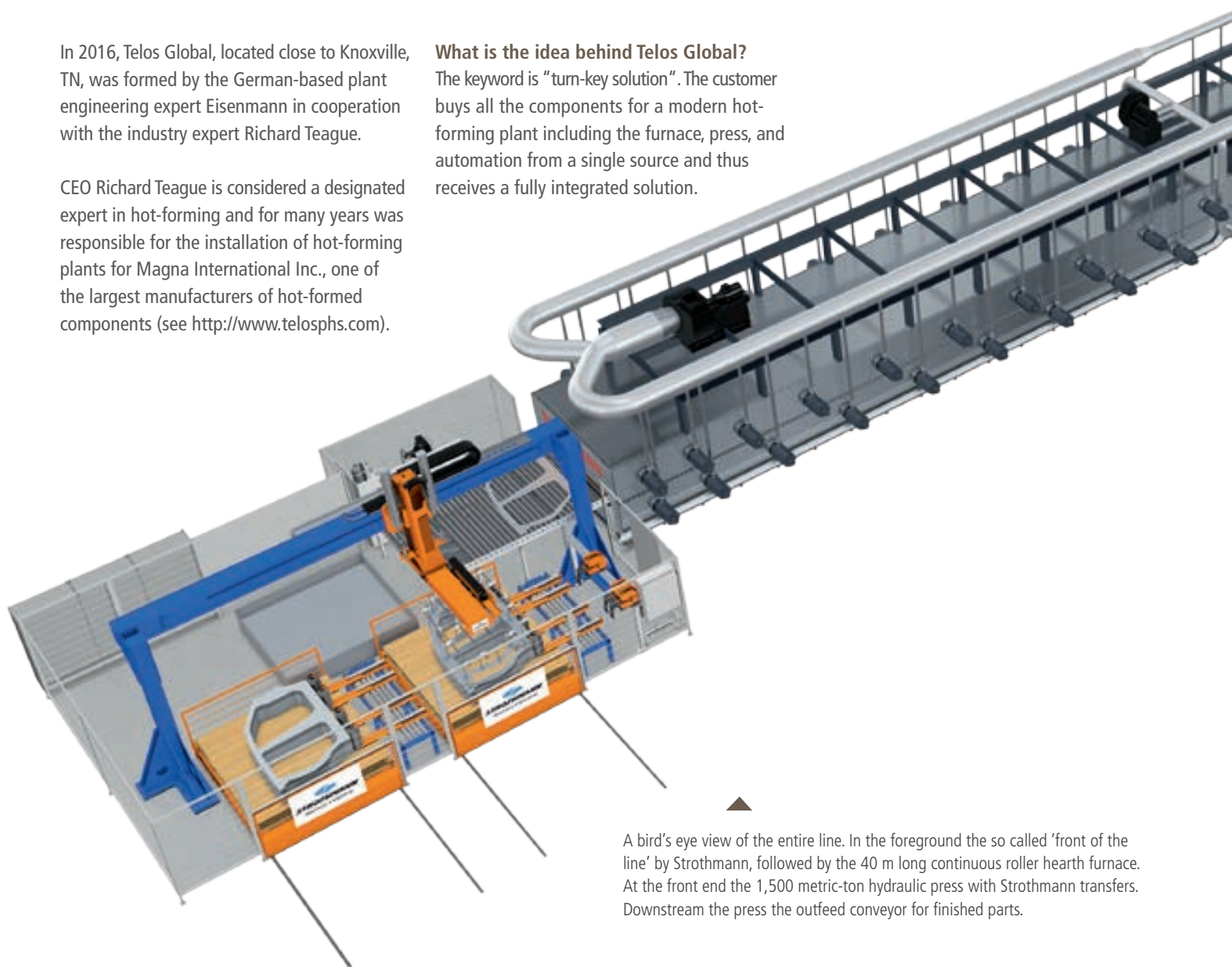
A complete hot-forming plant went into operation at TELOS Global in Caryville, Tennessee, in a 17,000 sq. m (22,332 sq. yard) factory building in June 2017. Strothmann Machines & Handling GmbH contributed key components from the area of press automation to this trend-setting pilot plant.

In 2016, Telos Global, located close to Knoxville, TN, was formed by the German-based plant engineering expert Eisenmann in cooperation with the industry expert Richard Teague.

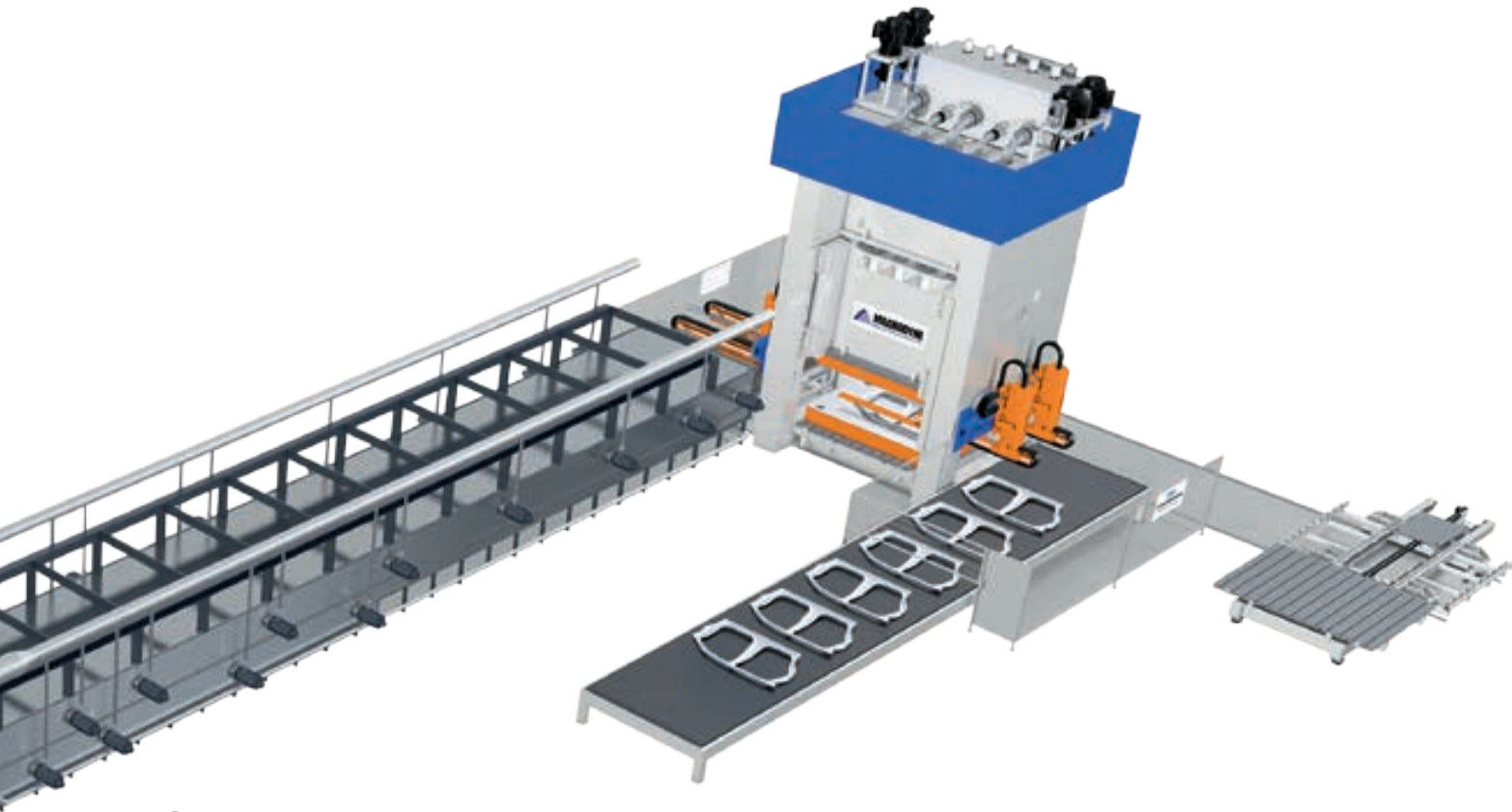
CEO Richard Teague is considered a designated expert in hot-forming and for many years was responsible for the installation of hot-forming plants for Magna International Inc., one of the largest manufacturers of hot-formed components (see <http://www.telosphs.com>).

## What is the idea behind Telos Global?

The keyword is "turn-key solution". The customer buys all the components for a modern hot-forming plant including the furnace, press, and automation from a single source and thus receives a fully integrated solution.



▲  
A bird's eye view of the entire line. In the foreground the so called 'front of the line' by Strothmann, followed by the 40 m long continuous roller hearth furnace. At the front end the 1,500 metric-ton hydraulic press with Strothmann transfers. Downstream the press the outfeed conveyor for finished parts.



## Hot-forming / press-hardening – the latest trend

The hot-forming process is not new. In the 1990ies the Scandinavian automobile manufacturers Saab and Volvo started producing serial parts according to this process.

The breakthrough for hot-forming, however, didn't happen until several years later and went hand in hand with the effort to reduce the weight of cars and with it the fuel consumption. Press hardening also plays an important role in increasing passenger safety. The new body sheets developed by the steel industry from the martensite-hardenable steel 22MnB5, today provide the opportunity to produce components with complex deep-drawn geometries and component strengths of up to 1,700 MPa.

Therefore, the need for car body components with a favorable strength-to-weight ratio is growing. These include in particular A and B pillars, the side impact bars in doors, door sills, frame parts, bumper parts, crossbeams for floor and roof, as well as front and rear side members. While in the beginning there were only three or four hot-formed components per vehicle, today there are vehicle models with more than 30 hot-formed parts.

Involved in this project are three cooperation partners: Firstly, Eisenmann Thermal Solutions GmbH & Co. KG as the furnace manufacturer, a subsidiary of Eisenmann SE. Secondly, the Canadian press manufacturer Macrodyne

– and thirdly, Strothmann. "We are proud to be part of this partnership. Thus, we can break new grounds in sales as well as research and development," says Lutz Bussmann.

The new line at Telos Global creates added value for the customer in many ways. Customers from around the world can take a closer look at the showcase manufacturing plant. Next to

the hardware, newcomers in the area of hot-forming attach particular importance to the process know-how. A team of specialists with many years of expertise in production and process technology and many decades of experience in plant engineering operates the competence center and supports customers with practical knowledge during the design and startup of new hot-forming lines.



"6th Press Hardening Steel (PHS) Suppliers Forum" from September 28 – 29, 2017 in the production facilities of TELOS GLOBAL, Caryville/Tennessee. From left to right: Eugen Reimer (Sales Press Room Automation Strothmann), Lutz Bussmann (Sales Director Strothmann), Richard Teague (CEO TELOS GLOBAL), Henning Seffers (Managing Director Strothmann), Christian Fais (Sales Director North America Strothmann)



## Strothmann and the hot-forming market: key data

More than 70 hot-forming lines worldwide operate with Strothmann automation. The latest project in the area of hot-forming involves the automation for two lines which were supplied to Ford in China via Loire Gestamp, largest Spanish manufacturer for hydraulic presses.

Next to China, the USA has the largest growth market for press-hardened parts in the automotive sector. Compared to Europe, American automobile manufacturers have some catching up to do with regard to the use of press-hardened parts. "Through our sales partnership by means of the pilot plant at Telos Global and our in-house team of experts at Strothmann Shanghai we are well positioned in both key markets for hot-forming," says Lutz Bussmann.

The linear automation by Strothmann competes in the area of press automation for the hot-forming process with conventional 6-axes robots. The clear advantage of linear automation is the higher speed. Higher speeds mean less cooling of the blanks which leave the furnace with a temperature of ca. 950°C.

The trend towards thinner blanks reinforces the requirement for higher speeds when loading the press. The thinner a blank is, the quicker it cools off. Strothmann feels confident that future retrofits will generate orders for the replacement of conventional robots with linear technology.

The line manufactures small batches for end customers and the location also has its own in-house toolmaking. It is suited especially well for the production of prototypes – Honda has placed a first order in this area.

In June 2016 Telos Global ordered from Strothmann the press automation for the innovative hot-forming line. Part of the scope of supply is the so called "front of line", that is, the complete unit for the de-stacking of the blanks prior to

the furnace. This includes the blank feeder SRT 4/080 with automatic tool change device, a blank cart on Strothmann's RoundTrack® system as well as the control and safety technology. The scope of supply also includes a hydraulic marking station, a new development by Strothmann. Hot-formed parts receive a batch number which conventionally is applied with a pneumatic marking device. These marking devices are very loud, require large amounts of energy, and often provide bad

marking results. These weaknesses are eliminated by Strothmann's hydraulic marking station.

Additionally, Strothmann supplies the press room automation, consisting of a servo-motor driven centering table at the furnace outlet area – likewise a new development by Strothmann. Furthermore, Telos Global ordered a transfer feeder SRT 3/080 each for loading and unloading of the press, gripper units, a RoundTrack® system RS 60 for the tooling change, as well as control and safety technology.

Telos Global is more than a customer for Strothmann. "Through our commitment to the project, we have access to the plant and can test new component parts or technologies (e.g., condition monitoring) with the plant," says Lutz Bussmann, Sales Director at Strothmann. "In this way, we also profit from accessing production data from the hot-forming process which would otherwise hardly be available to us!"



Strothmann's company headquarters in Schloß Holte-Stukenbrock

# Resource efficiency and rice straw: The board of the future

→ By Dr. Michael Schöler

Board manufacturers and the wood-based panels industry are facing far-reaching change processes: What does the board of the future look like when you will have to consider the challenges that limited resources and climate protection pose for us? To what extent do annual plants open up alternatives? Together with the American company CalAg LLC, Siempelkamp has been breaking new ground for several years. Research and development efforts are now followed by the first project!

The order that Siempelkamp received in June 2017 is a win-win situation in several different ways. CalAg LLC ordered a production plant for fiberboards made of rice straw to process annual plants. The Californian CalAg LLC signed the supply contract on June 14, shortly after it became known, at this year's LIGNA 2017 in Hannover, that the required investment volume became available through contributions

from public investors. The future production location was financed by CalAg LLC by issuing bonds at the New York Stock Exchange.

This project is not only a milestone regarding the regional development, but also and especially for the economic use of a raw material which would otherwise remain a waste material. Rice straw is available in large



Small bale of rice straw,  
field crop from California





Pan 1:  
rice straw after shredder

Pan 2:  
rice straw after hammer mill

Pan 3:  
fibers after refiner

## MILESTONE

Economic use of rice straw: valuable resource instead of waste product

quantities in North America. The USA grows approximately 10,000,000 metric tons of rice every year. This makes the United States one of the 20 largest rice producers in the world, ranking eleventh behind Japan. The main cultivation areas include the states of Mississippi, Arkansas, Texas, Louisiana, and California.

### **Wet rice cultivation and the consequences: a process with many facets**

In Northern California primarily wet rice is grown. Due to optimal soil conditions this rice achieves the premium quality necessary to be

used as sushi rice. This is also an advantage from an economic perspective: While one ton of standard quality rice sells for about \$100, the same amount of sushi quality rice yields a sixfold sales amount!

To this point, these are best prospects for wet rice agriculture in California if this part of the country wasn't considered an area scarce of water. Due to the prolonged drought, the administration of the US West Coast state decided a few years ago to stipulate water-saving measures. These also have an effect on wet rice cultivation. "The process depends on vast amounts of water: Fields are flooded before rice can be planted. Later the water is drained, the fields dry and the rice is harvested," explains Dr. Michael Schöler, Head of Research and Development at Siempelkamp. During the conventional process, the remaining straw is chopped and left on the fields. Afterwards, the fields are flooded for a second time so that the chopped straw can rot. "This second flooding of the fields was prohibited by decree in California. Attempts to leave the straw on the fields resulted in a plague of mice and fungus. Therefore, the focus was put on finding other

Rice – source of new application options



options to use the straw meaningfully and, from the viewpoint of resource efficiency, adequately," says Michael Schöler. To burn the straw was not an option since the CO<sub>2</sub> emissions from the material were hazardous from an ecological perspective. Then again, the heavy flooding of the soil with water also has a negative impact on the Earth's atmosphere. An almost oxygen-free habitat for anaerobic methane producers is created by the process.

**"Belief and perseverance in the project!"**

On this basis the vision to develop machinery for the processing of rice straw emerged. This vision was fed by many advantages. For one thing, the raw material solves many problems that scarcity in the supply of wood is causing. Countries, such as Egypt, have no wood supply at all. Furthermore, the use of rice straw in board production adds significant value to the raw material.

Siempelkamp and CalAg have invested almost a decade in the research and development of machinery for processing rice straw. In 2017 the project was market-ready and resulted in an order for Siempelkamp's complete range of products. The Krefeld company is planning, building, and supplying the entire machine technology for the Willows location which will also include the start-up processes.

[The combined expertise of the Siempelkamp Group leads new raw materials to market maturity – always in constant dialogue with the plant operator.](#)

The order value of 75 million Euros includes the complete preparation technology for rice straw bales with bale twine remover and shredder by Pallmann, a 100% daughter company of Siempelkamp, as well as a cleaning system for the straw to remove coarse materials and dust.

Pallmann also supplies two refiners for the fiberizing of the rice straw. These refiners are equipped with horizontal digesters, a design typical for annual plants, to prevent material bridging. The cleaning system for separating silicate components from the fibers is a design

specially developed by Siempelkamp and designed to process rice straw. The natural gas fiber dryer designed for a material throughput of up to 32 metric tons/h bone-dry is supplied by Siempelkamp's subsidiary Büttner. So are the energy plants needed for steam and heat generation. The front-end technology for fiber and mat preparation is supplied by the Italian subsidiary CMC. To comply with environmental requirements, a special resin blending system with a turbo mixer will be used. This high-speed mixer processes PMDI in a procedure developed by Siempelkamp.

**ContiRoll® Generation 9:  
the new industry benchmark**

The core component of the future production plant for rice straw fiberboards will be a 9th Generation ContiRoll® press with its numerous innovations including, for example, the highly efficient drive motor ContiRoll Ecodrive. These motors provide the plant operator with energy savings of at least 7% under full load operation and up to 14% under partial load operation.

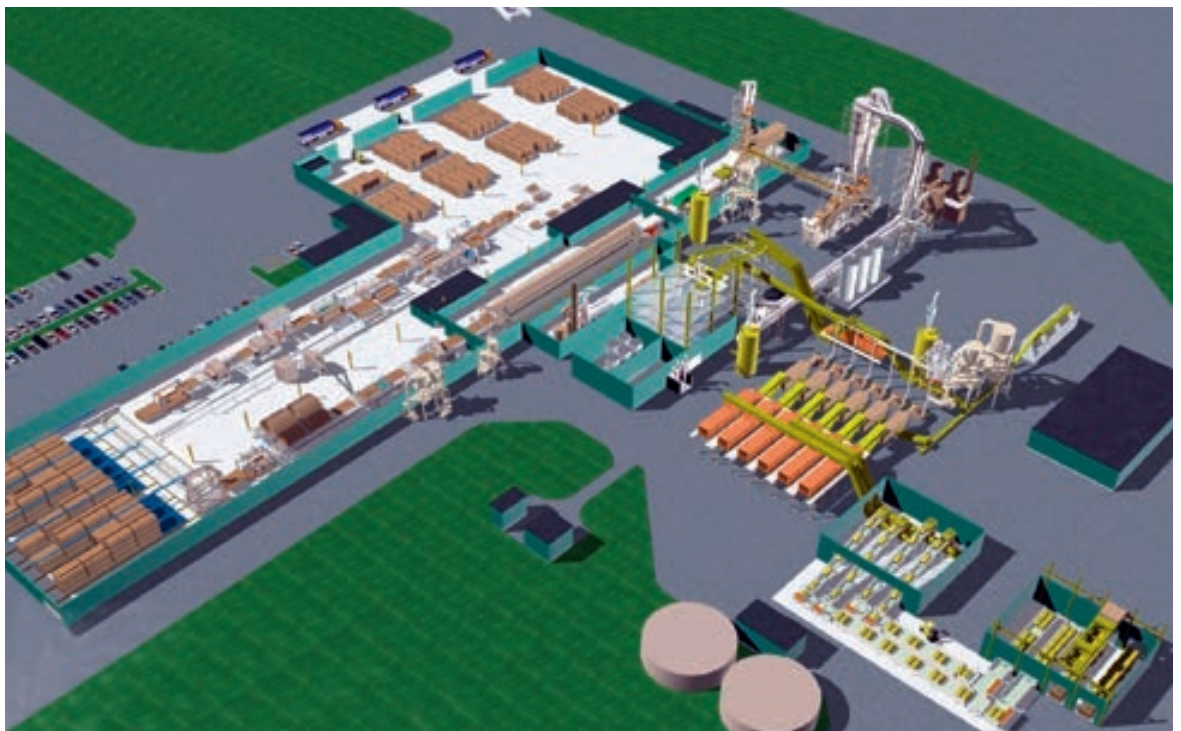
# 14%

## ENERGY SAVINGS

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under partial load operation,  
7% under full load operation –  
thanks to ContiRoll Ecodrive

3-D rendering of complete plant for CalAg





## Annual plants: quick growth, cost-effective alternative

In botany an annual plant is a plant that completes its life cycle, from germination to the production of seed within one year, and then dies. Frost as well as draught can influence the growing season. Examples for fast-growing plants are rice, bamboo, bagasse, reed, and giant cane.

The advantages that open up when using annual plants are discussed even more intensively than before. Annual plants not only contribute to resource efficiency. As a product of intense farming, annual plants primarily grow in more densely populated areas with a good infrastructure which is an advantage for the logistics. Furthermore, most of the time, a central source of annuals in large amounts is available as an optimal basis.

Next to the further development of the mechanical and hydraulic machine components, the newly developed Siempelkamp Press Controller, Sico SPC, controls the desired press forces and distances between the cylinders in the technological press zones of the ContiRoll® by means of modern hardware technology and precise sensor technology. The ContiRoll® will feature a variable press width of 8 – 10' and a length of 35.4 m.

The finishing line will include a diagonal saw (rip-cut saw) which will cut exclusive sizes for Columbia Forest Products, one of the largest US-American suppliers of wood-based products and main purchaser of the fiberboards. Next to the sanding and stacking lines, a fully automatic storage system with warehouse vehicles and base carrier is also part of the scope of supply. With the new Siempelkamp plant, CalAg will produce 200,000 m<sup>3</sup> of fiberboards with a thickness ranging between 2 and 30 mm annually following the start-up of the plant scheduled for the end of 2018.

### Prospects!

"After many years of intense research we have succeeded in developing a special method to produce MDF from rice straw which need not shy comparison with standard wood-based boards," summarizes Dr. Michael Schöler. Siempelkamp has already received further requests aiming at an economical use of rice straw from customers in sparsely wooded countries such as Egypt and China.

In sparsely wooded regions the use of rice straw opens up new opportunities for board production.

# THREE QUESTIONS FOR Dr. Michael Schöler



**Dr. Michael Schöler,**

Head of research and development at  
Siempelkamp

## RICE STRAW FOR BOARD PRODUCTION

**Bulletin:** Dr. Schöler, can the process for wood-based board production be transferred one to one to the board production with rice straw?

**Dr. Michael Schöler:** The process is identical in almost all details. The greenend, the preparation process as well as the resin blending process have to be specifically adjusted. Starting with the raw material feed into the forming machine all the way to the finished board, the process follows conventional MDF production. The quality of the board is not less than that we achieve for standard wood-based boards.

**Bulletin:** What does the new process mean for the training of the team at the location?

**Dr. Michael Schöler:** In this area, CalAg profits from the fact that wood has become a scarce commodity in California which caused several saw

mills to close. For that reason the company has easy access to technically trained personnel which will be able to competently carry out all operational and maintenance tasks

**Bulletin:** Rice straw for board production – turning circumstances to one's own advantage?

**Dr. Michael Schöler:** Definitely. This raw material has developed from a waste product to a useful applicable material. Resource efficiency here plays a leading role in a different way as it usually does because in this case the resource use is eco-friendly. The entire technology has been perfected and the Willows location is considered the perfect industrial location because it has excellent transport connections. From a logistical point of view the company profits from an optimal starting position to supply the entire West Coast of the USA with boards. This all sounds like we had a head start which we only had to use to our advantage. However, our success is last but not least the result of a concentrated research and development process which also took into account many special conditions!



### Rice straw: long ignored raw material

During rice harvest the rice grain is separated from the straw; the threshing process leaves behind large amounts of rice straw. It differs from the straw of other grain types in that it is not hollow on the inside but fibrous. In most areas with rice cultivation burning is the conventional option to dispose of the straw, thus contributing to air pollution.

Oftentimes the straw is used as feed for livestock even though it has no special nutrient content. Due to its thermal insulation properties, rice straw is also used as building insulation. The use of rice straw in board production opens up completely new prospects for this raw material which are not only ecologically effective but also economically sensible.

# “Lucky Bamboo”: Research and customer projects involving an annual plant with best properties

→ By Dr. Michael Schöler

The topic “quickly growing and CO2 neutral raw materials” is high on the agenda for wood-based panel manufacturers worldwide. Which materials are suitable and what technology has proven to be mature? Siempelkamp takes up the current challenges as the specialist for the corresponding machines and plants: Together with Artison Agrotech Pvt., Siempelkamp initiated a project which advanced the production of particleboard made of bamboo. As it happens, bamboo is symbolic for friendship in India



Bamboo cane



Chinese bamboo forest

Products made of bamboo are no longer just reserved for the food industry and lifestyle trends from the areas of garden landscaping and decorating. The plant offers potential for

many other application areas: As a quick growing raw material bamboo is well suited for everyday goods such as bike frames, bio plastics, and furniture. In the wood-based materials industry the positive characteristics of bamboo have long been known. Some



## Bamboo – the basics

- Botanically not a woody plant, but a woody grass
- Growing regions: worldwide along a belt of tropical and moderate climate zones, primarily in Japan, China, India, also Ethiopia, South America, and Southern Europe
- Wide variety of types ranging from grasses of a few centimeters to 40 m high forests, more than 1,000 different species of bamboo are known worldwide
- Many bamboo plants grow extremely fast, some up to a meter per day
- As a result high CO<sub>2</sub> absorption, reducing the greenhouse effect
- Permanently new plants due to extensive root systems – cutting the bamboo does not kill the entire plant

Flexible, light, weatherproof, and extremely resilient: thanks to its biological blueprint, the bamboo plant is best suited for a variety of requirements.

and flexible, hollow, light and chambered, weatherproof, waterproof, and extremely resilient. Large amounts of bamboo are available worldwide.

types of bamboo grow faster than any other plant and even outperform some types of wood as far as their mechanical-technological characteristics go.

Due to the hardness and density of the material, bamboo can be used to manufacture robust and durable furniture and flooring materials.

At the same time, the plant is light and flexible so that it can be used as building material as well. Because the inside of bamboo is made up of chambers, the plant offers a higher stability than trees with their system of growth rings. With its special “biological blueprint” the bamboo plant is predestined for a variety of physical requirements – round

To use the advantages of this raw material, Siempelkamp started to advance the development of machines for the production of particle-board made of bamboo.

The research and development centers that Siempelkamp operates at the headquarters in Krefeld and in Zweibrücken, the location of the 100% subsidiary Pallmann, offer optimal requirements to do so.



Wood – the topic of Siempelkamp research and development

## Siempelkamp research and development: From the vision to market maturity



Fibers for MDF made from bamboo

### FEASIBILITY STUDIES

- Process analysis
- Project planning
- Technological concept design

### PRODUCT ANALYSIS UNDER LABORATORY CONDITIONS DURING

- Preparation
- Resin application
- Forming
- Pressing

### ANALYSIS

- Product properties
- Suitability
- Risks

### RAW MATERIAL EVALUATION

- Wood and annual plants
- Plastics and rubber
- Minerals
- Resin



Chips for MDF made from bamboo

### Research and development in Krefeld and Zweibrücken: From the vision to market maturity

The research and development center of the size-reduction specialist Pallmann was especially involved in the bamboo project. 120 size reduction machines that are ready for operation are installed in Zweibrücken.





Research and development center at the Siempelkamp headquarters in Krefeld



Pallmann uses this equipment to concentrate on process development, for the further development of machines, and for the testing of new developments. Furthermore, the company puts a strong focus on customer trials: The research and development center is consulted by international plant operators to turn visions into market-ready products together with the Pallmann process engineers.

In 1993 Siempelkamp began first intensive laboratory trials to manufacture boards made of bamboo. In 2009 the involvement increased by carrying out broad trials regarding the production of MDF, OSB, and particleboard made from bamboo. Even when Pallmann was not yet part of the Siempelkamp Group, the company carried out the preparation of bamboo to chips, OSB strands, and particles.

At that time the results already complied with the standards for European wood-based materials: All particleboard thicknesses met the highest requirements for mechanical



Precision work at the research and development center in Krefeld

strength. All other standard requirements including swelling were easily met even by the lightest test specimens for applications in either wet or dry areas. All test specimens in the scope of the OSB trials achieved all requirements with ease even regarding their bending strength despite the fact that the boards were formed by hand in a non-oriented manner.

Within the scope of the current bamboo project, the experts from Zweibrücken and Krefeld worked together with the Indian partner in close cooperation and dialogue: Together, a particleboard plant was designed using 100% bamboo as the raw material. To be as close to reality as possible Artison flew in fresh bamboo from the Khandwa region, Madhya

Pradesh, India, for use in the feasibility study at the Pallmann location. There the raw material was prepared by means of a special material-specific method and then pressed to particle-board at the Siempelkamp test area in Krefeld. The mechanical properties of these boards exceeded the expectations of all participating parties.

The results will have broad repercussions: Bamboo is available in large amounts worldwide. Furthermore, wood is regarded as scarce commodity in many regions. To nevertheless ensure the supply with wood-based products two options remain: One is to import such products – or go with the alternative and

break new ground with annual plants such as bamboo. With the latter, several win-win effects can be achieved: The development of a local industry with new jobs, the opening of new markets, and last but not least, the use of a sustainable raw material with a positive carbon footprint.

# Win-Win-Situation

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win-win situation – new jobs, new markets, resource efficiency

OSB made from bamboo





All made from bamboo, all made by Siempelkamp: MDF from bamboo (bottom), OSB (left), particleboard (right)

A large part of the bamboo currently sold comes from Indian and Chinese plantations. It is predicted that Ethiopia will move up in the ranking of the world's most important bamboo suppliers. In this landlocked country in Northeast Africa bamboo is increasingly grown to push back the desert.

Another advantage: Bamboo can be processed ideally with a standard wood-based material production plant, the material does not need to be spliced and, at the same time, no knots

have to be cut out of the material. Apart from adapted conditioning during the green end stage, bamboo can be processed as is. These are all good reasons to increase the efforts towards establishing bamboo as a raw material for panel production!

Preliminary stages for particleboard made of bamboo:



# Guararapes – a client portrait

## How to meet the market with courage and innovation in difficult times

→ By Bernd Hauers

Brazil, Bento Gonzalves, a review: At FIMMA 2014, one of the most important Latin American trade shows for wood-working and wood-processing, Ricardo Pedroso and his employees were present with their own booth. Next to the necessary presence of Guararapes at this show, the reason for the company's participation was to achieve a special goal: Mr. Pedroso and his team were on the lookout for a new production plant to replace an outdated Chinese-made multi-daylight press. Siempelkamp, a regular exhibitor at FIMMA for many years, was the first stop and after a talk with the sales team a project materialized. It had to be a forming and press line with a ContiRoll® press.



Business premises in  
Caçador

Ricardo Pedroso, Managing Director of Guararapes Industria De Compensados Ltda. is an entrepreneurial heavyweight in the Latin American wood industry, one of the major players. Together with Joao Carlos Ribeiro Pedroso, President, and Diorgenes Bertolin, Industrial Director, he runs the company. Founded in 1984 as a sawmill for veneer production in Palmas, Parana, Ricardo Pedroso decided only a year later to produce plywood. Today, at a second location in Santa Cecilia,

Santa Catarina, Guararapes manufactures approximately 400,000 m<sup>3</sup> of pine plywood each year and is one of the largest producers in Latin America. For the most part, Guararapes used to sell the waste from production, chips and residual wood, to pulp mills and wood-based panel manufacturers.

In 2006 the decision was made to invest in MDF production and an order for a Chinese-made multi-daylight press with belt forming



Pine plantations of Guararapes



line was placed. Since the move to enter into board production was very risky from an entrepreneurial position, this small line became the foundation of a new production site in Caçador, Santa Catarina, under the company name Guararapes Paneis Ltda. In spite of the risk, the entrepreneurial optimism of the Guararapes management team had also prevailed for this project. At that time, the company had already invested in a high-quality refiner and solid sanding machines. From the beginning on, the entire plant was planned in such a way that an even larger MDF plant with continuous press line,

allowing the production of thin boards, could be installed at a later date.

This later date coincided with FIMMA 2014. At the Siempelkamp booth Ricardo Pedroso and the Siempelkamp team agreed to meet for a factory tour of the Guararapes production site in Caçador. The investment plans quickly took shape and finally an order was placed. This order represented a comprehensive investment which was made amidst the Brazilian economic crisis. The country's economic output regressed for the fifth consecutive quarter, but Ricardo Pedroso made this courageous

▼ Forming- and press line with ContiRoll®



decision – a decision with foresight, uninfluenced by the current predominant economic conditions. From autumn 2014 the project “market reinforcement” started to take shape on site and was implemented: The factory was extended, approximately 600,000 m<sup>3</sup> of rock was moved in order to build new production and shipping buildings and to create a large parking area for trucks. A new gatehouse, production hall for the surface finishing of the MDF, storage facilities, and finally, a factory canteen for the employees were built.

As soon as the foundations for the plant components were poured, the work started. The deliveries from Krefeld arrived in Caçador, two production plants in a double pack had to be installed and started up: One assembly site handled the forming and press line consisting of a forming machine and 9' x 37.1 m ContiRoll® for the production of MDF/HDF, as well as the subsequent cut-to-size station with a double

diagonal saw. The other assembly site was dedicated to a 2 x 6 x 9' short-cycle press designed for 240 press cycles/h at a specific pressure of 600 N/cm<sup>2</sup>. The short-cycle press has a special design allowing it to produce an innovative product with a unique selling point. The complete plant configuration fits into Guararapes' business concept whose top priorities include “continuous innovative strength” and “sustainable production”.

It is important to Guararapes that only wood from sustainably farmed plantations that complies with the international FSC® (Forest Stewardship Council®) certification is used. This implies that only wood from forests that are managed following strict social, ecological, and economic criteria, and other controlled sources can be used for production. All of the manufacturer's products are certified according to CARB2, the “California Air Resources Board – Phase 2”. Guararapes is allowed to export

Modern kitchen interior with decor plates by Guararapes



Short-cycle press



## Guararapes Industria De Compensados Ltda.

- 1984 founded as veneer mill
- 1985/86 start of plywood production in Palmas/PR
- 1989 first exports of plywood
- 1992 first reforestation programs
- 2002 plywood mill starts production in Santa Cecilia
- 2003 first important international certifications
- 2006 modernization of the mill in Palmas/PR
- 2009 product diversification, starting MDF production in Caçador/SC
- 2016 continuous MDF production with ContiRoll® and production of laminated panels with synchronous pore structure on both sides

to all US States because the certification ensures that the company adheres to even the strictest permissible emission levels for formaldehyde. The company also puts emphasis on resource-saving energy consumption and the recycling of plant waste water at all their production locations. In general Guararapes strives for energy-efficient production – a market advantage from a business point of view. The manufacturer implements the corporate philosophy of “continuous innovative strength” with a modern product portfolio in the high-quality sector. Thus, floors with NanoxClean® surface sealing as well as decorative panels in an extraordinary large range of colors and with impressive product properties complete the product spectrum.



The installation was carried out by the Siempelkamp assembly team in the usual reliable and conscientious manner. The first board was produced in Caçador in April 2016. Since the start of regular production, Guararapes has tripled its production capacities for MDF to 600,000 m<sup>3</sup> annually and thus, is considered one of the largest South American manufacturers of wood-based panels. Despite the enormous increase in production, the manufacturer was able to lower its resin consumption for 15 mm furniture boards to under 50 kg of resin per m<sup>3</sup> with the Siempelkamp Ecoresinator resin blending system. The company also took a step forward in regards to energy-efficient and sustainable production. With the individual control of each cylinder and pressure distribution that is virtually isobaric with the 8th generation ContiRoll® press, Guararapes is achieving immense energy and material savings. In regards to “continuous innovative strength”, Guararapes even took a giant step forward thanks to the new Siempelkamp short-cycle line which Ricardo Pedroso is especially proud of. With it, a completely unique product for the entire American market and other markets is produced: A panel with synchronous pore structures on both sides, that is, the relief-like grooves in the replicated wooden structure run synchronous to the embossed wood grain. The result is a robust wood-based board that

has the appearance of natural wood and can be mistaken as such – and that on both sides.

“Today we only use 65% of the MDF production capacity of the new plant,” explains Ricardo Pedroso in April 2017. “It is normal that a new plant has to be “run in” first. I am predicting a stabilization and run-up phase of a year and a half. Thus, we will achieve full capacity at the same time the Brazilian economy is due for an upturn. The first indications for a recovery are

already noticeable this year.” Ricardo Pedroso and Guararapes can look optimistically into the future because modern production technology “made in Krefeld” prepares the manufacturer for the upswing. Courage and continuous innovative strength for new and future-oriented products and the awareness of sustainable production is the motivation for Guararapes Industria De Compensados Ltda. – the motivation for a successful future.



Cooling turner

# Siempelkamp Giesserei: The future begins...

→ By Dr. Georg Geier and Dirk Howe

According to the Federal Association of the German Die Casting Industry, German foundries produce parts and components with volumes of over 5 million metric tons each year. Siempelkamp Giesserei, which is considered one of those, is regarded as a globally leading manufacturer of sophisticated large and heavy castings made of ductile cast iron with unit weights ranging from 3,000 to 300,000 kg. To implement the needs of customers in a more goal-oriented, precise, and quicker manner, Siempelkamp Giesserei developed a future concept based on three pillars comprising of a quality campaign, the further development of materials, and the digitalization of processes.

## INTERVIEW

# “RELIABILITY, QUALITY, AND COMPETENCE”

Interview with Dirk Howe and Dr. Georg Geier

**Bulletin:** Mr. Howe, Dr. Geier, what challenges will the foundry face and what demands will be put on the company in 2018?

**Dirk Howe:** The environment of the foundry industry continues to be extremely competitive. The prices for raw materials for the foundry are rising, however, the market prices for cast products are not always reflective of these price increases. That's why, from our point of view, an increased customer benefit is also a correct answer. We provide high product quality, excellent processes, and close customer relationships.

**Bulletin:** What expectations do customers buying products and services from Siempelkamp Giesserei have?

**Dr. Georg Geier:** I believe reliability, quality, and competence are among the most outstanding expectations of our customers. Furthermore, Siempelkamp can offer and implement customized, partially individual solutions for each particular need. Our high material competence is especially appreciated and in demand by many of our customers.

**Bulletin:** When innovations have to be tested and implemented your company in general operates right on the pulse of the customers. How exactly does this work?

**Dirk Howe:** By tradition, Siempelkamp Giesserei has a unique team of specialists from the different fields in casting technology. We place this wealth of technical expertise from theoretical, in many cases, academic education, and many years of practical experience at the disposal of our customers to meet their needs. Depending on the requirements of the component part, these experts work either in a direct exchange with our

customers or in the background. Nowadays, our experts use virtual chat rooms with our customers in order to accelerate this process.

**Bulletin:** You are currently pushing a quality campaign which is intended to last several years. What brought about this campaign and which members of the team were involved?

**Dr. Georg Geier:** More people than you might think... When preparing the conceptual design, many ideas were used: Of course, in the beginning there was a basic idea that was discussed with our experts. However, we also considered remarks and comments of foundry employees and everything together contributed to the current campaign. One thing is clear, only when all team members work together will this campaign be successful in the end!

**Bulletin:** How important is the integration into the Siempelkamp Group when it comes to visions for the future?

**Dr. Georg Geier:** This integration is important in two aspects. On the one hand, in regards to its location, the Siempelkamp Group is our closest customer. This allows us to carry out an intensive exchange. Thus, we also find out quickly and in an unfiltered way what our customers in machine engineering want. On the other hand, with the Group we have access to an extensive pool of different competences and experiences which we like to fall back on. Here, the size of the Group and its diversification are ideal: The Group is large enough to cover many different disciplines, but small enough to maintain personal contact to people in different areas.





Dr. Georg Geier and Dirk Howe,  
Managing Directors of Siempelkamp Giesserei

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> BY TRADITION, SIEMPELKAMP GIESSEREI HAS A UNIQUE TEAM OF SPECIALISTS FROM THE DIFFERENT FIELDS IN CASTING TECHNOLOGY. WE PLACE THIS WEALTH OF TECHNICAL EXPERTISE FROM THEORETICAL, IN MANY CASES, ACADEMIC EDUCATION, AND MANY YEARS OF PRACTICAL EXPERIENCE AT THE DISPOSAL OF OUR CUSTOMERS TO MEET THEIR NEEDS.

Dirk Howe

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Dirk Howe and Dr. Georg Geier

### 1. Quality campaign – reduce production tolerances, optimize processes

As part of our multi-year quality campaign, Siempelkamp Giesserei, for example, is testing production processes with the goal of reducing production tolerances. The first focus here is on the chemical analysis for a more accurate and targeted adjustment of the composition of the used melts. "As little variation as possible coupled with efficiency," is the goal.

The focus is particularly on reducing the variation of the magnesium content in the casting by 30%. Magnesium is responsible for the nodulization of the graphite in castings and therefore for the production of ductile cast iron. Magnesium not only has a low melting point but it also evaporates around 1,100°C, which is significantly below the melting temperature of cast iron. Therefore, it is difficult to dissolve magnesium in iron. "Our metallurgists, process engineers, and specialists of the melting operation work together to improve and optimize the process of introducing magnesium to the melt and all processes up to the point when the melt is poured into the mold," explains Dr. Georg Geier, Managing Director Siempelkamp Giesserei.

### 2. Material development – new boost to innovation

The second pillar of the future concept is dedicated to material development in the areas of application and production. Material development has a long tradition at Siempelkamp. The development of ductile cast iron as shielding material for nuclear applications has been driven forward since the 1970s.

The consistent further development of the metallurgy of cast iron has brought forth new world records in the manufacture of large castings made of ductile cast iron; currently the world record for an individual casting is at 320 metric tons. Solid solution strengthened ductile casting iron has been available for customers of Siempelkamp Giesserei for large components since the beginning of the new millennium. "In this field we were one of the first foundries which could supply materials that didn't become part of the European standardizations until 2012," reports Dirk Howe.

Siempelkamp is continuing on its current path and increasingly focuses on high-strength and hard materials – always in a close dialog with the customers. Thus, the application limits for high-strength silicon solid solution strengthened materials in the area of thick-walled castings are explored and optimized in a goal-oriented manner. Together with Siempelkamp Maschinen-

Press beam – a casting made by  
Siempelkamp Giesserei

fabrik (machine factory), the first cast pistons for large presses were developed. These are characterized by an extremely hard surface with excellent wear properties and a comparatively ductile core which is ideally suited for the high pressure loads in a large cylinder. Thus, together with the machining expertise of Siempelkamp Maschinenfabrik, a great service package "made by Siempelkamp" was developed.

Furthermore, in coordination with Siempelkamp's Machinery and Plant Engineering unit, the possibilities of the targeted heat treatment of thick-walled castings with the goal to obtain certain surface properties are explored and optimized. "Thus, we will be able to equip functional areas of large plants appropriately for their application in a wear-resistant manner. The component part itself can be made of reliable and cost-efficient ductile cast iron," says Dr. Georg Geier.

Pillar No. 3 in the future concept involves the topic of "digitalization" (see page 70). Here, the objective of Siempelkamp Giesserei is to design processes and technologies according to new standards and to use a major topic, which is currently discussed in all industries, to the benefit of the customers.

# 320 metric tons

The world record for a single casting made by  
Siempelkamp Giesserei





# MACHINES

Intelligent production, Industry 4.0: tomorrow's visions base on marketable machinery and plants. In all its markets Siempelkamp relies on an early assessment of the demands. Our inhouse Research and Development Policy, implemented at various R&D Centres, makes new concepts ready for the market – more and more often on behalf of our customers



# Digital transformation in casting technology: 3-D, data-mining and the like set milestones for the future

→ By Dr. Georg Geier and Dirk Howe

How is the major topic of “Digitalization” applied to the processes and technologies at Siempelkamp Giesserei? What is the customer benefit? From the planning phase to the optimization of component parts, the company is using numerous potentials to integrate digital tools into the overall process. The following is an overview.

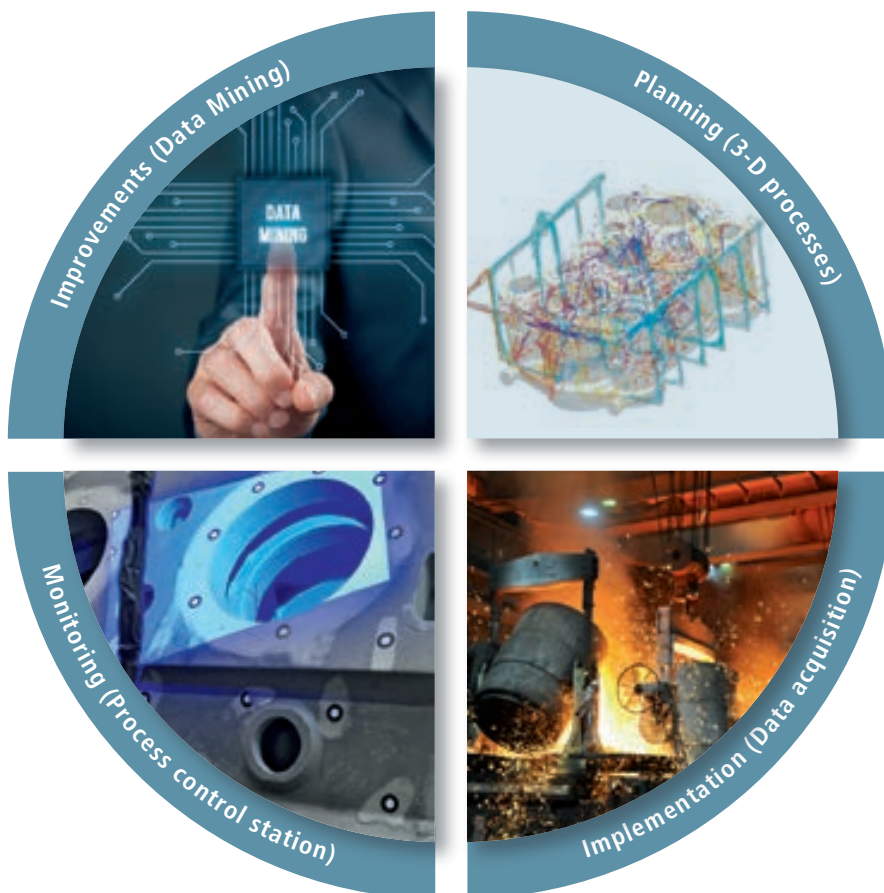
At Siempelkamp Giesserei the digitalization of processes is advancing – step by step along the entire value-added chain. The particular focus here is on the control cycle between “planning – implementation – control – optimization”. This cycle is also embedded in the customer control cycle at Siempelkamp which means that this interface is also included. The basis is a networking of the IT systems used at the

foundry to ensure a data exchange between these systems. The Krefeld company is gradually making progress in this area.

“The vision of our customers is that we handle the order planning together in interlinking platforms. There are already some systems with a few cast product purchasers which simplify the data transfer. Furthermore, they provide support in equalizing the capacity utilization through mutual coordination,” explains Dirk Howe. The objective is to reduce complexity and errors on both sides. With regard to complex technical issues and discussions, for example regarding new part designs, joint discussions between experts are still difficult to replace. However, conference systems can provide valuable support during this phase of the project even today. The same goes for the order tracking and monitoring during the implementation stage.

Today the planning of castings and patterns is mostly handled with the help of 3-D models even though 2-D drawings remain indispensable for production. In the future this will be the basis for further production processes and production monitoring.

At the same time 3-D technology is in many cases the prerequisite for the numerical simulation of processes and applications. In the mid-eighties Siempelkamp Giesserei started carrying out finite element simulations with the goal to optimize castings for their application. As soon as the first commercial process simula-

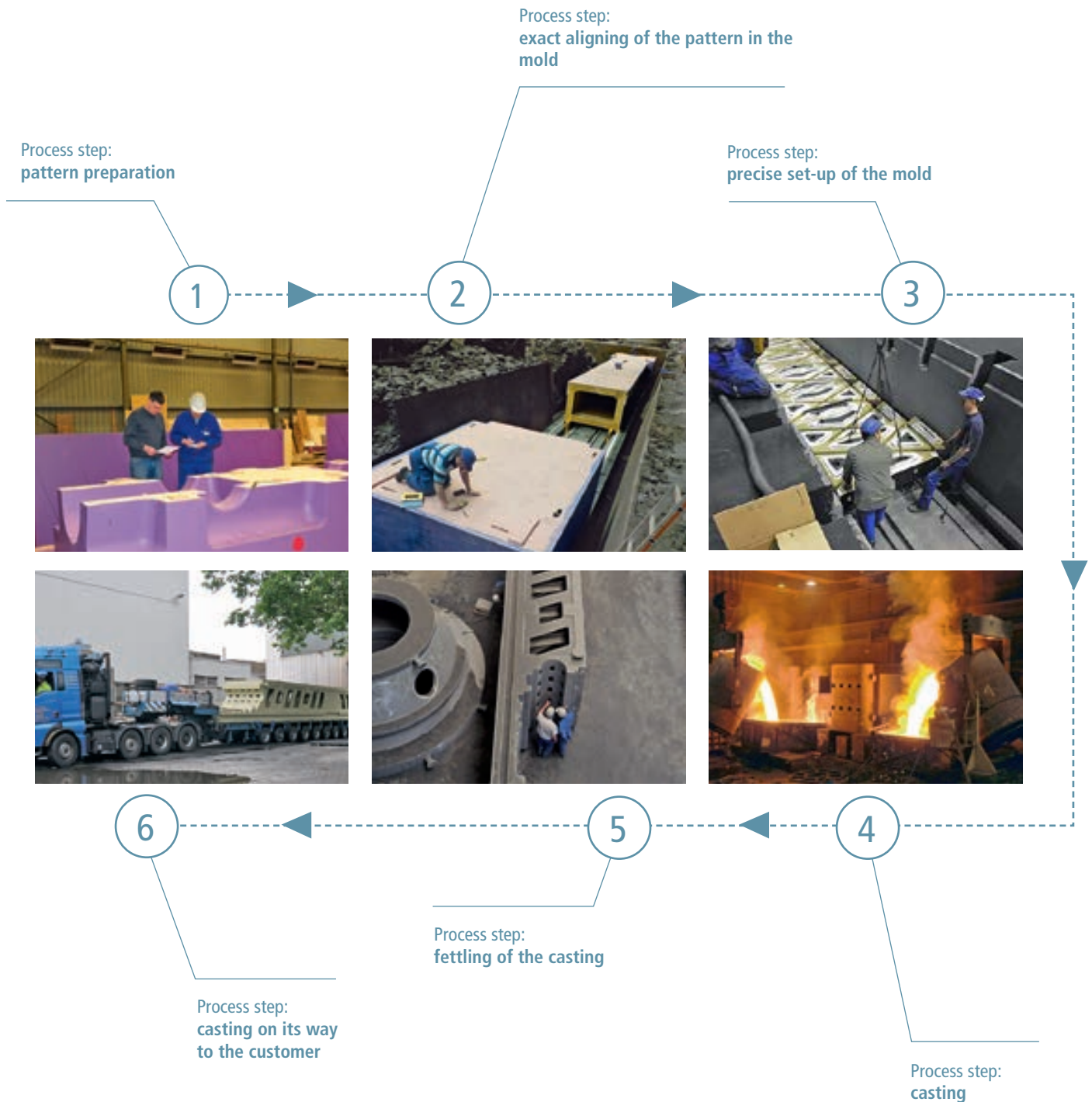


tions for the foundry industry became available, they were used at Krefeld. "Today our possibilities go clearly beyond. The entire range of simulation tools of the Siempelkamp Group is available to our customers. These range from the already mentioned simulation of the casting

process and possibly induced internal stresses, to additional production processes, to the use of the component part and its optimization in regards to the mechanical and thermal behavior or, for example, the throughflow with media and materials," says Dr. Georg Geier.

**3-D technology and knowledge management: Digitalization boosts trade**  
3-D models have been used at Siempelkamp Giesserei for a long time whenever pattern equipment had to be built. When suitable and efficient, the team makes sand cores from these models by using 3-D printing or direct forming processes. Because of the quick further development of generative manufacturing processes, more and more application potentials

## Process chain casting



emerge. This can accelerate product development, especially for individual parts or very small series (depending on part geometry and requirements).

In the course of production, the 3-D data of a component part can also be used to compare data from the model and the finished part obtained through optical measurement. This is especially beneficial for complex geometries or free-form surfaces. In the event of variations,

the data sets serve as a simplified cause study regarding different production steps.

Another advantage of digitalization: Siempelkamp Giesserei is known as the specialist for very individual component parts with specific requirements. Given the many particular demands, a tool for the visual knowledge management has proven itself in production. The manufacturing processes of individual component parts are documented with instructions and pictures as well as specially marked very important production and control steps. They are retrievable for employees from many terminals in production.

Top: Non-destructive testing of a finish-machined part

Center: Pattern check

Bottom: Spectral analysis



Combining the data from different systems and areas of the company also improves the opportunities for process control. Thus, the current state of operation or individual areas can be visualized at tailor-made process control stations in order to quickly provide the corresponding managers with the information needed by them.

Today it is already standard procedure to electronically exchange documents with the customer at the end of the production process. The order and delivery documents as well as invoices, which today are sent out semi-automatically, could be replaced by so called "smart contracts" in the future. The advantage for the customer: Processing can be considerably more automated, thus, reducing errors.

Furthermore, the component history can be exchanged between customers and suppliers in the future and thus it can be integrated in the documentation systems of the final application. Based on this, the use and further processing of the cast part can be individually determined by the customer. "For example the transmitted actual values from the material and the measurements taken during the processing of the part can be considered here," says Dr. Georg Geier. With the findings from the manufacturing process at Siempelkamp, if applicable, from their own manufacture, and data from the application, customers can optimize future component parts.

In the same way, based on the mentioned networking of individual manufacturing systems,



## 3-D measurement

Siempelkamp Giesserei can also initiate improvements for processes. Especially the methods of data-mining and machine learning will gain significance for the complex casting process with its manifold potential influences in the future.

The digitalization of the foundry also provides possibilities for the further automation of processes. Generative manufacturing used in 3-D printing of sand cores was already mentioned above. "Their application is still limited today so that the acquisition of such a printer does not seem worthwhile yet. We, however, follow the developments in this area closely. Based on modern robotics and sensor technology, further



production processes can be improved in the future with the goal to increase uniformity and efficiency. An example here is the cast post-treatment including fettling and sand-blasting of the components."

Casting was established more than 5,000 years ago. The potential for further improvements of the

processes in a foundry is far from being exploited. Siempelkamp Giesserei has accepted this challenge and will continue to work in this area to improve quality and efficiency for its customers!



## Digitalization and the like at Siempelkamp Giesserei: An industry dictionary

**Digi|tali|zati|on general meaning** Generally used to refer to changes in processes, objects, and events with increasing use of digital devices; **Focus at Siempelkamp Giesserei** Integrating IT systems with the goal to create a consistent process environment

**Data-Mining general meaning** Systematic use of statistical methods and algorithms for the extraction of empirical relationships and trends; **Focus at Siempelkamp Giesserei** Use of different measured values and data sources in the foundry for the optimization of complex processes and procedures

**Gen|er|a|tive man|u|fac|tur|ing general meaning** Collective term for additive manufacturing processes that create workpieces without the use of forming tools; also referred as three-dimensional printing, additive manufacturing or rapid prototyping; **Focus at Siempelkamp Giesserei** Decreasing lead times and customization for the manufacturing of individual parts

**Ro|bot|ics general meaning** Design and control of workflows by means of robots ; **Focus at Siempelkamp Giesserei** Increasing uniformity and automation for the various and individual processes

**In|ter|faces general meaning** Defined points of contact between systems at their boundaries ; **Focus at Siempelkamp Giesserei** Increasing the mutual benefit in the information exchange with the customers

**Sen|sor tech|nolo|gy general meaning (technical)** Use of sensor technology for the measurement, evaluation, and recording of system changes; **Focus at Siempelkamp Giesserei** Considering individual characteristics in automation when manufacturing small series and individual parts

**Smart con|tracts general meaning** An electronic protocol that contains contractual conditions, monitors and controls the adherence to those conditions and the steps resulting from it; **Focus at Siempelkamp Giesserei** Continuous simplification and automation for the processing of orders

**Knowl|edge man|age|ment general meaning** Targeted activities to gain, safeguard, and make knowledge in organizations accessible; **Focus at Siempelkamp Giesserei** Securing and improving complex processes as well as considering individual customer requirements

# Ring rolling with SicoRoll 3.0

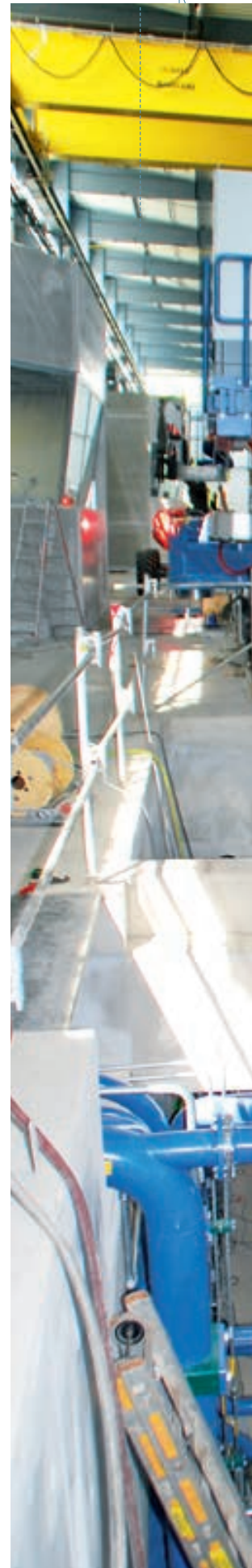
## The new rings of L' Union des Forgerons

→ By Rüdiger Bartz

In Bulletin 02\_2016 we reported about the assembly start in the French Méréville commune; in our last issue 01\_2017 we provided an interim report. Since October 2016 a complete production line for parts made of nickel-based alloys and titanium was installed and put into operation at the French manufacturer of high-quality forgings. A year later, the moment has arrived: Next to the open-die forging and ring blanking combination press, now a ring rolling mill has started production successfully. It is the second ring rolling mill supplied by Siempelkamp to date; the first machine was sold to JSC Metallurgical Plant Electrostal, Russia.

L' Union des Forgerons ordered the two special machines from Siempelkamp in October. Meanwhile both machines were delivered and put into operation. The open-die forging press is a unique custom product, precisely tailored to the requirements of the customer. With this press, L' Union des Forgerons has been manufacturing work pieces with weights up to 10 metric tons. Even small batch sizes are economically viable. The same machine also manufactures ring blanks made of nickel-based and titanium alloys. An automatic tool magazine allows quick changing of forging dies and therefore, highest flexibility during production.

Axial Rolls



View of the underfloor area



A lifting and centering device for blanks as well as a tool shifting table automate the three-stage forging process consisting of upsetting, pre-forming, and piercing.

With a press force of 30/33 MN the ring rolling mill offers just as much flexibility as the combination press. It has been operating since September and manufactures rings with a maximum ring diameter of 2,500 mm, a height of up to 700 mm, and weights of up to 5 metric tons. With radial and axial forces each of 4,000 kN, this ring rolling mill belongs to the large ones of its kind. The open-die forging and ring blanking combination press, producing the ring blanks, as well as the ring rolling mill are used to process special alloys such as nickel-based alloys or titanium alloys.

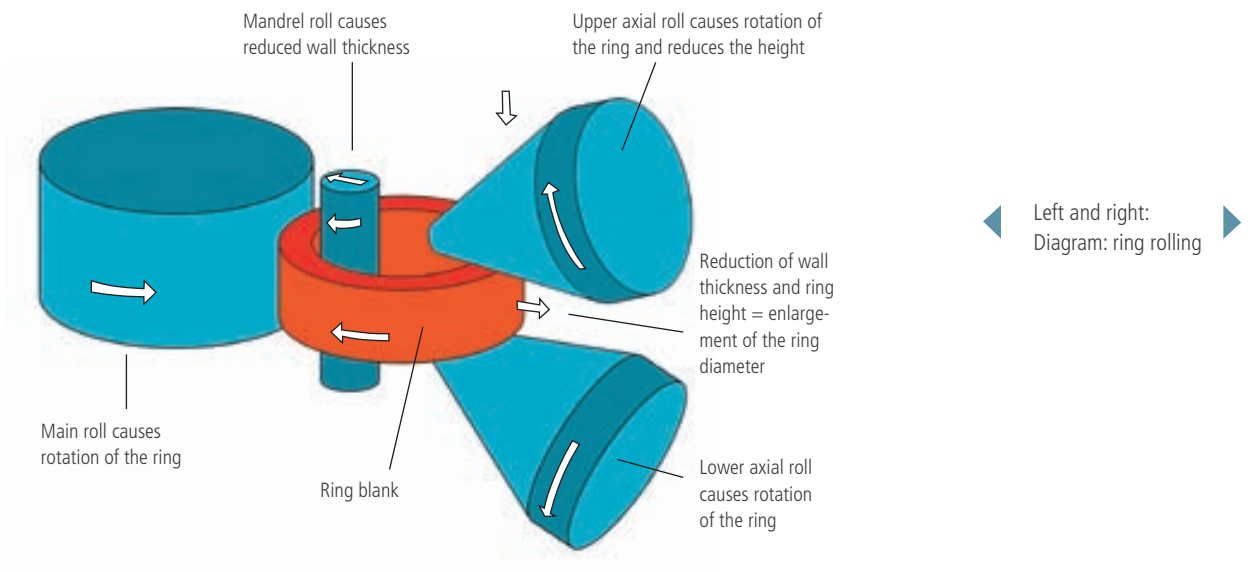
The high production flexibility offered by this machine can be explained with its electronic intelligence. L' Union des Forgerons can also manufacture rolled rings in small batches, as highly-stressed components for special applications, which are primarily used in the aerospace industry or in the petrochemical



# 4,000 kN

## RADIAL AND AXIAL FORCE

maximum ring diameter 2,500 mm  
maximum piece weight 5 t



sector. With the right software solution – SicoRoll 3.0, the manufacturer is able to use its ring rolling mill to its fullest capacity despite smaller batch sizes.

### Welcome to the digital future of ring rolling: SicoRoll 3.0

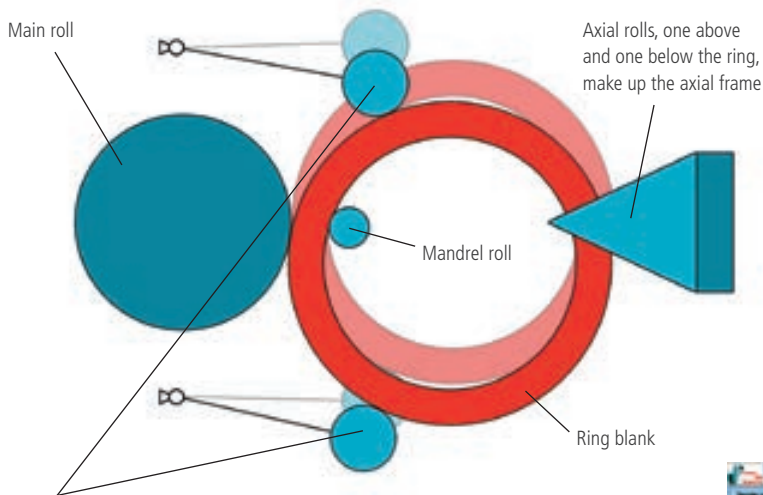
The intelligent control of the machine automates each product change. For products that are produced for the first time, SicoRoll 3.0 provides the optimal rolling strategy – practically at a push of a button. No matter whether the dimensions of the blank are known or the ring to be rolled is a completely new product, Siempelkamp's intelligent machine control adjusts all necessary process parameters automatically to the requested rolling process. The intelligent control also has the ability to recognize the limits in regards to geometrical feasibility and pays attention to valid machine parameters such as allowable in-feed speeds. On its own, SicoRoll 3.0 divides the rolling process into initial rolling, main rolling, and calibration phases. Furthermore, the user has the ability to interrupt the entire rolling process for necessary re-heating phases (re-

heating of the blank). All uncertainties, such as existing dimensional and volume tolerances, are detected by the sensors of the ring rolling control and automatically adapted to the process.

The machine operator only has to enter the dimensions of the blank and/or the measurements of the ring to be produced, such as internal and external diameter, height, as well as forging temperature and provide details

The machine operator only has to enter the dimensions of the blank and/or the measurements of the ring to be produced as well as forging temperature and provide details about the material. SicoRoll 3.0 does the rest fully automatically.

about the material. SicoRoll 3.0 does the rest fully automatically. For each work piece the ideal rolling strategy is simulated in an exact, virtual image of the machine. This process simulation also includes possible process interruptions, such as re-heating phases. SicoRoll 3.0 considers all process parameters from the blank to the final product and visualizes the production process as a product-optimized rolling curve. A changeover of products can be



Passively running centering rolls on swivel arms for power transfer of the axial frame – by shifting the center position of the blank the rolling process is stabilized



SicoRoll 3.0 process visualization

## Rolled rings

Ring rolling is a flexible manufacturing process for the economic production of rings. This process is used to manufacture rings with different diameters, wall thicknesses, and heights. Even complex cross sections can be produced with specially profiled rolling dies. The rolling process produces near-net-shape, seamless rolled rings of supreme quality with the benefits of hot-formed components. The subsequent heat treatment releases production-related internal stresses in the structure. Thus, rings with excellent material characteristics can be reproducibly manufactured in large quantities. Rolled rings are important constructional elements in large-scale gears and valves, rolling bearings, sprockets, wind energy plants, and in the field of pipeline construction. In the aerospace industry rings made of nickel and titanium alloys are used as turbine rings in engines where they have to withstand high thermal and mechanical stresses.

easily carried out by the operator. He/she only has to select the ring to be produced from a database and SicoRoll 3.0 supplies all necessary process controls from the internal recipe management. Each new work piece with previously unknown product dimensions will be stored in the SicoRoll database with all its process parameters and the resulting rolling curve and will be retrievable the next time this product has to be produced.

### Intelligence in the control – memory in the database

The new database-optimized SicoRoll 3.0 concept also allows decentralized control and access possibilities from specifically equipped computers. Thus, working and production sequences can be planned in advance and can be viewed from an external control room by, for example, the production planning team to make sure blanks are available or to have them produced, if necessary. This enormous flexibility and the intuitive easy handling turn SicoRoll 3.0 into a superior tool in the production of rolled rings.

The philosophy of the control: For the manufacture of a new product only three pieces of information are necessary. What is the correct forging temperature of the blank? What material is the blank made of? What are the final dimensions of the end product?

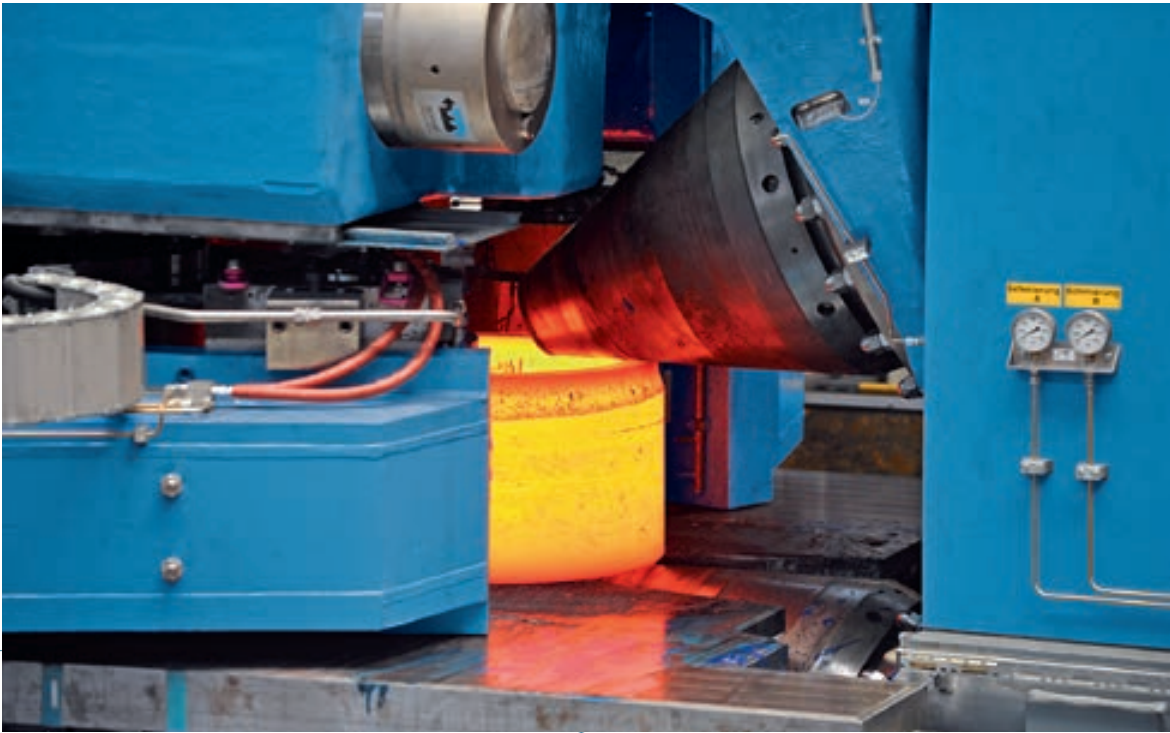
Production processes can also be customized individually, even several additional temperatures are managed by the system and can be retrieved quickly in the case of repeat production. The process data acquisition and its material flow tracking are archived and managed by SicoRoll 3.0 and Siempelkamp's process

control technology Prod-IQ® for documenting the complete manufacturing process.

The new software was thoroughly tested by Siempelkamp and L'Union des Forgerons during the commissioning of the ring rolling mill in Méréville. Starting September all possible dimensions for blanks and work pieces made from many different metal alloys were rolled. After completion of the test in December 2017, the opinion was unanimous: Ring rolling has never been easier. The new control software SicoRoll 3.0 has kept what its developers had promised – under all conditions. SicoRoll

The new ring rolling mill at L'Union des Forgerons





Rolling process of a ring with small wall thickness



Mandrel roll inside the ring blank, axial rolls (left), and centering roll (bottom right)

represents a new standard with database connection and recipe management, a software solution that offers maximum flexibility and ensures the production process in an optimal way. This is ring rolling in the age of digitalization. This is how the customer gains decisive market advantages and gets the leading edge in modern production. With the

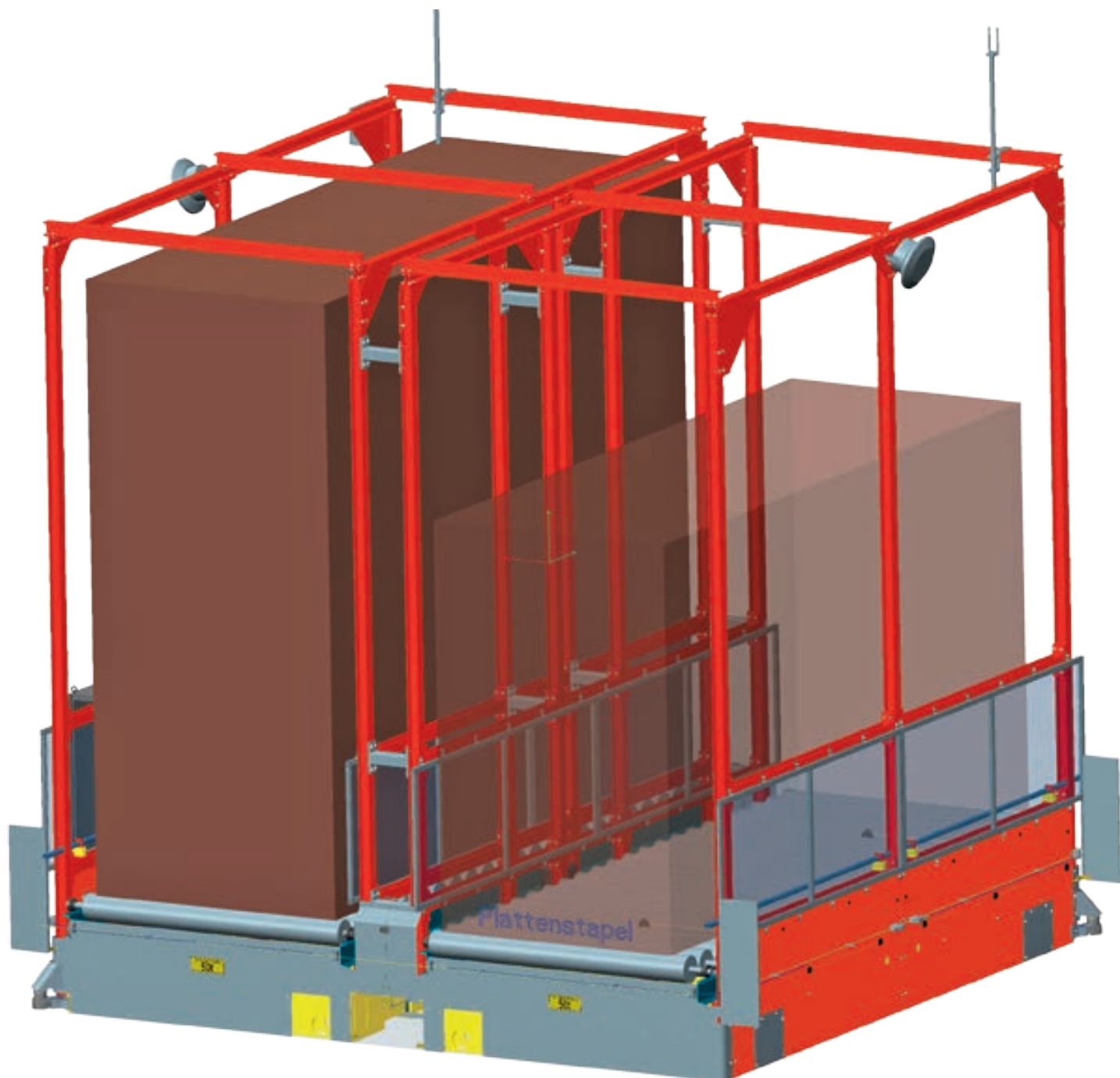
new open-die forging and ring blanking combination press and the ring rolling mill, L'Union des Forgerons is best equipped for the future and can further expand its product portfolio, even in regards to small batch sizes. Siempelkamp's ring rolling mill and SicoRoll 3.0 make it possible – speed in ring rolling is no longer a dream.

“Handle with care”:

## Strothmann supplies RoundTrack® system for Egger

→ By Lutz Bussmann

With RoundTrack® technology Strothmann Machines & Handling GmbH opens up new, productive organizational forms in flow or pulse assembly systems and allows energy-saving and precise transports of heavy loads up to 200 metric tons. Efficiency increases of up to 30% are not uncommon. In January 2017 the Egger Group placed an order with the handling specialist within the Siempelkamp Group for a RoundTrack® system including several inductively driven carts for the board handling downstream from the ContiRoll®.





Front: three tracks of the RT60 system are already installed. Only 48 hours after assembly they can carry a full load. Background: cut floor where the old track system was located



# 200 metric tons

the load the RT60 system can handle per cart

RoundTrack® systems are used in manufacturing and logistics processes in a variety of industries and consequently, are also well suited in the wood-based materials industry for transporting stacks of boards. Due to minimal rolling resistance, components weighing several tons and often with large-scale dimensions can be moved easily, safely, and precisely.

The long-time Siempelkamp customer Egger ordered the Strothmann equipment for its German location in Brilon. Here, an existing rail system, which had been in use for 25 years, was replaced by one of Strothmann's custom-fit concepts and with it, new plant logistics got off the ground. The new system

increases process efficiency and storage space. "Prior to this order we had already talked to Egger about designing a new linear portal in the packaging area including supply and disposal via a track system. This system and that of the new scope of supply are in close vicinity to one another; the tracks intersect in two locations. Thanks to Strothmann's modular system, we were able to ensure practical compatibility," explains Lutz Bussmann, Sales Director at Strothmann.

Strothmann offers three different RoundTrack® sizes; Egger decided for the most load-bearing system RT60, which can handle loads up to 200 metric tons per cart. RoundTrack® 60 has a payload of 15 metric tons per wheel – a cart with four double-wheel sets can therefore move loads of up to 120 metric tons. Made from hardened steel and polished blank, the round bars are installed in the floor by means of aluminum holding profiles. The wheels are manufactured from roller bearing steel. A concave profile ensures minimal contact with the rails and therefore minimal rolling resistance.



3-D view of a panel distribution driven cart with a payload of max. 100 metric tons per carrier, Dimensions: 5700 mm x 6000 mm x 400 mm LxWxH (=height of carrier), max. traverse speed: with load approx. 24 m/min, no load approx. 45 m/min

Double transfer cart with the dimensions 5700 mm x 6000 mm x 400 mm  
LxWxH (= height of carrier), payload per carrier max. 30 metric tons,  
max. traverse speed 45 m/min

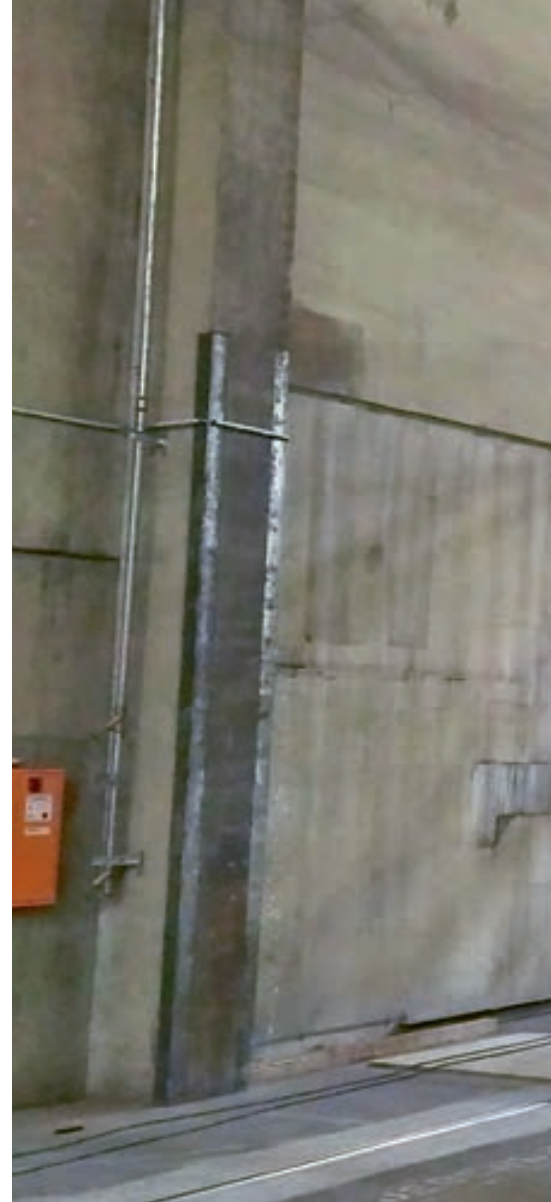
More than 1 kilometer of RoundTrack® 60 was installed at the production facility in Brilon in several stages and after close coordination with Egger. "Altogether, we implemented the track installation in ten stages so that normal operation in Brilon could be maintained," says Lutz Bussmann. First, the wood-based panel manufacturer commissioned Strothmann with the disassembly of the existing track system. The following installation of the new RT60 system included assembly, levelling, and pouring. For the quick supply of the production plants with board stacks and impregnating materials, Egger ordered additional carts.

The scope of supply thus included 4 driven carts with roller conveyors that have a maximum carrying capacity of 90 metric tons, 2 driven roller conveyors on a lifting table with a 90° crossover device for transporting stacks off crosswise with a lifting height of 800 mm, as well as 1 driven roller conveyor with a lifting device. Regarding the drive system, Egger

relied on efficient energy supply by means of induction. The inductive cables for the power supply were installed in the floor just as the tracks and an energy pickup in the cart provides power for the drive and auxiliary functions.

Three additional roller conveyors were mounted on a steel frame. Strothmann also supplied the wheelsets for the conversion of the existing driven carts to the new RoundTrack® concept as well as the drive system, implemented the electrical and mechanical engineering, and carried out the project management.

The assembly of the RoundTrack® system was carried out by the experienced Strothmann team according to a well-designed concept. In



## Advantages of the RoundTrack® system

- Flush to floor installation, no trip hazard
- Easy and quick installation in existing floors possible
- Brakes and locking devices ensure a safe stand and easy handling
- Cleanness – no grooves which can soil, functional surfaces remain clean, no lubrication (dry system)
- Ergonomics – up to 5 metric tons can be moved by one person by hand
- Economy – little maintenance effort, little wear, long life cycle of wheels and tracks
- Resource efficiency – low energy consumption to drive the carts due to low rolling resistance
- Precision – highest positioning accuracy of transported goods, nearly no settlement of position in applications for measuring rooms, repeatability of position every time
- Flexibility – different systems for the change of driving direction allow various track layouts, flexible track widths based on customer requirements
- Individuality – customized carriers with different functionalities are tailored to the transported goods
- Subsequent expandability of the existing system
- Tracks are traversable
- Fully automated carriers including control and safety technology



Strothmann has more than 40 years of experience in RoundTrack® technology. The constantly further developed and patented system convinces with high economic efficiency.

existing as well as new production halls the floor is cut with highly precise diamond cutting machines and prepared for the levelling of the tracks. Special installation jigs provide for a quick, precise, and clean assembly of the tracks. The remaining grooves are poured with low-shrinking grout. All installation processes can be carried out during normal operation of the customer's plant.

For Egger this was an important advantage because the disassembly and installation were implemented in stages during ongoing pro-

duction. After completion of the first subsection with a length of approx. 35 m, the first transport carrier was converted from the old to the new system. This ensured that normal operation could be maintained. After completion of the entire track system, the second transport cart was converted to the new RT60 system. The third stage involved the extension of the track system to 240 m.

#### Fine-tuning in demand

Regarding the project management, the work required precise step-by-step coordination on

the parts of Egger and Siempelkamp. The tight time schedule posed a challenge to both teams. After placing the order at the end of January 2017, the process of converting both existing transport carts for use on the RoundTrack® 60 system took place from the end of January until the middle of May. Afterwards, the additional carts were delivered. Strothmann also supplied the transfer equipment and the connecting roller conveyors in mid-May. In mid-July the team equipped the plant in Brilon with the panel distribution carts for the second drive track. Furthermore, the cart for the transport of impregnated foils was delivered. At the same time, the buffer roller conveyor started operation. It includes a lifting device to lift stacks of impregnated boards.

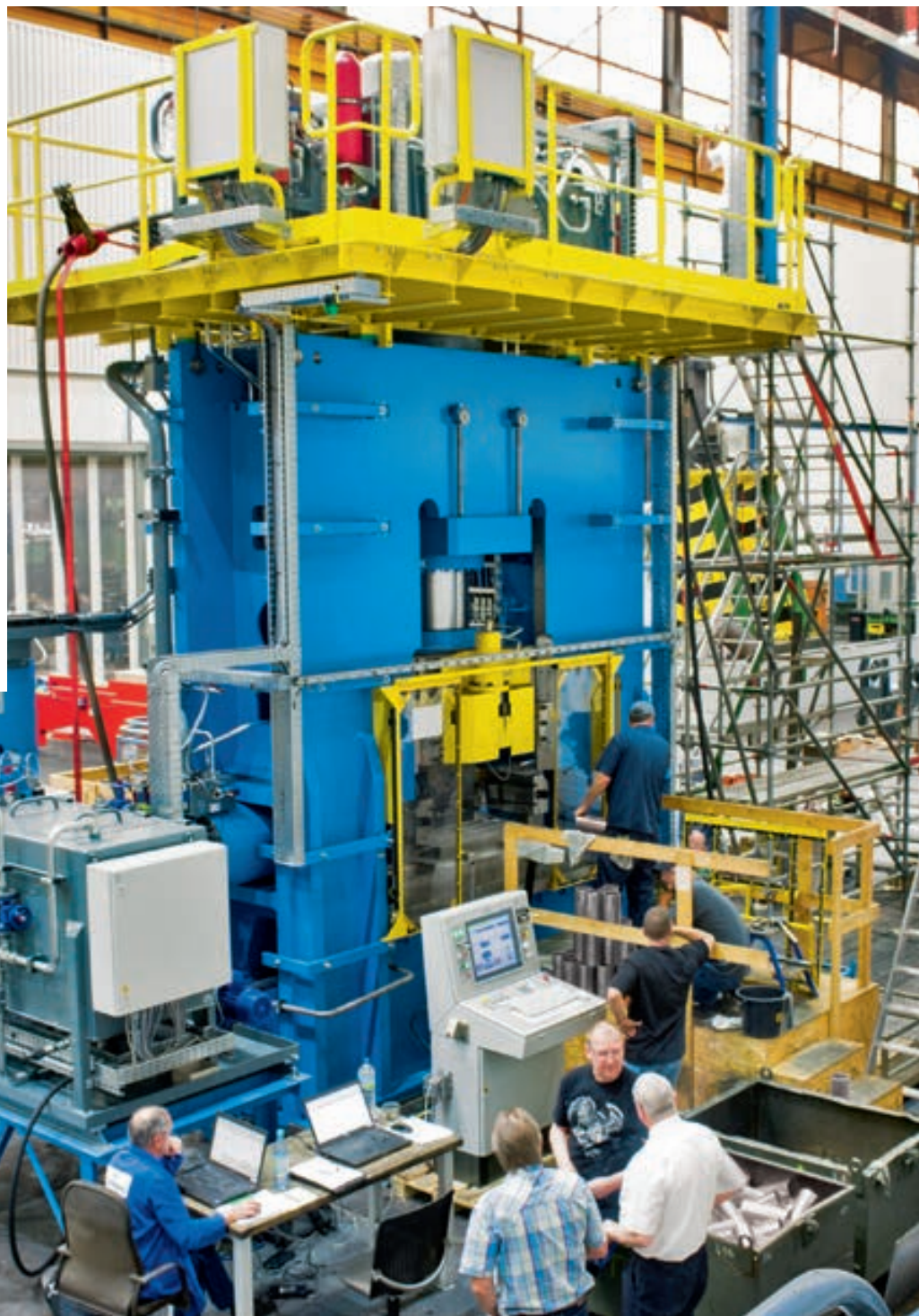
# With hydropower fit for fittings – or: **best “Made in USA” quality produced on high-tech press technology “Made in Krefeld”**

→ By Amir Tanbakouchi

“Fitting” not only describes a small connecting piece, but also the action of fitting something together. A good fit: What accessory parts can achieve can also be achieved between two business partners. Such happened in the case of an American customer and its German supplier Siempelkamp!

The first contact with the American manufacturer for fitting pieces used in pipe assembly took place at the TUBE 2014 Fair in Düsseldorf. The manufacturer was looking for a suitable press for the manufacture of seamless T-pieces, used to connect three pipes. At TUBE, the trade show for everything to do with the processing and machining of pipe materials as well as their manufacturing, the fitting specialist was quickly convinced of the expertise of the Krefeld specialist and a visit of Siempelkamp’s production location was arranged.

The customer visited the factory grounds in Krefeld a few weeks later and was able to get a comprehensive picture of the unique possibilities at the location. The customer was impressed with the in-house production of large structural components for presses in





CAD rendering of the IHU press with the pressure transducer



Workshop assembly in Krefeld, Germany

Siempelkamp's foundry, as well as the highly precise machining of these cast components at the collocated in-house machine works. The US American company was not only fascinated with the facilities and machine equipment of Siempelkamp's production, but also with the extraordinary production width, especially the in-house production of hydraulic elements.

#### **In the beginning is the product**

Shortly after the visit in Krefeld, the American customer decided to order its future production plant from Krefeld. The system solution with a pressure transducer that is exactly tailored to the requirements of the press and also produced in Krefeld, made the decision even easier. Another crucial factor was the joint process development and planning of the manufacturing process and the machine itself, a direct cooperation of the Americans with the team from Krefeld and the University of Siegen. All

product-specific requirements of the American customer were the focus of the development project; all necessary manufacturing processes were simulated on the PC and optimized in cooperation with the University of Siegen. Thus, all necessary manufacturing processes were virtually perfectly tailored to the future products of the customer.

In June 2016 the Americans placed the definite order. Due to the comprehensive research results and simulations, all construction plans of the machine were made in October. The production acceptance of the press also took place the same month and was completed in April 2017. Two special milestones were contractually specified: a preliminary startup and the first equipment acceptance by the customer were agreed to take place at the Krefeld factory. To do so the complete press system had to be assembled at the Siempelkamp manufacturing facility starting in April 2017 and put into operation in July. The Krefeld team had agreed with the American customer that, starting July 17, a two-week equipment acceptance test would take place during

## HYDROFORMING OF METALS

Internal high pressure forming, also known as hydroforming, describes a manufacturing process used for forming hollow metal parts. Through hydro-mechanic pressure the hollow parts are formed from the inside out. To ensure the emulsion pressure is evenly applied to the inner surface of the hollow working material, it is necessary to secure the work piece between the dies and seal its openings with hollow punches. Through these hollow punches a liquid, usually an oil-water emulsion, is finally pushed into the hollow part by means of a pressure transducer. Depending on the product, the internal pressure required may equal up to several thousand bars. The liquid, which is under high pressure, causes the hollow body to expand until its inner surfaces form to the upper and lower die. Since the process is comparable to conventional deep drawing in regards to the operating principle, the term hydro-mechanic deep drawing is also used for hydroforming. However, unlike during conventional deep drawing, during hydroforming the work pieces are closed on all sides which allows the forming of very complex geometries with high forming precision.

The production process itself requires a level of experience with hydrostatic pressure since its power handling has to be exactly coordinated with the mechanical contact pressure of both hollow punches. Here, it should be considered that the length of the hollow part is significantly reduced during forming inside the die. If the hollow punches are not sufficiently pushed against the work piece to be formed with increasing dynamic pressure, the necessary pressure build-up needed to complete the forming process cannot be achieved because of developing leaks due to the change in length.

If, however, the press-in pressure of both hollow punches is too high, the work piece forms in an undefined way. Siempelkamp has known the hydroforming process from the inside out for several decades and has done a lot of pioneering work in this area since 1965.

which different products would have to be manufactured failure-free in series production. For this visit the American customer brought heavy luggage: For one thing, the Americans brought a lot of blanks in the form of pipe segments in five different dimensions, wall thicknesses, and metal alloys. Secondly, they brought five different dies to manufacture different final products. Even the future operating personnel of the plant traveled to Krefeld. On July 20, the day had finally come – the performance of the machine was to demonstrate that the customer had decided for the right supplier.

First test pressings with product





Opening the press



Inserting the blank



Closing the press – the hollow punches can be seen to the right and left of the blank

### Competitive edge through technology and in-house production

The first trump of the Krefeld company involves the extremely precise pressure axle provided by the hydroforming press. Due to the uncompromising in-house production of all components and the experience from over 50 years in the area of hydroforming, Siempelkamp hydroforming presses are characterized by their extremely precise axle guidance of the hollow punch. Another advantage of the design is that the product-specific pressure curve (pressure increase in the hollow parts) is directly proportional to the positioning of the forming cylinders. Thus, the highly precise guidance of the forming cylinder and the extremely dynamic pressure transducer ensure the necessary exact process pressure. This does not only benefit production but already pays off with commissioning or rather when setting up the dies. Thanks to the profound knowledge of the customer about their work pieces and due to the excellent characteristics of the Siempelkamp hydro-

forming press, the startup engineers achieved the respective product-specific internal pressure curve within a short time. Depending on the process, the first products were manufactured with an optimized strain-relieving method for hydroforming processes at peak pressure values of 800 to 900 bar.

At this time, the second trump comes into play – the in-house custom-made pressure transducer which feeds via two nozzles with 1,500 bar each the oil-water emulsion into the component part to be formed. With the custom-made design extraordinary running lives can be achieved which significantly exceed those of standard hydroforming system solutions. The pressure transducer was also designed with ease of maintenance in mind. A replacement of the seals can be performed in only a few minutes. Here, Siempelkamp's in-house production along with reference installations at such well-known customers as BMW, Metalsa, and Magna pay off.

Last, but not least, another trump in the area of hydroforming press system solutions made by Siempelkamp is the in-house developed highly-specialized control software for hydroforming applications. Thanks to the continuous further development, the current version of the control software is so sophisticated that each production process is supported with individual process parameters. For a product change only the tools have to be replaced; after selecting the product, the control software automatically controls all the necessary process-determining parameters. The perfect interplay of all press components, the control specifically designed for hydroforming, and the extremely short cycle times at precise repeat accuracy lastingly impressed the American customer. The customer had not expected such high part quality and a product output that far exceeds the target values.

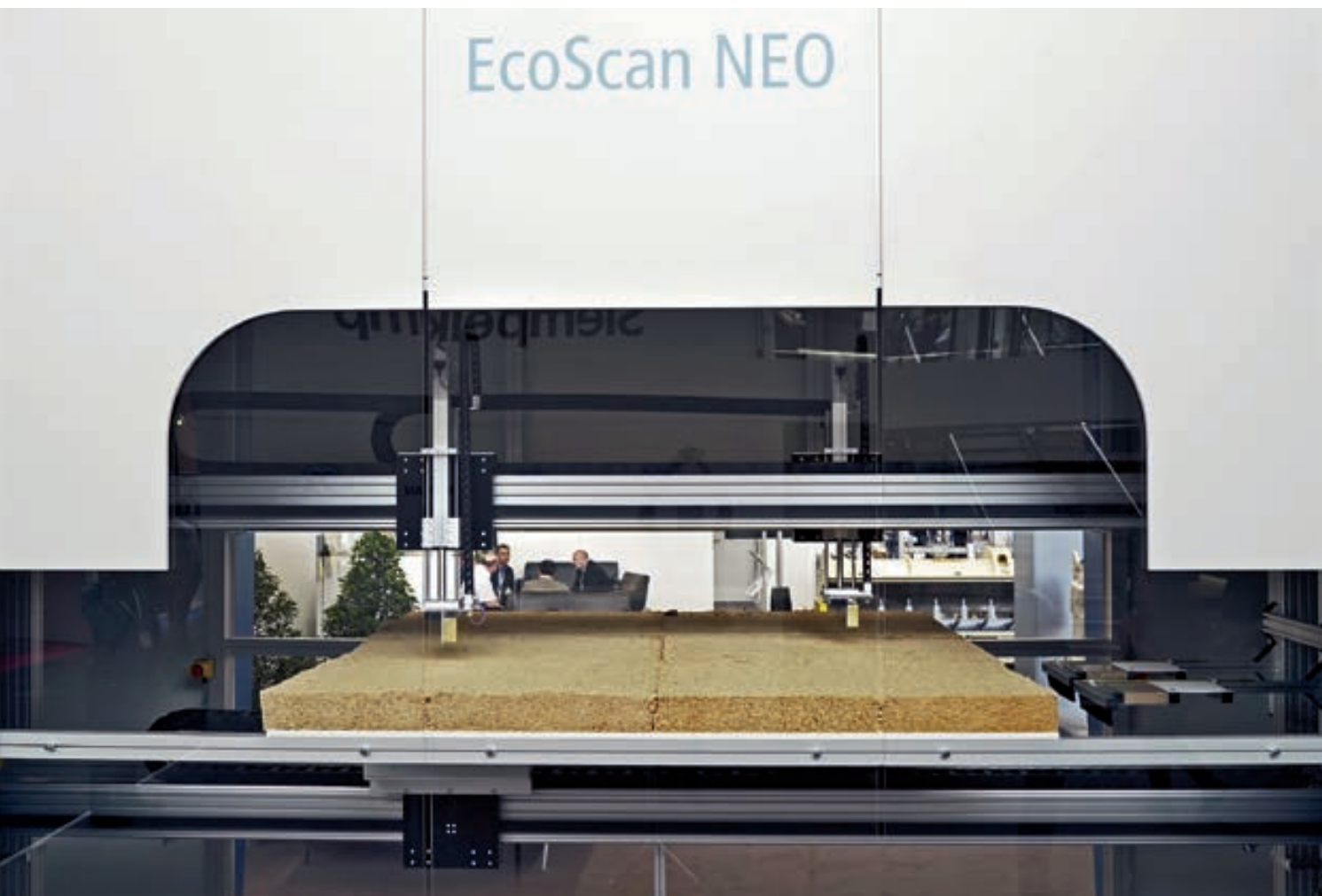
### Assembly and startup for the second time

After the American production crew departed, the entire press configuration was dismantled into separate functional units which were sent as complete assemblies to the USA. Siempelkamp has meanwhile perfected the shipment of complete functional component assemblies, in part due to the in-house production of all components. Fundamentally, all hydraulic assemblies are checked regularly for functionality, not only after provisional assemblies and startups. Thus, shorter assembly times and quicker startups can be ensured on site. For the American customer, the re-installation and startup, this time on the customer's premises, represents little challenge. All workflow processes are still well known to the assembly crew which means high-quality "Made in the USA" fittings will be produced this year. The existing press, a German construction, which has been used for decades and no longer satisfied the customer's production requirements, can now be dismantled. The new hydroforming press "Made in Krefeld" not only provides the customer with the market advantage to produce fittings with a higher quality, but also allows quicker production.

## Even smarter solutions for the future: **self-learning production control including process optimisation and plant monitoring**

→ By Dr. Volker Middelmann

What kind of technologies will be driving the future of the wood-based materials industry? Siempelkamp relies on intelligent systems ranging from the adaptive, self-learning production control, mechatronic system components up to machine monitoring and predictive maintenance. Convincing customers' benefits: top quality and reduced production costs



EcoScan NEO at LIGNA 2017

There have been multifaceted and ever increasing demands made on an adaptive and self-learning i.e. an intelligent control for the production of wood-based boards, especially during the last decade. These demands refer to plant protection as well as the monitoring of product quality and machines on the one hand

and an adaptive production which is able to adjust to any changes, be it to the process, the materials or the targeted product on the other hand. Reducing the production costs while at the same time maintaining, or even increasing, the product quality remains our priority goal.

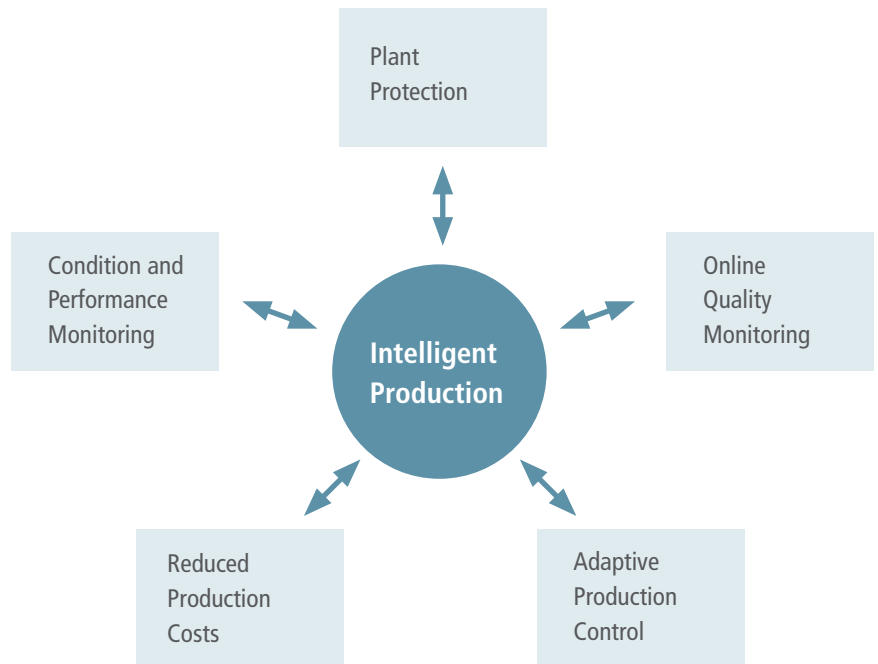


To achieve this goal, Siempelkamp relies on innovative, highly efficient measuring systems. They are of vital importance when it comes to online quality monitoring and control.

Integral part of our continuous press ContiRoll® is the online thickness measuring system which operates on strict principles. Measuring accuracies of +/-0.02 mm despite fluctuating production and ambient conditions are a must. 'This is the only way to obtain board thickness tolerances of 0.05 mm to 0.08 mm,' as Dr. Volker Middlemann, Head of Siempelkamp's R&D Centre puts it.

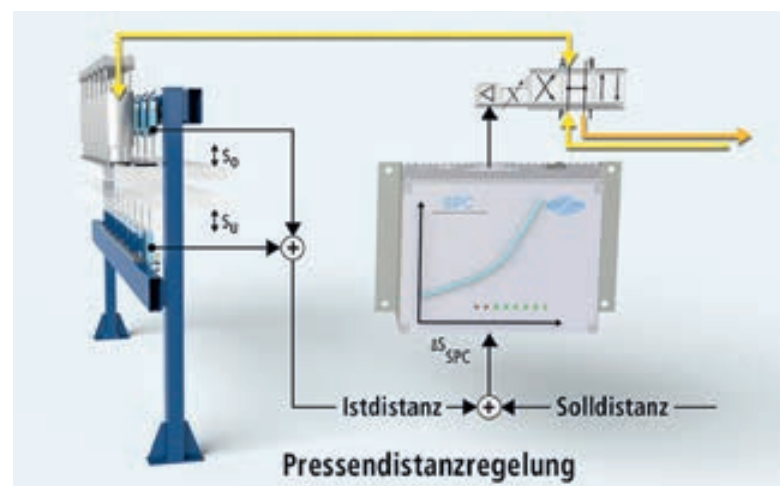
It would not be possible to maintain such challengingly tight tolerances, unless the ContiRoll® allowed fine-tuning as well. To this end, Siempelkamp has developed a measuring frame which measures the press gap precisely to one hundredth. Deviations or fluctuations in the thickness tolerance can thus be made up for in the calibration zone. Another advantage of this measuring principle is a fast response time because any deviation will be detected immediately at the place of occurrence and adjusted highly dynamically by a most efficient hydraulic system. Rejects caused by production changes are virtually a matter of the past.

In addition to the thickness, the geometry of the board is also measured – online – since only recently. An innovative optical measuring system assesses online the precise squaring of a board. This is the basis for computing precisely the board's geometry and its perpendicularity.



▲ Demands made on an intelligent production in wood processing plants

Measuring system for determining the press gap

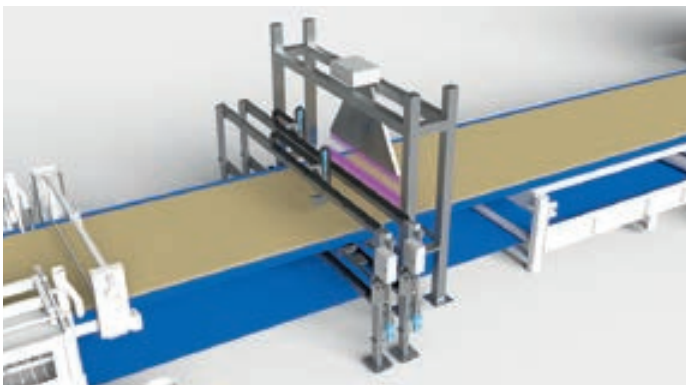


Any deviations from the requested geometry are evaluated and the saw parameters are readjusted. This will improve the board's geometry significantly and at the same time reduce the amount of rejects. Besides, it adds to safety because the board geometry does not have to be measured by the operator during the production process.



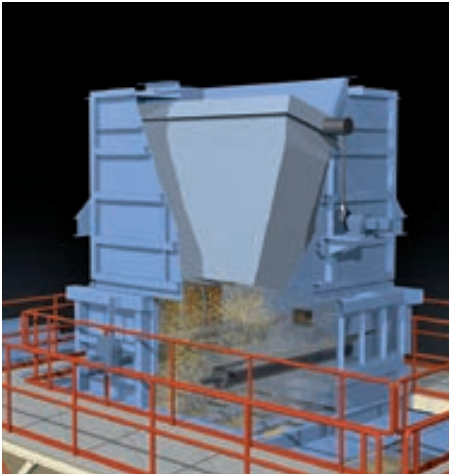
Measuring system – geometric ONLINE measuring of the board

▼ EcoScan NEO: tramp material detection and weight-per-unit-area measurement in one go



EcoScan NEO: traversing weight-per-unit-area gauge and tramp material detector for particle mats, fibre mats and strand mats  
The two traversing measuring heads of EcoScan NEO facilitate a unique resolution of 6 g/m<sup>2</sup> of weight per unit area. A tramp metal detector has been integrated. However, it is fitted with a separate X-ray source, which, unlike the weight-per-unit-area gauge, operates on high voltage. Glue lumps or plastic elements with a diameter of just 3 mm are safely detected. This provides the best possible plant protection.

Any detected fluctuations in weight per unit area are evaluated by an intelligent software; the systematic fluctuation will be corrected. Fluctuations are corrected by making changes to the forming system which is designed as a mechatronic i.e. an adaptive system. Notably the oscillating chute, the distance-time function of which can be variably adjusted, is part of this system. This, in turn, enables a targeted filling of the bin. The same applies to the levelling rollers, the speed of which can be adjusted, so



Pendulum chute

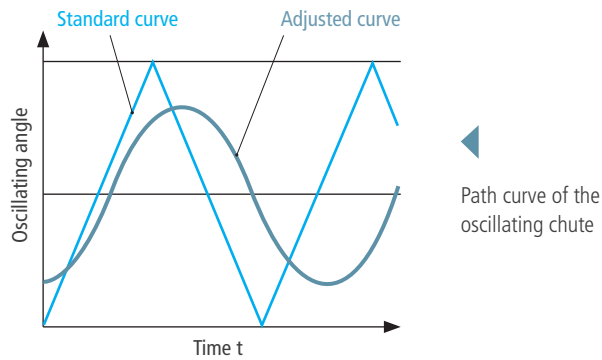


Mechatronic forming system

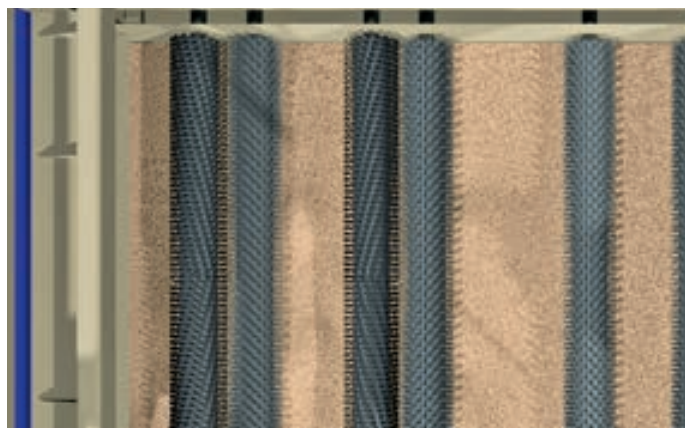
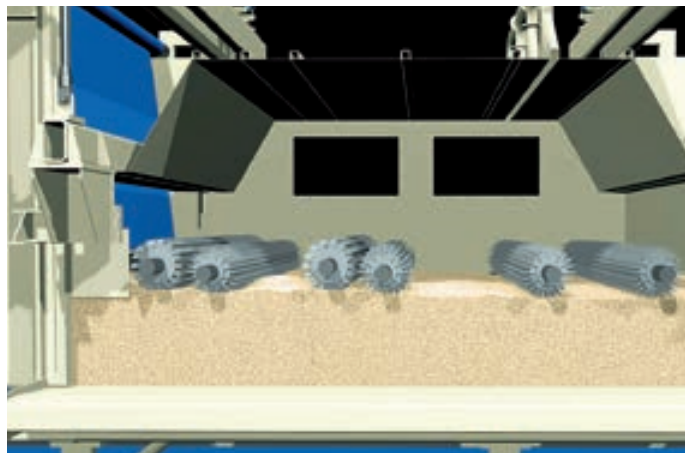
that the spread material can be levelled out from the middle of the board towards its edges and vice versa. Deviations in the forming of the mat crosswise to conveying direction are thus reduced by more than 2%. The prototype plants were able to reduce fluctuations in the weight per unit area across the mat permanently from 3% to a remarkable 1.5%.

Hence EcoScan NEO opens up two important benefits in one system: a high-resolution analysis of the weight per unit area and a reliable tramp material detection. In addition, EcoScan Neo offers a clear multidimensional visualisation which can be configured to the operator's needs.

Siempelkamp sets new standards in the wood-based materials industry by introducing its Condition Monitoring System. Entire facility systems are monitored and their serviceability states evaluated. This is exhibited in the figure 'ContiRoll® machine monitor' for the ContiRoll®.

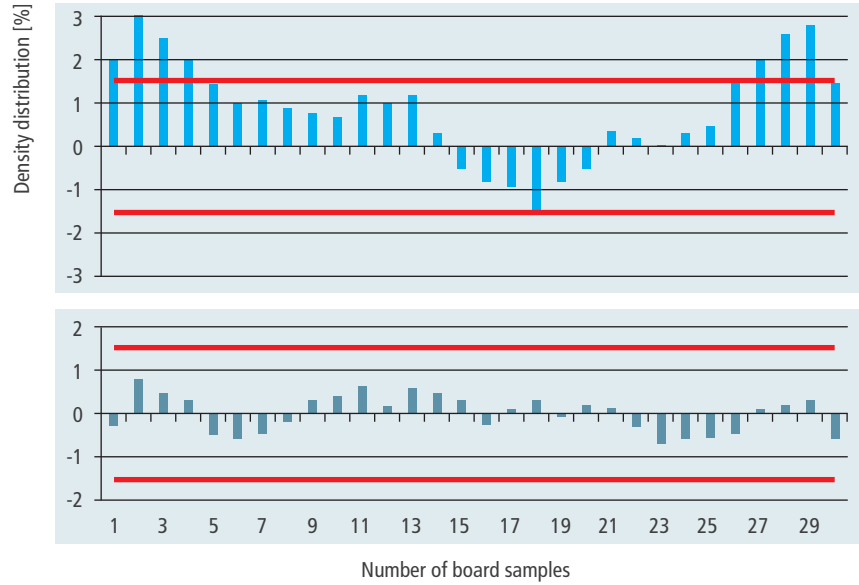


Path curve of the oscillating chute



Top and bottom: levelling rollers for levelling the material from the middle of the board towards its edges and vice versa

Optimisation results achieved by the EcoScan NEO and the adaptive forming system



The important system components like drive systems, hydraulic system, insulation, roller rod chains, friction linings and the steel belts themselves are monitored online, their state of wear is assessed, so any imminent failure will be detected.

The information is provided to the relevant system users in the form of a sophisticated information chain. Our service department receives its relevant information immediately and directly, and so do the production manager and other system users. The authorised persons

Machine monitoring system included in the ContiRoll®

- Chains
- Friction pads
- Insulations
- Steel belts



- Supporting rollers
- Hydraulics
- Gear units
- Drives



The new Siempelkamp Press Controller Sico SPC 9

navigate through the locations and system components by mouse click and are thus able to monitor the plant state specifically and efficiently.

In addition to an optimised design, the newly developed Siempelkamp Press Controller was retrofitted with a more efficient electronic system. Just like before, the intelligent pressure/position control uses raw data obtained from pressure and distance sensors for the control of the requested pressing forces / press gaps of the ContiRoll®. But also the functionalities described above like Condition Monitoring are processed on the new SPC9 fast and efficiently.

With respect to the development of plants for the wood-based material industry, Siempelkamp relies on intelligent systems ranging from the adaptive, self-learning production control, mechatronic system components up to machine monitoring and predictive maintenance. Our customers benefit in two ways: obtaining top quality and reducing their production costs!

▼ Siempelkamp Condition Monitoring System





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