Siempelkamp

Intelligence in integrated wood processing

Complete systems for the wood-based products industry

Content

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Executive Editor (Person according to the German press law)
Christian Hassler

Text Dr. Silke Hahn
Design and Layout VIP Grafik Kommunikation, Aachen
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Siempelkamp plants for wood-based materials: "Intelligence in integrated wood processing"

Anyone who invests in a plant for the production of wood-based materials sets the course for the success of their company, oftentimes also for important future prospects for the entire region. This focus in a highly competitive international market begins with the selection of the right partner.

The reason that the leading international wood-based material manufacturers decide to partner with Siempelkamp is clear: our competence as a supplier of complete plants from the woodyard to the finished board. According to the guiding principle of "Intelligence in integrated wood processing", we develop production plants for wood-based materials as integrated system solutions – from research and development to the layout and calculation to the design and construction all the way to the installation and start-up of the plants.

We not only sell machines, but thought-out solutions and concepts for plants and processes. Current demands such as the resource-conserving use of raw materials, energy-efficient technologies, and the use of annual plants are part of this integrated concept.

The result is a complete plant, which consistently uses all options of digitalization and intelligent process control technology, and thus efficiently manufactures the optimum boards for its markets.

The fact that we have sold 320 ContiRoll® concepts makes us the world-market leader for complete plants for the production of wood-based materials.We support customers reliably, efficiently, and individually from the engineering to the after-sales service. All this saves our customers time, costs, resources, and logistics expenditure.

Project design, planning, construction design

Integrated engineering is the key to plants that deliver optimum performances. This is the core competence of Sicoplan – Siempelkamp's subsidiary in Belgium. Nearly every piece of equipment that we supply benefits from this expertise – an expertise that rounds off our full-service concept.

Sicoplan's engineering services start with the pre-engineering which clearly defines the plant's concept. Subsequent basic planning builds up an exact 3D model of the plant to design many details, e.g. estimated raw material volumes for the structural steelwork, the dimensions of production halls and the specifications for the foundations. This model constitutes the optimum basis for making important decisions together with the customer about the plant's design.

Sicoplan's particular strength lies in the precise 3D design concepts that it develops for modernisations / retrofits, extensions and conversions, for example, which it visualises on the basis of 3D scans that bring together the new machines and the existing equipment into which they are to be integrated. The local conditions at the future plant owner's site will be precisely scanned and documented. The results are then processed into 3D models that provide even more realistic impressions of the overall concept for the plant and – even more importantly – make planning even more precise.

Sicoplan supports official approval procedures by providing process descriptions, consumption data and emission data. During the actual planning phase, all detail engineering of the machines is incorporated into the overall concept of the plant. All connecting mechanical and pneumatic conveying equipment is designed in 3D and the corresponding parts lists are elaborated, together with a set of manufacturing drawings.

Scanning techniques, the use of lasers and drone flights on site and above the customer's premises provide the engineering experts with the exact topographical conditions in electronic form. All this is required for perfectly tailoring a plant to our customer's requirements.

Are you intending to integrate a new plant for the production of wood-based materials into the infrastructure of an older existing plant? Our 3D technology can help and support you in optimizing the installation, connecting existing structures to new machines, and saving precious time.

The Sicoplan team working on a 3D scan

Live impression of the plant for wood-based materials – realistic and precise

Our services:

- Process engineering and planning of the technical equipment and plant, including calculations for the required raw materials and energy supplies
- Assistance with approval procedures
- 3D planning of complete production plants
- Designing mechanical and pneumatic conveyor systems
- Integration of all process machines made by the Siempelkamp Group or other manufacturers
- Technological consulting and optimization of the production process in regard to technology and economy
- Modernization packages, extensions and modifications, including 3D planning for pre-owned plants

Sicoplan project team

Financing support by Siempelkamp right from the start

Financing support

The investment in a large-scale Siempelkamp plant is based on highly individual financing preferences in international markets. Upon request, our team of specialists will assist with advice about financing concepts to determine the solution most suitable for your situation.

This is where modern finance know-how comes together with the expertise gained from many years of experience as an equipment manufacturer in a dialog with worldwide producers of wood-based materials.

It is in this way that tailored structures and solutions – developed in consultation with selected financial institutions – can be drawn up. Our customers appreciate this service, particularly in times of volatile capital markets.

Our services:

- Trade financing
- Project financing
- Export financing
- Domestic and cross-border financing

Customer benefits:

- Support from a team of specialists in short-term and long-term business
- Tailored financing solutions
- Independent advice in the customer's interest
- Combination of financial know-how and industrial expertise

Milling of a hot platen

Production

Assembly work in continuous production at Siempelkamp, Krefeld

Siempelkamp is known in the market for its great manufacturing expertise in an international manufacturing network. In addition to the cutting-edge technology of our plants, this opens up numerous advantages for our customers:

According to the guiding principle of "plug and produce", the entire logistics chain at our production locations is geared towards ensuring a quick start-up at the customer's site.

In principle all ContiRoll® components are machined using state-of-the-art CNC technology. This facilitates cost optimization by keeping throughput times short and guaranteeing consistently high product quality. Not least, in-house production competence is also an essential foundation for the continuous further development and optimization of our products.

Significant components are pre-assembled at the production locations to the point that a functional test of the electrics and / or hydraulics can be performed before the component leaves the factory. This contributes decisively to a smooth installation at the customer's site.

Furthermore, most assembly units of a ContiRoll® line are pre-assembled at the manufacturing factory in such a manner that standardized overseas shipping containers can be used for shipping. Such "containerization" of the assemblies helps to optimize packaging and freight with regard to time and costs.

Digester-refiner-system

Wood preparation and size-reduction technology

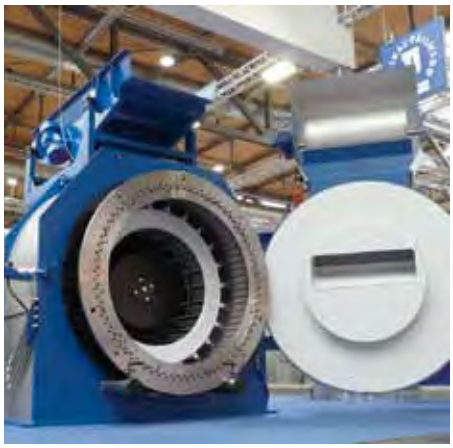
Our "all from one source" principle also includes the technology for wood preparation and size-reduction. After all, the quality of the finished wood-based boards depends on the quality of the prepared chips, particles, fibers, and strands. With our subsidiaries CMC, Pallmann, and Hombak we stand for comprehensive know-how with many decades of experience in the development and manufacturing of machines designed to prepare wood for subsequent processing.

Pallmann Maschinenfabrik, completely integrated into the Siempelkamp Group since 2017, plays an important role as the specialist for size-reduction machines and complete preparation systems for the wood-based products industry within the Group. "Top performance in size reduction" is the company's core competence. Located in Zweibrücken, the company's size-reduction machines and wood-preparation systems are very popular among customers. Customers profit from our continuously expanded knowledge in chipping, flaking and fiberizing of different types of wood.

Wood-preparation for the particleboard industry

Siempelkamp offers the complete range of machines for the production of high-quality chips. Our disc and drum chippers, knife-ring flakers, hammer and surface layer mills guarantee the production of high-quality particle material. Recycled wood can also be prepared with the help of specific cleaners.

Our Italian subsidiary CMC is responsible for the gentle handling of the particle material and offers separation technology including disc and roller screens, oscillating screens as well as wind separators. Paired with innovative conveyor technology from Sicoplan (cf. page 27), we supply the complete package for the production of top-quality surface and core layer flakes. Our scope of supply for the intermediate storage of the particle material includes bunker and silo installations as well as dosing systems which provide uniform material feed to the downstream equipment.



Knife-ring flaker

Universal flaker

Wood-preparation for the MDF industry

Our first-class expertise in wood preparation is also used for the production of high-quality MDF. The solutions we offer stand for high-performance, low production costs, and high-quality fibers. We support customers starting with our size-reduction technology: We offer special rotor and drum debarkers for removing the bark from logs. Due to optimized chipping geometry and improved material infeed, drum and disc chippers produce high-quality chips. Our solutions for the intermediate storage of the chips include silos or bunkers with different discharge systems such as pull or push floors with dosing and rotating screws. The priority here is to achieve precisely dosed material discharges. Together with our new subsidiary Pallmann we provide performance-strong and energy-efficient refiners for MDF manufacturers.

Our refiner plants produce high-quality fibers made from wood chips, sawmill shavings and chips as well as annual plants for MDF, HDF, and insulation board plants. Pallmann supplies an overall system of perfectly coordinated components to ensure the production of high-quality fibers with minimal energy input.

We meet the customer demand for more energy-efficient and higher throughput sifters with our own development, the EcoSifter. This sifter provides the best sifting results for all types of fibers while keeping energy costs to a minimum. The EcoSifter is an in-house development by Siempelkamp's flow and planning specialists. Flow-optimized via cutting-edge CFD software, the sifter provides a 20% higher fiber throughput than comparable designs – while, simultaneously reducing fan outputs by 30% based on fans including frequency converter controls on all motors made by our Siempelkamp subsidiary Ventapp.

Disc chipper

Silos for SL & CL material

Strander being assembled at our Krefeld workshop

Fiber dosing bin

Strand bin

Wood-preparation for the OSB industry

For the production of first-class strands we offer different size stranders depending on the customer's application field. Currently the largest strander achieves throughputs of up to 45 tons / h, bone-dry, at a strand thickness of 0.65 mm. Due to its dimensions – 2,500 mm diameter, 850 mm cutting width, 56 knives – the strander is of record size. Together with its subsidiaries Siempelkamp supplies the complete range of coordinated wood preparation equipment including debarkers, conveying, screening and bunker technology for OSB plants.

Roller screen for wood chips

Siempelkamp wood-preparation technology at a glance:

	Particleboard	MDF	OSB	
Debarking				
Size-Reduction				
· Drum chipper	PARTICLEBOARD	MDF	OSB	F*
· Disc chipper		MDF		
· Universal flaker	PARTICLEBOARD			
· Knife-ring flaker	PARTICLEBOARD		OSB	
· Hammer mil	PARTICLEBOARD			
· Surface layer mil	Particleboard			
· Re-chipper	PARTICLEBOARD	MDF		F*
· Ecopulser	PARTICLEBOARD			
· Refiner		MDF		
· Strander			OSB	
Separating, drying, screening				
· Disc and roller screens	PARTICLEBOARD	MDF	OSB	F*
· Oscillating screen	PARTICLEBOARD	MDF	OSB	
· Flash tube dryer		MDF		
· Drum dryer	PARTICLEBOARD		OSB	
· Wind separator	PARTICLEBOARD	MDF		
· Ferrous and non-ferrous separators	PARTICLEBOARD	MDF	OSB	
· Wood-chip dry cleaner	PARTICLEBOARD	MDF		
· Chip washer		MDF		
Intermediate storage				
· Bins with live-bottom system	PARTICLEBOARD	MDF	OSB	F*
· Round silos	PARTICLEBOARD	MDF	OSB	
· Floor conveyor dosing bin		MDF	OSB	
· Dosing bin with screw conveyor	PARTICLEBOARD	MDF		F*

F* = fuel

Dryers and energy plants

Type BLB duct burner

Regarding process technology and plant engineering competence, dryers and energy plants are part of the same system. That is why customers appreciate Büttner's strategy of supplying both products as an integrated concept. Plant owners are increasingly ordering their systems for process heat generation and drying as a single overall concept.

Our range includes dryers for different industrial sectors that, depending on requirements, are designed as drum or flash-tube dryers. We further develop heating and automation systems in-house and supply multi-fuel burners for the combined combustion of various fuels as well as gas-duct burners for the flexible heating of fiber flash-tube dryers. Thermal oil for presses, building heating, log ponds and impregnating lines, steam for refiners and flue gas for dryers: our energy plants help ensure reliable process a heat supply while simultaneously guaranteeing the economic use of wood and biomass as a resource and the reduction of emissions. The utilization of waste wood from production, e.g. bark or dust from screening and sanding, helps achieve high economic efficiency. The energy plants are also designed to burn such gaseous fuels as natural gas and such liquid fuels as light and heavy oils. Büttner covers the entire range of services – from planning to delivery to the commissioning of the entire energy plant and dryer– and will also train the customers' personnel in how to operate their systems. Furthermore, we offer comprehensive service and upgrades for dryers, burners, and energy plants of plants by all manufacturers.

Dryer details:

- Drying capacities from 5 to around 80 tonnes per hour bone dry
- Low specific energy consumption
- Individual solutions for different exhaust gas cleaning systems
- Short assembly and commissioning times by experienced specialists

Energy plant details:

- Combustion capacity of 10 to 100 MW
- Air-cooled moving grate firing system – if needed in conjunction with a combination burner system
- Process heat in the form of flue gas, thermal oil and steam
- Individual solutions for flue gas cleaning and emission reduction
- Integrated process control adapted to high industrial standards

Dryer plus energy plant as an overall concept – the benefits

- Highly efficient design of the combined dryer and heating system
- Higher efficiency and lower costs for engineering, transportation, logistics, assembly, and commissioning
- Optimal interfacing of process-control technology and automation, higher product quality
- After-sales service for the entire plant from one source

Fiber dryer

Energy plant

Drum dryer

Energy plant and drum dryer

Assembly of glue kitchen with modular design

Resin blending system

The modular concept of Siempelkamp's resin blending system with integrated glue kitchen as well as dosing and application systems not only provide for the best cost-benefit ratio but also the best possible end product. The constant and accurate dosing and mixing of particles and fibers with resin is the precondition in achieving a panel with good mechanical properties.

Our dosing bins are high-performance machines which provide consistent material feed, including fibers, chips, and strands, to downstream resin blending aggregates. Due to an improved leveling system and electronic weighing devices used to control material dosing, the new dosing bins have a positive impact on dosing consistency and resource efficiency during resin blending. Siempelkamp offers different bin sizes according to the size and capacity of the plant.

Siempelkamp´s integrated resin kitchens are used for the efficient preparation and accurate dosing of the resin mixture and other recipes. These resin kitchens are equipped with load cells for exact gravimetric dosing of smaller components. For accurate and efficient dosing, our systems are also equipped with the latest flow meters and are tested at Siempelkamp´s laboratory prior to delivery.

Ecoresinator for fibers

CMC glue blending and metering system

Ecoresinator blending system

With the innovative Ecoresinator blending system, our customers profit from several advantages: accurate dosing and mixing of particles and fibers with resin, an optimal cost-benefit ratio, a high quality end product.

Due to special nozzle technology made by Schlick and the use of superheated steam, customers save up to 15 % in resin compared to the traditional blending process in a blowline. The homogeneous resin distribution furthermore improves board and board surface quality.

Siempelkamp supplies a ready-to-install complete resin injection system including switchgear cabinet and automation software. Our control technology system Prod-IQ® continuously records, monitors, and optimizes production data. The retrofitting of existing plants with Ecoresinator is possible within a short time frame and requires only low investment costs.

Particleboard mat-former

Ecoformer SL

Mat-former systems

The quality of a wood-based board depends crucially on the system that forms the board. No matter whether the process uses particles, fibers or strands – with comprehensive research effort we have developed equally excellent mat-forming systems for all types of wood-based boards.

These state-of-the-art systems used in conjunction with the ContiRoll® constitute technically and technologically sophisticated machine units.

The result: high-quality wood-based boards that will satisfy even the most demanding of customers!

System	Surface layer	Core layer	Method
Particleboard	Ecoformer SL	Cageformer	Classic
	Ecoformer SL	CrownFormer	Combination
	CrownFormer	Cageformer	Combination
	CrownFormer	CrownFormer	Mechanical
MDF	Starformer	–	Mechanical
OSB	DiscFormer	FinFormer	Classic
CSL/OSL	DiscFormer	–	Modified

OSB forming line

MDF forming line

Prepress

Forming line

Siempelkamp's forming line guarantees the best possible conditioning of an endless mat before it enters the press and provides the highest possible flexibility. Part of this flexibility is due to the fact that production width and board thickness can be easily adjusted.

Quality monitoring using mat scales, ferrous- and non-ferrous metal detectors, SicoScan moisture analyzers and weight-per-unit-area detectors as well as tramp material detectors complete the features of Siempelkamp's forming line. Prepresses specifically tailored to the products ensure optimal degassing and stabilization of the mat.

Following precompaction, the mat is passed through our in-house developed preheating systems, which ensure its conditioning to the best possible extent before it enters the press. Homogeneous heating of the mat upstream of the press not only improves the product quality, but also reduces the mat's dwell time in the press, consequently, increasing the plant's outputs.

Innovation 1: EcoScan NEO – weight-per-unit-area gauge and tramp material detector

According to the fast absorption measurement method, the traversing measuring sensor heads of EcoScan NEO scan the entire mat width in a sine curve in particleboard, MDF, HDF and OSB production. Even minimal deviations in the weight per unit area are detected at a consistent resolution of +/- 0.5%. An independent stand-alone X-ray system emits X-rays through the entire mat and – with the help of an intelligent algorithm – detects tramp material of as small as 1.6 mm.

EcoScan NEO – the benefits

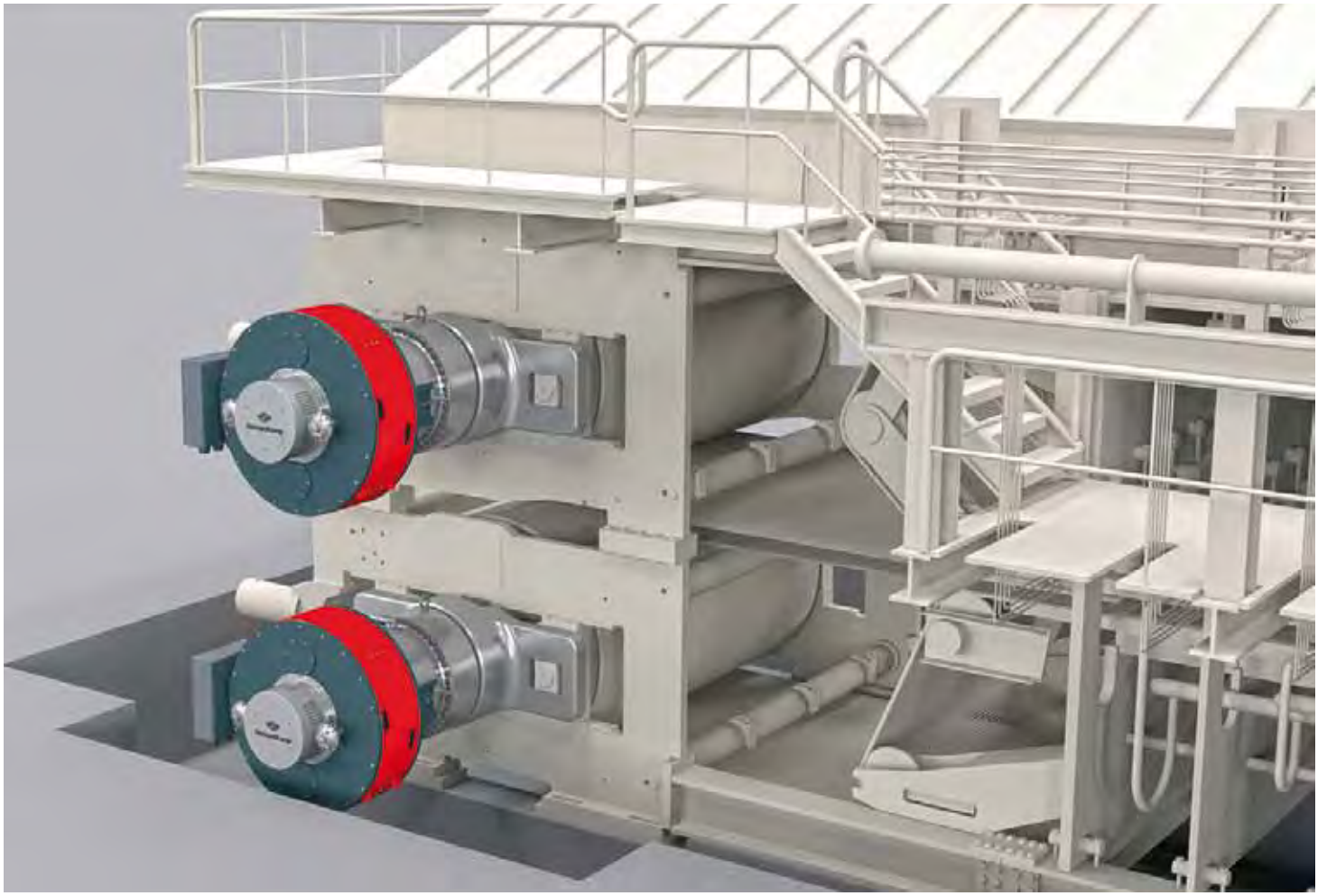
- Multi-dimensional visualization precisely locates forming errors and tramp material, detection of even the smallest tramp material possible
- Statistical online evaluation possible by linking the gauge to Prod-IQ®

Innovation 2: Siempelkamp's Compactor

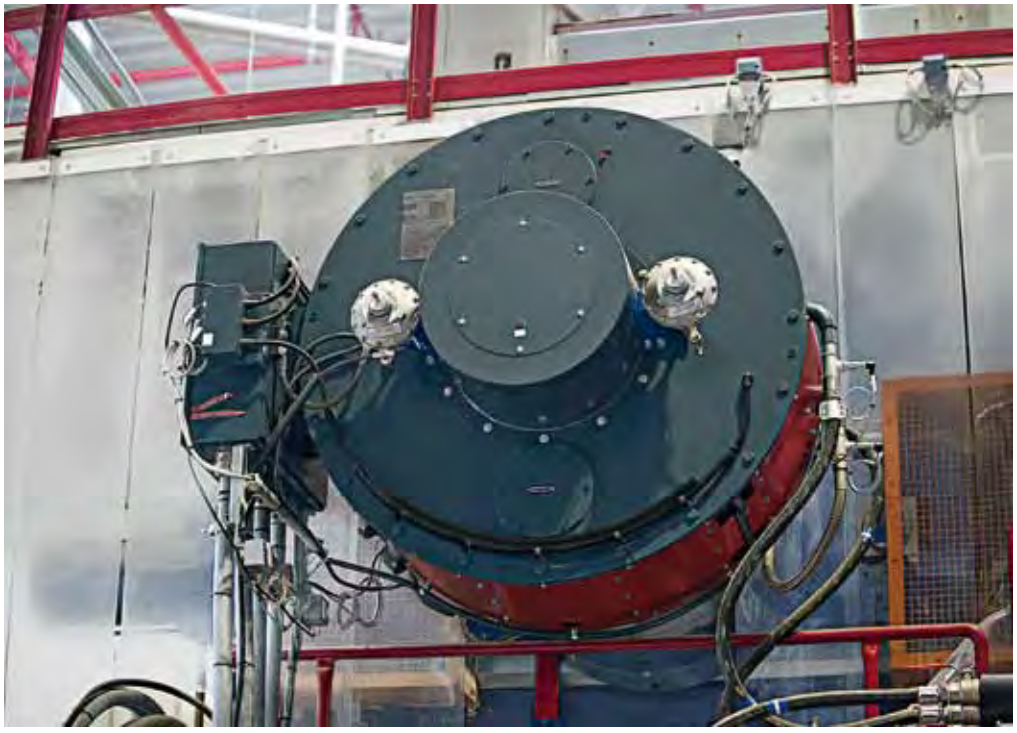
Our Compactor is able to help plant owners significantly increase the output and qualities in the high-speed production of wood-based boards. Especially at high production speeds the pre-compaction and thus the preparation of fibers help ensure the prevention of blowouts and delamination during the pressing process. Compaction forces of up to 8,000 N/cm reliably destroy any glue lumps and tramp material so that they are no longer able to damage the steel belts of the press.

Siempelkamp-Compactor – the benefits

- Highest production speeds
- Best product quality through homogeneous material density



ContiRoll Ecodrive motor on the drive drum of the steel belt



ContiRoll Ecodrive system

ContiRoll® presses: Siempelkamp's milestone concept

ContiRoll® Generation 9 NEO

The continuous ContiRoll® press lies at the heart of forming and press lines and is responsible for transforming Siempelkamp into the global market leader for continuous presses used for manufacturing wood-based materials. The concept has passed many milestones since the first ContiRoll® was taken into operation at Louisiana Pacific in 1985. More than 320 presses have been sold since then and are operated in all types of climates across the globe.

The decisive benefit of the ContiRoll® principle is its flexibility. The range of raw material – be it pine, eucalyptus, bamboo or rice straw – that ContiRoll® presses are able to process is so wide that they are used for manufacturing particleboards, MDF and HDF as well as OSBfor many applications . ContiRoll® presses are used for the production of panels for furniture and interior walls e.g. flooring laminates, ultra-thin boards, refined boards, and laminated veneer lumber for construction. The continuous presses are these days even used to make conveyor belts and high-pressure laminates and they are also employed as dewatering presses for the production of gypsum fiberboard.

Three different sizes of machine are available depending on the product, board size, and capacity requirements.

	Design 1 (Standard)	Design 2	Design 0
Width	6 – 10 ft	Up to 12 ft, with extremely high pressure profiles	4 and 5 ft
Hotplaten length	Up to 65 m	From 50 m up to 80 m	Up to 40 m

Our customers benefit from the unprecedented precision that is possible to achieve for raw boards with the ContiRoll®. The pressure-distribution plate technology – which is a fundamental invention by Siempelkamp – has allowed a press to be designed that operates on a virtually isobaric basis. The additional row of cylinders allows density fluctuations to be compensated in the machine's calibration section and limited to the absolute minimum with the help of individually controlled cylinders.

The top and bottom infeed heads on the ContiRoll® have been made from spheroidal graphite cast iron – one of the core areas of expertise at Siempelkamp's Giesserei. The use of this material means that it's possible to bend the upper hot platen and guide the roller rods into the press in an extremely stable and precise fashion.

ContiRoll® in use

ContiRoll® Generation 9: Continuously better

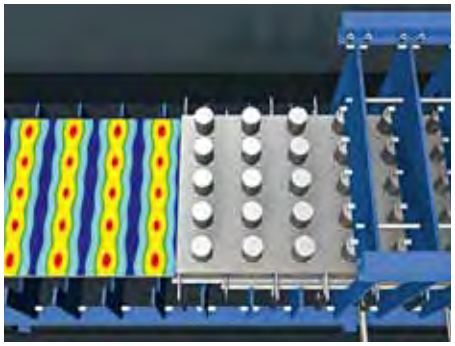
Continuous press, continuous success – that's something that's only possible with continuous developments. Meanwhile the ContiRoll® is available in its ninth generation.

For the first time, it is driven by a synchronous motor, which not only improves stability at high speeds, but also makes the system significantly more efficient to operate and virtually maintenance-free.

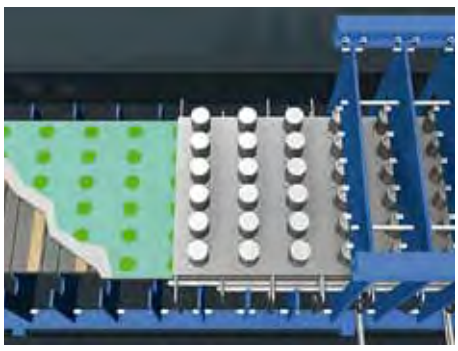
These ninth-generation presses also come with innovative roller rod chains that allow them to operate reliably at production speeds of up to 2,500 mm/s. The wearing behavior of the newly developed generation of chains – the HPC40 high-performance chains – has been improved considerably. These chains may also be monitored with the help of sensors. The press' hydraulic units, the hot-platen connections, the press fumes extraction system as well as the production accuracy that the continuous presses achieve have also been advanced.

Siempelkamp has further perfected the thickness-measurement process that the system's ninth generation uses. It was only possible to realize a thickness-measurement process that wouldn't be affected by anything else that the press was doing and that could impact results by creating a stand-alone design. A structurally stable and separate measuring frame serves as the sound benchmark for reference dimensions – decoupled from all thermal and structural material effects. The result is that it's now possible to locate any deviations in the tolerances for product thickness in the calibration zone with great precision and immediately correct them by readjusting the thickness-measurement feedback. The new system helps prevent waste even at very high production speeds.

The ninth generation of ContiRoll® presses is available in two versions: the standard design and the ContiRoll® Generation 9 NEO. The latter features a press infeed that is twice as long as that used in the standard design and a super flexible infeed hot platen. The extended press infeed also allows different production processes to be implemented for the first time thus resulting in significant increases in production.



Pressure distribution with pressure distribution plates



Pressure distribution without pressure distribution plates

The advantages that the integrated ContiRoll® press concept offers include:

- High economic efficiency with best uptime and capacity reserves
- High accuracy
- Short assembly times and quick start-ups
- Steep ramp-up curves
- Lower consumption of wood and resin
- Optimized energy consumption – optimized density profile of the boards

ContiRoll Ecodrive drive system,
exhibited at the LIGNA 2015

ContiRoll® for MDF

Finishing lines, handling systems, intralogistics, board finishing

The range of services we provide continues downstream from the press right in line with our motto that is: 'Perfection to the end.' To support our customers, we deliver complete finishing lines that feature storage technologies, intralogistics, and board finishing as well as trimming and cross-cutting saw units up to and including packing lines.

Multi-diagonal saws are used for cross-cutting the boards once they have left the ContiRoll® press while Siempelkamp's cooling turner is characterized by high levels of uptime and low levels of required maintenance. We offer versatile and demand-led stacking stations with lifting tables that use lifting chains and don't need pits and that will also handle jumbo stacks with our tried-and-tested gripper carriage. Our automated stacking stations generate jumbo stacks that are precisely counted up to heights of five meters (16 feet) as well as any order-related smaller stacks.

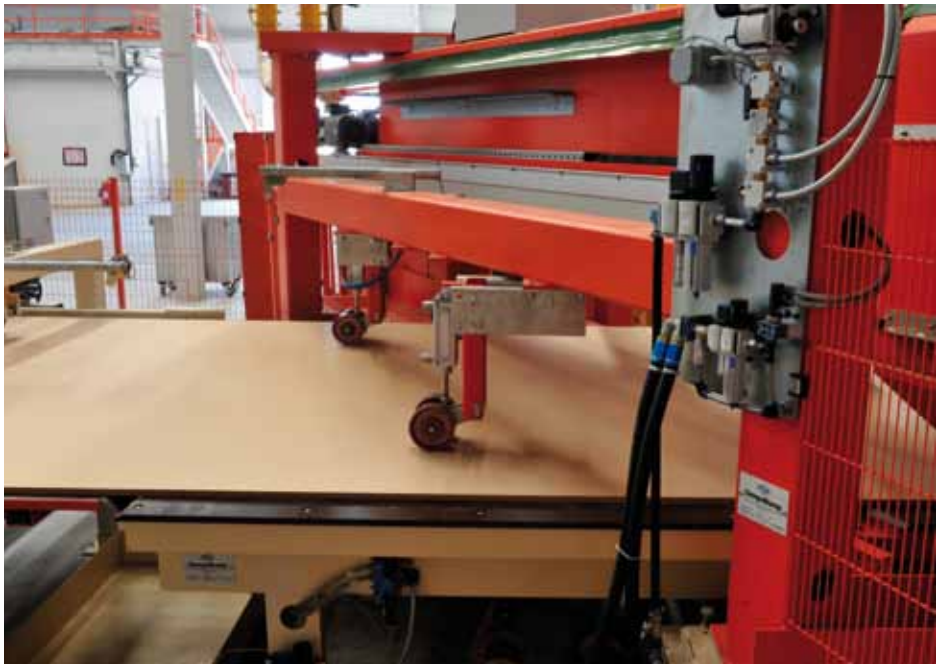
Our high-performing sanding lines and our cut-to-size technology support the later stages within the process. The sanding lines, for instance, feature quick-feed technology, cutting-edge surface inspection as well as intelligent stacking and sorting systems to ensure quick throughputs. Siempelkamp's cut-to-size technology provides customized high-performance saw solutions with flexible cutting patterns and lowest-possible cutting losses. These saw solutions are developed as inline concepts that are either integrated into sanding lines or realized as offline angular cut-to-size plants.

Our semi- and fully-automatic packing lines may also be integrated into production plants or set up separately. The automatic system reduces costs and increases packaging qualities.

Our intralogistics processes represent additional components that are integral to our production lines. They allow customers to benefit from great reliability, high volumes, low maintenance costs, and highly transparent material flows.

High-stack storage system

Cooling turner

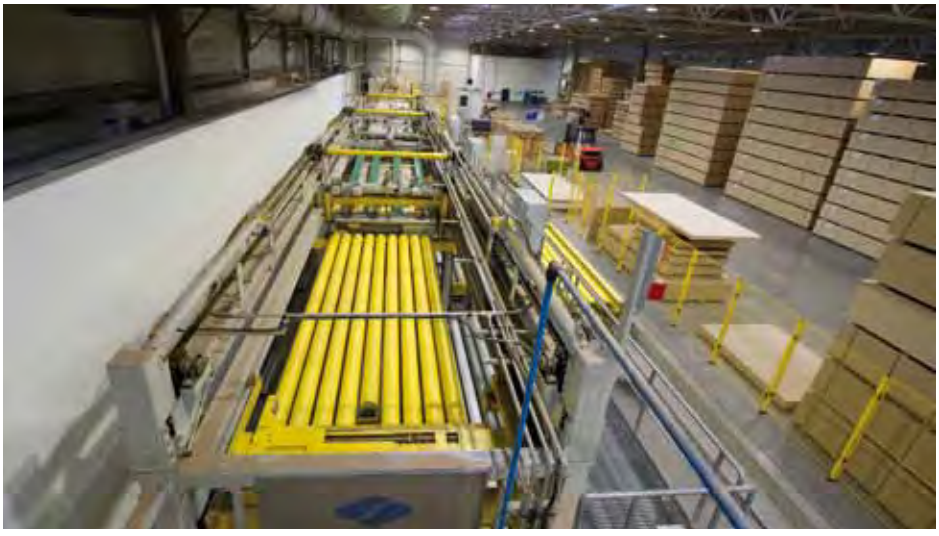


Diagonal saw

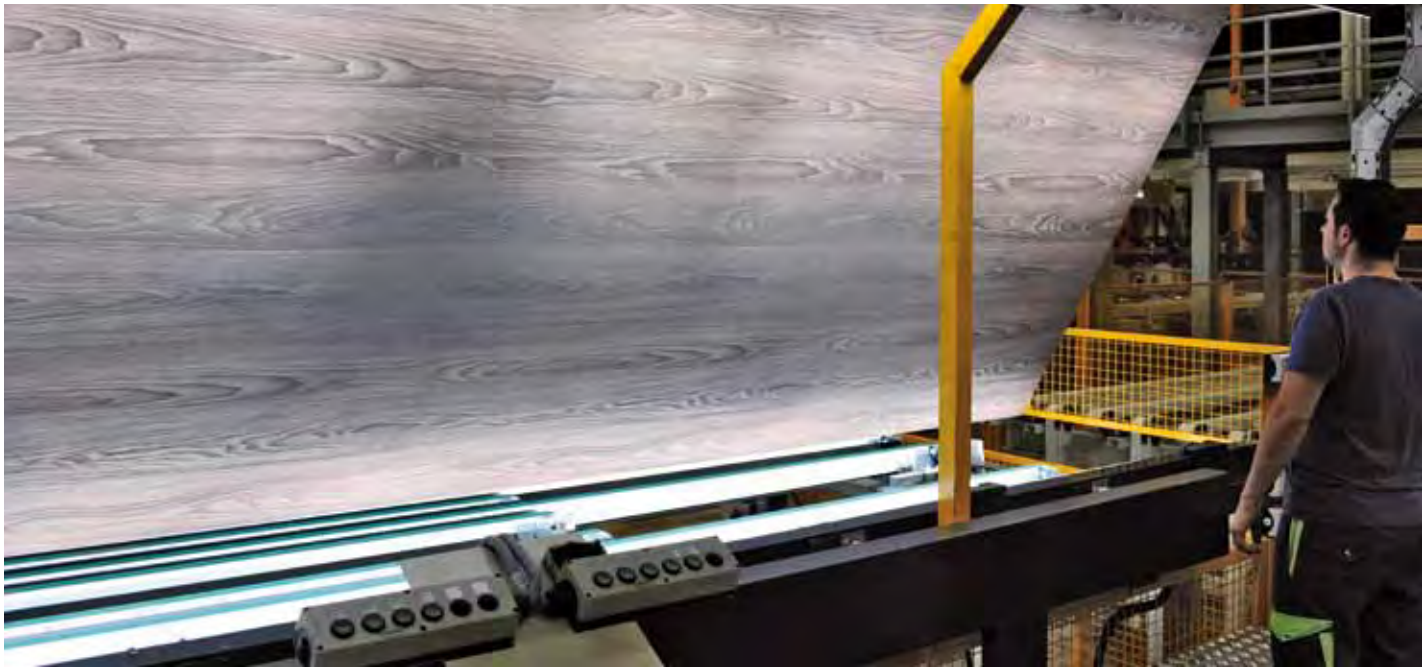
Edge-trimming saw

Gripper carriage with stacking stations

Gripper carriage



Stacking stations



Laminated board for the highest standards

KT700 short-cycle press – the high-end model

Short-cycle presses

As a press specialist, we support you with the appropriate presses for the fast, accurate, and economical surface-laminating of particleboard, MDF or HDF. Laminate flooring and boards for interior home and shop construction are coated with decorative papers using Siempelkamp short-cycle presses. Ever greater demands are being made here on the visual appearance and feel – and with that also on lamination technology. Due to the fact that laminated panels achieve significantly higher prices than non-laminated panels, a short-cycle press is a profitable investment.

We offer two custom-made short-cycle press concepts: They cover the entire bandwidth of the production range in demand, from the standard furniture board to the demanding specialty product.

KT400, the standard line

The multi-cylinder press "standard-line" is ideal for the production of high-quality products in line with European standards. Up to 40 press cylinders, an energy-efficient heating control, and pliant hot platens ensure the ideal pressure distribution. The advantages of this press are revealed in particular when it comes to laminating very different board sizes.

KT700, the high-end line

Do you produce particularly high-quality and innovative boards? Our high-end KT700 model is best suited for, among other things, the production of relief-embossed tiles, wall and ceiling panels as well as furniture boards. Due to a reduced pressureless exposure time of 0.8 seconds as well as increased pressure of up to 700 N/cm^2, the KT 700 ensures optimal product quality. The benefit for the customer includes higher added value through specific high-quality designs, for example, with deep embossings or metal decors.

Beyond the pressing process, you can find both KT models integrated in a logical overall concept – including material handling, storage and packaging systems.

Special plants

As a specialist for plants for the processing of panel-type materials we have developed a good feeling for our customers' requirements and for new market opportunities. Our special plants support customers in manufacturing innovative products efficiently and in high quality.

Plants for the production of laminated veneer lumber (LVL)

Siempelkamp plants for the production of laminated veneer lumber demonstrate how plant operators and manufacturers cooperate together to set new milestones.

The positive characteristics of beechwood were the basis of a development project resulting in the continuous production of laminated beech veneer lumber with a thickness range between 20 and 85 mm. This new product can be used as joists, beams, and panels in the construction industry or in interior design.

The fully automatic, continuous production with our ContiRoll® ensures best pressure distribution due to innovative pressure distribution plates. Upon request, we also supply the energy plant, resin storage and dosing solutions, the board handling, as well as the automation for our plants for laminated veneer lumber.

Plants for the production of lightweight panels

Siempelkamp is using the ideal properties of hexagonal structures – minimal material and energy consumption, and at the same time greatest possible stability – for the industrial manufacture of frameless light-weight panels. These consist of two thin wood-based panels and a honeycomb core made of cardboard, paper or MDF, and are characterized by their low weight, stability, and smooth surfaces. The surfaces can be sanded down, laminated, painted or left untreated for further processing. This makes light-weight panels particularly suitable for furniture manufacturing.

Our double-belt presses for the manufacture of lightweight panels allow the production of about 34,000 m^2 of boards per day. At your request, we provide them with a handling system, resin blending and application system as well as cooling and stacking units.

Plants for the production of wood-fiber insulation boards

Wood-fiber insulation boards are most frequently used for thermal and acoustic insulation in external wall-cladding systems and in internal ceilings, walls as well as for sound deadening in floors. Their qualities are also in high demand in the ecological construction sector.

For the production of wood-fiber insulation board, Siempelkamp has developed a special production method. This concept allows the manufacturing of boards with a thickness ranging between 20 and 300 mm using a continuous drying process. As the only manufacturer to date, we supply wood-fiber insulation board presses with a width of 8.5´ as well as our specially developed resin blending system units.

An important feature in this process is the use of the of the Conti-Therm® continuous calibration and curing device for the heating of

The advantages:

- Increased board quality
- Reduced production costs
- Energy savings of about 30 % per ton compared to the traditional wet process technology

LVL plant

Door skin plant

Multi-daylight press

LVL product

Bamboo and bamboo chips

the pre-pressed fiber mat. The mat is heated by blowing a steam-air mixture with an exactly controlled dew point through it.

Our portfolio comprises specific handling systems including diagonal and cut-to-size saws, profiling systems, stacking and loading equipment as well as packaging systems.

Plants for the production of door skins

In the special segment of door skins – thin, compression-molded MDF – we have positioned ourselves with special equipment technology. With an output of up to 11 million door skins per year, it is one of the fastest in the world. With this Siempelkamp technology, molded panel doors can be manufactured easily, simply, and at low cost.

Transformer board / multi-daylight presses

For decades, plant operators have been relying on our multi-daylight presses. Whether particleboard, MDF, HDF, door skins or OSB: the entire range of wood-based products can be processed on these presses. Even insulation material from pure cellulose pulp for high-voltage transformers can be manufactured with them. Large multi-daylight presses with a maximum height of 30 daylights are constructed particularly for OSB production according to a special Siempelkamp design principle. The largest multi-daylight press achieves a maximum daily production capacity of up to 2,400 m^3.

On Siempelkamp multi-daylight presses, high quality products are produced according to the wet process, e.g. insulation materials for high-voltage transformers. The characteristics of this product include, among others, high density, consistent thickness, surface smoothness, high mechanical strength, flexibility, ageing resistance, and, of course, excellent electrical insulating properties. A simultaneous closing device guarantees simultaneous mat contact and densification of all sheets, independent from the daylight.

The advantages

- The highest possible accuracy in thickness
- Surface smoothness
- High mechanical stability and repeat accuracy
- Flexibility and ageing resistance of the product
- Excellent electrical insulation properties

Siempelkamp transformer board presses are equipped with intelligent control and measurement technology and are controlled by means of a database recipe system. Additionally, they are equipped with a process data trending system for archiving the equipment data. We also offer forming lines, pre-compactor systems as well as loading and stacking lines that are fully adjusted to the presses.

Equipment for fast growing resources / annual plants

Board manufacturers are facing some far-reaching change processes: What will the board of the future look like when thinking ahead about what impact limited resources and climate protection will have. To what extent will annual plants open up alternatives? Together with plant owners Siempelkamp is breaking new ground and takes new plant concepts from initial vision to market launch.

In an effort to use annual plants, Siempelkamp developed a production line for fiberboards made of rice straw. Another prime example is a plant for the production of particleboards made from bamboo.

Chip conveyor and storage system

Conveyor technology

Conveyor and wood preparation technology in an MDF plant

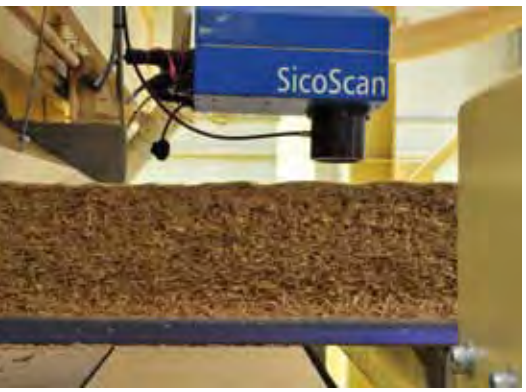
"All from one source" means that we can supply conveyor technology that is tailored to your equipment. Whether after removing the bark in the woodyard, as a feeder to the resin blending and metering system or to the dryer: Siempelkamp conveyor technology can be found anywhere within a wood-processing plant where bulk goods have to be transported quickly and safely.

Together with our subsidiary Sicoplan, responsible for planning and design, and the fan specialist Ventapp, we offer screw, belt, chain, flight, and pneumatic conveyors as well as extraction systems.

Measurement and process control technology: The intelligent production

The demands on the quality of particleboard, MDF, HDF, OSB, and veneer panels are high. Board weight, board thickness, density distribution, surface quality, and the mechanical properties are subject to very low tolerances. Siempelkamp meets these requirements with intelligent systems – from the adaptive, self-learning production control to mechatronic system components to machine monitoring and predictive maintenance.

SicoScan with mat



Partial view SicoCam – modern inline board measurement

Siempelkamp's automation and control technology combines control-related processes, control tasks, operation, visualization, and overlapping process control tasks into a sophisticated system.

SicoScan and EcoScan NEO

SicoScan plays a key role in the overall concept: this process-integrated measuring system avoids production fluctuations as well as unnecessary raw-material and energy consumption. With the ninth generation of the ContiRoll®, we have added EcoScan NEO to the SicoScan product family. EcoScan NEO is a traversing weight-per-unit-area gauge and tramp material detector for particleboard, MDF/HDF and OSB. According to the fast absorption measurement method, the traversing measuring heads of the EcoScan Neo scan the entire mat width in a sine curve. Depending on the board width, one or several X-ray sources located underneath the mat emit the X-rays through the mat. Self-adjusting measuring heads located above the mat detect the residual radiation that has not been absorbed. Taking into account the forming belt, even the smallest deviations in weight per unit area are detected at a consistent resolution of ±0.5% of the mat weight across the entire measuring range. An independent, stand-alone EcoScan Neo system emits X-rays through the entire mat. An intelligent algorithm detects tramp material as small as 1.6 mm. This is the most effective protection of all downstream press components.

Sequential product changeover

One of our key innovations in the area of process control technology is the sequential product changeover which can be ordered as an integral component of new a Siempelkamp plant or as a retrofit to existing plants. It is used when a plant operator runs many different smaller order batches and the goal is to minimize scrap, which is one of the biggest disadvantages of conventional product changeovers. This concept allows the production to be automatically changed over to a new recipe without having to open the mat reject nose.

The high-performing Siempelkamp resin metering system contributes to the interruption-free, sequential product changeover. Exact material quantities and changeover times are continuously calculated beforehand and monitored. The resin volume corresponds to a defined number of boards. This is to help minimize rejects.

Prod-IQ®

We developed Prod-IQ® to comprehensively analyze and optimize our customers' plants. This innovative process control technology system covers the areas of production management, quality assurance as well as maintenance and repair with a connection to an ERP system.

The modules at a glance:

- **Prod-IQ.basics** contains basic modules for the creation of reliable and up-to-date management KPIs (availability, plant output, consumption, quality) as well as for process documentation (MFT = material flow tracking)
- **Prod-IQ.business** for customizing reports, including the Script-editor

EcoScan NEO – in operation at EGGER

Customer benefits:

- High level of system availability due to fewer downtimes
- Optimized material consumption due to fewer rejects and optimal process control
- Higher production speeds
- Online quality control through prediction of physical properties and raw density profiles
- All data and numbers quickly available at the right time
- Cost-trend analysis evaluates the impact of modified settings on the costs
- Connection to ERP systems for vertical integration
- Energy data acquisition from the low-voltage network to the individual switch cabinets with existing measuring equipment as well as fuel-consumption data acquisition

Control room

- **Prod-IQ.quality,** online-quality prediction of physical properties, e.g. transverse tensile strength, bending strength, and thickness swelling
- **Prod-IQ.maintenance:** predictive and on-condition support for maintenance and repair
- **Prod-IQ.profile:** supplements the online-predictions by raw-density profiles on the basis of the physical simulation of the mat behavior in the press (powered by VHP).

Prod-IQ® Next – for the self-optimizing production plant

Prod-IQ® Next stands for the perfect interaction of all Siempelkamp developments supporting production intelligence. The concept integrates the ERP link, the recipe manager, the automatic production changeover, the online quality forecast and check, the optimized control circuits, the intelligent measurement technology, including condition monitoring for the ContiRoll®, as well as the performance monitoring of the machines. The customer plans the production – the plant carries out the production automatically. The entire process is monitored online, reliably, fully automated, cost-effectively and to schedule.

Simultaneous engineering, virtual commissioning: mechanics, hydraulic engineers, and software engineers are working together within a network

Savings	Value (in %)	Experience values	Notes
Downtime reduction	1.5	1.5 - 2.5	Systematic downtime analysis ⇨ faster trouble shooting
Waste reductions	1.0	1.0 - 2.0	Online quality check
Cut in material consumption	2.0	1.5 - 3.0	Reduced process fluctuations ⇨ lighter boards – consistent quality
Speed increase	0.5	0.5 - 6.0	Closest approach to the quality limit

Prod-IQ® – cut in cost

Sico CMS: To know everything about the future status of the machine

Siempelkamp's Sico CMS condition-monitoring system ensures high productivity for the manufacture of wood-based panels – a production that utilizes the service life of all wear parts and valuable remaining terms. Entire plant systems are monitored, their state of wear and use evaluated and imminent failures detected. The information is supplied to the different system users in a sophisticated information chain via dashboards.
The information is available locally as well as globally across all plants for IoT applications – e.g. for access to Siempelkamp's spare parts warehouse or service technicians.

Sico CMS is equipped with the well-known SPC computer technology for a quick and highly accurate signal acquisition, real-time computer technology, and software modules for the analysis of the machine status. Additional functions of the system: machine parameter restrictions for optimal low-wear mode of operation, web-based user interface, interface for the automatic notification to modern information technologies and secure access via remote access.

Due to its compatibility to any sensor technology, Sico CMS is well suited as a retrofit to existing plants to improve production. Sico CMS can be customized to meet individual requirements and can be expanded for future tasks.

Sico SPC

To meet the future demands on control systems and the digitalization in machine and plant engineering, we have developed the new Sico SPC G9 press controller. This intelligent pressure and position control system uses raw material data from pressure sensors and position gauges to control the requested press forces and the relevant measuring technology for highly accurate board thicknesses in the technological pressing zones of the ContiRoll®.

Control room

Raw-material and process data for mat forming

Online monitoring and optimization with Prod-IQ.quality

SicoCam: The innovative measuring system for inline board measurement system

The SicoCam inline-board measuring system by Siempelkamp (SLS) measures wood-based boards in a continuous cycle. Four programmable high-performance cameras supply measured values for calculating the board size and controlling the saws. These cameras capture the corners of every board that passes by during production. The measurement data undergo software-supported processing in the form of width, length, and diagonal dimensions and can be evaluated immediately.

SicoCam advantages at a glance:

- Material and resource savings
- Improved workplace safety
- Increased quality of manufactured boards
- Continuous quality control

Intelligent production – no vision, but a Siempelkamp reality

Regardless of whether we talk about Prod-IQ®, Sico CMS or EcoScan: All of the above introduced systems are part of an overall solution – "Prod-IQ® Next" – which saves the plant operator a lot of work. The operator places the production order, the rest happens automatically, accurately, and unerringly. In the self-optimizing plant all factors communicate and interact with one another, which is decisive for the final product. Everything becomes traceable; each board has a digital product memory across the entire value-added chain.

Switch cabinet assembly, ATR

Plant automation

Within the Siempelkamp Group, ATR Industrie-Elektronik GmbH stands for high-performance automation solutions that integrate ideally into your business processes. This enables best product quality and productivity. You have the choice between the highest possible level of standardization and solutions customized to your needs.

Our plant automation provides a consistent overall concept relating to electric components, open and closed-loop control systems, network components, drive technology as well as the operating and monitoring of the entire machine or plant. In addition, the solutions are integrated into the process control technology. Last but not least, we also provide for secure assembly and fast commissioning of the systems.

Switch cabinets, the core competence of ATR, represent the technical "central nervous system" of a plant. They secure power circuits, control drives, networks, and act as the interface for all information regarding the current state of the plant and processing. Increasingly more industrial branches are relying on this competence, so that our company is regarded as one of the largest providers in Germany.

Services:

- Power, control, drive, and microprocessor cabinets up to 1,000 V
- Manufacture of the switch gear and control gear assemblies in compliance with national and international regulations and standards, e.g. DIN, EN, ISO, NEC, UL, cUL, CSA, and EAC
- Acceptance and certification of UL and cUL plants on site by authorized personnel
- High development and production competence for instrumentation and control electronics
- Intelligently optimized and standardized manufacturing processes
- 100% final inspection of all switch gear and control gear assemblies
- Contract manufacturing in made-to-order and mass production

Transport, assembly, start-up

Siempelkamp customers can be found all over the world. That's why we offer country-specific transport concepts from A to Z. This is followed by the professional assembly and start-up of the plants at the construction sites – the perfect completion of the "all from one source" concept!

Transport

Our tailor-made logistics concepts include the organization and implementation of the entire logistics chain of worldwide suppliers all the way to your site. We organize the timely pick-up of the machine and plant parts from the manufacturers and are responsible for the necessary packaging, tailored to the mode of transport and the transport route.

Services:

- Detailed planning and control of the transport chains
- Barcode-based interface monitoring all the way to the customer construction site
- Complete storage planning for the construction site – at times through to the delivery of the foundations
- Implementation of the storage planning by trained personnel on site
- Support with the documentation and payment of customs duty in the recipient country

Assembly

We deliver all plant components for installation based on the detailed installation schedules and personnel plans to your construction site. In many cases our experts focus on supporting the customer's own assembly team. Increasingly often, however, we are commissioned to carry out the entire plant installation. Here, everything literally revolves around the Siempelkamp assembly manager who manages the entire installation on site and who coordinates and controls the deliveries and services together with the project-management team in Krefeld.

Services:

- Stipulating dates, deliveries, tools and assembly staff
- Coordination of the entire installation on site
- Speedy assembly process
- Transparency among everybody involved
- Binding arrangements between suppliers, customers and Siempelkamp
- Monitoring of time and cost planning

Packaging of the plant components for dispatch

Press assembly

Installation of ContiRoll® for LVL

Start-up

The first board

Start-up

Our specialists perform the mechanical, electrical and technological installation in close collaboration with customers all over the world in a professional manner. Our core skills include the start-up and subsequent ramp-up of production in as short a time as possible and for the plant to achieve regular 24-hour operation accordingly fast. Fast ramp-up is top priority for all plant owners so that the investment is amortized by a quick production start. Start-up times of less than six weeks from the beginning of the start-up to full production are not uncommon.

Services:

- Mechanical and electrical start-up of all equipment
- Start-up of the plant control system without and with material
- Training of the customer's staff in the operation and maintenance of the plant (mechanics, electrics, hydraulics)
- Start of board production with technological training including a technology manual
- Increasing production capacity until test operation of the plant
- Hand-over of the running plant to the customer

Driven by perfection – for service, modifications and upgrades

More than 1,000 supported plants across the world, three locations, one service promise: Siempelkamp Logistics & Service GmbH (SLS) is responsible for handling the Siempelkamp Group's service business. "You request – we deliver." – that's the company motto because our work doesn't stop when a customer has accepted a plant.

The core business for SLS is the provision of after-sales services for Siempelkamp machines and plants across the world. With activities that include the planning and implementation of upgrade and modification projects, spare-parts services, field services and support, digitalization and process automation.

Upgrades and retrofitting: From old to new

SLS offers retrofit and upgrade concepts that deliver efficient solutions adapted to the individual requirements of Siempelkamp, Küsters, and Bison plants across their life cycles – both in regard to upgrades for individual components and comprehensive retrofits that include installation.

Customer benefits

- Optimized processes
- Greater productivity
- Increased plant availability
- Reduced service and maintenance costs
- Short downtimes

SLS location Bad Kreuznach

Spare parts from the specialist: You request. We deliver.

As a specialist for spare parts, SLS knows what matters most to its customers: Speed and quality. That's why the service and logistics center at the Bad Kreuznach location has boosted its service capacities further by getting itself certified as a Known Consignor'. Its modern warehouse-management system, large available stocks, high capacities, and streamlined processes ensure highest performances. SLS additionally offers further services that enable it to comprehensively cater to its customers' needs. These include, for example, the stocking and management of customer inventory and a digital service platform.

Customer benefits

- Original spare parts from the manufacturer
- Large capacities and quick availability through efficient logistics
- Reduction of own spare parts inventories
- Reduced wear, improved product properties
- Increased plant availability

Service and logistics center in Bad Kreuznach

Service team at work

Connecting the supply chain: From Service 4.0 to Logistics 4.0

Smart, digital, networked – that's how the SLS Service 4.0 connects with Logistics 4.0. Here, sales channels have been digitalized for the purposes of networking with customer processes. Service 4.0 thus enables customers to synchronize spare-parts lists and prices directly through their ERP systems and exchange order details with SLS through a portal. The result is lower transaction costs and faster coordination. The benefit: processes that run very smoothly.

24/7 and worldwide: SLS is wherever its customers are

Continuous support is one very important element within SLS's strategy for the provision of services. SLS has consequently established a 24/7 remote service in addition to its regular field services for the purposes of enabling it to deliver rapid and effective responses and adapt the direct, fast and reliable analysis of the status of a plant in a way that has been tailored to suit industrial applications.

SLS further provides its customers with highly qualified services that range from needs analyses to on-site troubleshooting, which means that its service teams will handle all work related to plants manufactured by Siempelkamp. These teams also receive technical support during their worldwide consulting and engineering deployments from all other machine and plant departments at Siempelkamp.

Customer benefits:

- Access to plants only after service request by the plant operator
- Access to released plant components only
- Automatic documentation of remote-service support
- User-friendly handling

Service 4.0

The technologies that fall under the Service 4.0 heading also constitute important aspects within the concepts that SLS offers. One example here is Prod-IQ® (see page 28): The intelligent control-technology system that improves cost transparency, reduces resource consumption and increases plant uptimes. It is thus one of the many options that SLS is able to draw on when preparing existing plants for a successful future.

Pre-owned plants

Siempelkamp also supports its customers in acquiring and selling used plants for the wood-based panel industry. We buy back, consult and disassemble field-proven machinery, tailoring it to customer-specific requirements to lead them back to the market. Our support includes all services leading to the re-commissioning of used plants.

Both the seller and the new plant owner will benefit from our support: When shutting down a plant, the customer contacts us to benefit from our worldwide marketing expertise. Customers buying a pre-owned plant know that they may rely on our experience and the provision of all adequate equipment.

Our service portfolio at a glance:

- Marketing of pre-owned plants for manufacturing particleboard, MDF and OSB with continuous press systems made by Siempelkamp, Küsters, Bison and Metso
- Marketing of pre-owned machinery for surface lamination of particleboards and MDF (short-cycle press plants)
- Support in the placement / purchase of pre-owned plants
- As-is analysis, including technical assessment
- Advice on repairs, spare parts, modernizations and possible complementary new equipment
- Plant planning and engineering of tailor-made solutions
- Project-specific planning of all the individual processes
- Appropriate disassembly, "all-round care-free" logistics, professional re-assembly, including start-up and functional guarantee

The advantages

- Reliable Siempelkamp expertise as plant manufacturer and system supplier for integrated systems in the wood-based material industry
- Sound basis: our detailed knowledge and experience in the pre-owned plant business
- Database-based system for collected potential interests worldwide
- Support by an experienced project team during the entire realization process
- Cost reduction, greater availability of the plant, higher capacities, increased product quality and less maintenance costs due to the implementation of innovative modification and modernisation packages
- Project safety with regard to dates and costs
- Complete solutions from one source – a competent partner

Disassembly of pre-press

Disassembly of ContiRoll®

Re-assembly of ContiRoll® press frames

R&D Center, Krefeld

R&D Center, Zweibrücken

Research and development

During the production of panel-type materials, increasingly higher qualities and capacities are just as much in demand as the conservative use of resources and high energy-saving potentials.

Employees specializing in different fields develop new methods and solutions for highly complex technical processes at our research and development center located at the Krefeld headquarters. From the first idea to the finished equipment, we dedicate time to feasibility studies and analyses about product properties, suitability, and risks. Our scope of services also consists of raw material evaluations regarding the processed wood all the way to the applied resin as well as product analyses under laboratory conditions.

With the integration of Pallmann, the specialist for size-reduction technology, into the Siempelkamp Group, we have gained another research and development center – the largest of its kind. At the Zweibrücken location we are working with 130 installed size-reduction machines, which are fully-operational. This equipment supports our process development, the further development of our machines, and the testing of new developments.

The ecology of modern production processes is becoming increasingly important. The topic of energy efficiency is becoming a strategic factor of the highest priority. In this way, the manufacturers of wood-based products obtain considerable cost and competitive advantages, conserve valuable resources, and reduce emissions with our equipment.

Another focus of our development strategy: Intelligent systems from the adaptive and self-learning production control, to mechatronic system components and efficient measurement systems, to machine monitoring and predictive maintenance. The topic of digitization is gaining importance in all business units. The objective here is the self-learning and automatically self-adjusting production plant.

Last but not least, the Generation 9 ContiRoll® and the Generation 9 NEO are the results of our continuous research and development. The newly developed press infeed section, the innovative drive and measurement technology, the simulation and process control technology as well as the new methods for mat-preheating and for the finishing line take the ContiRoll® to a new level. The newly developed roller-rod chain sets new standards in regards to service life and wear resistance.

Samples at the Krefeld research and development center: a broad spectrum

Siempelkamp R&D Centers – the topics:

- **Size-reduction** – e.g. chipping, flaking, fiberizing, milling
- **Separating** – e.g. screening, sifting
- **Drying** – e.g. chips, wood-particles, minerals, special drying goods
- **Mixing** – e.g. plastics, granulates, rubber
- **Resin application** – e.g. bio-based binding agents, silanes, fibers
- **Mat forming** – e.g. mat forming with fibers or plastic pellets
- **Unwinders and winders** – e.g. paper sheets, plastic sheets, rubber sheets
- **Presses** – e.g. ContiRoll®, cycle presses, heating-cooling presses

Siempelkamp in Blatnice, Czech Republic: Steady growth

Wuxi, China: First competence center in Asia

Internationality: More quickly, locally, and cost efficiently

International markets and location factors set specific parameters for the production – whether in regard to resources or the climate, local markets or political framework conditions. Thanks to our long range and adjustment to differentiated markets, we have become faster and more locally available for our customers and as a result more cost-efficient. Our guiding principle of "Top quality according to the Siempelkamp standard" applies worldwide!

Blatnice / Czech Republic: Effectively used synergies

The Blatnice location has been a part of Siempelkamp's international production locations since 2008 / 2009. A large bandwidth of components for the forming line as well as products for chip production, such as log feeders, rotor debarkers, wood chippers, flakers, forming machines, and finishing-line machines, are manufactured in Blatnice. An increasing number of high-quality component groups, including the electrics and pneumatics expand the production volume. Synergies within the group of companies are actively being used, for example, with Ventapp, which is a Siempelkamp subsidiary in Germany. Ventapp supplies finished laser parts and laser-chamfered parts to Blatnice.

Wuxi / China: First competence center in Asia

As a technology supplier, Siempelkamp has many decades of expertise in Asia. From a plant concept that is specifically tailored to this market to two top-equipped production locations in China, we have our finger on the pulse of our plant operators. Our first Chinese production location, founded in 2004, manufactures components for forming machines and the forming line for the Asian market. Another mainstay is the manufacture of mass-produced parts for the plant network. For Siempelkamp this location represents an important interface to the Asian market.

Qingdao 2017: Second location in China

Our production location in the Sino-German Ecopark Qingdao in the southern area of the Shandong province provides the best conditions to supply the Asian market with press components quickly and reliably according to Siempelkamp's quality standard. Our proximity to the market enjoys a high level of popularity: Several times already our customers placed direct orders with Siempelkamp Qingdao.

CMC / Italy: The front-end innovator

Established in 1962 as a metalworking company, CMC has been cooperating with Siempelkamp since 1980. In 2010, CMC became a 100% Siempelkamp subsidiary and contributes its expertise in the area of technology for the front-end of the line. The competence of CMC in the wood-based panel industry resulted in several innovations in recent years. This includes, for example, the Ecoformer SL, a further development of the traditional wind forming concept.

CMC in Colzate, Italy

Sicoplan / Belgium: The planning and engineering experts

The key to an optimally operating plant is comprehensive engineering – the core competence of of Sicoplan, Siempelkamp's subsidiary in Belgium.. The spectrum starts with technological consulting services, includes comprehensive project studies containing raw material and energy requirement calculations, and ends with the planning of complete production plants. Furthermore, Sicoplan also carries out the technological start-up- of plants, performs measures to optimize processes, and is involved when plants are to be upgraded, modified, or expanded.

Siempelkamp in Quingdao in China: preparation of test with active load

Europe

1 Germany

Corporate Headquarters
Siempelkamp Maschinen- und Anlagenbau GmbH
Siempelkampstr. 75
47803 Krefeld, Germany
Phone: +49 2151/92-30
Fax: +49 2151/92-5604
wood@siempelkamp.com
www.siempelkamp.com

Siempelkamp Maschinenfabrik GmbH
Siempelkampstr. 75
47803 Krefeld, Germany
Phone: +49 2151/92-4445
Fax: +49 2151/92-5445
www.siempelkamp.com

Siempelkamp Logistics & Service GmbH
Branch office Bad Kreuznach
Sandweg 2–6
55543 Bad Kreuznach, Germany
Phone: +49 671/796110-0
Fax: +49 671/796110-69
sales@sls.siempelkamp.com
www.sls-siempelkamp.com

Siempelkamp Logistics & Service GmbH
Branch office Krefeld
Siempelkampstr. 75
47803 Krefeld, Germany
Phone: +49 2151/92-30
Fax: +49 2151/92-5604
sales@sls.siempelkamp.com
www.sls-siempelkamp.com

Siempelkamp Logistics & Service GmbH
Branch office Wolfratshausen
Hans-Urmiller-Ring 6
82515 Wolfratshausen, Germany
Phone: +49 8171/402-0
Fax: +49 8171/402-251
sales@sls.siempelkamp.com
www.sls-siempelkamp.com

Büttner Energie- und Trocknungstechnik GmbH
Siempelkampstr. 75
47803 Krefeld, Germany
Phone: +49 2151/448-0
Fax: +49 2151/448-310
sales@buettner-energy-dryer.com
www.buettner-energy-dryer.com

Büttner Energie- und Trocknungstechnik GmbH
Branch office Hanover
Lohweg 8
30559 Hannover, Germany
Phone: +49 511/58 979-0
sales@buettner-energy-dryer.com
www.buettner-energy-dryer.com

ATR Industrie-Elektronik GmbH
Siempelkampstr. 50
47803 Krefeld, Germany
Phone: +49 2151/92-6100
Fax: +49 2151/92-6101
info@atrie.de
www.atrie.de

VENTAPP GmbH
Hooghe Weg 45
47906 Kempen, Germany
Phone: +49 2152/2008-0
Fax: +49 2152/2008-90
postmaster@ventapp.de
www.ventapp.de

Pallmann Maschinenfabrik GmbH & Co. KG
Wolfslochstr. 51
66482 Zweibrücken, Germany
Phone: +49 6332/802-0
Fax: +49 6332/802-401
management@pallmann.eu
www.pallmann.eu

Hombak Maschinen- und Anlagenbau GmbH
Sandweg 2–6
55543 Bad Kreuznach, Germany
Phone: +49 671/707-0
Fax: +49 671/707-67
info@hombak.de
www.hombak.de

Siempelkamp Krantechnik GmbH
Daimlerstr. 1
26802 Moormerland, Germany
Phone: +49 4954/9591-0
Fax: +49 4954/9591-90
info.krantechnik@siempelkamp.com
www.siempelkamp-krantechnik.com

Strothmann Machines & Handling GmbH
Maschinenbau und Handhabungstechnik
Altenkamp 11
33758 Schloß Holte-Stukenbrock, Germany
Phone: +49 5207/91-22-0
Fax: +49 5207/91-22-196
info@strothmann.com
www.strothmann.com

International Siempelkamp locations

② France

Siempelkamp France SARL
2, Parc des Fontenelles
78870 Bailly
France
Phone: +33 130 800690
Fax: +33 134 625174
sicofrance@wanadoo.fr

③ Italy

CMC S.r.l.
Via Luigi Rodigari, 10
24020 Colzate (BG)
Italy
Phone: +39 035 737111
Fax: +39 035 714449
info@cmc-texpan.com
www.cmc-texpan.com

④ Czech Republic

Siempelkamp CZ s.r.o.
P.O. Box 10,
Prumyslova zona
Blatnice pod Svatym Antoninkem 893, 696 71
Czech Republic
Phone: +420 518 698 210
Mobil: +420 602 733 124
Fax: +420 518 698 215
michal.pospisil@siempelkamp.cz

⑤ Belgium

Sicoplan N.V.
Koningin Astridlaan 46
8930 Menen-Lauwe
Belgium
Phone: +32 56 439011
Fax: +32 56 439010
mail@sicoplan.be

⑥ Spain

Siempelkamp Maschinen- und Anlagenbau GmbH
Calle Norte Nr. 70, local 12
08950 Esplugues de Llobregat (Barcelona)
Spain
Phone: +34 93 371 3195
Fax: +34 93 473 8693
silvia.matisek@siempelkamp.com

⑦ Turkey

Siempelkamp Maschinen- und Anlagenbau GmbH
Kayısdagi cad.
1. Bayraktar sok. No:9
Ülker Ünver Plaza K:4 D:10
Atasehir / Istanbul
Turkey
Phone: +90 216 469 3593
Fax :+90 216 469 3594
Faruk.Sisci@siempelkamp.com

Eastern Europe/Russia

⑧ Russia

Siempelkamp GmbH
115054 Moscow
Russia
uliza Dubininskaya 57
Building 2, Office 2.211A
Subway station – Paveletskaya
Phone: +7 495 6603485/87
konstantin.putintsev@siempelkamp.com

⑨ Belarus

IOOO Siempelkamp BEL
220004 Minsk
Republic of Belarus
Rakowskaja ul.,
16B, Pom. 5N, Kab. 6
Phone: +375 17 209 42 84
Phone: +375 29 507 88 72
valery.kalesnikovich@siempelkamp.com

Asia

⑩ China

Siempelkamp (Wuxi) Machinery Manufacturing Co. Ltd.
Unit 1420, Landmark Tower 2,
8 North Dongsanhuan Road
Chaoyang District, Beijing City
China
北京市朝阳区东三环北路8号 亮马河大厦2座
430室
P.C.: 100004
Phone: +86 10 6590 7512 22 32
Fax: +86 10 6590 7502
yu.ming@siempelkamp.com

Siempelkamp (Wuxi) Machinery Manufacturing Co. Ltd.
2nd Phase No. B-12 Land of Wang Zhuang Industrial Zone
New District,
Cheng Nan Road 223-3, Wuxi, Jiangsu Prov. 214 028
China
Phone: +86 510 85360680
Fax: +86 510 85360640
china@siempelkamp.com

Southeast Asia

⑪ Singapore

Siempelkamp Pte. Ltd.
1 Fifth Avenue / # 02-10 Guthrie House
Singapore 268802
Singapore
Phone: +65 622 33168
Fax: +65 622 58387
henning.gloede@siempelkamp.com.sg

⑫ India

Siempelkamp India Pvt. Ltd.
7A, Elgin Road
Kolkata - 700 020
India
Phone: +91 33 2283 2014/2034
Fax: +91 33 2283 2041
siempelkamp.india@gmail.com

Australia

⑬ Australia

Siempelkamp Pty. Ltd.
Suite 5, 214–216 Bay Street
Brighton, Victoria 3186
Australia
Phone: +61 395967577/78
Fax: +61 395966694
post@siempelkamp.com.au

North America

⑭ USA

Siempelkamp Limited Partnership
200 N. Cobb Pkwy, Suite 302
Marietta, Georgia, 30062
USA
Phone: +1 7045220234
Fax: +1 7045221804
info@siempelkamp-usa.com
www.siempelkamp-usa.com

South America

⑮ Brasil

Siempelkamp do Brasil Ltda.
Av. Cândido de Abreu, 70 sala 43 – Bloco Corporate
80530-000 Curitiba/PR
Brasil
Phone: +55 4132326806
siempelkamp@siempelkamp.com.br

Siempelkamp

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