

# presses and more

The Dieffenbacher Group Magazine  
Issue 2017



**DIEFFENBACHER**

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Dear customers and friends,

October 1, 2016, is a milestone in the history of our company: In the Croatian city of Bjelovar, a CPS+ was put into operation for the first time and produced its first board for our customer Kronospan.

The CPS+ embodies what we mean by the motto: "the next level of plant efficiency." It is under this motto that we will appear at Ligna 2017, and it will be our constant companion for a long time to come. It expresses our goal to be the leader in the wood-based panel industry for efficient turnkey production lines.

In this edition of *presses and more*, you will discover how we plan to achieve this goal. On the following pages, you can read about the first CPS+ and innovations in the fields of screening and flaking, as well as retrofit options that increase plant profitability. There are reports on a superlative OSB plant that we have implemented for MLT in Russia, the new MyDieffenbacher customer service portal, and a plant relocation as an efficient alternative to a new plant.

Special coverage of Latin America and a guest article by Mike Botting, Editor Emeritus of the renowned *Wood Based Panels International* trade journal, are further highlights of this edition.

That is just a brief insight into the topics covered in this edition of *presses and more*. We hope you enjoy reading it, and we are sure you will find many more interesting and exciting features!

Christian Dieffenbacher

Wolf-Gerd Dieffenbacher

# Milestone Reached: New CPS+ Produces First Board



CPS+



Double-hinge-infeed system for maximum flexibility



Orthogonal steel belt adjustment for improved steel belt tracking



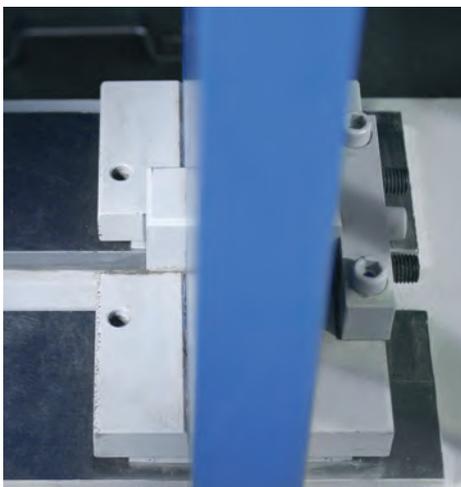
Control room



Interior and offset located cylinders for ideal pressure distribution and best thickness tolerances



Easy maintenance access



Sliding plates for thermal expansion absorb lateral forces

*Additional Highlights:*

- Production speed up to 2,500 mm/s
- Exchangeable protection platens
- Possibility to use steel belts with thicknesses up to 3.5 mm

Only 17 months after being unveiled at Ligna 2015, the first plant with the new CPS+ press has been successfully put into operation. After a seven-month assembly period, the first board was produced according to plan on October 1, 2016, at Kronospan's new particleboard plant in Bjelovar, Croatia.

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*First board:  
October 1, 2016*

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„The process of commissioning the first CPS+ was absolutely seamless,“ said Bernd Bielfeldt, Head of the Wood Business Unit. Only two weeks after first board production, Kronospan increased production to three shifts, citing the reliability of its CPS+ press. Kronospan has also said it is extremely satisfied with the project, adding that the joint approach to project processing has proven to be reliable. It was not apparent either in the planning phase or installation phase that this was the first project involving a CPS+.

## *Highlight of Further Scope of Delivery: Windformer*



Windformer with roller deck



Forming station



The three levels of the forming station



Raw board handling

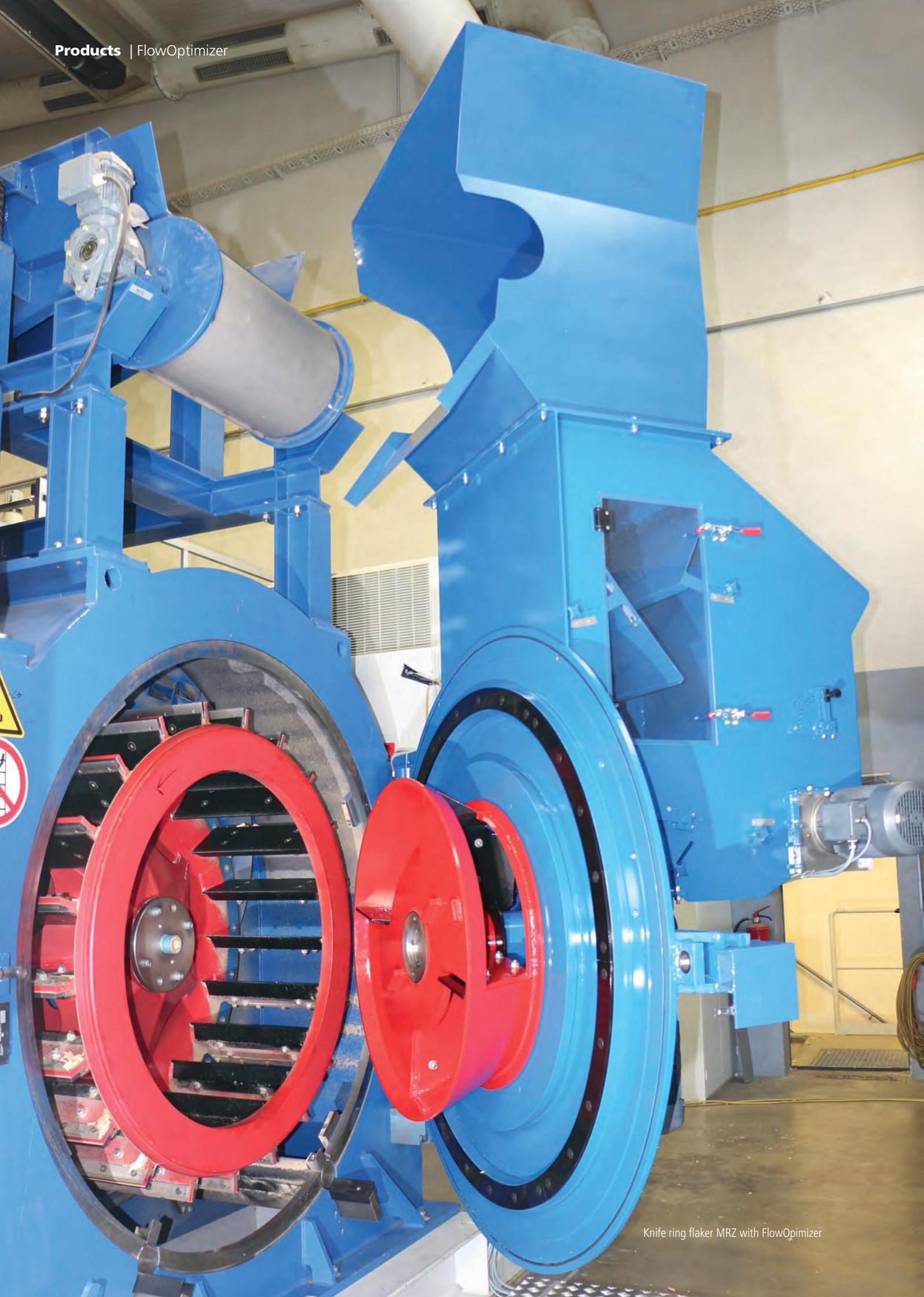
## From Roller to Nozzle – New Release Agent Applicator Safely Protects from Material Sticking on Steel Belt



PMDI glue is used to prevent formaldehyde emissions, particularly when producing OSB. However, since PMDI instantly reacts with smallest material deposits on the steel belts of the press, there is an increased risk of damaging both the surface of the board and the steel belt itself. To prevent this, a separating layer is applied to the steel belts, using a special release agent.

In conventional systems, the release agent is sprayed onto a roller and then applied to the steel belts. However, the new system dispenses with the intermediary roller and works exclusively with nozzles. The amount of release agent applied is automatically adapted to the operating speed of the machinery. Additionally, the spraying width can be adjusted by switching individual nozzles on and off. Potential evaporation will be captured by the press suction system, thereby preventing contamination of important components.

Since it is superior to the roller system in both price and function, the new release agent applicator is now standard in all new Dieffenbacher plants in which PMDI is used. The small amount of space it requires in front of the press makes it ideal for retrofitting in existing plants.



# FlowOptimizer

## 3-D Feeding of Knife Ring Flakers

### Innovation for optimizing flake preparation for particleboard production

Flake quality is crucially important for cost-effective particleboard production. It has a significant impact on downstream production steps such as drying, screening, sifting, gluing, and pressing. Moreover, it affects the final mechanical board properties and the finishing and further processing of raw boards.

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#### *Flake quality is crucial*

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Optimum flake quality enables the saving of raw materials and glue required for particleboard production. The key requirement of flake preparation is achieving an optimum – preferably constant – sieve distribution curve and receiving flat flakes with narrow thickness tolerance, adapted to the needed board quality.

Modern particleboard plants mostly use knife ring flakers for the flake preparation. In practice, these machines may have difficulties achieving uniform material distribution in the flaking chamber. This situation can be significantly improved using the FlowOptimizer.



#### **State-of-the-art Knife Ring Flakers**

All knife ring flakers currently on the market have a similar general design and working principle.

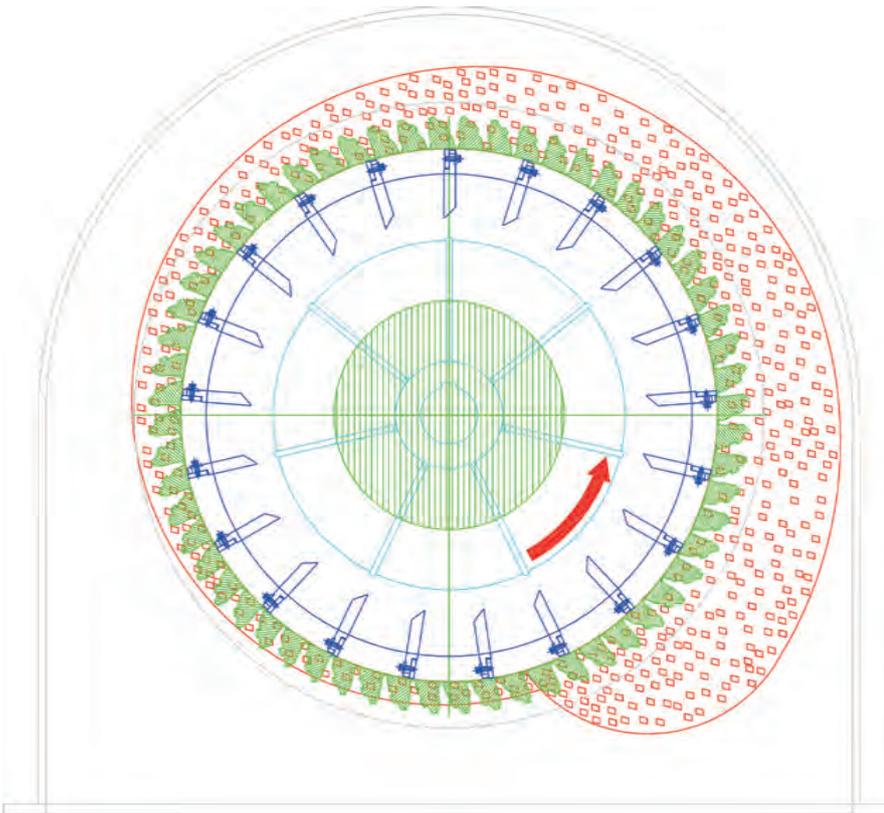
The wood chips are fed into the flaker via a vibration conveyor with magnetic drum and material cleaning system, executed as an air sifter. The air flow used for the sifting process axially forwards the chips through an opening in the machine door into the flaking

chamber. In the flaking chamber the chips axially impact the rotor, are deflected in the radial direction, and are guided by the rotor shovels to the knives of the knife ring to be cut into the required flat flakes.

Crucial factors affecting flake quality include the quality of the wood chips, the adjusted knife ring protrusion, the knife angle and knife relief angle, the gap between the rotor knives and knife ring, and the size of the flake

discharge gap, determined in the modern knife rings by the wear plates.

The uneven wear of the parts interacting with the material flow at the rotor and knife ring not only reduces the life of the parts themselves, but it also results in difficulties adjusting knife protrusion, rapid worsening of the cutting conditions, and finally, loss of flake quality.



State-of-the-art knife ring flakers: uneven material distribution over the knife ring circumference



Maier knife ring flaker with FlowOptimizer: even material distribution over the entire knife ring circumference

### Inhomogeneous Material Distribution – Uneven Wear on the Knife Ring and Rotor

A well-known problem is that the material being deflected by the rotor in the radial direction often impacts the knives of the knife ring only at a relatively limited zone. In this zone, the wear of knives and wear plates is faster than in the zones with less material load. As a result, the entire knife length (knife ring width) cannot always be used evenly.

Another problem of modern flakers is that the feeding via an axial air flow and gravity force – combined with particular flaking chamber design – make it impossible to distribute material over the knife ring circumference homogeneously. As a result, the knife ring has a limited zone with maximum material load, depending on the direction of the rotor rotation. This means that the considerable part of the knife ring circumference is not optimally used for flaking. Moreover, the knives over the knife ring circumference are also not evenly worn; in the zones with more material load the wear is bigger than in the zones with less load.

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### *Uneven wear causes problems*

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Various approaches are used in modern ring flakers to remedy the problem of material distribution. So-called “distribution discs” are one approach for influencing the material distribution over the knife ring width. These are used in two different ways:

- Static distribution discs firmly mounted at the rotor;
- Dynamic, eccentric distribution discs, which are separately driven.

Using the distribution discs in practice does not always guarantee even chip distribution over the knife ring width. In principle, the problem of uneven material distribution over the ring circumference cannot be solved in such a way.

Various solutions on the market can reduce the wear over the entire knife ring circumference. For example:

circumference of the knife ring.

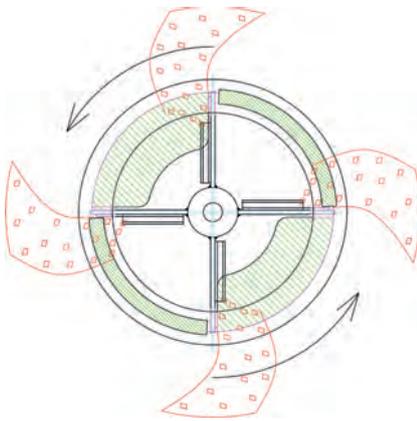
### FlowOptimizer Solves the Problem of Inhomogeneous Material Distribution

A new approach from Maier, however, does solve the problem. Using "3-D distribution technology", it ensures the optimum material distribution

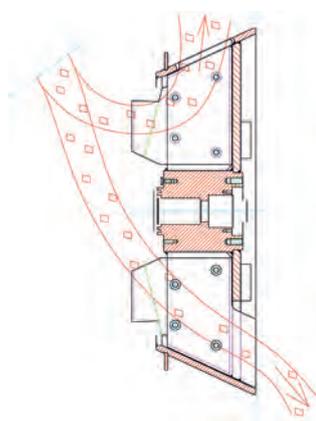
ference, allowing the optimum and uniform use of the entire knife length.

### Easy Retrofit, Impressive Results

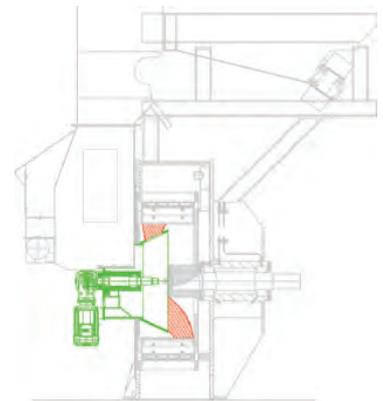
The primary advantages of optimum 3-D material distribution are optimization of flake quality and lower operating costs per ton of material produced.



FlowOptimizer working principle: even material distribution over the knife ring circumference



FlowOptimizer working principle: even material distribution over the knife ring width (knife length)



Even material distribution over the knife ring width (knife length) in the knife ring flaker

- Use of a continuously driven knife ring, slowly rotating in the opposite direction to the rotor during the machine operation;
- For flakers with a static knife ring – periodic manual rotation of the knife ring during the knife ring exchange.

While these approaches reduce the uneven wear on the knife ring over the circumference, they cannot prevent uneven material loading caused by the type of feeding into the flaker; nor can they influence the wear of knives over the knife ring width.

Unfortunately, none of the current approaches provides a reliable solution to the problem of uneven material distribution over both the width and

over both the entire knife ring width (knife length) and the entire knife ring circumference.

The key is the FlowOptimizer, a special distribution rotor integrated into the flaking chamber. The axially blown-in chips enter the inner chambers of the distribution rotor, are set into rotation and are guided via centrifugal forces through the openings at the front

### FlowOptimizer ensures even material distribution

and rear side of the system toward the main rotor. This achieves optimum distribution over both the knife ring width and the entire knife ring circum-

Overall, the new solution provides the following:

- Optimum use of the total knife length (both of the complete width, as well as the entire circumference of the knife ring), resulting in increased throughput and extending the service life of wear parts;
- Uniform wear on all wear parts of the rotor and knife ring affected by material flow. This enables optimized adjustment of the knife ring to improve flake quality;
- Smaller rework and regrinding, e.g., of the rotor blades and the knives of the knife ring;
- Optimum cutting conditions over a greater period of time, thus reducing energy consumption during the flaking process.

Implemented as a prototype, the solution was initially tested in a Knife Ring Flaker MRZ 1400 at Dieffenbacher's test laboratory. Comprehensive laboratory tests clearly demonstrated that the material distribution in the flaking chamber could be substantially enhanced. Adapting to different input materials and production conditions is easily achieved by varying the rotation speed of the FlowOptimizer and by adjusting some parts of the system.

Based on the successful laboratory tests, a pilot machine was installed in a particleboard plant to test long-term operation under industrial conditions. Additional machines will be equipped with FlowOptimizer technology.

The new FlowOptimizer is mounted with bearings in the flaker door, making the retrofitting of existing machines very simple: Only the door with the distribution rotor and heavy particle separator must be replaced. The ability to easily retrofit flakers on the market was another important target of the new development.

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### *Successfully tested in practice*

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The FlowOptimizer will be available as an upgrade for existing flaker systems and as a standard component for the latest generation of Maier MRZ knife ring flakers.

## Buffering and Metering in Particleboard Plants

**Universal Bin for Forming (UBF) – a further development of the metering scale in the forming station**



The UBF consists of a flake bin and a discharge unit. The exact metering of the output rate is regulated by means of a belt scale. The UBF comes in three variants with which it tackles the various challenges presented by surface and core layer forming. Its high-quality wood covering prevents static charge as well as condensation; therefore, it also prevents the caking of flakes on the interior walls of the bin.

**Universal Bin for Gluing (UBG) – the latest model of the metering hopper before gluing**



Similar to the UBF, the UBG also consists of a hopper and a metering unit. The four UBG types differ in terms of their discharge width and buffer capacity. They are perfectly matched to the EVOjet P and support its glue-saving effect thanks to the continuous discharge of a homogeneous chip flow.



## *Newly Designed Next Generation Knife Ring Flaker*

The next generation knife ring flaker MRZ stands out because of its completely new product design. Besides the dynamic and distinctive appearance, the MRZ provides improved functionality and higher user confidence. Therefore, it combines customer benefits with modern design.

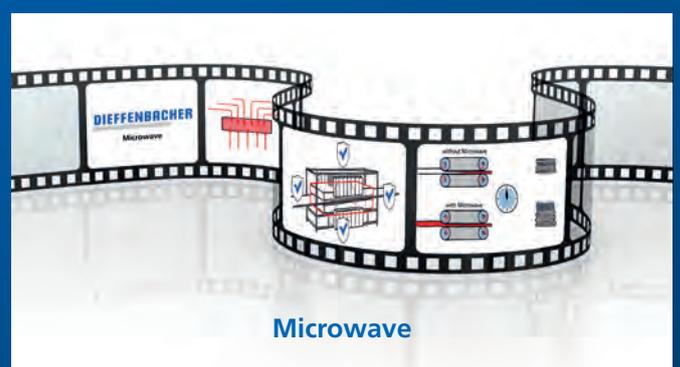
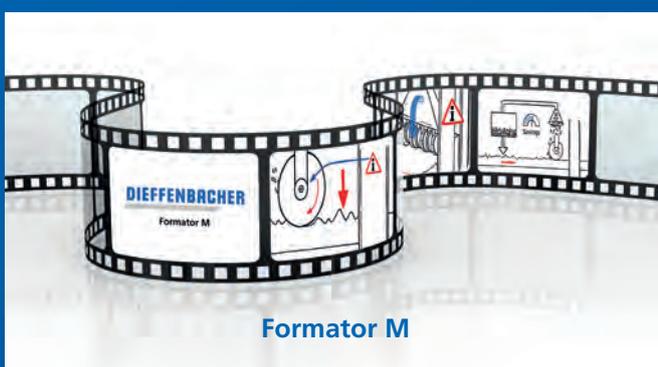
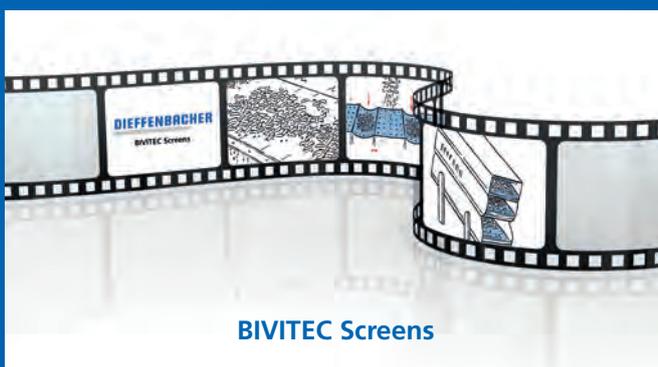
## Dieffenbacher Plus



Dieffenbacher offers customers a wide range of opportunities for increasing the profitability of their plants. The Dieffenbacher Plus campaign examines four of these systems:

BIVITEC Screens are a brand new screening technology for use in the wood-based panels industry. EVOjet P offers glue savings of up to 15%, the Microwave preheating system can increase the production capacity of a plant by up to 30%, and the Formator M has achieved material savings of between 1% and 5% in reference plants.

The function and customer benefits of the four systems are explained with short video animations at [www.dieffenbacher.com/plus](http://www.dieffenbacher.com/plus):



## Screening Rethought: BIVITEC Screening Machines

Maximum screening performance, minimal maintenance. BIVITEC screening technology offers both, and only Dieffenbacher has it in the wood-based panels industry.

BIVITEC screens are made by the Austrian company Binder+Co AG, headquartered in Gleisdorf. In business since 1894, the company offers single systems and treatment plants mainly for the mining and recycling industries. These industries use BIVITEC screens to separate bulk goods that are difficult to screen. Grit, gravel, silicon, iron and precious metal ores, coal, waste glass, rubble, and compost are just some of the applications.

### Completely new screening technology

BIVITEC screening machines consist of one or more screen decks with screen mats made of polyurethane. Each screen deck has two oscillation systems. Every second transverse bar is rigidly connected to the screening pan

(system 1). Between these transverse bars are free-swinging bars. Together with the longitudinal beams, this represents its own oscillating frame (system 2). The screen is driven by rotating eccentric weights causing the

oscillation of system 1. This results in a relative movement between the active system 1 and the passive system 2. Since each screen mat is attached on a fixed and a freely swinging bar, the relative movement causes an alternating



Oscillating system 1



Oscillating system 2



Overall system

stretching and slackening of the mats. When stretched, the screening material is accelerated by up to 500 m/s<sup>2</sup>. The individual particles can thus be detached and separated from each other very well. With repeated striking against the screening mats, the screening material thus has the required degrees of freedom to ensure effective screening with high selectivity.

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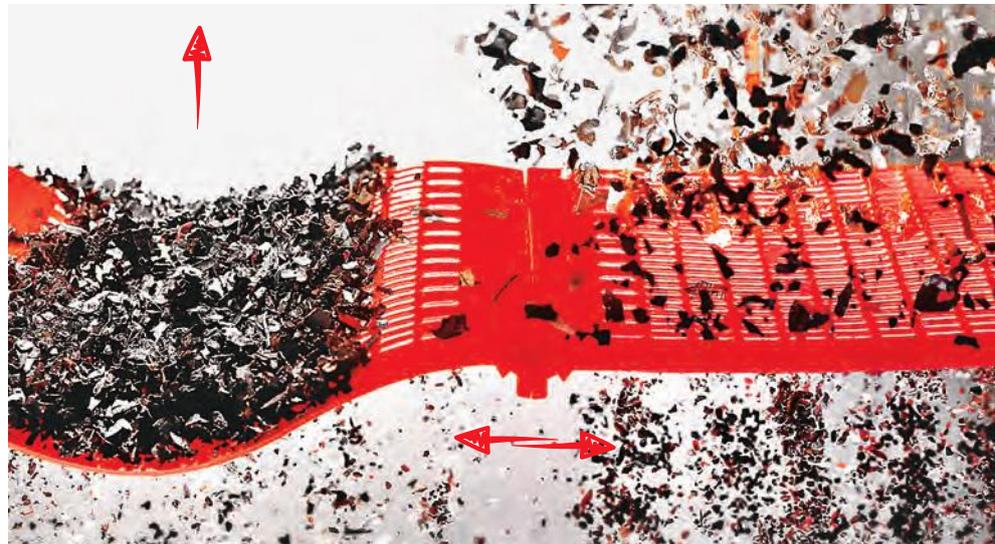
### Screen mats with self-cleaning effect

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In addition, the permanent stretching and slackening of the mats leads to an excellent self-cleaning effect. The screwless mounting system ensures an absolutely smooth screen deck surface, which also supports this effect and enables the quick and easy exchange of the screen mesh.

Unilin, Egger, and Pfleiderer are the first customers from the wood-based panels sector to rely on the BIVITEC screening technology. Four BIVITEC screens have been used since May 2015 in the Unilin particleboard plant in Oostrozebeke, Belgium. The plant is operated mainly with recycled wood. Screening with high selectivity is essential. The separation and cleaning of the moist chips is made before chipping in four groups of between 100 mm and 2 mm. Laboratory tests have shown that significantly smaller groups can also be achieved easily with the BIVITEC screen. Up to 0.25 mm groups are possible without problems. The screening machines can be used both in the area downstream of the dryer in particleboard and OSB production, as well as upstream of the dryer for the screening of moist sawdust and chips.

Irvin Coussens, Strategic Project Manager at Unilin, describes the benefits



BIVITEC screen functional principle

of the BIVITEC screening technology as follows: „The screens are highly effective and separate the groups absolutely reliably. Due to the fact that we almost completely separate the fine material portion of the recycling

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### „Highly effective and absolutely reliable“

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wood, the wear within our complete production plant has been significantly reduced. In addition, the maintenance and cleaning costs for the screen itself are close to zero. In 18 months we have not had to replace any of the self-cleaning screen mats.“ In compar-

ison to the conventional screen usually used in the wood-based panels sector and for those where the screen linings are made of wire mesh, the BIVITEC screening machines, with their polyurethane screening mats, also have a significantly lower risk of sparking.

Dieffenbacher has an exclusive contract with Binder+Co for the wood-based panels sector and is therefore the only manufacturer able to offer its customers the BIVITEC screening technology. This applies both to new plants and for retrofitting in existing plants.



Screen mats with self-cleaning effect



## „The Microwave Acts Like an Additional Press Length“

FINSA Group, based in Spain, is one of the leading companies in the wood-processing sector in Western Europe. Founded in 1931, it currently has 13 production sites in three countries and 18 branch offices.

Gonzalo Machado, Plant Director FINSA Orember, recently discussed his experience with the Dieffenbacher Microwave preheating system.

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*How long have you been using the Dieffenbacher Microwave and in which plant?*

**Machado:** We started using the Microwave preheater in October 2015 at

our plant Orember in Ourense, Spain, where we produce MDF boards.

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*What was your motivation for choosing the Dieffenbacher Microwave preheating system?*

**Machado:** We were exploring the prospects for increasing both plant capacity and the board thickness range because we needed an alternative plant able to cost-effectively produce thick board.

Within the FINSA Group, we already had experience with mat preheating devices other than Microwave. Once we became aware of the Dieffenbacher Microwave, we visited an installation

in Brazil to check out its reliability and decided it could be the right option to produce thicker boards in our MDF plant in Ourense.

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*Did you experience the desired positive effect on productivity and efficiency after the installation of the Microwave system?*

**Machado:** By adjusting the electrical power of the Microwave itself and the specific pressure on the mat, the Microwave acts like an additional press length.

These capabilities have a positive impact on the cross-profile of the board



Gonzalo Machado (second from left) and his team in front of the Microwave

and on the density profile in general. The lack of heat energy supplied by the thermal oil press heating system is balanced by the Microwave.

Prior to installation, the maximum board thickness that could be manufactured on a reasonable scale was 30 mm, whereas typical board thicknesses required by the market are 44 mm and 45 mm. With the installation of the Microwave, maximum board thickness can be increased to 50 mm.

Further, the capacity increase ranges from five percent for 10 mm boards up to 25 percent for 30 mm boards. For thicker boards there are no reference values as board thickness was previously limited to 30 mm.

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*Did you experience any additional improvements directly related to the use of the Microwave, for example, in relation to the manufacturing process?*

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**Machado:** Since we began using the Microwave, production now runs under more stable conditions. The output of the plant has increased as we have broadened the range of board thicknesses with very low press factors.

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*How would you describe the installation procedure?*

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**Machado:** In general, the cooperation and the service rendered by Dieffenbacher was good. Delivery was on time, responses were always quick, and we

never felt that we were being left alone.

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*In conclusion, are you satisfied with your decision to invest in Microwave technology?*

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**Machado:** We are satisfied. The investment was worth it and will pay off in a very reasonable time period. From my personal experience with this project – and having experience with other suppliers as well – I would choose Dieffenbacher again as long as technical and price competitiveness are provided.

Interview by Johnny Carl (Sales Europe and Russia) and Stanislaw Hartwig (Sales Modernization) in November 2016



LVL plant

## *A Superlative OSB Plant – the Largest Project in Dieffenbacher's History*

The Russian town of Torzhok is located 230 km north of Moscow in the Tver region. A Dieffenbacher plant was put into operation there in 2008, and Modern Lumber Technologies Ltd. (MLT) has been using it to produce LVL panels ever since. MLT is a subsidiary of the Taleon Group based in Saint Petersburg, which is active in the real estate business. The construction of the LVL plant represented the first time it had invested in a wood-based panel production facility of its own.

The Taleon Group had big plans at that time: The first LVL line – with a 60 m

long CPS and an output of more than 120,000 m<sup>3</sup> per year – is the largest individual LVL plant in the world. It was set to be followed by further LVL and OSB plants spread across the entire Russian Federation, which were intended to meet domestic demand for

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### *The largest individual LVL plant in the world*

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standard modules used in prefabricated house building. This vision was abruptly halted by the financial crisis of 2008.

The project as a whole was put on hold for three years, but plans for an OSB plant at the Torzhok site were revived in 2011.

It was to be one of the biggest OSB plants in the world. Naturally, Dieffenbacher was not the only applicant for this project. But for several reasons, this family business based in Eppingen, Germany, was awarded the contract: MLT was impressed by both the commercial and technical aspects of the bid but was ultimately convinced by its positive experience operating the LVL



September 2014

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*A great and trusting relationship has formed over the years*

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plant. A great and trusting relationship has formed over the years between MLT and Dieffenbacher, providing an excellent basis for further cooperation.



September 2014



January 2015



June 2015

Once the funding had been secured with the help of the state bank VEB, the delivery contract was signed at the end of 2013. Assembly began in Torzhok in April 2015. Due to the large-scale nature of the project, some minor delays during the assembly phase were unavoidable. But in June 2016, when

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*First board: June 2016*

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the first board was pressed, both MLT and Dieffenbacher declared that they were extremely happy with how the project had gone, considering the size of the plant.

For Dieffenbacher, this project was the largest and most complex in the company's 140-year history. The scope of supply included all facilities, from log debarking to strapping of the finished boards ready for shipping.

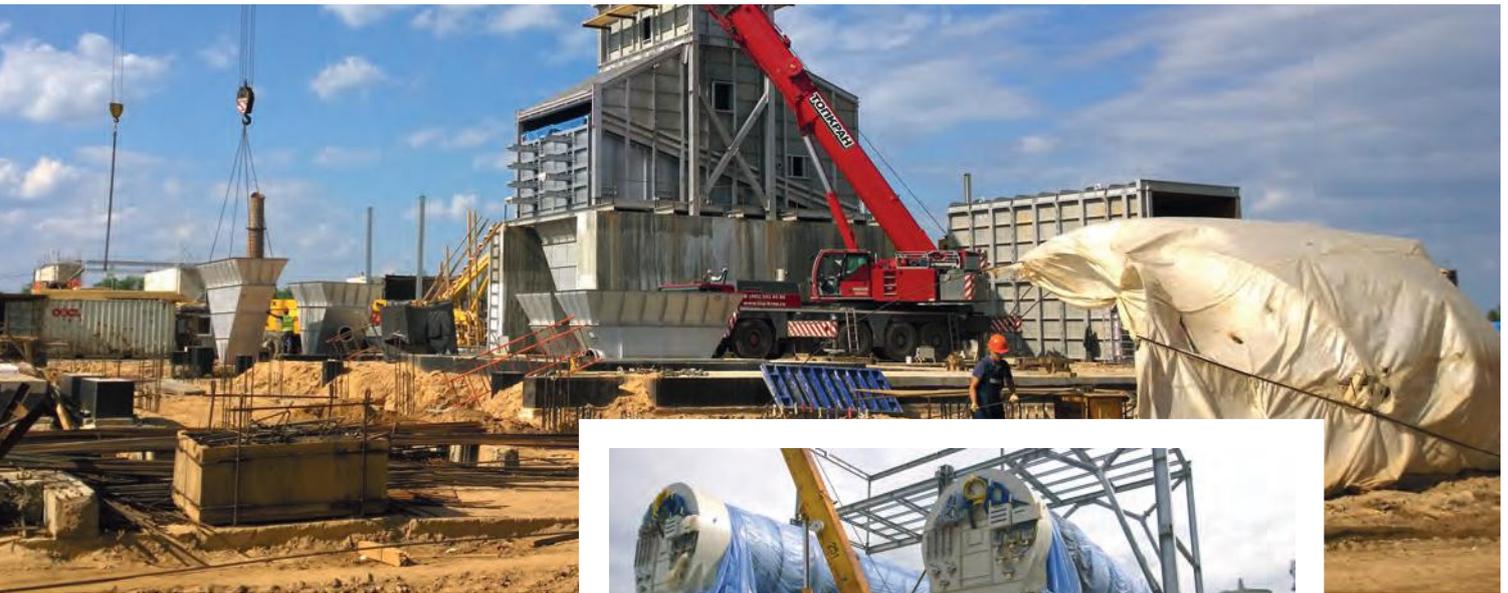
Due to the size of the plant, it is fed by two complete material processing lines with log conditioning (deicing). They are followed by two drum dryers with discharge box, as well as the screening, glue preparation, and gluing system. The forming station is equipped with the latest generation of four-head systems. Dieffenbacher also supplied a 60 m long CPS press that can be used to



October 2015



December 2015



produce OSB with a thickness of 6–40 mm and a width of 2,250–2,800 mm. Raw board handling, the storage system, a tongue-and-groove system, and

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### *Extraordinary large scope of delivery*

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two packaging lines were also part of the project scope, as were two biomass energy plants with a total combustion output of 113 MW. In addition, MLT ordered further secondary sections, including the low-voltage main distribution system, emergency power generators, and cables (including cable



July 2015

trays and accessories), as well as all the pipelines and cyclones for both dryers and the pneumatic conveying systems. The total package also included supporting steelwork with a total weight of 4,000 tons, plus fire detection and extinguishing equipment, various measurement and laboratory facilities, a compressor station, and sharpening machines for the knife ring flaker and the diagonal saw.

MLT processes 80 percent aspen and 20 percent birch in Torzhok. The plant is

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### *OSB for prefabricated housing*

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designed to deliver an annual output of 600,000 m<sup>3</sup>. The finished OSB is mainly used in the construction of prefabricated housing, just like the LVL panels that are made on the same site. OSB and LVL standard modules provide a good-value alternative to house building, particularly in the rural and less accessible regions of the Russian Federation.



June 2016

### Allgreen Timber Products

The new plant replaces an old production line with a multi-opening press from Dieffenbacher.

### Martco

The OSB plant is the first large greenfield project in the North American wood-based panels industry since 2005.

### Placas do Brasil

Placas do Brasil is a joint project of about 40 companies from areas including the furniture industry and forestry sector.

### Arauco

The plant in Grayling will be the largest particleboard plant in North America.

## NEW PROJECTS

Project/Customer	Location
Duraplay	Hidalgo del Parral
Hubei Hongyi	Xiaogan
<b>Allgreen Timber Products</b>	<b>Segamat</b>
Fantoni Spa	Osoppo
Ganzhou Huaerda	Ganzhou
<b>Advance Fiber</b>	<b>Kanchanaburi</b>
Florapac	Paragominas
Green Fiber	
<b>Martco</b>	<b>Corrigan</b>
Panel Plus	Hatyai
<b>Greenply Industries</b>	<b>Chittoor District</b>
Swiss Krono	Menznau
Wanhua Ecoboard	Xinyang
Danzhou Huashengxin	Danzhou
<b>Placas do Brasil</b>	<b>Pinheiros</b>
Heze Maosheng	Heze
Lankao Dinfeng	Shangqiu
<b>Wanhua Shentai</b>	<b>Xinyang</b>
Shanxian Huakang	Heze
Fujian Xichan	Zhangzhou
Xianghe Tianya	Xianghe
Liuzhou Sanyi	Liuzhou
<b>S.P.B. Panel Industries</b>	<b>Surat Thani</b>
Tangshan Jinxin	Tangshan
<b>Arauco</b>	<b>Grayling</b>
Xin Weilin Panel Industry	Shitang
<b>Fenglin Wood Industry</b>	<b>Nanning</b>
Kelin Wood Industrial	Anqing
Kijchai	Rayong

### Fenglin Wood Industry

Among other things, Fenglin will use its plant to produce extremely lightweight particleboard (Super PB).

# 2017/2018

Country	Press	Product
Mexico	CPS	MDF
China	ContiPlus	MDF
<b>Malaysia</b>	<b>CPS</b>	<b>PB</b>
Italy	CPS	MDF
China	CPS	PB
<b>Thailand</b>	<b>CPS+</b>	<b>MDF</b>
Brazil	CPS	MDF
Iran	CPS	MDF
<b>USA</b>	<b>Multi-Opening Press</b>	<b>OSB</b>
Thailand	CPS+	MDF
<b>India</b>	<b>CPS</b>	<b>MDF</b>
Switzerland	CPS+	PB
China	CPS	PB
China	CPS	PB
<b>Brazil</b>	<b>CPS+</b>	<b>MDF</b>
China	ContiPlus	PB
China	ContiPlus	PB
<b>China</b>	<b>ContiPlus</b>	<b>PB</b>
China	ContiPlus	PB
China	ContiPlus	PB
China	ContiPlus	PB
China	Multi-Opening Press	MDF
<b>Thailand</b>	<b>CPS+</b>	<b>MDF</b>
China	ContiPlus	PB
<b>USA</b>	<b>CPS+</b>	<b>PB</b>
China	CPS	OSB
<b>China</b>	<b>CPS</b>	<b>PB</b>
China	CPS	PB
Thailand	CPS+	MDF

## Advance Fiber

Advance Fiber is part of the Metro-Ply Group, which ordered two CPS+ units within three months.

## Greenply Industries

Greenply has operated a Dieffenbacher MDF plant in Pantnagar Rampura, India, since 2009.

## S.P.B. Panel Industries

S.P.B. already operates a particle-board plant from Dieffenbacher at the same site.

## Wanhua Shentai

Wanhua can use the plant to manufacture panels constructed from wood and straw.

## MyDieffenbacher Digitalization in After-sales

Paper spare parts lists and operating instructions that run to hundreds of folders and countless pages may seem old-fashioned in our long-digitalized personal lives, but they are still common in the field of large-scale plant construction.

There are many consequences to using this much paper, including the significant degree of work involved in identifying parts, the time-consuming process of searching for the appropriate documentation, and the amount of communication required when ordering spare parts. These processes are not

only error-prone, but they also cost time and cause stress.

But progress is now being made, including in after-sales. Ongoing technical developments are constantly opening up new opportunities. More than ever, rapid and goal-oriented service provision is a key factor when it comes to ensuring humans and plants perform reliable work. Dieffenbacher is driving forward the digitalization of after-sales and has risen to this challenge with its new online portal MyDieffenbacher. In the first step, MyDieffenbacher covers spare parts identification and plant doc-

umentation. In the future, it will grow to a complete life-cycle support center where customers will easily find any information related to their individual plants. MyDieffenbacher is immediately available with every new plant.

- Ergonomics: User-friendly software with intuitive operation
- Parts visualization: Rapid, clear identification of spare parts
- Simple and direct request for quotation: Minimal communication required
- Intelligent documentation: Two-way link between parts and documents
- Full text search: Comprehensive comparison of entire documentation with the search term
- Responsive design: Available directly at the plant on smartphones, tablets, and notebooks



Minimized error probability



RELIABLE

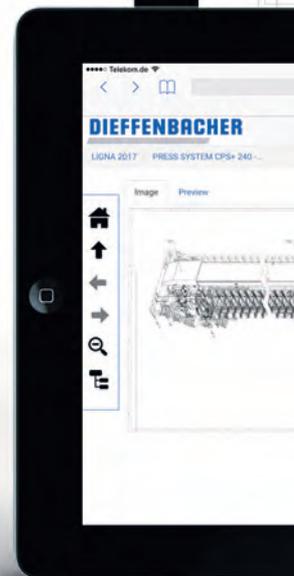


Acceleration of the entire process

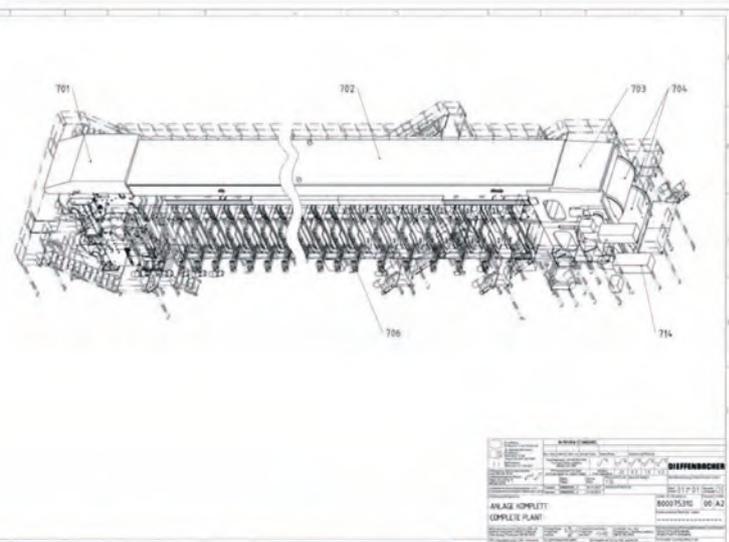


FAST

&

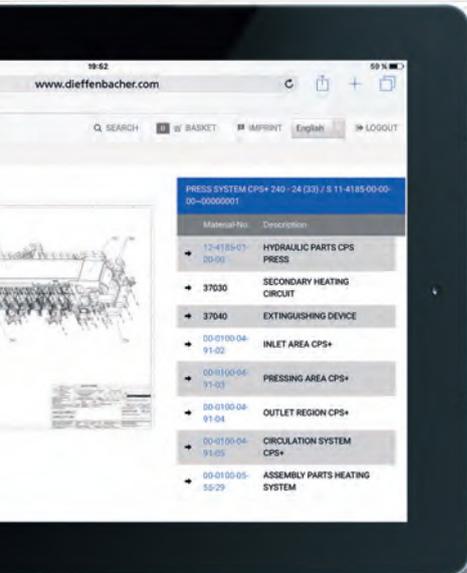


Preview



PRESS SYSTEM CPS+ 240 - 24 (33) / S 11-4185-00-00-0000001

Pos.	Material-No.	Description	Qty.
+	X 12-4185-01-00-00	HYDRAULIC PARTS CPS PRESS	0
+	X 37030	SECONDARY HEATING CIRCUIT	0
+	X 37040	EXTINGUISHING DEVICE	0
+	701 00-0100-04-91-02	INLET AREA CPS+	1 PC
+	702 00-0100-04-91-03	PRESSING AREA CPS+	1 PC
+	703 00-0100-04-91-04	OUTLET REGION CPS+	1 PC
+	704 00-0100-04-91-05	CIRCULATION SYSTEM CPS+	1 PC
+	706 00-0100-05-55-29	ASSEMBLY PARTS HEATING SYSTEM	1 PC
+	714 00-0100-05-32-17	DRIVE ENGINEERING CPS+	1 PC
+	735 00-0100-06-65-75	ASSEMBLY PARTS 2 COMPONENTS	1 PC



# Always There for Our Customers

Although the term might suggest otherwise, “after-sales” at Dieffenbacher starts right from the sale of a new machine or plant. Tailored services and individual wear and spare parts packages round out each offering and are proof that Dieffenbacher oversees

the entire life cycle of its products from the very beginning. They also showcase the company’s focus on a long-term working relationship with its customers. Beyond the sale itself, the Dieffenbacher service offering can be divided into six different areas:

## 1. Commissioning

- Support via the online remote maintenance system TEO (Tele Engineering Online Service)

## 2. Planned preventive and corrective maintenance

- Advisory services on action to be taken
- Joint and on schedule implementation of measures
- Ensuring system performance and availability

## 3. Resolving faults and problems

- 24/7 availability, remote diagnostics, and corrective action using TEO
- On-site support
- Professional experts at every service site

## 4. Optimizations, upratings, and modifications

- Joint optimization of the plant performance
- Support with modifications
- Advisory services from specialists from all fields

## 5. Spare parts logistics

- Ensuring availability of spare parts
- Optimization of the customer-side spare-part and wear-part warehouse
- Joint proactive implementation of updates in the product life cycle (e.g., sensors, electronics)

## 6. Training

- Individual training courses for plant operation, plant optimization, preventive, and corrective maintenance at Dieffenbacher or at the plant
- Product training courses like the annual CPS/CPS+ training

Dieffenbacher service associates are often recruited from the company’s own construction, assembly, and commissioning departments. Among the well-trained technicians are specialists in the fields of mechanics, hydraulics, electrics, and software. In addition to their experience and expertise, they can also call on other experts from all fields at Dieffenbacher during on-site visits to the customer. These experts come from

development and design engineering, project management, automation, maintenance and construction site management, as well as technologists and process experts, all working together across departments to ensure that the service team can offer the best solutions to customers. This approach applies not only in Germany and Europe but also worldwide.





## Dieffenbacher Service Sites

- Dieffenbacher GmbH Maschinen- und Anlagenbau in Eppingen, Germany
- Dieffenbacher GmbH Maschinen- und Anlagenbau, Branch Office Leverkusen, Germany
- B. Maier Zerkleinerungstechnik GmbH in Bielefeld, Germany
- Dieffenbacher Panelboard Oy in Nastola, Finland
- OOO Dieffenbacher in Moscow, Russia
- Dieffenbacher Servicecenter in Torzhok, Russia **New**
- Shanghai Wood-based Panel Machinery Co., Ltd., in Shanghai, China
- Dieffenbacher Machinery Services (Beijing) Co., Ltd., in Beijing, China
- Dieffenbacher Asia Pacific SDN. BHD. in Petaling Jaya, Malaysia
- Dieffenbacher Customer Support, LLC, in Alpharetta, USA
- Dieffenbacher do Brasil in Curitiba, Brazil



## *Peter Martin is the New Head of Dieffenbacher Customer Service*

**Mr. Peter Martin** took over the management of global Dieffenbacher Customer Service in January. In this role he is responsible for all the Dieffenbacher service sites worldwide and for the expansion and further development of the Dieffenbacher offering of services and spare parts. As a state-licensed engineer with a Master's degree in mechanical engineering and an experienced technical manager at companies including Michael Weing AG, Mr. Martin brings with him profound knowledge of wood processing.



## *Service Associates in Focus: Peter Kimmel and Manuel Breunig*

**Peter Kimmel** is a trained machinist. Following his training he spent 12 years in the German Armed Forces before completing further training to become a mechanical engineering technician. He first came into contact with Dieffenbacher through his work for the company HIMA, which was involved in the assembly of a Dieffenbacher plant in Norway at the time. Only about a year later he started working for the Dieffenbacher service team in the Wood Business Unit as part of a plant relocation from Malaysia to South Korea. After some time working in service planning, Peter Kimmel now mainly works with customers on-site. His tasks include plant inspections and managing maintenance, modification, and modernization work.





## *TEO – Tele Engineering Online Service*

- Online remote diagnostics tool
- 24/7 accessibility and support worldwide
- Real-time access to all software and hardware components
- Videoconferencing with all Dieffenbacher experts
- Totally secure data transfer

## *Inspection Agreements*

- Regular inspection of the plant
- Guarantee of optimal performance and function
- Ensure reliability
- Documentation with a detailed checklist
- Confirmation with certified inspection seal



**Manuel Breunig** started at Dieffenbacher on a training course to become an industrial mechanic in 1994. After completing this training, he initially worked for the Composites Business Unit in the assembly and service departments. In 2003, he moved to the Wood Business Unit and worked there on the service and modernization teams in addition to other assignments. Manuel Breunig has been responsible as a technical coordinator for the creation of spare parts lists, the compilation of spare parts packages, and the technical review of renewal parts quotations for 12 years. He also supports the 24-hour TEO service team and sometimes also works directly on-site with the customer.





## From Canada to Scotland

Just under 6,500 metric tons of steel: hardly a small matter. Particularly when it means transferring this volume – dismantled into many individual parts – from one site to another, including disassembly and modification, or modernization and installation, with the addition of new parts. In fact, operations of this type are the exception rather than the rule in the timber industry. And yet, this plant relocation strategy for entire production lines does make sense from a business perspective in certain cases. A spectacular project of this kind, which began 10 years ago, is the relocation of a Dieffenbacher plant from the Canadian province of Alberta to Inverness in Scotland.

### Project Stopped Shortly before Completion

Markets change, as do economic conditions. Economic crises create

### *Real estate crisis stops the project*

casualties: Canadian OSB manufacturer Ainsworth Lumber was one of the

companies affected by the real estate crisis that hit the construction sector particularly hard in North America (sub-prime mortgage crisis). The result, in 2007, was the abrupt halt of an investment project in Grand Prairie, Alberta, the site with the highest-performing OSB production at the time in North America. The installation of a 55 m long, 2.95 m wide CPS from Dieffenbacher to replace the multi-opening plant built there in 1995 was aborted

just a few weeks prior to the start-up of the plant. The nearly completed press line, up to the twin diagonal saw

### *OSB plant in “hibernation”*

(without steel banding/chains), was put into “hibernation.” However, Dieffenbacher had previously taken important precautions to maintain the line. Hydraulic parts and bearings were topped



Second week: Lifting the press cylinder in its frame out of the upper section of the press

off with oil, measures were taken to prevent rust, and plant components were packed up where appropriate. Solid financial protection ensured that Dieffenbacher suffered no damage in this respect.

Even though there was no plant activity over the years, the production hall was continuously air-conditioned, and no damage was suffered. The tide turned with the announced takeover of Ainsworth by the global wood-based panel manufacturer, Toronto-based Norbord Inc., on December 8, 2014. The transaction was completed on March 31, 2015.



July 2015: View of the Ainsworth press hall with an almost complete line, still in good condition despite never having run production



Second week: View of the press frames with interjacent heating plates



Second week: Disassembly of hydraulics

### Plant Relocation as an Alternative to New Machinery

Norbord had been planning for some time to expand its long-standing Scottish site in Inverness. During the 1980s, the first OSB system in Europe, and the first European OSB production site, was put into operation there. Dieffenbacher competed for the press line contract and submitted the final tender for a new plant in the summer of 2014. The takeover of the Grand Prairie site and its unused OSB line opened up new prospects for Norbord in the spring of 2015. The idea of relocating the line thus became more of a reality under the leadership of Dieffenbacher. In May 2015, at Ligna in Hanover, Dieffenbacher was commissioned to inspect the condition of the site in Alberta. This was supposed to result in submission of a tender for relocating the plant to Inverness in addition to overhauling and retrofitting a large number of components, including the control technology, and adding a new finishing line.

Dieffenbacher was looking forward to the challenge, especially as it had recently had a good experience with

a similar case: At the end of 2007, Pfeleiderer Holzwerkstoffe GmbH in Neumarkt had ordered an MDF/HDF production line with a daily capacity of 1,400 m<sup>3</sup> for the plant in Novgorod, but it stopped the delivery in 2009. The plant was stored in crates until it was finally purchased in 2015 by Kastamonu and set up in record time at the new Alabuga site in the Republic of Tatarstan.

### Good experiences with plant relocations

To verify the functional condition before shipping, some major parts went through spot checks. Owing to the generally good condition, a joint decision was taken with the customer that no further detailed review was needed. The plant has now been producing for well over a year without any issues. The plant was commissioned as smoothly as a new one.

Bearing in mind the experience gained from this process, a team of five specialists from Dieffenbacher carried out a week-long inspection of the Norbord plant in the summer of 2015 in Grand

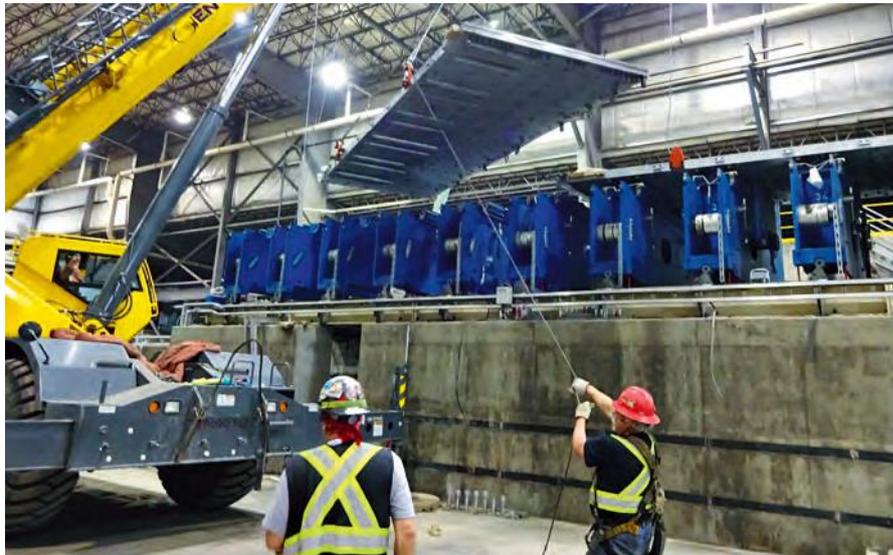
Prairie. The results were very encouraging. All of the components were still in excellent condition; the preservation efforts had been a success. In the fall, an agreement was reached with Norbord regarding technical adjustments and upgrades, which culminated in a contract being awarded in the spring of 2016.

### Scope of supply includes major upgrade package

The scope of supply now also includes a complete finishing line up to billet stacking, in addition to a completely new control mechanism, new drive engineering/electronics, and various other new components, i.e., a major upgrade package. On this basis, Dieffenbacher was also able to offer warranty terms similar to those of a new plant, safe in the knowledge of the stability of mechanical components such as frame elements, heating plates, drive drums, etc.



Second week: Press parts in weatherproof packaging, stacked onto pallets



Fifth week: Lifting out a heating plate

### OSB Plant Goes Live (Finally)

This is a great deal for Norbord. One of the requirements from the specifications is the production of boards that are 100 mm wider than originally planned in Grand Prairie. As the forming line and press permit this, these system areas can now predominantly be adopted unchanged. What is new now, however, is a state-of-the-art spreading station with greater width. This will also facilitate greater nominal capacity – 640,000 m<sup>3</sup> p.a. compared with 540,000 m<sup>3</sup> on the original line. As a result, forming is the only component in Grand Prairie to remain in its original location, an option for later use in a new line.

Norbord officially announced investments at the Inverness site in a press release on January 28, 2016. The release detailed investment volumes (EUR 124.5 million), replacement of the former multi-opening press with a continuous unit, almost doubling previous capacity and starting

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### *Norbord invests almost 125 million euros*

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operation in the second half of 2017. This should meet the increased demand for OSB in British and European markets and further increase the importance of the already strong European business. Disassembly of the plant began in July

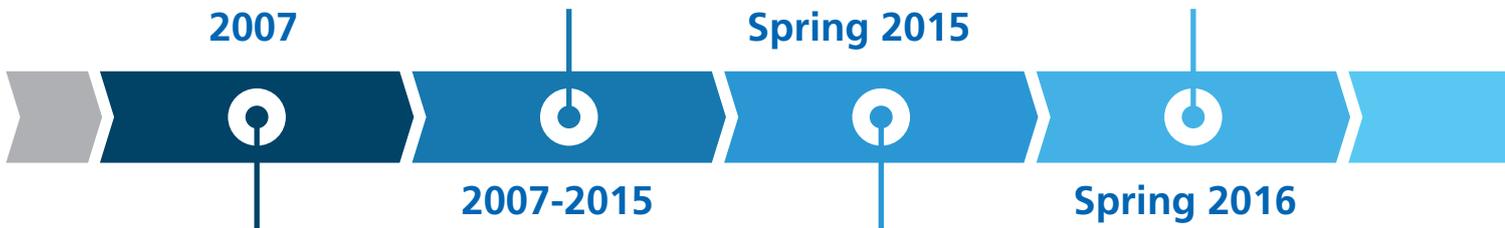
and ended in the middle of August 2016. Four Dieffenbacher specialists were on-site in Alberta for this, with around 25 installers from a contractor, as well as employees from the appointed logistics company, these areas also being outsourced by Norbord. Also thanks to the frequent contact via Skype and support from Eppingen with extensive documentation, the disassembly went well and there were no adverse surprises. All of the logistical work, including delivery of new components from Eppingen, corresponds approximately to that for a completely new plant. Transporting the parts to the port – a transport weight almost 6,500 tons – was handled by a total of 152 trucks.



Fifth week: Press parts, packed ready for transport, with some packed in seaworthy crates, wait for pick-up.

- The plant is in „hibernation.“

- Norbord commissions Dieffenbacher to move the plant from Alberta to Inverness.
- The order also includes expanding the plant to include a new spreading station, an entire finishing line through to billet stacking, a new control mechanism, and new drive engineering and electronics.



- Canadian OSB manufacturer Ainsworth Lumber halts its investment project involving a Dieffenbacher plant shortly before commissioning due to the real estate crisis in North America.
- Dieffenbacher makes important precautions for the preservation of the plant.

- Ainsworth Lumber is acquired by Norbord.



Fifth week: View of the heating plate in place: well-oiled, pristine condition

### Two Assembly Phases, Old/New Ratio 50:50

Assembly of the old parts in Inverness, followed by the installation of new parts in the second assembly phase, began in January 2017. The first board is set to be produced at the end of July, with plant commissioning scheduled for September 2017.

The automation and control of the CPS press line fundamentally designed for retrofitting took advantage of state-

of-the-art technology. This affected all position measuring systems, monitoring sensors for roller bars, and the roller bar development, for example. Completely new drive technology is

### New automation and control technology

being used since the Canadian standard does not transfer over to the EU standard. The hydraulic system was moved from the side down into the

„press pit“ because the working height of the press has been changed from 5 m to 1.6 m. The system has new piping installations/space heating systems and a new forming belt.

The control center is being completely rebuilt. Subject to customer request, CLX 8 modules from Allen Bradley in Milwaukee are used as control elements. These are comparable in terms of performance to the Siemens S 7-1500. The plant in Inverness is the first with this new generation of automated control mechanisms from the U.S. manufacturer. The period scheduled for the assembly is thoroughly realistic, despite the complex functional specifications, given that the standard period for new plants is normally around six months. The nearly complete use of new parts in the second phase is of crucial importance, as well as the present complete documentation of all parts of the plant. The ratio of old to new part installation is roughly 50:50, with the old/new ratio being approximately 80:20 for the “plant build.” The ratio is exactly the reverse for the plant intelligence (control mechanism).

- The components are being re-installed in Inverness.
- Dieffenbacher delivers and installs the new spreading station and finishing line and modernizes the control mechanism, drive engineering, and electronics.

**July/August 2016**

**End of July 2017**

**Since January 2017**

- The plant is dismantled in Alberta and shipped to Scotland.

- The first board will be produced at the relocated and expanded plant.

### Expansive New Mainstay in Plant Conversion

Dieffenbacher is proving its competence in the plant conversion sector with this project. Conversions are a strategic, relatively new mainstay for the company that has more than tripled its turnover over the last 3 years from EUR 10 million to approx. EUR 30 million. Different rules apply to the



Fifth week: Lifting a cross bar out of the drive section above the deflection roller on the press outfeed

### Strategic plant relocations

conversion sector than to new plant business: Customers that are modernizing expect quick turnaround times within manageable limits. The ability to plan is more difficult, and the potential for surprises on-site is greater. However, since Dieffenbacher deliberately does not rely on the used machine trade, the relocation of existing plants to third countries (in the same way as car exports to the "third world") is not a field of activity. Strategic plant relocation for long-standing, reliable customers such as Norbord in the Inverness project is very much part of the modernization quote.



Seventh week: After dismantling the press, only the spreading station remains at the site in Alberta. A new one will replace it in Inverness.



## Implement Plant Reserves – Increase Plant Performance

The relocation of the plant from Grand Prairie to Inverness is a milestone in the long-term partnership between Dieffenbacher and Norbord. However, there are even more examples of successful collaboration between the two companies. One of these is the continual uprating of the OSB plant at the Belgian site in Genk. In 2001, Dieffenbacher installed a CPS there that was 33.5 m long, designed for daily output of 800 m<sup>3</sup>, with maximum board widths of 2,800 mm. To date, output has risen to 1,400 m<sup>3</sup> – an increase of 75 percent – thanks to continual and successful optimization efforts undertaken jointly by Norbord and Dieffenbacher. This includes continuous upgrades to the press line and improvements in gluing and strander technology.

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### Capacity increase of 75 percent

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This uprating is a test case that demonstrates the options available to a plant operator for achieving maximum output via intelligent fine-tuning and balancing. While in this case the initially specified scope for expansion—such as extending the press to 38 m and expanding the 3-head spreading station still in use to a 4-head design—is still not implemented, there are basic reserves waiting in the wings. The fact that significant increases were possible without the options mentioned above was a pleasant surprise for those involved.

Dieffenbacher had already taken the expansion options into account during the design phase, the potential of which was to be jointly exploited, for example, in the area of transport routes/conveyor systems. Norbord obtained each of the



necessary permits from the authorities locally and in good time. Individual measures turned out to be highly efficient. These include a new wet-type strander bin upstream of the dryer as a buffer for running up to full capacity and for optimizing the strander ring replacement times.

Over the years, Dieffenbacher adapted the dryer, among other things, and improved the press control mechanism, spreading control, glue dosing/drum, and the overall process engineering (e.g., increasing the pressure/temperature in the hydraulics). There are regular, open, and constructive exchanges of opinion and collaboration; Norbord is happy to take the suggestions on board and strives to implement them. Via online access, system output can be continuously and directly monitored in Eppingen. Further increases are conceivable—especially the awaited expansion option for the press line; just increasing the length would produce another increase of 13–14%. Once the plant

relocation is completed, this could be the next joint project.

Genk's example shows that working together constructively can, in principle, allow considerable reserves to be exploited in every production line. Dieffenbacher checks all systems regularly so it can inform the customer about changes associated with the introduction of state-of-the-art technology. The entire line is the focus of attention; there are almost always upgrade options, and Dieffenbacher supports its customers in this regard to ensure maximum competitiveness. The following principle applies: Give and take for mutual benefit is the right strategy for the future.



# From Sensor to Plant Relocation – from Engineering to Optimized 3-shift Operation



March/April, 2017: The Dieffenbacher modernization team reassembles the relocated plant from Canada at the Norbord site in Inverness, Scotland

At Dieffenbacher, the topic of modernization covers the entire spectrum of possible modifications worldwide. As soon as even the smallest design and/or electrical adjustments need to be made to a component part, the modernization team takes responsibility for the conversion. This is the case, for example, if a sensor requires a new holding device or its function is adapted.

At the other end of the scale, the modernization portfolio can involve increases in performance, e.g., retrofitting of a preheating system such as the microwave system, or complex plant extensions. It can even involve complete plant relocations, including revision and optimization. Just such a project is currently taking place for Norbord, whose plant is being moved from Grand Prairie in Canada to Inverness in Scotland. The modernization team is also responsible for sales of stand-alone machines.

The modernization team of eight people includes a management assistant, expe-

rienced mechanics with a background in assembly and initial start-up, technicians from the fields of electrical engineering and construction, and mechanical engineers and wood engineers. Together they analyze customer plants, check the output data, and look for improvement potential. The space available on-site and the influence of possible modifications on the overall plant is always included in the assessment. Afterward, planning documents are created, and the customer receives comprehensive support, all the way from the quote

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*The team works on more than 400 projects per year*

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through to the final contract and project processing. The modernization team works on 400–450 projects per year.

Within after-sales, the modernization and service departments work hand in hand. The service department identifies optimization and expansion potential

during on-site visits and passes this on to the modernization team. Conversely, the modernization team reports spare part and inspection requirements to the service team. This enables everything in Dieffenbacher after-sales to run like clockwork for the customer's benefit.



## Dieffenbacher Machinery Services (Beijing) Co., Ltd.

Dieffenbacher Machinery Services in Beijing is the service provider for China within the Dieffenbacher Group. In this role, they were, among others, involved in the following projects:

### The first fully automatic plywood layup line in China

On January 13, 2017, Kangxin began producing plywood using China's first fully automatic plywood layup line. Supplied by Dieffenbacher Zaisenhausen, the new plywood line complements Kangxin's production of OSB panels, which began in 2015 on Dieffenbacher equipment, including a CPS. Those panels serve as the core layer in container flooring, an important product for Kangxin.

With the plywood layup line, veneer stacks of length veneer, cross veneer, and OSB are first positioned on the loading stack conveyor by a forklift. Then they are moved to a stack conveyor on the lift table. Each piece of veneer is transferred to the center strand belt conveyor by the multi-suction feeding device. Afterward, the veneer is glued during pass-through at its top side by a curtain coater. Another device feeds the top layer veneer. From



Kangxin's fully automatic plywood layup line

there, the layup line automatically forms a preconfigured multiple-layer plywood billet.

The new equipment helps Kangxin produce container flooring less expensively. Traditional container flooring is a plywood that relies on tropical hardwoods. Due to decreasing hardwood supplies and regulations designed to protect the environment, the cost for making container flooring has increased. Rapid labor cost increases in China, the world's largest producer of container flooring, have also driven up costs.

Kangxin has positioned itself for success in the large container flooring market with the new automatic plywood layup line and the continuous press CPS.

### Super Particleboard

In 2016, we introduced to Chinese customers a super-strong particleboard (Super PB) made possible by our MSF Strand Flaker. The particleboard is lighter, costs less and uses less material than traditional particleboard. Customers Liren and Fenglin Huizhou are among the Chinese customers running the flaker, with excellent results.

With the MSF-type flaker, board density can be reduced up to 10 – 30 kg/m<sup>3</sup>. That's thanks to the use of longer particles – 30 to 50 mm in length – and thickness averaging 0.7 mm at the core layer. The result is a higher slenderness ratio, which improves the strength of the produced particleboard.



Signing ceremony

## Dieffenbacher SWPM

In early June 2016, Dieffenbacher Germany and Dieffenbacher SWPM met with customers and prospects at the WMF 2016 exhibition in Beijing. The focus of the exhibit of international woodworking machinery, furniture manufacturing equipment, and related supplies and accessories was sustainable, intelligent, and green manufacturing solutions.

The latest Dieffenbacher technology and board samples produced on our equipment were featured during the four-day event. Our technical seminar explored future technology and wood-based panel industry trends. It also showcased the company's comprehensive solutions for dust and gas emissions, advanced technology in PB production, OSB trends

in China, and the company's OSB experience. Representatives from IKEA and SUOFEIYA HOME shared their operating experiences and requirements of wood-based panels for making furniture.

Another special event during WMF 2016 was a signing ceremony with Mr. Pu Erku, Chairman of the Henan Dingfeng company, and Mr. Li Mingjun, the County Chief of Lan Kao, to celebrate the

purchase of a 4 ft ContiPlus PB production line. It was Henan Dingfeng's second purchase of a complete PB production line from Dieffenbacher SWPM.

## *New Location for Dieffenbacher USA, Inc., and Dieffenbacher Customer Support, LLC*

North America customers will benefit from a new larger Dieffenbacher location in Alpharetta, Georgia. The new location, which includes a warehouse that's 70 percent larger than the previous location, will house a combined operations team consisting of the former Dieffenbacher USA Inc. (DIA) and Dieffenbacher Customer Support LLC (DCS).

Effective February 1, 2017, these changes put service, spare parts, modernization and sales and support staff all in one location. That will help employees share knowledge more effectively and efficiently. The larger warehouse allows the company to stock additional parts, decrease lead times and improve overall customer satisfaction.

Within a week of the relocation, a first-of-its-kind meeting brought together



The Dieffenbacher team for North America

team members from the different disciplines as well as colleagues from our installations in Mexico and Canada. Peter Martin, Global Head of Spare Parts and Service, and Hauke Jeske, Head of North American Sales, also attended.

The meeting helped establish a stronger foundation for helping customers throughout North America.

## *Dieffenbacher Asia Pacific SDN. BHD.*



The DAP team celebrating Chinese New Year 2017

Current customers and new projects in Southeast Asia depend on Dieffenbacher Asia Pacific (DAP). The DAP team includes several nationalities, with Malaysian, Thai, Indian, and German among them. The highly skilled engineering team is able to communicate in several languages, making it simpler to overcome cultural differences and language barriers. With several projects in Southeast Asia receiving DAP support, plus additional after-sales support, the year will be busy for Andy Mueller and his DAP team.

## Dieffenbacher in Latin America

The Latin American wood-based panels industry has always been of great interest to Dieffenbacher. Having sold its first single-opening particleboard plant in Germany in 1957, Dieffenbacher

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### *First orders in the sixties*

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made the leap to South America in the 1960s and was a presence there for the next 30 years with single- and multi-opening presses.

In the 1990s, it established continuous presses with the same success it had enjoyed when first entering the market in the 1960s. Dieffenbacher unveiled the CPS continuous press in 1990, and the eighth unit sold went to Latin America in 1995. Masisa—one of the „big players“ on the continent—ordered the press line for its Concordia site in Argentina, then placed a further order for a CPS in Mapal, Chile, just a short time later.

### **Successful Diversification Strategy**

Dieffenbacher achieved its current position in the Latin American market

with a thoughtful development strategy. From the very beginning, the company's focus was not only on the “big players,” but also on smaller manufacturers and newcomers. In close cooperation with Inserco, Dieffenbacher's local sales and service partner, Dieffenbacher won over these new and smaller market participants, particularly in Brazil. And,

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### *Efficient turnkey production lines for Latin America*

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by successfully implementing and managing projects for these new clients, Dieffenbacher confirmed its reputation for expertise in complete plants and their profitability.

### **Ambition: Market Leadership – Five Plants Sold in 3 Years**

The realization that good money could be earned using Dieffenbacher technology expanded among the leading manufacturers in Latin America: Dieffenbacher has sold five new plants in the region over the past 3 years (three in Mexico and two in Brazil). The innovative gluing systems remain an important part of the sales pitch.

In addition to the complete plants, Dieffenbacher also installed three EVO-jet M retrofits in Brazil over the same

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### *Dieffenbacher technology earns good money*

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period, enabling customers to make big savings in their glue consumption.

### **People Make the Difference**

The recent upturn in fortunes for Dieffenbacher is a credit to the people who represent the company in Latin America, rather than simply the technological developments. The Dieffenbacher sales team for South America is always an expert point of contact, and not just

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### *Sales team speaks the customers' language*

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for technical issues. They speak the customers' language in the truest sense of the word. This is a significant advantage, particularly when it comes to financial matters. After all, it is safest for people to discuss monetary questions in their native language.



Maintaining customer relations at Dieffenbacher is the responsibility not just of the sales team, but also of the boss. Dieffenbacher management and the Dieffenbacher family maintain frequent contact with customers in Latin America. This is a major advantage when initiating business contact, and is often decisive when projects are awarded. On a continent where an agreement made by handshake still counts for something, good and trustworthy personal contact at the level of managers and owners cannot be overestimated.

### Long-term Cooperation

Through its references in the region, Dieffenbacher can demonstrate to its customers that an owner-managed family business with over 140 years of history is a reliable partner for a business relationship that can exist over decades. No Dieffenbacher customer is left to fend for itself after a plant has

### *Trustful partnership over decades*

been commissioned. In fact, Dieffenbacher believes this is only the starting

point for a partnership of trust that will endure over the plants' service life of 15, 20, or even 30 years.

### Equipped for the Future

Dieffenbacher's current position in Latin America is better than it has been in the past 20 years. Over the last 3 years, it has won about half of all new projects on the continent. The sales team and management at Dieffenbacher, as well as the sales partner Inserco, believe they are in an excellent position to meet future challenges in this highly com-

### *Many new projects for Dieffenbacher*

petitive market. If things go their way, these most recent successes will be just the beginning of a long success story for Dieffenbacher in Latin America.

## The Wood-based Panels Market in Latin America

- A few big players, some operating internationally, with state-of-the-art, large-scale plants
- Many operators of small and very small plants (often second-hand or „Made in China“) who operate in a regional or niche market
- The main markets are Brazil, Mexico, Chile, and Argentina
- Almost all manufacturers have their own forests and are also active in the plywood, sawmill, and pulp industry
- 90% of the panels manufactured are intended for use in furniture production
- MDF and particleboard panels make up about half of the total market
- As there is no investment in prefabricated housing, OSB plays only a marginal role
- The market is undergoing significant change, as the political and economic situation is difficult in many countries
- There is potential for market growth, but investment is being held back at the moment
- As soon as the economic and political situation stabilizes, new investment is expected



## *The Dieffenbacher Team for Latin America*

Dieffenbacher's recent market successes in Latin America are, above all, a sign of exceptionally good teamwork.

Johannes Schwendele and Johannes Ohlsson have the main responsibility for sales and can rely on support from the Head of the Wood Business Unit, Bernd Bielfeldt, in crucial sales meetings. Dieffenbacher management is often also involved in these meetings. Portuguese- and Spanish-speaking Latin America experts are also employed in tender planning and project management.

Two Dieffenbacher service technicians, mechanical engineer Eduardo Santos and electrical engineer Douglas Francisco, provide full-time on-site support of customer projects throughout the region. The two are often involved on projects beginning with plant assembly, have direct contact with the customer, and know the plants in detail.

The Latin America team is completed by Inserco, Dieffenbacher's cooperation partner. Inserco has an excellent network in Latin America and maintains good contacts with companies in the industry. As a cooperation partner, Inserco contacts new customers, carries out cold calls in the event of replacement investment, supports all projects as an intermediary or moderator, and also drives after-sales.



Eduardo Santos (left) and Douglas Francisco (right) at one of their on-site visits

## Johannes Schwendele, Sales Manager for Latin America

- Trained as a carpenter and holds a degree in Wood Engineering (Rosenheim University of Applied Sciences)
- Has worked in the wood-based panels industry worldwide since 1989, serving as a planner, start-up engineer, and technologist
- Responsible for sales in Latin America at Dieffenbacher since 2005
- Foreign languages: Fluent English and Spanish, good knowledge of Portuguese

- *Johannes Schwendele is an expert on Latin America. He has been a regular visitor to Chile for over 30 years and says he knows the south of the country "like his own backyard." He built a house there in 2005.*
- *As part of his job in Latin America, he got to know Brazilian soccer idol Pelé personally a few years ago.*



## Johannes Ohlsson, Sales and Project Management for Brazil

- Degree in Industrial Engineering (Technical University of Kaiserslautern)
- Has worked at Dieffenbacher since 2008, including in product management and sales for energy systems
- Provided project support for Brazil, beginning in 2013; now sales and project management for the Brazilian market
- Foreign languages: Native language Portuguese, fluent English, good knowledge of Spanish

- *Johannes Ohlsson grew up in Portugal as a bilingual speaker of Portuguese and German.*
- *In 2005 he spent a semester abroad in Porto Alegre, Brazil. Curiously enough, his first foreign deployment for Dieffenbacher in 2008 brought him to Montenegro, not even 50 km from Porto Alegre as the crow flies.*



## Industry profile: Arauco's Gonzalo Zegers Reflects on the Company's Expansion and Diversification



Gonzalo Zegers

Santiago, Chile-based Arauco is a fast-growing company offering sustainable forest product solutions for the construction, casework/ fixture fabrication, architectural design, and papermaking industries. Products include a comprehensive selection of medium-density fiberboard, high-density fiberboard, particleboard, and hardboard, as well as premium plywood, millwork, lumber, and wood pulp.

Gonzalo Zegers, Arauco's Senior Vice President of International and Business Development, shares his story about how he arrived where he is today, the company's rapid expansion, and its priorities moving forward.

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*You have been working in the wood-based panels industry for over 20 years. Tell us about your professional career and how it all started.*

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**Zegers:** My career in this industry started in 1996 with Masisa. Before that I was working for a food company here in Chile that was part of the same group, the Pathfinder Group headed by Juan Obach and partners. I worked for the food company for 10 years before being promoted to Masisa's

CFO position. I did that for a year and was promoted to CEO and held that position for 9 years. The years at Masisa were a wonderful time and a great experience, and I learned a lot about wood-based panels and the wood-based panels industry.

In 2002, the Pathfinder Group sold Masisa to Terranova and in 2004 Mr. Obach decided to initiate a project in North America and founded ATC Panels. He invited me and others he knew from Masisa to participate in the project and I accepted. It really was an adventure but in the end we were stopped by the subprime mortgage crisis and the adventure did not go well.

I had moved with my family to the U.S. and lived in North Carolina for about a year when the 2007–2008 crisis arrived. The demand for wood-based panels dropped to a third of what it was and finally I decided to resign my position in 2008. That was where Arauco came in.

When they heard about my decision they contacted me and offered to put me in charge of their wood-based panels division. That was August 2008 and now I have been here for more than 8 years.



Arauco Pulp Mill in Valdivia

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*During that time Arauco took a lot of big steps in the wood-based panels industry. Previously it was mainly known to be strong in the pulp and paper industry. From an external perspective, one gets the impression that Arauco tried to achieve a better balance between pulp and paper and the wood-based panels division.*

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**Zegers:** Exactly. The company was concentrated in pulp and paper. Arauco decided that it would be good to have some kind of diversification. It was a very logical decision to start looking for options in other businesses in other parts of the world.

Consequently, we acquired the assets of Tafisa Pien in 2009, and a couple of years later we started the construction of two new mills: a particleboard mill in Teno, Chile, and MDF line No. 2 in Jaguariáiva, Brazil. Dieffenbacher was part of the project in Brazil, delivering the dryer and gluing system EVOjet M.

In 2011, we started the process to acquire a mill in Moncure, North Carolina, that I knew of from my time at ATC. We already had a good position with imports in Canada and the U.S., and decided it would make a lot of sense to become a producer in the North American market.

Then I received a call from Kelly Shotbolt, President and CEO of Flakeboard Co., the biggest manufacturer of wood-based panels in North America at that time. He told me that he was looking for an investor to help Flakeboard, which was struggling in challenging economic conditions and the ongoing effects of the subprime crisis.

We reached a preliminary agreement with certain conditions. The most important one was that we wanted to keep the Flakeboard team on board because we knew that they had been committed to Flakeboard for a very long time and were experts in the North American market.



Also, Arauco did not have the internal capabilities to manage a company like Flakeboard without a proper and well-functioning team. In the end it was a win-win situation: Flakeboard was a major addition for Arauco and the Flakeboard team maintained responsibility for all production in North America, including the recently acquired Moncure mill.

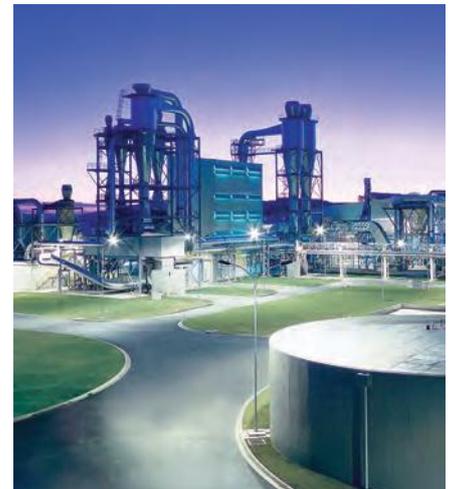
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*Looking at your career and the development of Arauco, we realize that expansion has always been a major topic for you. Are you proud that Arauco today is the second-biggest producer of wood-based panels in the world and the role you had in this growth?*

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**Zegers:** Absolutely, but it is not only me. It is the team that achieved this. We are proud that we created a company with operations in many places and with people from many different origins. I find it very positive to have the opportunity to work with people of different cultures, different languages and different views of the business and life in general.

From this diverse group, we have created a culture of working together to fulfill shared common objectives. That's why everybody at Arauco is proud to work for the company. Personally, looking at the last 8 years, it has been an outstanding experience both in terms of my professional career and personal development.



EVOJet M at Arauco MDF line No. 2 in Jaguariáiva



Greenfield site in Grayling, Michigan

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*With Arauco now doing business all over the world, it's hard to imagine that it will suddenly stop expanding and that you, personally, will stop thinking in this direction. What are your plans for the future?*

**Zegers:** In 2016, we entered the European market by forming a joint venture with Sonae from Portugal. Europe is a very competitive market with big players and we are glad that we can get our start there in a strong partnership with a knowledgeable company like Sonae. We feel very well prepared to compete in Europe with Sonae Arauco. It is a good option for us to learn what is happening in this part of the world and try to apply some new concepts in the market.

European customers are very sophisticated. From a market point of view this is an area where we have some lessons to learn. At the moment, our approach in Europe is to understand the market, learn about the good practices, and apply them to other markets.

In North America, we have an excellent market position and we want to keep it. That's why expansion and upgrades will be necessary. Compared to Europe,

there is a lot of outdated equipment in the U.S. and Canada. The average age of the machinery is probably more than 30 years old. That requires a lot of modernization or completely new equipment and to stay competitive we'll need to invest.

The new project in Grayling, Michigan, where we will be collaborating with Dieffenbacher, is a first step in this direction. It's a similar situation in Latin America. I'm not sure that the market requires much more capacity, but it will certainly require modernization.

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*On the Grayling project, Dieffenbacher is very proud to get the chance to deliver a full line for Arauco for the first time. What are your thoughts about this project?*

**Zegers:** We are very happy to do this project with Dieffenbacher. We have great confidence in the people working at Dieffenbacher and the technology that will definitely help us to improve our position in the North American market.

We trust Dieffenbacher because we know the history of the company and the family background. Family ownership helps a lot to have a good

personal relationship and it is easy to find ways to cooperate with this kind of approach.

Trust is the essential part of the equation: Trust in the way that you know the owner, know how the owner acts, and know that if you have a problem – and you will always face problems, that's just part of life – the owner will reliably solve this problem. From my experience with Wolf-Gerd Dieffenbacher, I can say that he is a very accessible and practical man who always tries to help you, not only regarding joint projects but also if you need good general advice.

It is always a plus to receive input from such a knowledgeable person, especially when you come from a smaller country like Chile and need to learn about the specific markets around the world.

Interview by Johannes Schwendele  
(Sales Latin America)

# Inserco: A Strong Partnership in Latin America

A guest contribution by Ralf Bergmann, Managing Partner of Inserco Industrie Service GmbH in Viersen, Germany



**Ralf Bergmann**

Werner Schläger founded Inserco in February 1984 with the aim of creating a bridge between European machine and plant manufacturers and customers from the wood-based panels industry in Latin America.

Inserco first started to deliver spare parts for Dieffenbacher plants in the 1990s. At this time, there was also a close and friendly working relationship between Inserco and Schenkman & Piel, which would later be taken over by Dieffenbacher. Back then, Schenkman & Piel and Inserco had a joint exhibition stand at Ligna, for instance.

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## *First discussions in 2004*

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At IWF in Atlanta in 2004, the first discussions were held with Dieffenbacher regarding a closer working relationship in some Latin American markets. 2 years later this was followed by an agreement that gradually made Inserco the exclusive cooperation partner for Dieffenbacher products in Latin America.

The first successes of the working relationship would soon be noted. In

a joint show of strength, the market presence of Dieffenbacher was improved decisively, culminating with new

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## *New plant orders in Colombia and Brazil*

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plant orders in Colombia (Tablemac, later Duratex group) and Brazil (Eucatex) in 2009 and 2010. In addition, a used particleboard plant was installed at the Masisa site in Montenegro, Brazil. That was followed by successes with gluing systems, with three EVOjet M systems in Brazil and several PROjet systems for plants in Argentina, Brazil, Chile, and Mexico.

The big breakthrough came in the past 3 years, with five orders for MDF complete plants in Brazil (Floraplast and Placas do Brasil) and Mexico (Duraplay, ProMDF, and Masisa) as well as four MDF plants from Dieffenbacher SWPM for the customer Emman (Mexico). In addition, orders for stand-alone machines came from customers in Ecuador and Peru.

In 2016, the biggest success of the long-standing working relationship between Dieffenbacher and Inserco came with the project for a particleboard plant in North America. The customer, Chilean company Arauco, is the largest producer of wood-based panels in Latin America. The plant was its first greenfield project with Dieffenbacher.

The pairing of strategically driven communications and outstanding technological innovations has made the cooperation between Dieffenbacher and Inserco a model for success. The

companies' common approach to the marketing of Dieffenbacher products will be continued in the future. An extension of the working relationship was recently negotiated.

Latin America offers exciting opportunities while also posing economic

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## *Common approach will be continued*

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and political challenges. The individual assessments of the region's markets, which to some extent are very different, is a great strength of the Dieffenbacher-Inserco cooperation. Customer loyalty has been achieved with a high technological standard, decades of proven Dieffenbacher products, consulting expertise across the entire value chain, and Inserco's commitment to customer care.

These advantages continue to make Dieffenbacher and Inserco a strong team in Latin America.

## Developments and Innovations in the Wood-based Panel Industry

Mike Botting looks back at the many changes during his 22 years in the panel industry; and forward to a promising future for the industry.

Panel manufacturing capacities have increased dramatically in the last 20-plus years, as has the need to produce panels more quickly and to ever-higher standards of quality. Inevitably, such increasing demand created many more challenges for the industry.

Firstly, it put strains on the raw material supply. Further complicating the issue for the panel manufacturers was the increasing emergence of environmental concerns. These initially concerned emissions from the factory chimneys and the generation of dust. More difficult to address were the gaseous emissions from the panels themselves, which became an increasing focus of regulation, particularly concerning volatile organic compounds, the most famous of which is formaldehyde.

It is in meeting these challenges that technology has come to the rescue. Diefenbacher quickly stepped up to assist its customers in increasing capacities and, importantly, quality, while at the same time improving the competitiveness of those customers' production facilities. The panel industry has been transformed since the early days of sticking bits of wood together into panels-which-just-about-did-the-job to become a high-tech provider of engineered products fit for many different purposes. These high-tech products also brought the fight to competitor materials such as brick, block, and plastic; and that battle of course continues.

### Tracing the growth of the panel industry

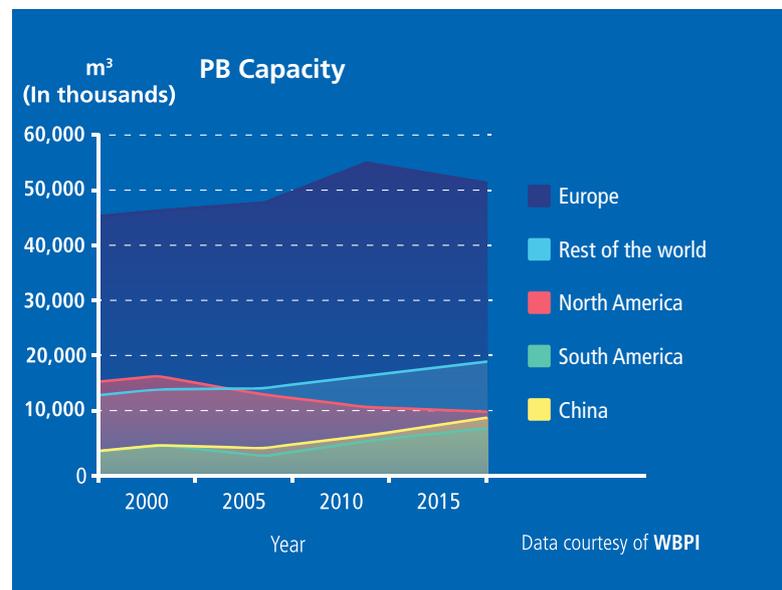
Plywood is by far the oldest-established panel product; veneer is said to have

been invented by the ancient Egyptians, while plywood was found in ancient Greece and Rome. The technology of plywood manufacture, like that of composite panels, has come on in leaps and bounds since those early days. That industry is so historic and widespread that meaningful capacities cannot be presented here.

Although not used as a panel, laminated veneer lumber (LVL) and parallel strand lumber (PSL) are made as "plywood-like" panels then cut up into building components.

Particleboard, also widely known as "chipboard," was first produced commercially in the late 1940s. The particleboard of today is of course a world away from those early panels, which were often laid up by hand. Particleboard has the great advantage that it can be made from recycled and lower-grade wood. Hence, poorly forested countries such as Italy have been able to build a significant particleboard-making industry and to lead the world in utilising wood recycling technology.

The graph shows the progression in global production capacity of this panel since Wood Based Panels International (WBPI) magazine began compiling its surveys in the year 2000, with the latest figures available being for 2015.

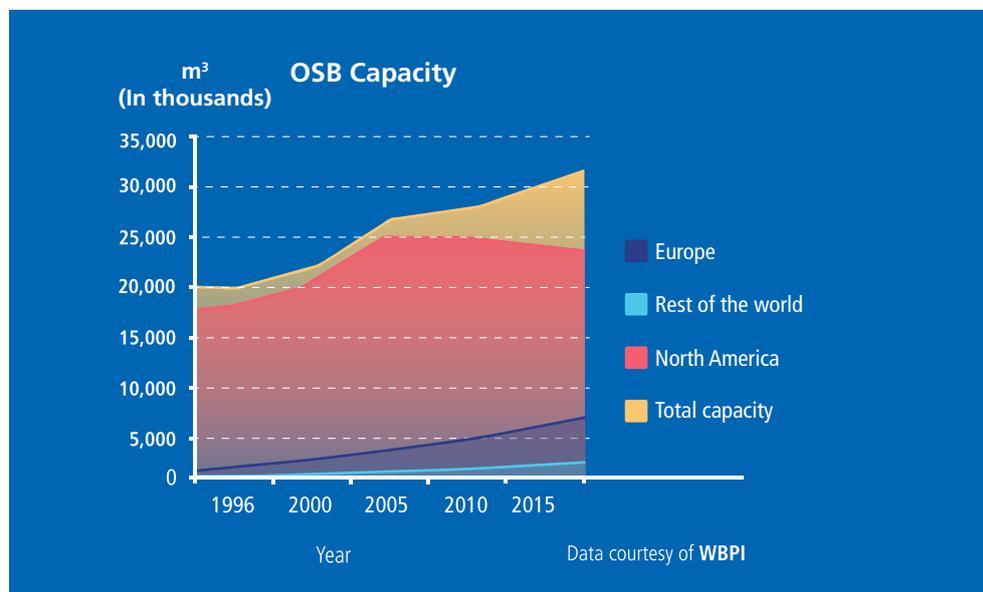
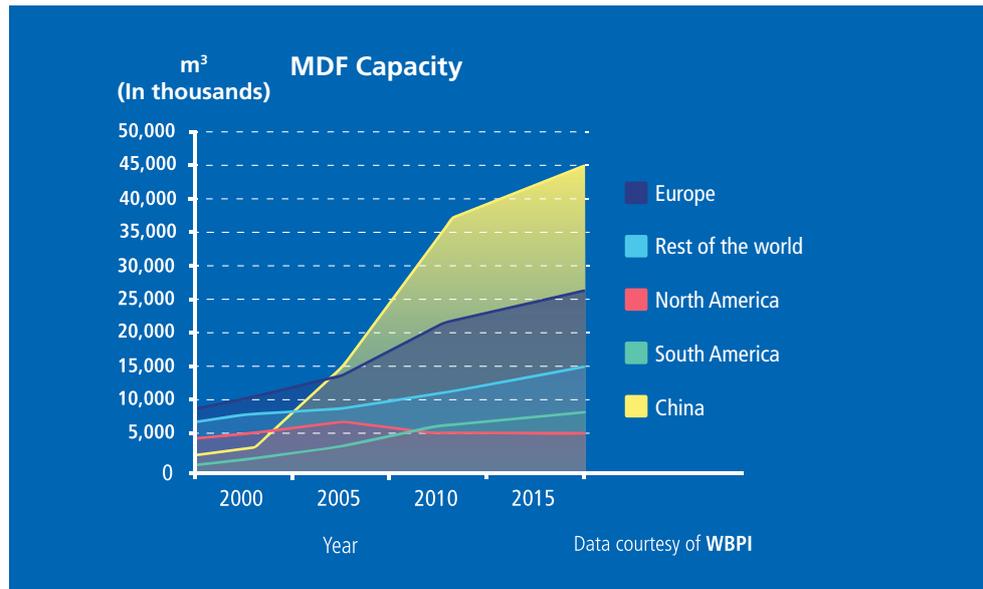


It can be seen that Europe is way ahead of other regions and peaked in 2010, with a capacity in 2015 of just over 51 million m<sup>3</sup>. North American capacity declined over the period. China is beginning to show growth at the end of the graph and new lines are currently being added there, after some years of concentration on building MDF capacity.

The first board of MDF was produced in the USA in 1966. In fact, this was the result of a “technical accident”! The first commercial production of MDF took place in 1974, when the brand “Medite” MDF was launched in Medford, Oregon, USA. Soon, due to the versatility of the continuous press, we also had HDF and the revolution that was laminate flooring and ultra-thin HDF.

We can see from the graph that there is a very different story for MDF versus particleboard! China’s capacity has soared from under 4 million m<sup>3</sup> in 2000 to nearly 45 million m<sup>3</sup> in 2015. With the exception of North America, even though that is where MDF began, all other regions have increased MDF capacity over the same period.

OSB, or “Oriented Strand Board” is a more recent invention, too. This panel began life, again in the United States, as “Waferboard” and today’s OSB is a development of that simpler concept. The difference? Essentially, waferboard was not developed as a structural board and had a homogenous composition of thin rectangular wood flakes. OSB brought the concept of engineering and orienting those flakes in such a way that they imparted greater rigidity and strength to the board. Once serious moisture



resistance was added to OSB, it became a real competitor to plywood.

Global capacity for OSB has risen from less than 20 million m<sup>3</sup> in 1996 to 32 million m<sup>3</sup> in 2015. This increase was largely driven by Europe, which rose from less than 1 million m<sup>3</sup> in 1996 to over 7 million m<sup>3</sup> in 2015. It has shown

dramatic growth in recent years, most of it in Eastern Europe.

We can see from the foregoing graphs that production of all three composite panel types has increased, driven not only by increased demand for the well-known panels, or “market pull,” but Dieffenbacher’s developments in these alternative panel types have helped to provide “market push,” as we shall see later.

### Technical development history

I began my international travels for WBPI in 1995 and the years since have been some of the most active and fascinating in the history of the panel industry.

### Increased flexibility through continuous presses

The technological development of the continuous press is one obvious example. The preceding single- and multi-daylight “cycle press” systems had their limitations. What was needed was the ability to vary, quickly and

easily, the type of panel being produced – i.e., that all-important word “flexibility”.

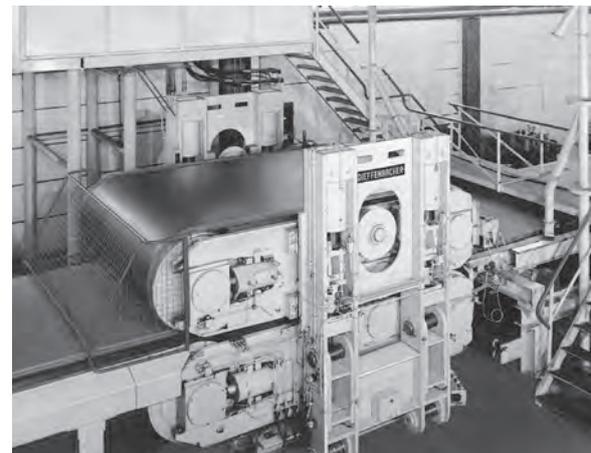
That is where the continuous press came into its own. It really started with the first continuous particleboard press developed by a Mr. Bartrev in England in the 1950s. This was based on a system of rotating hot platens and was not really a success as it lacked flexibility and was too complex. Some 20 years later, a German machinery maker, Bison, built a continuous press for its own particleboard production based on the same principle of the rotating hot platen. This concept was not a commercial success either, for the same basic reasons.

In 1971, Dieffenbacher developed a prototype continuous hot press, in which the mat was pressed between two steel belts, with a heat-resistant layer that had a low-friction coating. However, this could not withstand temperatures of 200 °C or the pressure of 40 kg/cm<sup>2</sup> for a long enough time. Next for Dieffenbacher was a cold-forming continuous press, which laid the foundations for the develop-

ment of the company’s first continuous hot press, launched in 1974 and supplied to particleboard maker Kunz & Co, Germany.

### Early prototypes are too complex

Another German machinery maker, Küsters, developed a longer double-belt continuous press in 1977. Again, this suffered from excess complexity. I am not forgetting the Mende-



1974: Cold-forming continuous press

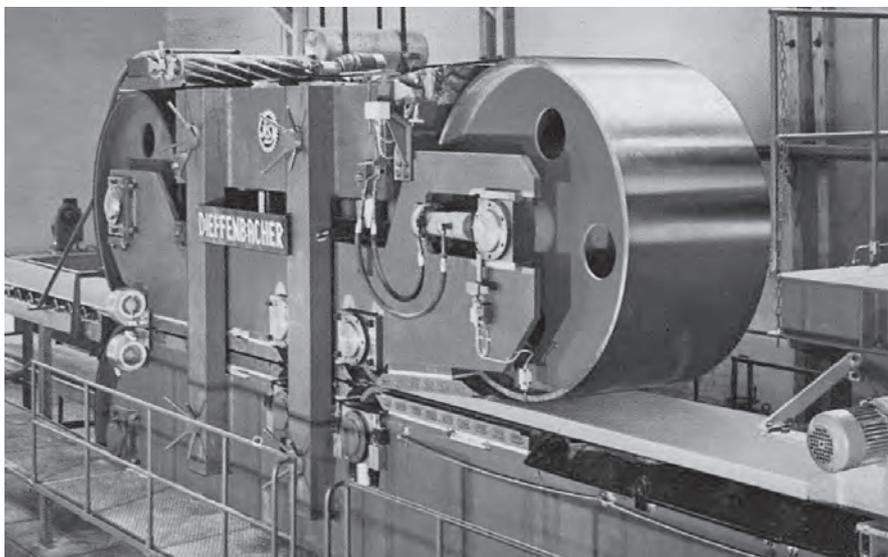
type continuous press but this is a calender type and also has limitations.

### Dieffenbacher innovations

Dieffenbacher launched its now-familiar continuous press system, CPS, in 1990. At the Ligna exhibition in 2015, Dieffenbacher announced the latest development of its CPS press and named it CPS+. This was not “just another upgrade,” but the most significant development in the history of the CPS,

### CPS is followed by CPS+

dramatically improving the whole operation of the press. The first of this new generation CPS+ successfully went into



1971: Prototype continuous hot press



CPS+

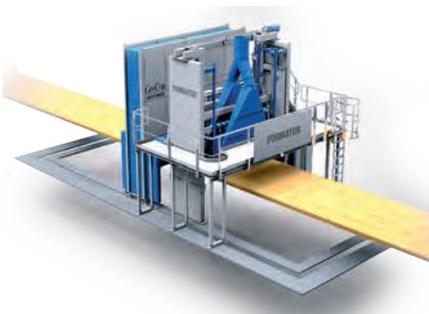
production in October 2016, at Kronospan's plant in Bjelovar, Croatia.

### *Becoming a supplier of complete plants*

However, Dieffenbacher is about a lot more than just presses and, since that launch of the original CPS, it has progressed a lot in the range of equipment it offers to panel makers. Over the years, the company has acquired the know-how for all the panel making processes both in front of, and behind, the press, by targeted takeovers and by continual internal development and innovation.

erates in a closed-loop system with the well-known Dieffensor for immediate changes on the production line, during forming.

Another launch was the Microwave Pre-heater, positioned before the press, and this changes only the temperature in the mat, while the moisture content remains unchanged.



Formator M

Dieffenbacher has also put a lot of development into forming and in 2015 developed an improved wind-forming system with an incorporated roller deck for particleboard production. Dieffenbacher says that its Formator M for MDF greatly improves crosswise forming accuracy. This segmented scalper op-



Microwave

The EVOjet M, for dry blending in MDF production, has been another success story, with 14 units sold to new plants, and for retro-fits. There is also the EVOjet P for particleboard blending.

Dieffenbacher subsidiary Maier specialises in size reduction machinery, particularly for the particleboard industry. Its latest innovation is the 3-D feeding of knifing flakers. This is designed to reduce the inherent problem in most flakers – uneven wear of the knives and wear plates. To overcome this problem, Maier offers a special distribution rotor, integrated into the flaking chamber.



EVOjet P



Slender flake (top) and standard flakes (bottom) for the production of Super PB

### Alternative panel types

As mentioned earlier, the challenges for panel makers are not all about production methods; another major consideration is the raw material, particularly in countries where wood is difficult or impracticable to obtain. Thus Dieffenbacher has developed methods to utilise alternative raw materials, for example bagasse and straw.

### Extremely light particleboard

The company has also worked with its customers in the development of new panel types. One example of such a panel is “Super Particleboard.” Dieffenbacher looked at the historic structure of particleboard and developed Super Particleboard (“Super PB”) to be produced at reduced manufacturing costs. By enriching a constant ratio of standard flakes with slender flakes, it is possible to achieve a board density up to 30 kg/m<sup>3</sup> lower, using less wood without forfeiting board properties. The production of slender flakes also has the advantage that raw materials other than logs can be used: slabs and off-cuts from sawn timber can easily be made into slender flakes, as well as utilising extremely thin and curved logs, which are far less expensive. In view of the booming knock-down

furniture business, weight is another factor and furniture made from lighter Super PB board is not only cheaper for the final consumer, but is also easier to transport.

### OSB that can be laminated

Another innovative panel that the company has developed is Fine Surface OSB. It has high flexural strengths and panel densities and can be made from affordable industrial timber and off-cuts from sawmills. The problem for laminating OSB was its uneven surface. Thus Dieffenbacher developed Fine Surface OSB in which the core layer is covered top and bottom with particleboard to give a better structure to the surface and panels that can be laminated on both sides with melamine



Production of Fine Surface OSB

or phenolic paper in a short-cycle press. Then there is “Container OSB.” This panel offers a low-cost alternative to conventional tropical hardwood plywood by replacing the central veneers with a cheaper OSB core. Longer strands are first sorted by new disc screens and then arranged crosswise in a precise, multi-layer, formation. A specially designed press is then used to produce a panel with high density, which is veneered in a hot press to

### OSB for container flooring

produce Container OSB. However, Dieffenbacher has already shown it can manufacture high-strength OSB on a laboratory scale, without additional veneers. These boards are now undergoing extensive practical testing.

### Overview

The technology for making composite panel products has changed dramatically over the last 20-odd years of my involvement with the industry, responding to customer demands and to the demands of the environment. The global spread of manufacturing operations for those panels has also increased greatly. Look at China and South America! Eastern Europe has come from almost nowhere to produc-



Container OSB

ing a large proportion of Europe's panel products, including OSB. Meanwhile, OSB itself has gone from a global capacity of around 20 million m<sup>3</sup> in 1996 to 32 million m<sup>3</sup> today.

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### *Innovative family-owned company*

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Dieffenbacher, which remains to this day a family-owned and managed company, with a turnover of €490 million in 2015, has been at the forefront of helping the panel industry to grow so fast, by technological innovation in

the panel making process and, as we have seen, by developing new panel types with different raw materials and re-engineered panel constructions, notably in particleboard and OSB. The company has continually innovated, and expanded its offering, by internal developments and carefully targeted acquisitions, to the point where it is able to offer practically everything you need for a panel manufacturing line from its own resources.

## About the Author



Mike Botting is Editor Emeritus of Wood Based Panels International magazine. He worked for the magazine as editor from June 1995.

During this time he has travelled the world and seen a lot of wood based

panel plants in very different places, and in different configurations. He has thus had direct experience of all the changes in the industry in the past 22 years.

Today, at the age of 65, Mike enjoys his semi-retirement (and more time with his wife, children, and seven grandchildren; and his classic cars) in his home in Norfolk, UK. He is, however, also still active for the magazine, giving the benefit of his experience and knowledge to the new editor. Furthermore, Mike has just started a consultancy called MBES Mike

Botting Editorial Services "Making English make sense," which helps companies in the panel industry to correct the English in their literature, PR material, and advertisements.



## Changing the Lightweight World – Again

Due to legal requirements, high safety standards, and rising energy costs, the use and further development of composites to reduce weight in automobiles and other industrial products has become indispensable. In addition to focusing on materials, research is also centered on the development of more energy-efficient technologies for large-scale production with the aim of lowering production costs.

At Dieffenbacher, our associates are continuously developing new efficient solutions and concepts for economic and sustainable production systems, all the while considering market requirements and the needs of users.

This development work is carried out in close cooperation with independent research institutes and universities. As part of its research and development activities, Dieffenbacher takes a leading role in shaping the technologies and production methods of the future. Examples of developments include production plants for the wet molding process and the new Fiberforge tape laying system.

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### *BMW relies on Dieffenbacher know-how*

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The economic processing of fiber-reinforced plastics is now beyond the

development phase and already in evidence on our roads. BMW began using carbon in high-volume production with the i3 and i8. For its new 7 Series, BMW relied on the process knowledge and lightweight design expertise of Dieffenbacher for the industrial production of carbon components. Today, carbon and hybrid components are manufactured on seven production lines in a fully automated process.



## *Fiberforge – the Fastest Tape Laying System in the World*

Dieffenbacher provides various solutions for the manufacture of lightweight components made from fiber-reinforced plastics. One of these solutions is the newly developed Fiberforge tape laying system.

The tape laying technology enables a component made from fiber-reinforced plastic to be reinforced with fiber tapes at the precise points at which it is subjected to the greatest strain. With Fiberforge technology, it is also possible to manufacture high-quality components entirely out of tapes. This tape laying technology is used for components such as seat shells and door modules.

The fourth generation of Fiberforge technology is the fastest tape laying

system in the world. It is 3.5 times faster than its predecessor. The system allows fiber tapes to be laid individually in a pre-defined pattern in a matter of seconds. The fiber-reinforced tapes consist of glass, carbon, or natural fibers based on a thermoplastic matrix.

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### *One tape up to 2 m in length in just one second*

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The latest Fiberforge technology offers two primary advantages. First is the laying speed. One tape up to 2 m in length or several short tapes can be laid in just one second. Second, the new angle-cutting system enables the tape to be cut either straight or at an angle of minus to plus 45 degrees. The resulting precise

and near-net-shape cutting and laying of the tapes reduces waste and lowers material costs.

Uninterrupted manufacturing is particularly important for mass production. For this reason, the plant is equipped with an automatic reel changing system with up to four large reels that does not require user intervention. This means that several hundred kilograms of material can be processed per hour. The Fiberforge technology from Dieffenbacher facilitates efficient and cost-effective high-volume production thanks to its speed, automation and economical use of materials.





## Dieffenbacher Advances Preform Technology

To make vehicles lighter, the automotive industry is increasing its use of components made from carbon-fiber-reinforced plastics. The latest preform technology from Dieffenbacher simplifies and lowers the costs of making these components.

When manufacturing such automotive components, the first step in the process is to produce a preform. For complex three-dimensional components, it is more efficient in terms of material utilization and more reliable in terms of formability to manufacture the preform from individual sub-preforms. Until now, joining the sub-preforms was a complex step in the manufacturing process. With the optimized and automated preform technology from Dieffenbacher, it is now possible to form a lightweight component from several sub-preforms in one work cycle. This

reduces the effort, the complexity, the cycle time, and the costs of producing three-dimensional preforms.

As a result, components in the shape of a frame can be manufactured with little cutoff waste. Examples of this are side frames or inside reinforcing frames for engine hoods. The entire

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### *Reduced costs and complexity*

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manufacturing process in the preform center is automatic. This includes cutting the fiber material, joining the individual layers into what is known as the stack, forming the sub-preforms, and trimming. In the subsequent process step, the individual sub-preforms are picked up together by a robot and, at the same time, inserted into the tool

with defined overlap zones without a separate joining step. In the high-pressure resin transfer molding process, the preforms are then impregnated with resin in the press and cured.

This new method is used in the construction of the Roding Roadster. The Bavarian sports car has a roof reinforcement made from a thermoplastic hybrid carbon-glass-fiber component. The fiber structure of continuous filaments required must be transferred to the component contour to ensure the fiber orientation is free of warping and creases. This is a key criterion for the quality of subsequent components.

# Cost-effective Production of Carbon-fiber Reinforced Components Using the Wet Molding Process

Cost-intensive carbon fibers require intelligent processing of the material in the mass production of components. An automated and fully integrated production line allows the material to be used efficiently. This means that higher quantities can be produced while

## High quantities – low production costs

manufacturing costs are lowered. To achieve this, it is essential to use a process that offers a high level of stability as well as short cycle times. The wet molding process meets both of these criteria.

Wet molding is used for the manufacture of carbon-fiber components with low three-dimensional complexity. This includes structural components such as vehicle drive tunnels, or reinforcements in the roof area, which must be able to withstand particularly high loads.

One of the ways in which these component parts are being utilized is in the new 7 Series from BMW. The automotive company manufactures carbon fiber components using five Dieffenbacher wet press plants in its Dingolfing production facility.

For the production of the BMW 7 Series, wet molding offers a

cost-effective alternative with a process chain that is easier to maintain. In contrast to conventional resin transfer molding (RTM), the resin mixture in wet molding – usually epoxy resin – is applied to the carbon fiber fabric outside of the press. The advantage of this is that it can be applied while other components cure in the press. High carbon costs are offset by short cycle times and thus higher quantities.





# More Recycled Wood in Particleboard Production – Innovative Recycling Solution for Pfeleiderer

Using recycled wood in the production of particleboard promises economic benefits as well as increased flexibility when purchasing wood. However, it also presents challenges, including fluctuations in the type of contamination, the quality, the size and the moisture content of the furnish.

With the help of Dieffenbacher, Pfeleiderer in Neumarkt overcomes these challenges with a novel combination of proven screen and sifter technology and a sensor-based X-ray sorting process.

## Optimized flake preparation

The Dieffenbacher solution provides greater reliability to correct the unavoidable fluctuations in the furnish material and the inherent wide mix of impurities, further optimizing subsequent flake preparation. Thanks to efficient cleaning, the complete material flow can be prepared using known flake technology. Particularly in the preparation of fine materials, emphasis was placed on minimizing wood losses while achieving the required degree of cleanliness in all particle sizes. The concept has also been successful in removing a high proportion of unwanted MDF fibers from the waste wood flow, which has increased plant availability in subsequent processes as well.

When it comes to the secondary size reduction of oversized pieces, Dieffenbacher uses a size reduction system that cuts at a slow speed. In addition to the low specific electricity consumption, the technology is such that only a minimal level of dust is generated by the size reduction. The system operates

continuously and has been designed by Dieffenbacher so that it can be integrated into the existing Pfeleiderer plant structure very efficiently.

After commissioning of the plant, Pfeleiderer will be able to significantly increase the proportion of recycled wood

in the production of particleboard while retaining the same high level of panel quality. This will continue to expand the economic benefits of using recycled wood.



Pfeleiderer particleboard plant in Neumarkt

## Dieffenbacher Continues to Rely on Apprenticeships!



### CLASS OF THE NEW YEAR 2016/2017

On September 1, 2016, Axel Dieffenbacher and the team led by Dr. Ralph Weber, HR Manager at Dieffenbacher, welcomed the new intake of apprentices for 2016/2017 at the company's Eppingen site. The class includes ten trainees, two cooperative students, and five dual students.

In the next few years, the apprentices will experience the theoretical and practical phases of training in areas such as mechatronics, machining, and electronics/operating technology as they become specialists in their individual field of expertise.

In the machinery and electronics area of the Dieffenbacher Training Center, trainers will provide the young adults with subject-specific fundamentals, interdisciplinary basic skills, and specialized knowledge in the individual disciplines. At the same time, the trainees will put theoretical knowledge into practice in areas such as switching circuit technology, drive engineering, and programming. In the framework of manufacturing orders, experimental plants, and new developments, they will manufacture turned and milled parts and build terminal boxes and switch cabinets.

In addition to providing sound knowledge and expertise, the trainers and specialist departments at Dieffenbacher also help the young people to develop through social competence training, business simulations, and an exchange with subsidiaries in Germany and abroad.

Trainers Matthias Höfle and Hauke Schmidt are looking forward to further cooperation with the 2016/2017 year group and a "very pleasant, motivated, and open-minded team" that sticks together and has started the training at Dieffenbacher in a good mood.

### SOCIAL COMMITMENT

In summer 2016, our trainees painted the basement and hallways of Eppingen's Waldstraße kindergarten. The washing machines and dryers were then put in place. Finally, the old kitchen facility was taken apart, clearing the way for the kindergarten's brand new kitchen. In close cooperation with the German Protestant Church, led by priest Friedhelm Bokelmann, social projects will be an integral part of training at Dieffenbacher.

"With this initiative, we want to further strengthen the social consciousness of young people and, at the same time, support the town of Eppingen," said Dr. Ralph Weber, HR Manager at Dieffenbacher.



## CONSTRUCTION SITE VISIT IN THAILAND

Julian Müller started his apprenticeship as a mechatronics engineer at Dieffenbacher in 2012. Since 2014 he has been studying mechatronics through the cooperative model at Heilbronn University. Last year he completed his practical semester at Dieffenbacher. This included four weeks in Thailand during the summer at the site of our customer Metro-Ply.

Met by Dieffenbacher colleagues on the construction site about 100 km northeast of Bangkok in the province of Prachin, Julian Müller experienced in practice the assembly of the hydraulic unit, the connecting pipes, and the press infeed and outfeed, among other aspects. He also showed team spirit when setting up the site containers or building an assembly bench to make the work easier.

In addition to experiences on the construction site, Müller was impressed by the open and cheerful mentality of the Thai people on a brief trip to Bangkok. His conclusion: "These four weeks allowed me to broaden my knowledge, become familiar with the working environment on a construction site, and learn a great deal about the Thai people. In other words, I'd definitely recommend doing a work placement like mine!"



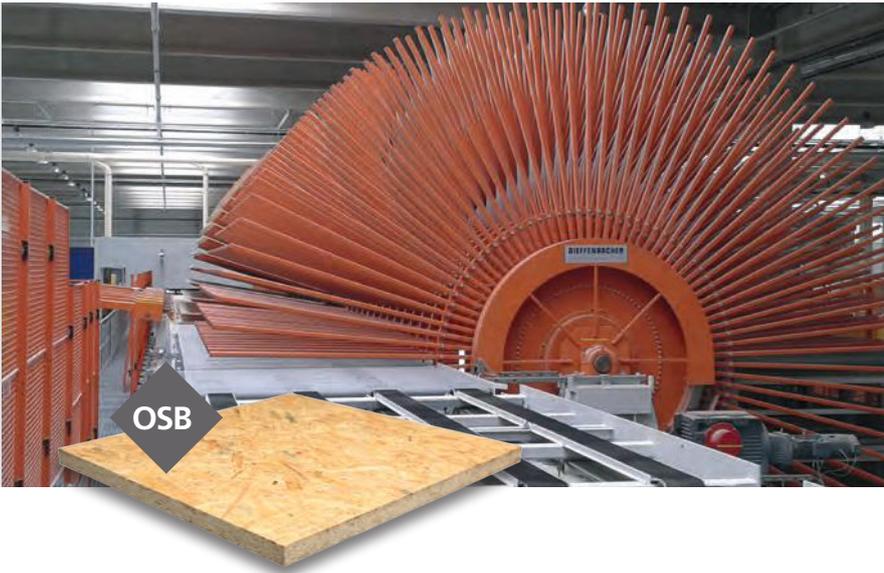
## STEFAN KRESS AND CHRIS WACKER RECEIVE AWARD FROM THE GERMAN CHAMBER OF COMMERCE

During the graduation celebration of 2016, the IHK (German Chamber of Commerce and Industry) of Heilbronn-Franken honored graduates from the city and district of Heilbronn for their special achievements. Among these graduates were two Dieffenbacher trainees, Stefan Kress (machining specialist) and Chris Wacker (mechatronics engineer). Since his graduation in 2016, Stefan Kress has been working as a specialist in large mechanical production. Chris Wacker is employed as a service technician in the field of Composites at our sites all over the world.

# *Start-ups*

04/2015 - 03/2017





Start-up 2015

# Kronospan Strzelce Opolskie

**Project data sheet:**

Product:..... OSB

Plant location:..... Strzelce Opolskie, Poland



# Shouguang Luli

## Project data sheet:

Product: ..... OSB/Fine Surface OSB/PB  
Plant location: ..... Shouguang City, China  
Capacity: ..... 1,000 m<sup>3</sup>/day  
Board thickness: ..... 6-40 mm  
Board width: ..... 2,440-2,650 mm  
First board date: ..... September 2015

## Scope of delivery:

- Chipping (2-step strand production)
- Dryer
- Screening
- Gluing
- 5-head forming station
- Forming line
- Press system CPS 280-39.5 m
- Raw board handling



Start-up 2015

PB

# Yunnan Xinzexin

**Project data sheet:**

Product: ..... PB  
 Plant location: ..... Kunming, China  
 Capacity: ..... 600 m<sup>3</sup>/day  
 Board thickness: ..... 16 mm  
 Board width: ..... 1,220 mm  
 First board date: ..... October 2015

**Scope of delivery:**

- Gluing
- Forming station
- Press system ContiPlus 4ft-28.9 m
- Storage system



# Xinjiang Xinxiwang

## Project data sheet:

Product: ..... MDF/HDF  
Plant location: ..... Xinxiwang, China  
Capacity: ..... 740 m<sup>3</sup>/day  
Board thickness: ..... 2-40 mm  
Board width: ..... 2,440-2,480 mm  
First board date: ..... December 2015

## Scope of delivery:

- Forming station
- Forming line
- Press system CPS 265-33 m
- Raw board handling



Start-up 2015



# Cipin Nengtong No. 2

**Project data sheet:**

Product: ..... MDF  
 Plant location: ..... Cipin, China  
 Capacity: ..... 700 m³/day  
 Board thickness: ..... 6-9 mm  
 Board width: ..... 1,220 mm  
 First board date: ..... December 2015

**Scope of delivery:**

- Forming station
- Press system ContiPlus 4ft-38.6 m
- Storage system



# Green River Panels

## Project data sheet:

Product: ..... PB  
Plant location: ..... Songkhla, Thailand  
Capacity: ..... 1,400 m<sup>3</sup>/day  
Board thickness: ..... 6-35 mm  
Board width: ..... 2,070-2,500 mm  
First board date: ..... January 2016

## Scope of delivery:

- Dryer
- Forming station
- Press system CPS 265-27.9 m
- Raw board handling
- Lukki storage system



Start-up 2017

# PRO MDF

**Project data sheet:**

Product: ..... MDF  
 Plant location: ..... Huimanguillo, Mexico  
 Capacity: ..... 800 m³/day  
 Board thickness: ..... 3-40 mm  
 Board width: ..... 2,440-2,465 mm  
 First board date: ..... February 2016

**Scope of delivery:**

- Chipping
- Screening
- Refining
- Dryer
- Air grader
- Glue preparation
- Gluing system PROjet
- Gluing system EVOjet M
- Forming station
- Forming line
- Press system CPS 265-29.5 m
- Raw board handling
- STS storage system
- Sanding line
- Short-cycle laminating line
- Packaging line
- Extraction system and filters
- Energy plant
- Glue factory



# Parco

## Project data sheet:

Product: ..... MDF  
Plant location: ..... Rasht, Iran  
Capacity: ..... 735 m<sup>3</sup>/day  
Board thickness: ..... 2-38 mm  
Board width: ..... 1,830-2,440 mm  
First board date: ..... February 2016

## Scope of delivery:

- Refining
- Dryer
- Air grader
- Gluing system PROjet
- Forming station
- Forming line
- Press system CPS 265-35.9 m
- Raw board handling
- Storage system
- Extraction system and filters



# Masisa Durango

**Project data sheet:**

Product: ..... MDF  
 Plant location: ..... Durango, Mexico  
 Capacity: ..... 800 m<sup>3</sup>/day  
 Board thickness: ..... 2.5-30 mm  
 Board width: ..... 2,440-2,465 mm  
 First board date: ..... March 2016

**Scope of delivery:**

- Dryer
- Air grader
- Glue preparation
- Gluing system PROjet
- Forming station
- Forming line
- Press system CPS 265-29.5 m
- Raw board handling up to diagonal saw
- Extraction system and filters



# Hebei Bazhou Guangyang

## Project data sheet:

Product: ..... MDF  
Plant location: ..... Bazhou, China  
Capacity: ..... 650 m<sup>3</sup>/day  
Board thickness: ..... 8-30 mm  
Board width: ..... 1,220 mm  
First board date: ..... April 2016

## Scope of delivery:

- Forming station
- Press system ContiPlus 4ft-38.6 m
- Storage system



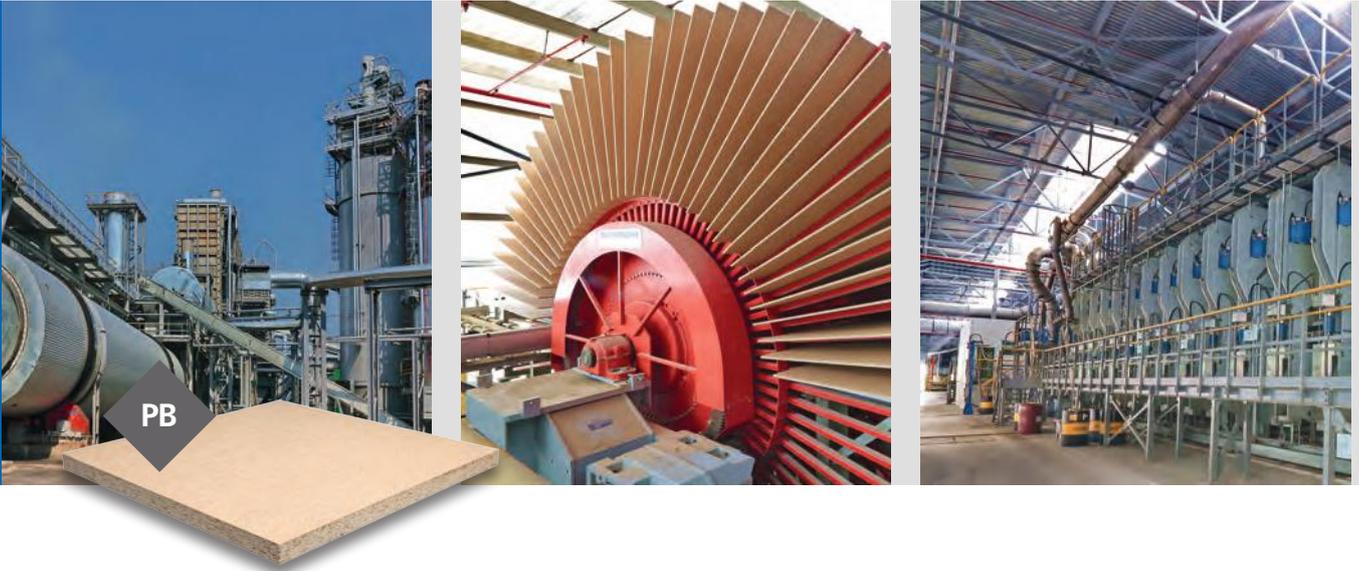
# Kastamonu Entegre

## Project data sheet:

Product: ..... MDF  
 Plant location: ..... Alabuga, Russia  
 Capacity: ..... 1,400 m<sup>3</sup>/day  
 Board thickness: ..... 5-40 mm  
 Board width: ..... 2,440-2,800 mm  
 First board date: ..... April 2016

## Scope of delivery:

- Dryer
- Air grader
- Gluing
- Forming station
- Forming line
- Press system CPS 295-48.4 m
- Raw board handling
- Storage system
- Sanding line
- Packaging line
- Extraction system and filters



# TomLesDrev

## Project data sheet:

Product: ..... PB  
Plant location: ..... Tomsk, Russia  
Capacity: ..... 909 m<sup>3</sup>/day  
Board thickness: ..... 6-40 mm  
Board width: ..... 1,830 mm  
First board date: ..... April 2016

## Scope of delivery:

- Dryer
- Flake preparation
- Gluing
- 3-head forming station
- Press system CPS 210-33 m
- Raw board handling
- Storage system
- Sanding line
- Extraction system and filters
- Energy plant



# Modern Lumber Technologies

## Project data sheet:

Product: ..... OSB  
 Plant location: ..... Torzhok, Russia  
 Capacity: ..... 1,866 m<sup>3</sup>/day  
 Board thickness: ..... 6-40 mm  
 Board width: ..... 2,250-2,800 mm  
 First board date: ..... June 2016

## Scope of delivery:

- Debarking
- 2 material processing lines with log conditioning (deicing)
- 2x chipping
- 2 driers
- 2x screening
- Glue preparation
- Gluing
- 4-head forming station
- Forming line
- Press system CPS 295-60 m
- Raw board handling
- Storage system
- 2 packaging lines
- 2 energy plants



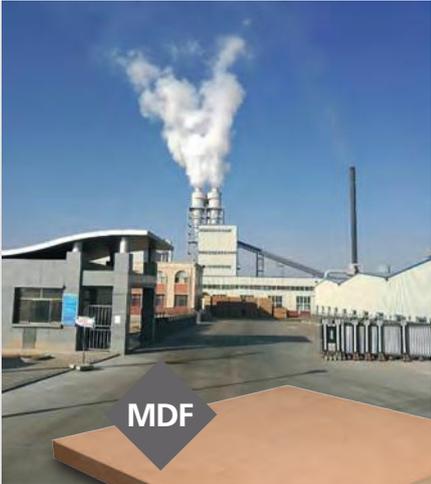
# Hebei Xinyu

## Project data sheet:

Product: ..... MDF  
Plant location: ..... Wenan, China  
Capacity: ..... 220 m<sup>3</sup>/day  
Board thickness: ..... 8-20 mm  
Board width: ..... 1,220 mm  
First board date: ..... June 2016

## Scope of delivery:

- Multi-opening press
- Raw board handling



Start-up 2017

# Ningxia Jinyuan

**Project data sheet:**

Product: ..... MDF  
Plant location: ..... Ningxia, China  
Capacity: ..... 350 m<sup>3</sup>/day  
Board thickness: ..... 9-25 mm  
Board width: ..... 1,220 mm  
First board date: ..... July 2016

**Scope of delivery:**

- Multi-opening press
- Raw board handling
- Sanding line



# Jiangsu Hongze Dongtai

## Project data sheet:

Product: ..... MDF  
Plant location: ..... Hongze, China  
Capacity: ..... 280 m<sup>3</sup>/day  
Board thickness: ..... 9-20 mm  
Board width: ..... 1,220-2,440 mm  
First board date: ..... July 2016

## Scope of delivery:

- Forming station
- Multi-opening press
- Raw board handling



Start-up 2017

# ZRK Industries

**Project data sheet:**

Product: ..... MDF  
 Plant location: ..... Mardan, Pakistan  
 Capacity: ..... 600 m<sup>3</sup>/day  
 Board thickness: ..... 2-32 mm  
 Board width: ..... 2,440 mm  
 First board date: ..... September 2016

**Scope of delivery:**

- Dryer
- Air grader
- Gluing system PROjet
- Forming station
- Forming line
- Press system CPS 265-27.9 m
- Raw board handling
- Storage system
- Sanding line
- Extraction system and filters



# Kronospan Bjelovar

**Project data sheet:**

Product: ..... PB

Plant location: ..... Bjelovar, Croatia



Start-up 2017

# Metro-Ply

**Project data sheet:**

Product: ..... PB  
 Plant location: ..... Prachinburi, Thailand  
 Capacity: ..... 1,850 m<sup>3</sup>/day  
 Board thickness: ..... 6-40 mm  
 Board width: ..... 1,880-2,550 mm  
 First board date: ..... March 2017

**Scope of delivery:**

- Dryer
- Air grader
- Forming station
- Forming line
- Press system CPS+ 265-40.5 m
- Raw board handling
- Storage system

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