

An ingenious interpretation of sustainability

*HIGH DEGREE OF PREFABRICATION
OBTAINED BY THROUGH-FEED SYSTEM*

*A passion for unique staircases
Craftsmanship meets modern 5-axis technology*

*Review of the Holz-Handwerk trade fair
Even the competitors were impressed*

*Flying climate-neutral
Digitised product development*

**HAMUEL
REICHENBACHER**
Members of the SCHERDELGroup



Foreword by Thomas Czwielong.

A new approach to sustainability

Dear customers, business partners and colleagues,

In the summer of 2022, I attended the Second International Congress of the Forum for Timber Construction Technology & Economy in Memmingen and gave a lecture there on the topic of "Planking parts in timber frame construction". If you are wondering why we have been so intensely concerned with the issue of timber construction for some time now: everyone is talking about sustainability, also and especially in connection with the building industry, and after giving it some consideration, we show what our contribution can be.

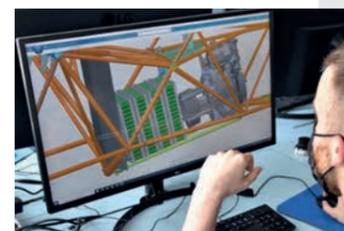
This is why we will be holding the second live expert meeting at our Dörfles-Esbach site in November 2022. Again as a hybrid event, again with contractors from the timber construction industry, planners and others involved in this sector. We will come together to participate in a lively exchange about new visionary solutions regarding the central theme of "A house at your fingertips!".

However, in the 12th issue of our Insight, we naturally also talk about what is happening in other sectors. We interviewed Diehl, a staircase manufacturer, and Regnauer, a producer of prefabricated houses, and after quite a long time we are once again offering a platform for research and development: Trier University of Applied Sciences has fascinating news to share on the topic of "climate-neutral flying". In keeping with the above also the contribution of the Fraunhofer Institute IPA to the first workshop in Stuttgart, where the focus was on new trends along the entire process chain of the "dry processing of aluminium profiles".

Under the category "Service Partners" we present to you this time the company Motec, which is working for us in Mexico, Honduras and Canada and provides interesting insights into its everyday work.

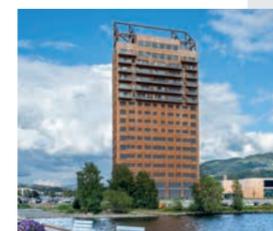
I hope you will enjoy reading this issue,

Thomas Czwielong
Managing Director
Reichenbacher Hamuel GmbH



REICHENBACHER HAMUEL

**SERVICE
PARTNER**



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A passion for unique staircases

Craftsmanship meets modern 5-axis technology.

It can be an exciting challenge to replace an existing CNC line with a more modern one. At the Diehl staircase manufacturer in Frankfurt, however, the electric power of the new one could have caused a brief blackout in parts of Frankfurt.

What had happened? In 2016, the delivery of their new VISION-ST 5-axis staircase machine was imminent, when the in-house electrician pointed out to Managing Director Jürgen Quirin that they had probably overlooked a small detail. Modern machining centres have a significantly higher power intake than older ones. It was not an option to connect the system and possibly paralyse the underground or to lay new cables in the district of Main Nord-Ost. The pragmatic approach was to rent a new production hall 12 km away from the head office.

Driven by the passion to create incomparable one-offs, carefully refined according to the individual ideas of the customers, Diehl has become a symbol for exclusive stair constructions over the last 50 years. Coiled, straight, folded, as block or cantilever steps, or connected with bolts: there are almost no limits to the variety of designs. Apart from wood, they use steel, glass and exposed concrete, as well as solid surface materials and leather. The secret of staircases realised way beyond conventional standards is the combination of craftsmanship with ultra-modern 5-axis CNC technology. After all, the VISION can process anything made from solid wood, aluminium, composite or solid surface material.

Here, the programming is essential for the entire process. NC-HOPS and Staircon, a staircase software from Sweden, turn ideas into precise planning and production steps. All relevant factors, such as the optimum pitch ratio, are calculated and shown in 3D simulation, followed by the creation of the data required for machining and their transfer to the CNC. "We can no longer imagine doing without the variety and flexibility that the software and machine also offer in terms of free-form milling," emphasises Tobias Krebs, who programmes and operates the machine together with a colleague.



Managing Director Jürgen Quirin with machine programmer Tobias Krebs.



Handrails manufactured to the millimetre are necessary to reach a perfect fit during assembly.



Tobias Krebs is enthusiastic about the CNC system because, in combination with the software, it offers enormous versatility and flexibility, also where free-form milling is concerned.

Things get challenging again, when the planning and simulations reach the implementation stage. After all, an optimum result depends on the clamping technology. "There will be no satisfactory results if the machining of components fails because the raw parts cannot be adequately fixed. Especially with the use of 5-axis technology and the rotary and swivel movements of the spindle in all directions, components must not move a single millimetre," Krebs explains. "For us, this means that we pre-mill a lot of the patterns from wood; also because we often use steel and glass. It is fascinating, how dimensionally accurate everything then fits during assembly," he enthuses. "This is the only way, for example, to manufacture with millimetre precision an oak handrail for a wave-shaped flat steel railing heavily twisted in the corners, which has a mitre connection in the corners and adapts exactly to the flat steel at all points. And all this without even the slightest scratch on the sensitive, powder-coated railing surface," adds Managing Director Jürgen Quirin.

The basis for these findings provides our VISION-ST with its massive machine substructure, which possesses an optimum rigidity and weight ratio and thus permits high acceleration values. In addition to the plate changer and pick-up station, the equipment also includes a manual beam table for stairs: this beam table possesses eight beam carriers made of steel profiles with 16 base bodies for the fixing of vacuum clamps, stops, swivel stops and support rails. Thus, the system with its table for steps and post clamping device is perfect in terms of production technology for the requirements of staircase manufacturers such as Manufaktur Diehl.

Review of the Holz-Handwerk trade fair

Even the competitors were impressed.

The Holz-Handwerk 2022 trade fair took place under different circumstances than in the past. Although, according to the fair organisers, 708 exhibitors from 33 countries and 28,500 expert visitors from 100 countries were present, this cannot conceal the fact that the change of date from March to July demanded many concessions from all involved.

More impressions come from our interview partner Volker Budzinski.

What was different after four years compared to 2018?

On the whole, considerably fewer exhibitors and visitors attended over the four days. We had two outstanding days with crowds of visitors to cope with, and, in total, we were able to record over 100 trade fair protocols with promising discussion results.

Yet this is where the real problem of the 2022 fair becomes apparent: the date in summer. Florian Mauch accounted for 1/3 of all interview notes. His sales area emerged as the winner, as all the federal states except Bavaria and Baden-Württemberg were on holiday; the same was true for Austria. It felt as if Asians, Chinese and Americans were completely missing, and there were only few Scandinavians present. This is not a suitable date to get satisfying results.

What did the team say about our presence at the fair?

Everyone was satisfied, on the one hand with our stand - many thanks at this point to Mike Beier (Marketing) - and on the other hand with the expertise shown by the visitors. This year, there were no family days as they used to be known. We were there with a bigger crew, which worked perfectly as a team. Everybody lent a hand so that everything ran smoothly: sales, service and catering - great praise to all.



Volker Budzinski, Director of Sales



The OPUS with its industrial control system was the absolute highlight.



Expert talks take place at our own stand.



The team was a well-coordinated one.

How was the machine on display received?

The OPUS was a real success. The stand was full of people in no time, when the live demonstration started. After all, we had vigorously advertised this new series in the run-up to the fair. 25 % of the enquiries concerned this line, which also attracted a lot of interest from our competitors.

Can we conclude from this that presence on site is important anyway?

As far as this trade fair and the machine are concerned, the definite answer is yes. These expert visitors wanted to see machines, and, above all, the industrial control system with the WOP/SFP interface was the absolute highlight. Compared to our entire competitors, we really have something special to offer to the woodworker, and this is how we convince young decision-makers with an affinity for technology in particular.

How did Reichenbacher position itself at the fair?

Three companies were represented at the stand: apart from us Amyon, the exclusive distributor for the OPUS in the DACH/GSA region, and SMB, the automation specialists in the group of companies. Although the latter was not a main topic, it was nevertheless worthwhile for some visitors, and we could clearly position ourselves as all-rounders. Moreover, with the machine on display, the recognition factor was considerably higher than in 2018.

Were there any actual procurement intentions?

There were many familiar faces, and some actually came to the fair with definite purchasing intentions.

The OPUS dominated the discussions, but, of course, some seized the opportunity to clarify other projects personally on site, too.

Is there no digital possibility for this?

The absolute majority of visitors were woodworkers - carpenters and joiners - and they want something they can touch. In contrast, almost no timber constructors with industrialised production were present. Here you can also see the difference between the generations: the younger ones have long been in tune with digitalisation. Customer relations are not just about hard facts, as they also include, for example, our catering with Coburg Bratwurst (roast sausage), which was very well received. You cannot do that digitally, and you should not underestimate the fact that these impressions also stick.

What do you think of the parallel trade show events?

As exhibitors, we simply had no time for the special events. We were unable to attend the keynote lectures and special shows ourselves or to provide speakers. We prefer to do expert talks at our own stand.

What is your conclusion?

The Holz-Handwerk has its justification, only the date in July is simply not worth the effort, as a large part of the public is missing due to the holiday season. The costs for a fair are considerable and therefore the fair must take place in its normal rhythm again in 2024. Otherwise, we will have to reconsider.

Dry processing of aluminium profiles

Stable milling processes with greater efficiency and cleanliness.

On 30 June 2022, the first workshop "Dry Processing of Aluminium Profiles" took place at the Centre for Lightweight Engineering of the Stuttgart Technology and Innovation Campus S-TEC. About 30 participants from industry and science were present to learn about new trends along the entire process chain of the dry processing of aluminium profiles and to discuss production-relevant challenges.

At the beginning, Andreas Gebhardt from Fraunhofer IPA presented the latest research approaches in the machining of lightweight materials. Afterwards, Stefan Fehn outlined how to use the perfectly matched machine and clamping concepts from Reichenbacher Hamuel successfully in aluminium profile machining. Stefan Michler used current examples from the apt Group to show what processing options for extruded profiles exist for the machining, welding and bonding process as well as assembly. In a practical presentation on CAM programming, Stefan Speiser and Benjamin Kopf from SolidCAM explained the advantages of using a CAM system in profile machining. The series of lectures ended with Thomas Haag's contribution on the benefits of MHT's air-cooling-lubrication system medium distributor for the dry machining of aluminium materials.



The presentations addressed trends along the entire process chain.



The in-house fair allowed for an exchange with experts throughout the event.



The live machining demonstration provided the participants with practical insights into the dry machining of aluminium profiles.

During the subsequent live machining on the ECO-2012-LT, the participants gained valuable insights into the dry machining of aluminium profiles: they were shown various milling strategies, machining operations and clamping technologies. It was demonstrated impressively that efficient and cost-saving dry machining of aluminium is possible with very good surface results.

The workshop was a common event of apt Extrusions GmbH & Co. KG, Reichenbacher Hamuel GmbH, SolidCAM GmbH, Spreitzer GmbH & Co. KG, Hufschmied Zerspanungssysteme GmbH, MHT GmbH Merz und Haag and the Fraunhofer Institute for Manufacturing Engineering and Automation IPA.

Additive manufacturing and industrial 3D printing

Formnext – Where ideas take shape.

This is the motto of the leading trade fair Formnext, the most important industry platform for additive manufacturing and industrial 3D printing as well as tool and mould making, which will take place at the exhibition grounds in Frankfurt am Main from 15 November to 18 November 2022.

Expert visitors from all application sectors regard the trade fair as an important international meeting point, as the next generation of product development, in particular the interaction of additive technologies and tool and mould making, is presented and illuminated here in all facets along the entire process chain.

We will co-exhibit with Hans Weber Maschinenfabrik in Hall 11.1 at Stand C 49. For the first time, we will present the new products HybriDX-LT and AMS 400 to a broad audience and print live on both systems. The HybriDX-LT constitutes the perfect combination between large-format industrial 3D printing and a post-processing system by milling. Apart from a large print volume, the use of technical and high-performance thermoplastics is particularly noteworthy.

The AMS 400 produces components based on the L-PBF (Laser Powder Bed Fusion) process for many areas of application. In addition, our partner will show further machines and Siemens will be represented with their own information stand, too.

formnext

Frankfurt, Germany
15 – 18 November 2022



Additive manufacturing system based on the L-PBF process.

"At this trade fair, we exchange ideas with expert visitors and show how we transfer norms and standards in terms of dynamics and precision from mechanical engineering to additive manufacturing, while making no concessions regarding accuracy and surface finish in doing so," says Dr Alexander Kawalla-Nam, Head of Additive Manufacturing Technology. He adds, "Here we have the unique opportunity to meet many international players – from the aviation industry via the medical and automotive industries and, in relation to powder production, also to companies from the chemical industry. It is important that we, as German manufacturers, highlight the strengths of our mechanical engineering sector in comparison to international competitors."



Large format 3D printing + finishing in one machine.



The HybriDX-LT produces suction nozzles or vases from various thermoplastics as well as from GF and CF. The AMS 400 permits the production of metal components up to a size of 400 x 400 x 500 mm.

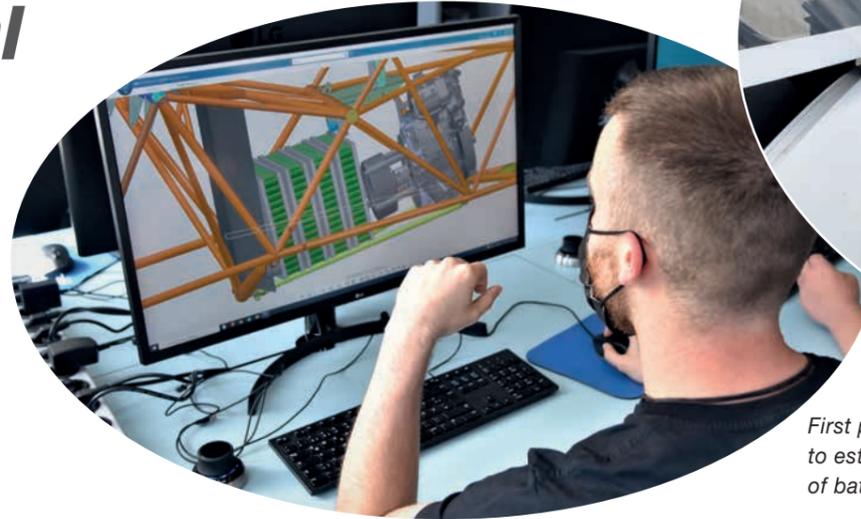
Flying climate-neutral

Digitised product development.

Many impulses for new methods of application or materials, which later find their way into everyday life, have their origins in research laboratories. This also applies to the Laboratory for Digital Product Development and Manufacturing (LDPF) at Trier University of Applied Sciences, which is intensely concerned with questions of sustainability and mobility of the future.

In this age of digital transformations, professions are subject to restructuring and fields of activity to changes. The use of modern IT tools and new technologies in the life cycle of products offers considerable potential in many branches of industry, and therefore must be an important aspect in engineering education, too. At the Trier University of Applied Sciences teaching is project-based, and Michael Hoffmann, head of the laboratory and lecturer in mechanical and automotive engineering, emphasises that the intensive study of sustainability issues is part of the LDPF's DNA.

The introduction of computer-aided manufacturing has revolutionised the production of complex components, especially so in tool and mould making. At Trier University of Applied Sciences, a CNC machining centre from our company is the core of the actual implementation in prototype and mould construction. The ECO-516 Sprint, purchased in 2001 thanks to funding from the Nikolaus Koch Foundation Trier, underwent a retrofit last year. In addition to the installation of a new control system from Siemens and of maintenance-free drive modules, the safety components, in particular, have been brought up to the state of the art.



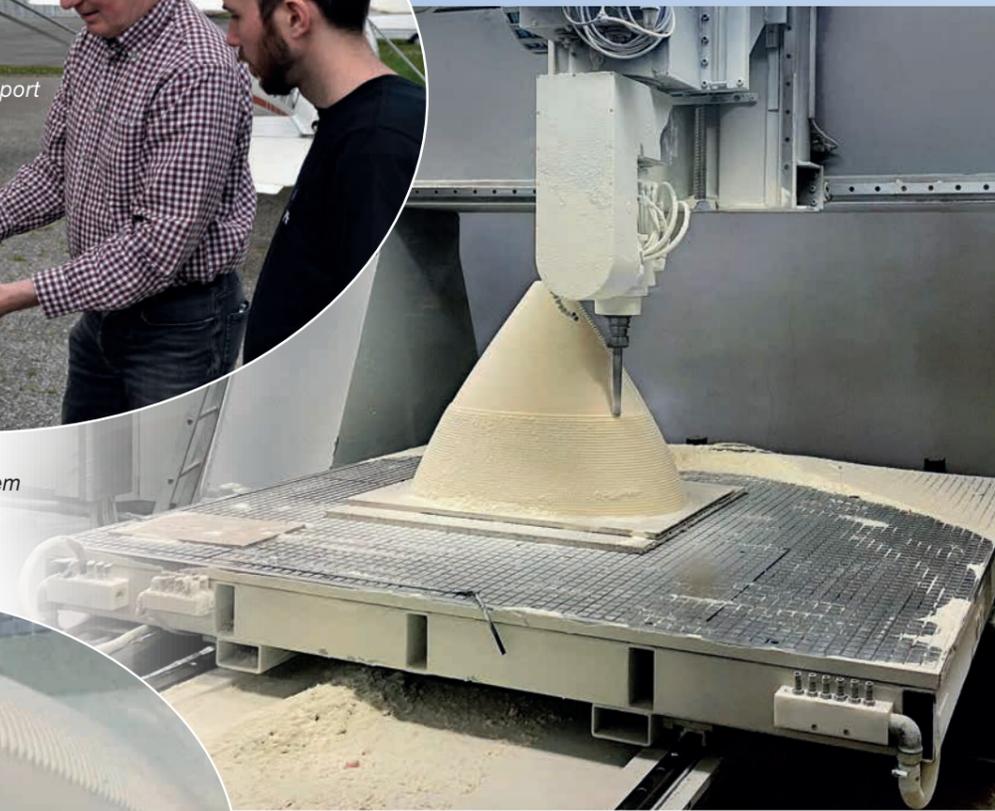
Installation of the motor support for the electric drive.

First package assessment in the 3D system to establish the design and positioning of battery and range extender.

At the LDPF, the current use of the machine is in three long-term projects: The first involves the development of a concept for an energy-efficient, electric local transport vehicle: the proTRon EVOLUTION. The focus is on climate- and environmentally-compatible mobility; thus, the basic structure of the monocoque predominantly consists of natural fibre composites. In the second project, they want to develop and produce a bicycle frame made of natural fibre composite, and – last, but not least – they want to eliminate the combustion engine of a motor glider and replace it with a climate-friendly electric drive. Of course, there exist technologies for emission-free hybrid drives in aviation today. There are electric aircraft engines, propellers, generators with matching power electronics, and the necessary battery technology including the electronic management system is available, too. The challenge is to harmonise the existing components and develop a practical and safe hybrid drive for a touring motor glider.



Preliminary foam pattern of the master pattern for the new cowling.



Finishing process of the foam pattern for the new cowling.

The task of the student team in the first phase is the structural design and geometric validation of the package and installation space for the drive and the battery packs as well as the 3D design of a new aerodynamic cowling for the drive to integrate the electric motor with propeller into the front section of the aircraft. After completion and approval of the 3D design, it will be possible to establish the master pattern of the cowling for moulding the fibre composite. For reasons of the size and shape of the component of 820 x 510 x 610 mm (L x W x H) and the material used, our portal milling machine is ideally suited for the production of the prototype component. Based on the 3D data, the programming, the simulation and the safeguarding of the milling process is effected offline at the virtual twin of the machine. Thanks to the 5-axis kinematics of the ECO-516 Sprint, the entire milling process can then take place collision-free in just one clamping operation.

The material used for the fabrication of the master pattern is Sika block material, a very easy-to-machine pattern foam based on polyurethane (PUR) and epoxy (EP). The block material consisting of sheet material is pre-sawn to raw part dimensions close to the final contour and glued together in order to avoid unnecessary material removal. After just under four hours, the milling process is finished and the moulding of the laminating mould for the final fibre composite component from the master pattern can follow. The conversion of the Stemme 2 motor glider provided will then take place near Trier University of Applied Sciences, in a hangar at the airfield in Föhren.



Stemme 2 experimental aircraft in the hangar at Föhren airfield.

An ingenious interpretation of sustainability

High degree of prefabrication obtained by through-feed system.

Who knows that 110 million m³ of wood grows in German forests every year and a mere 70 million m³ of it is used? At a net floor area of 1,000 m² a Regnauer building consumes 128 m³ of wood. Theoretically, this quantity of wood grows again in only 33 seconds. THAT is ecological and economical sustainability, especially since every cubic metre of wood in the building stores around 1 ton of CO₂.

When producing house walls and ceilings, the Chiemgau-based company Regnauer Fertigbau GmbH relies on a high degree of prefabrication. Building with wood has been a tradition there since 1929, as has the company's philosophy of masterly combining a healthy indoor climate, stylish architecture and high functional and aesthetic standards.

Modern automation technology dominates many steps in the production process. Everything comes from a single source at this company, which Michael Regnauer manages in the third generation, as the about 220 employees also comprise architects and construction engineers. What is so special about the energy-efficient buildings, which stand out due to their high-quality workmanship and first-class materials, is continuous innovation. Particularly noteworthy are the walls with wood fibre insulation and extra strong panelling made of gypsum, a natural building material, as their perfect temperature and moisture balance ensures a healthy indoor climate.



Company building of Regnauer Fertigbau GmbH in the Chiemgau area.



Highly efficient through-feed machine ECO-3313-A with a preceding area storage system with 14 places.



The removal cycle had become so fast that they have retrofitted a stop button for the machine operator.



A central CAD planning system provides the complete data sets with the correct project reference directly to the respective workstation.

Thanks to the progressive K60 construction method, Regnauer realises buildings with up to five storeys – exclusively in prefabricated timber construction.

The high degree of individualisation of the properties calls for very different panel types and sizes for the approximately 80 single-family homes and 25,000 m² of office space built every year. Knauf is the main supplier of natural and diamond gypsum panels used for double or triple planking of house and garage walls or as soffit panels for Silence suspended ceilings.

Last year, the heart of the wall production, a CNC centre for panel machining, needed replacement after 20 years. However, that alone was not sufficient, as production 4.0 means digitising even more profoundly, making workplaces more ergonomic and optimising processes in such a way that the right panels are always available at all production stations at the right time for each specific construction project. This is where we got involved. The tricky challenge was to implement the new centre for panel processing into an existing production sequence and at the same time to improve process flows, while Production Manager Michael Mattner and Senior Director Engelbert Regnauer had above all the more efficient handling of the panels in mind. On top of that, there was limited space and the desire to integrate existing peripherals such as the extraction system into the overall concept. Our Area Sales Manager Florian Mauch remarks, "That was quite a bunch of tasks we were given. However, we have a reputation that we do not simply supply milling systems, but do also reconcile such complex requirements and develop individualised process solutions."

The result: the highly efficient ECO-3313-A through-feed system was smoothly integrated into the existing production line in 2021 and has been a central component in the overall process ever since. An area storage system with 14 places precedes it, where the arrangement of the panel stacks is in line with the quantities required, meaning that the panel types most often needed are closest to the milling machine. A flexible gripper system moves raw panels with maximum dimensions of 3,300 x 1,280 x 25 mm and transports them into the CNC unit via a motor-driven roller conveyor. Then, five positionable grippers aligned along the table on a slide hold the panel in place. The sectioning and cutting to size of the panel are the next steps. "We rely on a high degree of prefabrication and deliver almost completely closed façade components to our construction sites, i.e. including façade formwork and plaster and with windows and doors in place. Therefore, the CNC performs all formatting, such as socket, door and window cut-outs, anchoring angles and fixing holes, bevel cuts for gables and other technically necessary notches," Michael Mattner explains and adds, "In the case of the plasterboard and the gypsum fibreboard with cardboard coating on both sides, we have to mill over the zero edge in order to cut through the cardboard reasonably. That is the reason why we have decided on exactly this design of the CNC system."



A flexible gripper system moves raw panels and transports them into the CNC unit via a motor-driven roller conveyor.



Regnauer relies on a very high degree of prefabrication and delivers almost completely closed façade components to the construction sites.



The present manufacturing sequence requires that all panels move through the processing centre, as for lack of space no raw panels are available at the downstream production stations. A central CAD planning system provides the complete data sets with the correct project reference for all workstations. This saves time and ensures optimum fitting accuracy and high quality. Thus, the intelligent interlinkage of all components in the sense of a smart factory makes a significant contribution to an increase in efficiency. The amount of material moved in the same time span is five times higher than in the past. The quantity of panels processed in one shift today equals that of two shifts in the past. The alignment and removal cycle had even become so fast that they had to retrofit a stop button.

"High plant availability is imperative, since there is no alternative option for this process step," Michael Mattner points out. "The system has been adapted to our process concept and hall layout in an exemplary manner, and the replacement was carried out during full production operation." Especially the customer-oriented approach on the part of Reichenbacher impresses him. After all, their expertise in finding technical solutions is obvious in many details, for example in the extraction system that removes the abrasive gypsum dust, which adheres strongly to all components, very close to the processing point. For this purpose, a suction bell directly attached to the top and the bottom of the milling unit extracts the gypsum dust with a powerful draught of air. The roller tables are also helpful, as the minimum amount of residual dust drops into the chip tray in the machine bed.

The demand for energy-efficient buildings is still on the rise, and Regnauer is in an excellent position, partly thanks to our plant.

The CNC performs all formatting, such as socket, door and window cut-outs, anchoring angles and fixing holes.

Industrial boom in Mexico

Marco Opitz – Service in South America.

Of the TUBE series alone, there are now more than 35 units in South America and it is, of course, important that we offer competent service for all our units. Since autumn 2021, MOTEC CNC-Technik, a service professional par excellence, has been supporting us.

CEO Marco Opitz founded the company in Southern Germany in 2006 with the idea of being an international solution provider for the industry in the machine - tool sector. Mainly in response to the industrial boom, he opened a subsidiary in Mexico in 2014, as many top-class industrial companies have established themselves there to use the region as an extended workbench to produce parts for their markets in America and Europe. Major car manufacturers such as Audi, but also Bosch and Siemens, have production facilities there, and they depend on professional all-round service.

We know that such high-class manufacturers demand very individual machine concepts, which are tailored to their needs while taking into account the optimum peripheral equipment. Motec is therefore not only specialised in the service and maintenance of cutting machine tools, production equipment and automation solutions, but also in the respective counselling and sales. Thanks to many years of knowhow and the experience gained from a large number of successfully implemented projects, Motec is now one of the leading trading companies and a sought-after service provider in Mexico. The specialists have become an important partner for Reichenbacher in a very short time, as they take over the repair and modernisation of the machines in addition to the installation of new systems and normal maintenance.



Managing Director Marco Opitz.



The MOTEC site at CP.766116, Querétaro, Qro, Mexico.



Motec supports a large number of systems of the TUBE series, including spindle maintenance.



Siemens control system: the company has its own spare parts stock in South America.

Part of the Motec team with Managing Director Marco Opitz.

Among their everyday tasks are updating control elements, replacing electrical cables or hydraulic hoses, removing the ATC, changing safety glass, levelling the geometry, installing motors, repairing and maintaining spindles – and a good deal more. Motec offers all kinds of industrial services, including spare parts distribution, engineering application consulting and programming support. This work for several machine manufacturers from Germany, Spain and Asia is done by a team of 7 people, among them 2 service technicians and 3 sales people, who are on the road in Mexico, Honduras and Canada.

This contact came about last year after recommendations from various Reichenbacher customers who produce their parts on numerous systems in South America as well as Canada. For us, Motec mainly takes care of the TUBE series, which, due to its special design, can be loaded into a 40" open top high cube container without the need to dismantle many components and is therefore easier to ship than other series. However, many ECO-NT and ECO-RS plants are also in operation in Mexico and the first HSTM 150 S2 has been installed for our sister company HAMUEL. Their Mexican customer manufactures turbine blades for gas and water turbines for the energy industry and states to be very happy with the performance of the machine tool. At around 70-80 %, the largest share of Motec's turnover is currently based on servicing plants for automotive and mould making; the rest on companies in other sectors, such as a German manufacturer that currently produces high-end kitchen sinks in Canada with one plant and will do so with a total of three in the near future.

If you are now wondering how the issue of supply chain disruption affects Mexico, Marco Opitz answers with an interesting observation. The shortages in Mexico are sometimes even worse than in Europe and there is a lack of everything: electronic chips, cables and many other things. In summer 2022, this even led to an American car manufacturer temporarily shutting down production for reasons of missing parts that are still stuck in containers in Asia.

If there is a need for service or maintenance, the customers report this to Germany and Motec gets the service order from here. The end customer in Mexico or Canada then receives the necessary spare parts directly from Germany. This can take quite a while, as Corona sometimes causes considerable disruptions to supply chains.

Communication with Reichenbacher's service centre is very good despite the time difference. There is also a trusting relationship between both parties, which allows Motec to work very independently. "Necessary information is provided promptly, the response time is good and that is most important for our customers," states Marco Opitz with satisfaction.



Forum Timber Construction Technology & Economy

Interview with Thomas Czwielong, lecturer on the topic of "Industrial requirements and the production of planking parts in timber frame construction".

The world's currently tallest wooden house rises to an impressive height of 85.4 metres in Brumunddal, Norway, on the shore of the country's largest lake (see picture). Its inauguration took place in March 2019 after less than two years of construction time. Apart from 72 classic hotel rooms, there are 33 flats and pure office floors on a total of 18 storeys, plus a restaurant, an event hall, and a roof terrace open to the public, where you can enjoy an unrivalled view.



Thomas Czwielong,
Managing Director of Reichenbacher

Why is timber construction such a focus for Reichenbacher?

Amended building regulations permit the building of houses higher than 80 m from this material. Dynamic solutions in timber construction are bringing this raw material more and more into focus, and automation is thus becoming increasingly important. As a logical consequence, more intelligent and inter-linked production lines are realised to enable the automated and precise prefabrication of timber elements in the factory. High-precision systems are only one side of the coin, as in the future, it will be even more essential to think in terms of processes. Timber construction in particular will shift significantly towards industrial production and away from actual craftsmanship – and that means partial or full automation.

What does this mean with respect to the production of planking components in timber frame construction?

The following applies to both solid wood construction and timber frame construction, or to a combination of both: the planking components used, made of various materials and intended for different functions, place high demands on the logistics of the production facilities and on the sequencing. "A house at your fingertips" is our claim, which we take as a basis when considering the industrial production of different modules for house construction. We do not only have the individual panel or the individual wall in mind, but we are also dealing with the manifold preconditions that have to be met before we can speak of an industrial production of planking components used in timber frame constructions.

What are the demands on equipment for the processing of planking components in timber frame construction?

When integrating new processing machines (panel-processing centres) into an existing production sequence, there are numerous requirements that must be in line with various targets: What strategy does the investment pursue? What investment budget is available? What performance must the system deliver and what task must it fulfil?

In other words, the decision as to which work processes are suitable for automation, has a significant influence on the implementation of the systems. We are convinced that solutions will only prevail if we understand the process as a holistic approach. After all, only then high-precision machines with sensible chip and storage concepts perfectly matched to accuracy and safety requirements can decisively increase productivity.

What then is the design of a plant based on?

The task of a panel processing centre is primarily defined by the workpieces and the degree of automation, and thus by the overall performance. The design of a system is based on a wide range of parameters: on the one hand there are the dimensions of the raw parts, the weights of the raw panels and the total stack weights, as well as the materials to be processed, while on the other hand there are the processing units and the total system output, the panel materials and thicknesses, the types of processing the planking components (cross-section) and – last but not least – the software environment.

What is the difference between the individual Reichenbacher plant systems?

In order to define the parameters of a panel-processing centre precisely, we split the systems up into individual functions. Depending on the application, it will be possible to define such a stand-alone system up to a fully automatic panel-processing centre with stock of raw parts and workpieces. In the entire sector of suppliers or manufacturers of wall modules for the construction of prefabricated houses, no uniform structures or working methods are recognisable today, except in the area of software standardisation (BTLx). This is why there is no answer to the question for the optimum panel-processing machine, as the individual company structure always has an influence on the design of the system.

However, there is one important factor to consider and that is the question of the degree of automation of the materials to be processed. Therefore, we differentiate between the so-called material-bound machine systems (only one material category is processed, for example mineral materials such as gypsum plasterboard), and the all-in-one machine systems (processing of all materials required, such as wood, gypsum, etc.), with or without automation technology.

What exactly do you mean by the term panel factory used by Reichenbacher?

This is virtually the highest level of expansion: here, in a so-called Giga-Factory, a processing centre with an associated high-rise storage system, including a shelf storage and retrieval unit, processes the panels. The objective is to alleviate manufacturing pressure by virtue of the great storage capacity for raw materials, goods on consignment or purchased parts. On the one hand, this allows for material-optimised production, but above all, it makes production planning easier. Thus, it not only optimises the handling in general, but also the processing of a wide range of panel materials.

The process chain here differs greatly from the customary systems, because there is no simple docking of a panel plant into an existing assembly line for wall modules, for example, but the entire production process is redesigned and optimised. The intelligent interlinkage of all components in the sense of a smart factory thus makes a significant contribution to increasing efficiency. The control via a master manufacturing computer system guarantees the timely assembly of the wall modules and the targeted degree of prefabrication of 90 % for wall modules can become a reality.

The world's tallest wooden house with a height of 85.4 metres stands in Brumunddal, Norway. Each of the 18 storeys measures 17 x 37.5 metres, which amounts to an area of 640 square metres. Sustainable regional wood products are the predominant building material. In addition to Norwegian glulam and CLT, laminated veneer lumber products from Finland are used, too, in the building.



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