

Simply the best for the stage

JUST-IN-TIME IS NORMALITY



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Smooth running for high quality
Machining centre for acrylic glass and polycarbonate

First technological seminar for experts in Dörfles-Esbach
From a driving ban to a milling ban

New group of companies
Stronger synergies within new group of companies

HAMUEL
REICHENBACHER
Members of the SCHERDELGroup



Foreword by Thomas Czwielong and Andreas Leutheuer.

Common Management in the group of companies

Dear customers, business partners and colleagues,

In the 5th issue of Insight, in our capacity as managing directors we would like to take the opportunity of addressing a few current topics.

First we would like to thank you for the very positive response to our preceding four issues, where you were given deep insights into our everyday activities, but also into exciting projects implemented for our customers.

In the meantime, some of you might have heard that Reichenbacher Hamuel and HAMUEL Maschinenbau at Meeder and Plauen have joined forces in a new group of companies. The main intention in this context is a reorientation with regard to common innovative development work and process optimisation. The cooperation and the related pooling of expertise from the three companies has been an excellent one for many years. However, we want and need to make the associated benefits even more transparent in the market (for further information please refer to pages 8-10).

In the review of our first technological seminar, for instance, you will read which innovative impulses have already been given behind the scenes (pages 4-5). The necessity for comprehensive process thinking and close cooperation between experts from most different industries has been made manifest during a compact event, which was met with great appreciation from our guests.

This is followed by an outlook at LIGNA in Hanover (page 15), one of the most important fairs for the woodworking industry worldwide, where we are going to present our new QUANTUM series to a global audience for the first time. This CNC-machining centre breaks new ground, on one hand regarding the operability of such a complex 5-axes line, but on the other hand also with our conceptions as to how woodworking companies can put themselves in a position to meet the challenges of the future and how CNC-technology can help in coping with the current lack of specialists.

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First technological seminar for experts in Dörfles-Esbach

From a driving ban to a milling ban.

On November 22, 2018, the companies Reichenbacher Hamuel, Hufschmied Zerspanungssysteme, Schuko and Fraunhofer IPA organised the technological seminar "Machining of hybrid light-weight materials in the automotive industry" under the heading "From a driving ban to a milling ban". Among other things, the speakers explained how particle sources in the machining process can be detected at an early stage and consequently be avoided.



In his capacity as host, Thomas Czwielong, Managing Director of Reichenbacher Hamuel GmbH, welcomed the 70 participants.



Panel discussion with (from the left) André Schulte-Südhoff, Schuko, Georg Hannig, Scherdel Siment, Ralph Hufschmied, Hufschmied Zerspanungssysteme, Andreas Gebhardt, Fraunhofer IPA, Heinrich Timm, CCeV, and Claus-Peter Köth, »Automobil Industrie«.



During their factory tour the visitors could see for themselves that even today a major share of the machine projects feature comprehensive solutions.



The Orangery at Rosenau Park in Rödentel was an attractive setting for the first »Automobil Industrie« - Expert Circle.

Volker Budzinski, Director of Sales, explained during the factory tour the close cooperation of tool experts, as well as of automation, application and extraction specialists. This process-oriented thinking was necessary to obtain optimum customer benefits.

Smooth running for high quality

Machining centre for acrylic glass and polycarbonate.

“There is neither textbook nor instruction how to machine plastics, and above all acrylic glass, correctly and immaculately. Such expertise results from long-term learning processes and a priceless wealth of experience.” This is the message of managing directors Michael Ray and Wolfgang Grubert. Their joint company Kunststoff- und Acrylglasvertrieb is located at Hallstadt (Upper Franconia) and – based on more than 25 years of experience in processing and machining polycarbonate, acrylic glass and technical plastics – they have earned themselves an excellent reputation.

Acrylic glass, also known under the trade name of Plexiglas®, has become part of our everyday life: like hardly any other material it can be formed, drilled and cut to size. This easy to clean material is used everywhere, as it is available in a great variety of colours, while being robust and UV-resistant. Although comprehensive know-how is the prerequisite for machining it. The greatest challenges are the surface structure and the required accuracy. If, for example, entertainment electronics companies are to be supplied with glossy acrylic panels for high-end applications, the surfaces won't tolerate even the slightest flaw.

In order to remain competitive, the two directors had to ensure planning reliability for the entire work process. The more enquiries they received, the better their coordination had to become, as with its staff level at that time the company had reached its limits. Moreover, there were the increasing demands regarding precision and speed. This absolutely necessitated the expansion of their machinery by an efficient 5-axes CNC-milling machine, as, also due to the re-clamping operations required for a 3-axes machine, the latter didn't ensure the necessary precision. The equipment of the new machine was determined by its job profile, as the work processes involved in the machining of acrylic glass are manifold: grinding, drilling, milling, groove cutting. Thus, the line must ensure an absolutely smooth operation, as any disturbance shows in the delicate material, and it has to be suitable for large series cuttings and nesting.

Even in its standard version, the CNC-machining centre of the VISION series is well-equipped, featuring a grooved table, a Gantry drive and a 5-axes unit. As component sizes vary a great deal, the line's displacements have been perfectly tuned to the requirements of our customer. Above all, in industrial engineering often very small parts are required, whereas in the fields of advertising, exhibition stand and interior construction the components reach a maximum plate size of 2,050 mm x 3,050 mm.

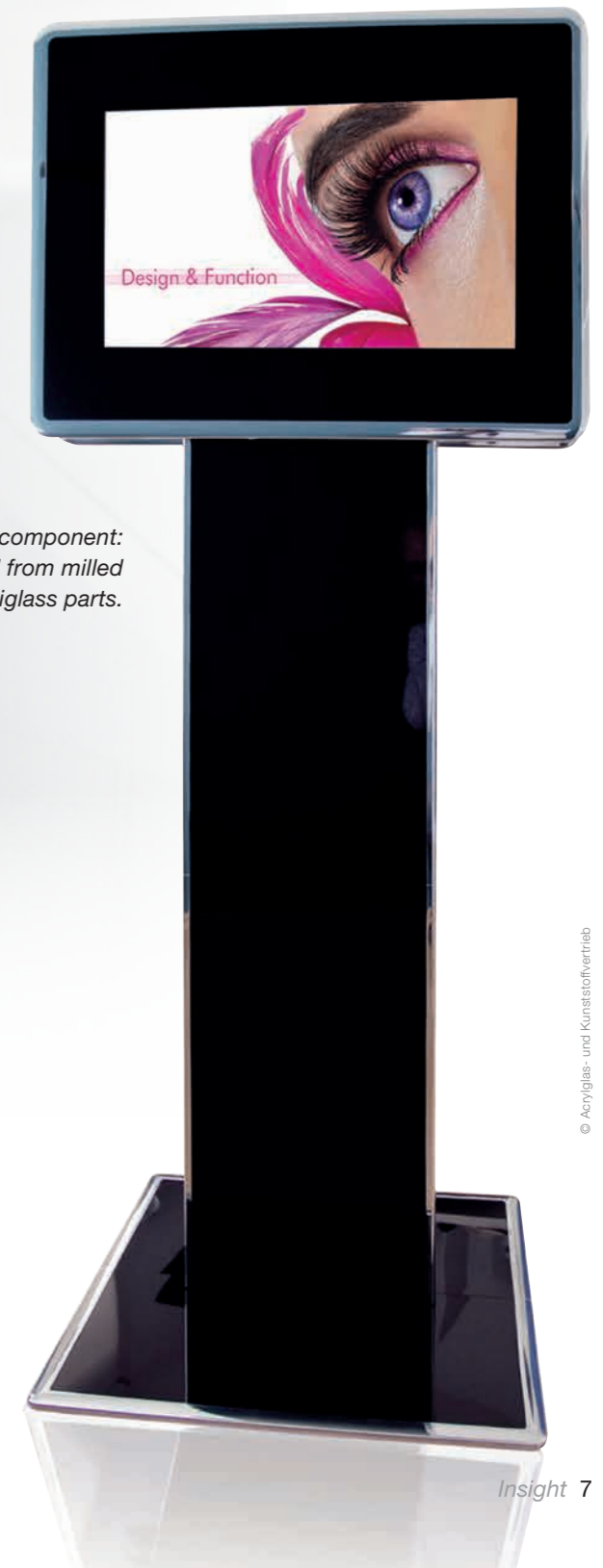
However, there were particular demands as to the machine's equipment, because the chips are charged and stick to all metal parts. This is why they needed a blasting nozzle with ionised air, which positively charges the metal chips, so that they no longer stick to the machine and the material and can be extracted more easily. The adjustable extraction hood and



Michael Ray und Wolfgang Grubert greatly appreciate the flexibility of the new machine. Now, the company can respond considerably faster to incoming enquiries.



Machine operator Leo Barth in front of the Reichenbacher CNC-machining centre VISION-I-T Sprint.



Finished component: stand assembled from milled and bent plexiglass parts.

the cross line laser, which, in the case of this unit, move along with the Y-slide, facilitate the exact positioning of the components or the raw material, respectively. Moreover, a vibration monitoring system (IFM) has been integrated into the spindle to display status changes via binary switching outputs. This system permits a possible imbalance of the tools to be recognised and the defective tool to be replaced. Thus, too large tolerances or even scrap parts can be avoided.

The managing directors agree: “The line is working without any trouble, although we max out 100 % of the machine's technical capabilities, including thread-cutting and interpolated working with five axes.” “The machine has opened up entirely new opportunities in our production processes,” Michael Ray says and Wolfgang Grubert adds: “We have become more flexible and take on orders we wouldn't have processed before, as we wouldn't have been able to do so, and we are reaching remarkable response times.”

Stronger synergies within new group of companies

Shaping the future together.

We are all well aware that the challenges resulting from an increasingly global economy present us machine builders with an entirely new set of tasks. To deal with this situation, we at Reichenbacher Hamuel and HAMUEL Maschinenbau in Meeder and in Plauen have for years been pooling our expertise in certain fields. In the future, we will operate as a corporate group of companies under the strong brand Reichenbacher-Hamuel in order to make this cooperation even more transparent in the market.

At the same time, the tasks we are facing are an outstanding opportunity, as we will also make a contribution to the future of the SCHERDELGroup's main machine building division. The operational merger is evident in the dual leadership management, where, as of this February, Andreas Leutheußer has taken on the responsibility for Finance and Human Resources and Thomas Czwielong is in charge of Technology and Sales. Thus, the overall group of companies has a total of 460 employees at three locations, 45 of which are apprentices.

It will be our strength that, in its particular area of expertise, each of the companies is a well-known player in the machine market. This will continue to be the case also in the future. Above all, we want to point out to our customers and business partners the positive synergies obtained by pooling know-how from different process technologies.

Our brand's product range now starts with the 5-axes CNC-machining centres for the processing of aluminium, wood, plastics and composites for trade and industry applications. It comprises the HSC-lines for heavy-duty machining from Meeder, which are, for example, needed for the production of blades for steam and gas turbines, as well as for jet engines. These CNC-lines for heavy-duty machining, which are predominantly used in the aerospace industry and by manufacturers for the energy generation sector, machine components from steel, cast materials, titanium and Inconel with sustainability, as well as energy and cost efficiency in mind. Not to forget MineralCasting, where we act as an equipment supplier and where everything is possible from the machining of the cast component up to the assembly of the entire machine. Last but not least contract work in the metal processing sector at Plauen.



HAMUEL REICHENBACHER



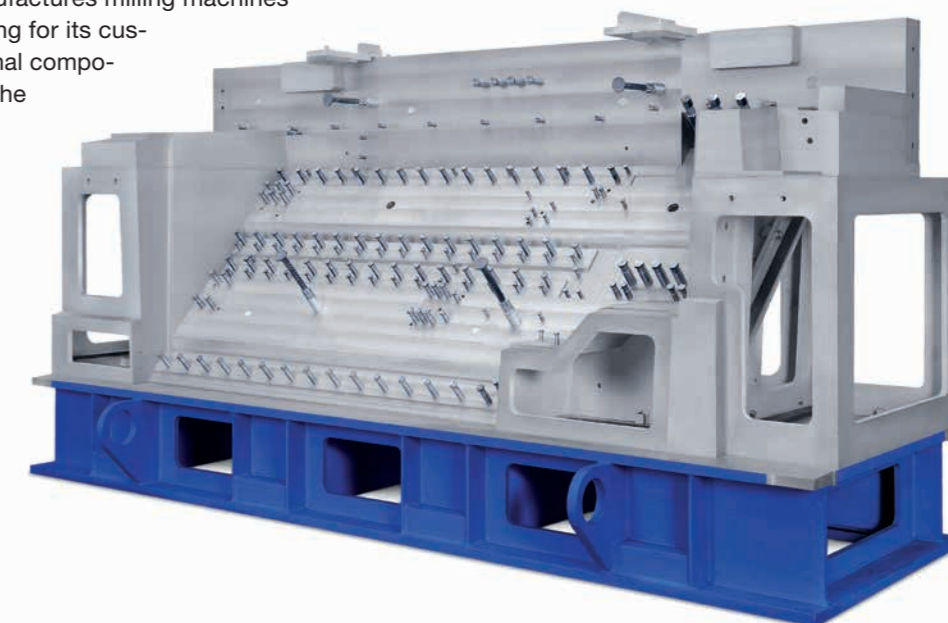
*CNC-machining centre VISION-III.
The components show what a
machine can do.*

Reichenbacher Hamuel GmbH

Its great innovativeness has gained Reichenbacher Hamuel GmbH a worldwide reputation as a manufacturer of first-class CNC-machining centres. At the Dörfles-Esbach location near Coburg 5-axes lines are developed and produced, which are up to most stringent safety standards and are used in aircraft construction, the automotive industry, shipbuilding and rail vehicle construction, as well as in the woodworking industry or by manufacturers of components made from aluminium, plastic materials or composites. All these lines perfect working processes, such as milling, drilling and sawing, while aiming at finding the "best-fit-solution" for the specific customer. The machines in modular design perfectly match customer requirements and impress by remarkable details, great ease of operation and amazing results.

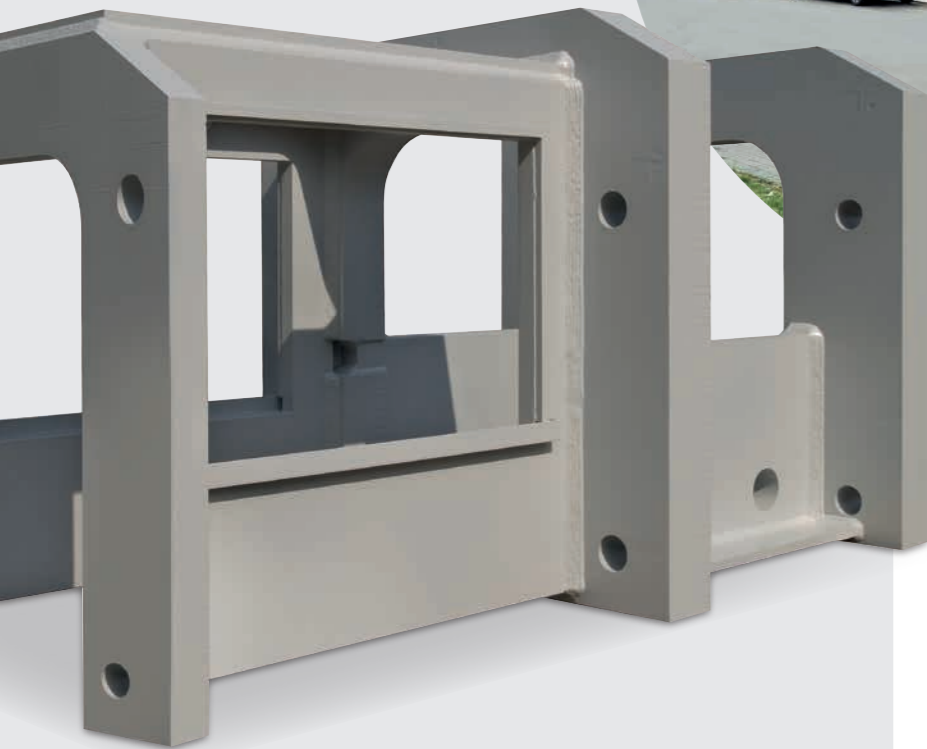
HAMUEL Maschinenbau GmbH & Co. KG Meeder

HAMUEL Maschinenbau at Meeder near Coburg is a company with a long tradition that develops and manufactures milling machines featuring 5-axes simultaneous machining for its customers all over the world. In 2012, internal component manufacturing was expanded by the MineralCasting unit. Equipped with most modern technology, the new factory for MineralCasts has started production at the beginning of 2014. Already in the development stage of your component you will benefit from more than 30 years of experience in MineralCasting and the manifest every-day micron-precision of a machine tool manufacturer. We can provide you with the entire package of services for the manufacture of your high-quality products from one source. HAMUEL MineralCastings is at your disposal as an experienced, competent and reliable development partner and supplier.



MineralCastings – The basis of efficient machine tools.

The focus of restructuring is, above all, on a reorientation in the fields of common innovative development work and process optimisation. This includes the bringing together of employees from various departments in so-called teams of experts: the longstanding successful cooperation between maintenance and service is now also to be implemented in other departments. Under the leadership of Volker Budzinski, the departments of sales and of application technology, for example, will from now on work hand in hand with the objective of being able to react even quicker to customer requests and demands. Other departments are to follow suit. This means for our customers that we are not only in a position to supply mere machine technology, but also software, service and engineering, and even contract work, if required.



Component manufacturing,
OEM solutions machine building.

HAMUEL Maschinenbau Plauen GmbH & Co. KG

HAMUEL Maschinenbau Plauen GmbH & Co. KG is the specialist for machining structural steel, stainless steel and aluminium. The company's experts for metal processing are your competent partner from simple components up to complex welded assemblies as individual parts, small or big series, and they have also made themselves a name as contract manufacturers. Thanks to a modern infrastructure, projects can be customised for the respective requirements. The combination of various metalworking processes permits the exploitation of their particular advantages for the project in question. Production processes can be individualised to suit the specific parameters. Thus, our customers benefit from efficiently manufactured and standardised components, which provide them with best conditions to compete in the market.

My father's skills, my mother's skills

A holiday job at Reichenbacher – an experience report.



Left to right: Mark Roschlau, Naemi Brückner and Tom Metz

In August 2018, three young students set out to find out more about Reichenbacher Hamuel and to use their holidays for an exciting experience. Why did they do this? Either their father or their mother is employed by Reichenbacher, and in doing so for a short period of time they could get extraordinary insights into the working environment of their parents.

During those three weeks also the parents of Naemi Brückner, Tom Metz and Mark Roschlau were part of this experiment, as apart from various staff members from different departments the three interviewed also their own parents to learn more about their everyday work.

They have recorded the exciting results in a report: they found out how the working hours have improved over those many years. For young people aged 15 or 16, it is fascinating to hear personal accounts about the situation and the working conditions at Reichenbacher 20 or 30 years ago and not just to read about them in school textbooks.

They found out that there are jobs where customer contact requires a different way of working than that in a team with its relative privacy and little influence from the outside. For Naemi Brückner it was also interesting that especially women are worrying whether they can reconcile their work and family life. During those three weeks they had to deal with terms, such as negotiation skills, empathy, flexibility, technology, know-how or competence.

They heard directly from people they know well that at the beginning all of them had had their dream job in mind, and that their life had taken one or the other unexpected turn. That also their parents had perhaps once wanted to become teachers, lab assistants, politicians, architects or cooks, but then have also had much fun over the years in working in bookkeeping, logistics, fitting or electronics. That, with art and crafts as one's favourite subjects in school, one can definitely get a job in a great company and support a family. However, their parents also mentioned that perhaps they should have made another choice, even if they are content today. They learnt that a good relationship with one's colleagues is important, as the hours on the job are among the most time-consuming in life, and that one's co-workers there are important companions, even if one can't choose them. And they were quite astonished when their parents said that the job and the colleagues there can also help to overcome problems.

Even disagreements and confrontations in everyday working life, no matter whether with superiors, colleagues or customers, were frankly discussed. And also the way to deal with them, a way sometimes quite in contrast to the ideas conveyed to young people as genuine and real on television or on social media platforms.

Enjoy every step

Where craftsmanship meets innovation.

The function of a staircase is a practical and at the same time a decorative one. It is often one of the first impressions you get of a building. Where creativity is concerned, the limits of individualism seem to be reached – not so in the opinion of Dutchman Frans Sonnemans. His company's specialty are staircases made from extravagant materials and variations regarding the type, style and design of a staircase.

As they are dealing with individual staircases, where none is like the other, all the elements have to be designed time and again, and this comprises all the work stages required. Hence, computers and most modern machines have become indispensable from the design through the manufacturing stage – and this includes also a 5-axes CNC-machining centre to turn these visions into reality.

Marc Termote, who knows Sonnemans well, from the very beginning provided leads as to how to achieve considerable improvements in the production process with a new machine. He was well aware that the key to success was a very robust portal machine. On one hand to guarantee top-quality machining results and, on the other hand, not to lose track of the primary target: to reduce tool changing time, which is always rather long in staircase construction, to an absolute minimum.

The Reichenbacher solution is an ingenious one: three vertical milling motors in addition to the 5-axes unit. One motor is responsible for the outer contours of strings and steps, another one for the slots and grooves, and the third one with integrated height-tracing manufactures the high-precision profiles. Thus, the work processes are assigned to different milling spindles, which in turn results in a considerable reduction in tool changing time. The main milling motor of the VISION-II-ST Sprint then only performs horizontal work, freeform and sawing processes. Moreover, optimum machine utilisation is a core aspect: work orders are no longer processed one after the other, which could require too much setting work at the machine, but based on the orders the components needed are defined and the best possible way of using the machine is planned. In doing so, flexibility is given top priority. Compared to before, Sonnemans estimates savings to be in the range of 20 per cent.

Environmental aspects, too, are taken into account. Frans Sonnemans considers wood a wonderful product of nature, and to give the staircases their special touch he doesn't resort to precious tropical woods, but generates the desired shade of wood using stain, transparent varnish or oil.



Left to right: Marc Termote (Reichenbacher Area Sales Manager Benelux), Frans Sonnemans (Managing Director Sonnemans Trappen) and machine operator Jan Schijven in front of the CNC-machining centre VISION-II-ST Sprint of Reichenbacher.



At Sonnemans the VISION-II-ST Sprint is equipped with a 5-axes head and with three additional units.



Frans Sonnemans und Marc Termote are checking a string wreath with a massive wall from cambala wood.



Finished stair steps.

Exhibition report ALUMINIUM and COMPOSITES

Good mood at the autumn trade fairs.



Along with Hufschmied Zerspanungssysteme, Reichenbacher presented themselves as an innovative all-rounder in the field of the 5-axes milling of aluminium honeycomb structures, plates and profiles for vehicle and aircraft construction.

German pioneering spirit was almost tangible at the Aluminium trade fair, as well as on the occasion of the first common appearance of the partners Reichenbacher Hamuel and Hufschmied at the Composites Europe.

A remarkably great number of visitors and professional talk on an intriguingly high level encourage all parties involved to consistently pursue their strategy "Discover new perspectives", meaning to enter into active discussions with potential customers, to get a better understanding of their specific requirements, and to generate optimum value chains and process solutions based on these insights.

One trend was clearly to be observed at both fairs: industrial manufacturing will have to deal with many new challenges and in this context the companies rely on the close interrelation of key technologies.



Common stand party by Hufschmied Zerspanungssysteme and Reichenbacher, Composites Europe 2018.

Hybrid materials, in particular, are becoming ever more important and the challenges inherent in machining these materials can only be met when experts closely cooperate in finding comprehensive solutions for the process in question. Even today, the majority of Reichenbacher machine projects already feature all-embracing solutions, as customers call for an efficient overall system.

For future trade fair appearances, in the opinion of Volker Budzinski, Director of Sales, it will be of importance to depict the processes in a solution mindset or to present them in a tangible way, respectively. Already in 2018 this vision hit the visitors' nerve, as at times sheer clusters of people formed around the machines, and their special attention was always on the live machining demonstrations, where we particularly stood out against our competitors, who mostly had mere machines „on show“.

World debut: The new compact class

Reichenbacher Hamuel in hall 27, stand H40

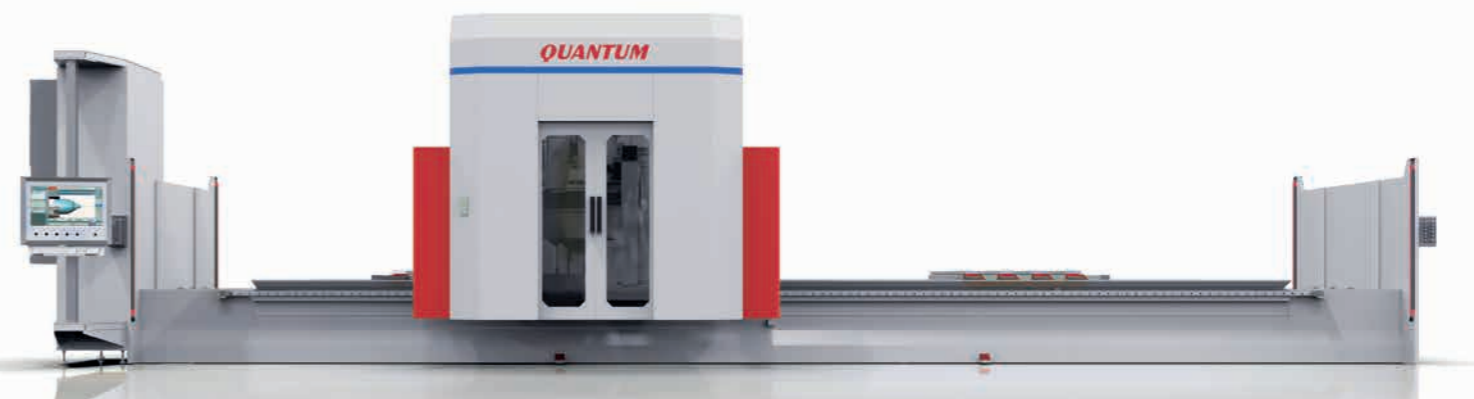


On the occasion of Ligna in Hanover from May 27 to May 31, 2019, we are going to present our new QUANTUM series to a global audience for the first time. This compact line has especially been conceived for joiners and carpenters who want to adopt advanced CNC-technology in the fields of staircase, window and door manufacturing.

Even at this attractive price-performance ratio, we live up to our recognised high technical standards. No doubt, the traditional wood processor will be impressed by the extraordinary possibilities the QUANTUM offers. Why so? It is our understanding that operating a machining centre in the future has to be as intuitive as the daily use of a smartphone. This includes also touch screen navigation by modern .NET-technology incorporated into the QUANTUM, which permits the safe generation of CNC-programmes also by inexperienced users. All this and even more can be done with the new line.

What else is of importance to a joiner or carpenter? In our experience low space requirements. And there you are: the new QUANTUM series is a real space-saver, not least due to our typical safety concept with bumpers. Live demonstrations at the fair will show that it can process panels of standard dimensions without the need to pre-cut them, machine the entire circumference of the workpieces, as well as that the table is automatically displaced and that a powerful synchronous 15 kW spindle implements all processing steps at impressive surface quality. Moreover, we will point out that the machine is delivered completely assembled including all the electronic connections, true to the motto: install it, switch it on and start working.

However, at Ligna we will go one step further by paving the way into 5-axes CNC-machine technology for wood processors, who are still applying traditional methods, by giving them innovative impulses. There is constant talk about a lack of specialists, but we will demonstrate that this innovative technology opens up new perspectives so that our customers can handle complex tasks also in the future and cope with increasing market demands.



Simply the best for the stage

Just-in-time is normality.

Most of us have never stood on a theatre stage. However, many have probably attended a musical, a drama, an opera or a ballet performance – and those who had the privilege to enjoy a cultural event at the Semperoper Dresden, the Elbphilharmonie or the Bolshoi Theatre in a sense also benefited from their perfect stage floors.

And this perfection is not a given thing, but the achievement of people who, for decades, have put their heart and soul into their work. Without a doubt, the 33 employees of Bühnenbau Wertheim GmbH are such people. Since the company was founded in 1984, they have specialised in processing exclusive lumbers into first-class stage floors. The very fact that the floors from Wertheim are to be found in the national theatres of Beijing and Taiwan, Helsinki, Saint Petersburg and Madrid, as well as on fifty different stages in Berlin alone, is proof of their success. Every year Bühnenbau Wertheim overhaul or completely replace almost 100 stages. The company is not only market leader, but, above all, technological leader, and planning offices all around the world are well aware of this fact.

When you enquire in greater detail for the secret behind their success, the response will be a multi-faceted one. One the one hand, their extraordinarily short response time is to be mentioned. In particular municipalities award their contracts at very short notice: when an order is granted, installation is to start four weeks from order placement at the latest. It is common practice to replace the entire stage floor during the summer break. To ensure this flexibility, they have their own 40 t truck for transportation and for installation employ only staff with many years of experience, who master their profession even in their sleep. Another aspect is the large storage area to provide the lumbers within short. At least 2,500 square metres of the entire factory premises of about 20,000 square metres are heated production and storage areas. There, the precious raw materials are stored – the basis of the high-quality and durable stage floors from multi-layered panels.

These so-called Wertheimer-3S-Panels have become the standard for high-quality stage floors and, as a load-bearing component, have been approved by the building authorities. They are subject to stringent requirements: the floors must sustain the assembly and dismantling of stage sets on a daily basis, great compressive and tensile stresses, heavy rolling loads and even the use of fork lifters. Traditional floor boards, as they were used in former times, can be no competition for them. Thus, today mostly the multi-layered panels glued crosswise, which possess a point load capacity of up to 1,500 kg, are to be found in the most renowned theatres and opera houses all over the world. They are manufactured with covering layers from Pitch pine, Oregon pine and Schwarzkiefer from Austria.



The company, which was founded by Hermann Patz, employs 30 highly specialised people who share a passion for the responsible processing of exclusive lumber.



A large storage area is required for keeping the plates in stock.

For decades, the company's founder Hermann Patz has been dealing with the careful selection and conscientious processing of timbers. He has inspected the stands in timber personally on site and defined the optimum cutting of the planks with the local sawmill staff. Bühnenbau Wertheim get the majority of these timbers directly from overseas countries. The best timbers are Oregon pine from the west coast of North America and Canada, Pitch pine from Honduras, and Schwarzkiefer from Austria. It is obvious from the often long supply routes that the company needs to keep large stocks. The stage floors are exclusively made from knot-free wood from large-diameter tree trunks. In addition, they also process other types of wood to form floating floors, parquet flooring or concert shells, ceiling awnings or theatre make-up tables, for example.

Raw materials and perfect organisation are only one aspect, the other being the superb processing and treatment of the carefully selected lumber, which is sawn in such a way with a band saw that so-called rifts, i.e. growth rings showing vertical grain, are obtained - an absolute must-have for a good stage floor. In 2007, they had no longer any other choice than the use of a CNC-unit for processes, such as sawing, milling and drilling, to ensure efficient finishing of the plates. They started out with a second-hand machine, but were not satisfied with the results and quickly determined to look for a high-quality CNC-machining centre. The decision in favour of the VISION-II-Sprint from Reichenbacher was reached, as the machine bed was the most robust one by far among all the competitors. "The fact that we are processing plates weighing 180 kg proved the exclusion criterion for most other lines," explains Kai Uwe Patz, Managing Director. "And in the end, I was also convinced by the safety concept requiring no cage," he gives a very graphic description of the Reichenbacher machine.

The 5-axes CNC-machining centre VISION-II has now been in use since 2011 and forms, together with the vacuum lifting device of Schmalz make, a perfect system for plate machining within the production sequence. The vacuum tube lifter ensures the ergonomic and efficient handling of large, heavy wooden plates, meaning that economic loading and unloading of the plates can be performed by one person only. This reduces standstills and increases productivity by almost 50 per cent.

The solid machine table in ripped welded design is equipped with eight beams and alternately loaded. Here, the eight pneumatically retractable stops in combination with four additional pneumatically retractable fixed stops and three stops for machining veneered material, as well as four support beams, have proven very reliable. Plates up to six metres in length can be processed in view of a table size of 6,200 x 1,400 mm. "But this is the limit," explains machine operator Matthias Weimer. The smallest parts processed on the line are so-called offset-flaps that are needed in the stage floor e.g. for sockets and other technical connections.



The CNC-machining centre and the vacuum tube lifter from J. Schmalz form a perfect duo.

When asked for possible improvements, Patz sees the need for action especially with respect to the control system, as the latter is still XP-based and thus lagging behind by a few generations. Reichenbacher is not in a position to directly influence this situation, but it is certainly necessary to provide a supplier with the corresponding input and requests for modification, and we are doing so, even more so as it is mandatory to ensure a sufficient degree of network security.

Stage floors must be of particularly high quality. Actors, dancers and singers use them for their performances. And up to three times a day the stage sets are assembled and dismantled, shifted or screwed to the floor for stage rehearsals and performances.

Individual floorboards of lower strength may wear out faster and thus lead to a premature replacement of the entire floor. Scientific tests have now shown a direct connection between the density of the wood and its strength: the denser the wood is, the stronger and therefore more resistant is the floor. Based on this knowledge at Wertheim they have developed a computer-assisted and patented measuring procedure which is able to determine the density of each board within seconds. The application of this measuring procedure results in a considerably longer lifetime of the stage floor, as its high strength can be assured. An advantage particularly for large stage floors which are subject to a great deal of wear during performances and stage rehearsals.



Heavy materials are used in stage building. A robust machine bed is absolutely necessary for the machining of the plates weighing 180 kg.



At Bühnenbau Wertheim they are very satisfied with the results obtained from the Reichenbacher VISION-II-Sprint.



Once integrated into the stage floor, the revolutionary offset flap is not only hardly visible, but also very functional and easy to handle.



Discover new perspectives

QUANTUM

The world debut in the new compact CNC class

QUANTUM - The solution to achieve a better capacity utilisation
in craft and industrial businesses.