Insight

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Feel-good factor on wheels

LIGHTWEIGHT CONSTRUCTION IS ESSENTIAL FOR CARAVAN BUILDING

Your customer is what matters
Meeting the requirements

Second technological seminar for experts was a great success
From diesel to air taxi

Staircases with a personal touch
Elegant simplicity or rustic charm

HAMUEL REICHENBACHER
Members of the SCHERDELGroup

Foreword by Volker Böhm.

The decisive step ahead

Dear customers, business partners and colleagues,

As the saying goes: „What belongs together is growing together."
Here, I refer to our group of companies, and I would like to use this occasion to address you as a member of HAMUEL Maschinenbau at Meeder.

For our readers it will certainly be interesting to learn what we have to offer. HAMUEL develops and produces 5-axes turn-milling machines for the manufacture of turbine blades for power plants, turbo chargers and aircraft engines from materials with difficult machining characteristics, such as chromium steel, nickel-based alloys, titanium and aluminium. For almost 40 years now, I have been involved in building machines for the production of turbine blades, and I'm still thrilled by the machines and the achievements our development team and application engineers ensure on a daily basis.

Aluminium is a material the people at Reichenbacher have extensive experience with. Personally, I'm fascinated by the widespread use of the Reichenbacher machines in the most diverse industries. In this issue, too, you will find some intriguing user reports for further reading.

It is not entirely selfless that I would like to draw your attention to our refined HSTM 150 HD, our smallest and most compact all-rounder, the technical features of which we have summarised for you on page 11.

Our successful activities don't pass unnoticed, which is obvious from the fact that a large delegation of Chinese engineers from the sectors of aircraft and engine production visited both our sites last summer (page 9).

I hope you will enjoy reading this issue and remain

Yours sincerely,

Volker Böhm
Key Account Manager
Innovation Management
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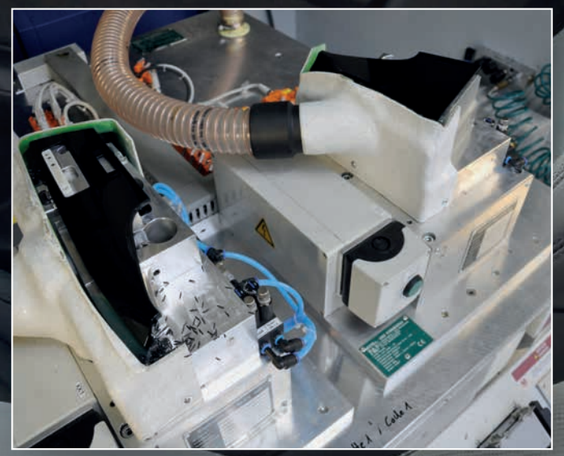
Your customer is what matters

Meeting the requirements.

Ralf Sdrenka, manufacturing engineering at Faurecia Innenraum Systeme, in front of the CNC-unit ECO-LT-1010 from Reichenbacher.

The Reichenbacher line at Faurecia has been in operation since the end of 2017 and has exclusively been producing high-gloss decorative parts for the dashboards at the driver and passenger side, as well as for the centre console, of the Audi Q8.



The devices are carried out for the simultaneous machining of two components per plate.

And when, as is the case here, a premium manufacturer from the German automotive sector prefers his components to be machined in a particular way, Faurecia will make an investment in a special-purpose machine to ensure the manufacture of superb interior parts for the premium manufacturer's new SUV luxury series.

Faurecia is a company whose trendsetting ideas for smarter car interiors correspond to modern zeitgeist. It stands to reason that Audi rely on this high-class workmanship for the four-door SUV Coupé Q8, as its interior underlines the luxurious lounge character. The about 360 employees at their Peine location have specialised in manufacturing top-quality car interior components, which comprise dashboards, centre consoles, door finishes, but also acoustic products and decorative elements.

In 2016 they received the following enquiry from Audi: subsequent to lacquering, 2-component plastic parts were to be milled at their edges and then they were to be complemented by a chrome frame. The peculiarity: the gap between the chrome frame and the component had to be zero. This requirement resulted in the initial decision not to laser-cut the high-gloss lacquered components as usual, but to mill them, as only this type of processing can assure such a degree of accuracy. 5-axes milling constituted a new technology at their Peine location, as Ralf Sdrenka, manufacturing engineering, explains. Consequently they were looking for a reliable partner, who not only supplied a custom-fit machine solution, but also guaranteed the implementation of process parameters, such as time specifications, accuracies, tolerances and machine uptime.

36 CNC-machining centres from Reichenbacher are in operation at various locations within the group of companies. By choosing the ECO-LT-1010 in special design, the decision-makers at Faurecia were sure to meet Audi's requirements as to machining quality. The production flow is a sophisticated one: the 2-component die-cast parts are produced in-house, then provided with high-gloss lacquering and taken inside the manufacturing line to the CNC-machine, where their outer contours are milled. "Currently we are manufacturing interior parts for about 240 vehicles of the Q8 type a day in 3-shift operation. The car manufacturer calls for delivery just-in-time, meaning that we are in a position to plan our production in detail one week in advance and to get an outlook on the next few weeks," Ralf Sdrenka explains.

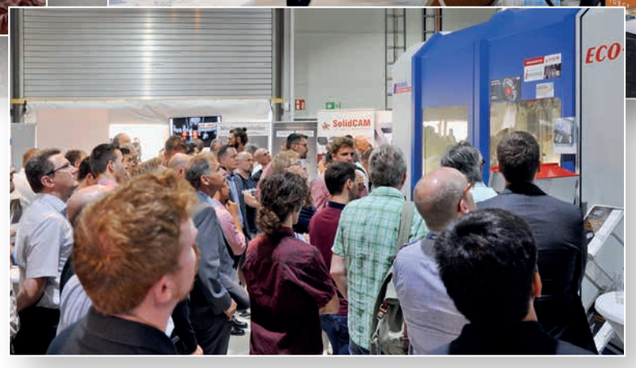
The ECO is in very compact design and thus ideally suited for the confined space. The devices are carried out for the simultaneous machining of two components per plate. Depending on the component in question, the heights of the basic plates measuring 1,170 x 1,100 mm (length x width) vary from 250 to 450 mm. The weight of a single device is a maximum of 300 kg, as is the case for the centre console. If required, the operator can flexibly set up the table in a different way by changing the respective clamping device. Centring is effected by a zero-point clamping system; this ensures the exact observation of the accuracy required for the milling operation.

The entire company sees in the demand for better environmental protection, as well as for connectivity and autonomous driving, an enormous potential and, along with its partners, promotes the integration of sustainable light-weight solutions based on plastics. Their Peine location also places the focus on another important aim: until 2025 they want to push the automation of the production process based on robot technology.

Second technological seminar for experts was a great success

From diesel to air taxi.

The second expert seminar from the lecture series „Mobility changes and their influence on machining technologies" took place at Hufschmied Zerspanungssysteme GmbH at Bobingen in July 2019. Here, the topic "From diesel to air taxi" met with a great deal of interest already in the preparatory stage.



On this occasion, too, all network partners were present to demonstrate to the audience from the fields of industrial manufacturing technology and research how the application of solution-focused manufacturing concepts entails the efficient processing of new materials or material combinations in lightweight construction. Vehicle building has become inconceivable without lightweight construction, and the demands made on the materials and the machining quality of the components will continue to increase.

The ever louder calls for better environmental protection, as well as the megatrends connectivity and autonomous driving, also offer major potential. This precisely is the reason for the network partners to use their cooperation to advance the integration of sustainable solutions for plastic-based lightweight constructions and to enhance the know-how concerning individual aspects of machining. Only if machine manufacturers, tool experts, automation and extraction specialists, as well as scientists and researchers, work hand in hand, in the end optimum solutions for the pressing issues of the future will be found.

Dr. Tjark von Reden (MAI Carbon) commenced the series of lectures by explaining the „Vision of a digital factory for air taxis", and then Ralph Hufschmied reported on the highly efficient flash-free processing of FSW-welded aluminium extrusion profiles covered by digital process monitoring.

Jochen Rühl (Reichenbacher Hamuel) convinced the participants that „Digital engineering is the driving force for process-based development". He used an example of a simulation in the process environment of a machine to point out how dusts can be extracted in an efficient and controlled way.

Such a realistic modelling of systems permits anticipatory error prevention and a verifiable increase in efficiency.

Peter Miller (Schuko) talked about "Energy-efficient strategies for the capturing of particles", Andreas Gebhardt (Fraunhofer IPA) explained new approaches used in application-oriented research. Once again, Prof. Dr. Claudia Traidl-Hoffmann could be welcomed as a speaker and her lecture "Clean air in a machining environment seen under the aspects of industrial medicine" gave the audience reason for thought.

Comments on the event:

Stefan Jack (Güdel AG/CH) is an advocate of the so-called „Digital Twin". „The realistic modelling of system properties allows, for example, for the simulation of process sequences taking place in entire production halls and thus provides the opportunity of recognising at a very early stage, whether a concept will work or not." Simulations permit the optimisation of system concepts in various steps, as well as anticipatory fault prevention, which means an enormous increase in efficiency. "Digital modelling costs time and money, but these costs are only a fraction of the expenses that would have to be incurred to carry out the optimisation steps under actual working conditions later on," he adds.

Hans Kimmel (Constellium Extrusion Deutschland) is impressed by the cluster of expertise to be found at such an exclusive event. His summary: „Networking provides you with new inputs and the discussions with experts also from other industries in a small setting are always stimulating ones; you can't gather such compact knowledge during big fairs, as this would take many days."

Lars Anders (Gaugler & Lutz OHG) mentions the changes due to the use of lightweight construction materials with respect to caravan building. „It is important to look beyond one's nose to be able to assess where the journey might lead to." For him the lecture on the air taxi was very informative, as Gaugler & Lutz like to specialise in niche products, the small numbers of which are not profitable for industrial producers. He adds: „For many years we have adopted various processes and acquired extensive experience in machining a wide range of lightweight construction materials and would be pleased to share our knowhow during such seminars."

Cetin Ince (Blanco GmbH & Co. KG) was convinced by the presentation of Jochen Rühl, which dealt with a simulation in the process environment of a machine with the aim of extracting dusts in a controlled way. He considers such simulations important, as this is the only way for the machine manufacturer to point out the best possible manner of integrating an extraction system to ensure the efficient extraction of dusts. This permits error prevention, quicker planning and the optimum integration of the entire machine into the production sequence. And it is assured that the machine is safe with respect to its reliability, but also to component and staff security, as limit values are consistently complied with.

Henrik Kummert (KA-RaceIng e.V.) had already been present at the first expert seminar at Coburg in 2018. He is, above all, fascinated by the fact that so many interdisciplinary lectures are combined and that discussions with experts from most different sectors are possible. He says that lightweight construction is important and has been encouraged at the University of the Karlsruhe Institute of Technology (KIT) for quite a long time.

Review of fair LIGNA 2019

A raving success.

The participation in any fair as an exhibitor is a great commitment and challenge. When it comes to Ligna, which counted more than 90,000 visitors from 50 countries, the people in charge at Reichenbacher can justifiably claim that they have done everything right.

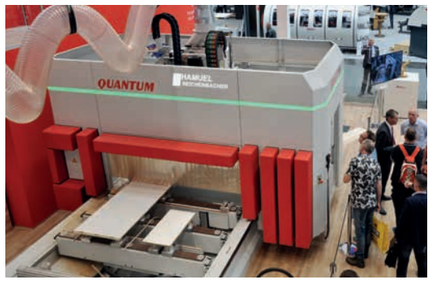
The interest shown in our exhibits by professional visitors was enormous – after all we are talking here of 311 registered guests in a time span of 5 days – and above all the international provenance of these guests and the high-level expert talks were impressive. Here, the new stand design, which was realised in this form under the leadership of Mike Beier for the first time, has proven itself. The lounge had been transferred to the upper level, a novelty welcomed both by the guests and by the colleagues, as it permitted talks in a quiet atmosphere away from the usual flow of visitors and the associated noise level.

This concept worked out perfectly, which was obvious from the fact that the Reichenbacher stand was much busier than those of our competitors. There are 153 intended investments (current figures), 61 of which require immediate action. This achievement is also to be attributed to our excellent trade fair team, whose members have always succeeded in giving our visitors a harmonious overall impression. As everyone knows, people stay longer and engage in more intensive discussions where they feel comfortable…

The new QUANTUM was shown at the fair fully equipped with all options, and this quite deliberately, as according to Volker Budzinski it is the objective to transfer the great experience gathered for industrial plants directly to the handicraft sector, as the new generation of decision-makers there is open to advanced technology. And this series, which can universally be used from object-related to industrial production purposes, needs far less space than a customary industrial plant.

Thus, the visitors could get an impression of the superior engineering while the experts on site could always respond to their very specific requirements and expectations. Then, the needs of the customer in question could quickly be addressed in individual talks and the possibilities of adapting the unit in an optimum way be established. This provides also an explanation for the fact that already after the first presentation 18 investments in exactly this new series have been registered, not to mention the 38 additional investments advised.

Our representatives at the fair were involved in interesting discussions.



The Quantum was deliberately shown with the full range of equipment available.

The Reichenbacher stand was always crowded.

Visit AVIC

A visit from Chinese engineers.

It was the second time after 2018 that Reichenbacher at Dörfles-Esbach could welcome a delegation from China. In view of the purpose of their journey, the guests made a point of paying a visit to Hamuel at Meeder, too.

This had the exciting effect that the Reichenbacher-Hamuel group of companies could for the first time jointly demonstrate at both locations of how much interest this cooperation within the group can be for potential customers. For what reason? The a little more than 20-member delegation of Chinese engineers is from the aerospace industry. They all belong to various turbine and engine producing companies united in the holding company AECC (Aero Engine Corporation of China). The latter is a joint venture established by the most important Chinese aerospace company AVIC in 2016.

According to the persons in charge, the objective of this journey were new business contacts, as top level representatives in China had defined the development of a domestic engine-producing industry as a key sector. And this simply necessitates highly complex machinery.

In his presentation, Andreas Leutheußer placed the focus on exactly the benefits such a group of companies provides. He talked about the synergies obtained by the pooling of expertise from most different process technologies and made reference to the teams of experts at Reichenbacher-Hamuel.

In their contributions, Davis Müller, Sales International at Reichenbacher, and his counterpart at Hamuel, Rico Bertzick, drew the attention of the visitors to particular machine configurations for the aerospace sector. The visitors were impressed by the machines for heavy-duty machining, as they are needed for the demanding manufacture of turbine and compressor blades, blisks and radial compressors.
The same was true for the sophisticated CNC-lines used in processing composites, which also enjoy an excellent reputation in the aerospace industry.

Live demonstrations of the milling of a turbine blade and of a blisk at Meeder provided a spectacular substantiation of these impressions. A business snack with regional Bavarian food completed the visit, which was part of the Chinese guests' several week long journey all across Germany.

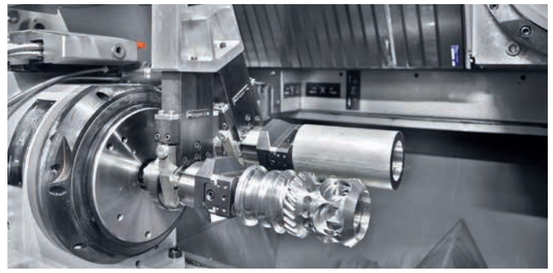
HAMUEL HSTM 150 HD

Fully-automated: the decisive step ahead.

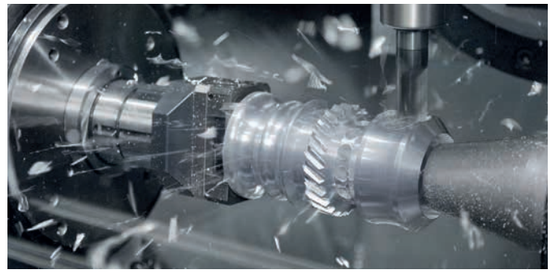
The refined HSTM 150 HD places us in a position where we can offer a fully-automated processing centre to the manufacturers of turbine and compressor blades for the aerospace industry.

A completely integrated workpiece storage and changer system allows for the entirely self-sufficient operation of the line, meaning that it can be operated unmanned for several hours. Along with a turning function of the rotary axis, comprehensive measuring technology and a laser cladding unit, the line offers features with decisive technological advantages when processing components from nickel-base high-temperature alloys or titanium.

HSTM 150 HD: CNC-milling solutions for 5-axes machining.



Changer with double gripper: Constant availability of tools and workpieces.



Turning function of the rotary axis: Workpieces can be completely rotated and machined in one clamping.

Materials with difficult machining characteristics that are key elements in the aerospace industry and in engine construction are precious metallic elements, and in view of greater sustainability it will become even more important to remanufacture components made from such materials. In its current configuration, the HSTM 150 HD combines many operations in an automated cycle.
The turning function incorporated into the rotary axis permits a complete turning operation and the processing of the workpieces in a single clamping operation.
In addition, modifications have been made to the milling spindle owing to which also all kinds of turning tools can be loaded.

Thanks to hybrid technology, manufacturing processes can be changed as easily as milling tools. Moreover, intricate measuring technology warrants for high accuracies, as not only the tools, but also the workpieces are measured.

Apart from traditional milling operations, as an option repair work can be carried out by 3D additive manufacturing, the so-called laser cladding. Turbine blades are subject to wear owing to the enormous loads they have to sustain and material losses result in reduced engine power of the turbine. The damaged area is milled and new material is deposited by additive welding to counter this development. Then, the surface of the added metal is treated by milling and polishing and thus adapted to the existing structure to achieve perfect surface homogeneity.

All processes are implemented by a special automation software, which during the entire operation provides for a feedback to ensure part orientation, damage assessment and accuracy assurance. This guarantees great precision, repeat accuracy and reproducibility, minimises cycle times and permits the remanufacturing of the component at a fraction of the cost caused by manufacturing a new part.

Top quality in series production

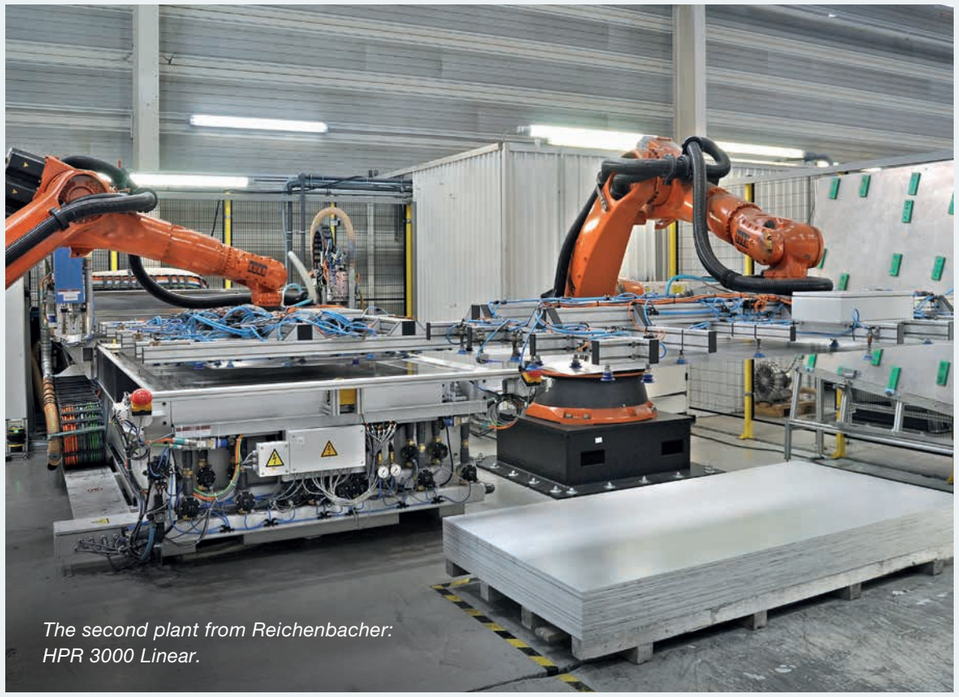
Dust and chip-free milling process.

At first, “a deliberate investment in future capacities” sounds daring, above all when it refers to a big CNC-milling unit including robot systems. For MN Coil, an important supplier of the automotive and aircraft industry, however, it constitutes a well-considered step to reach a position where they can react to changes in the market at any given time and ensure economic stability.

The company located at Neustadt in Holstein applies advanced technologies to process very different types of materials, such as aluminium, stainless steel, copper or titanium zinc. Customers from the automobile industry, from aircraft construction and from facade engineering, but also energy plant builders and companies from the fields of environmental technology and high-tech companies, use them as a source of precision 2D-form and rectangular cuttings.

For years, they have been cutting 2D-aluminium plates for the automotive industry in a highly-automated HSC-milling process. “This is how we assure a dust and chip-free production, and we do so in big volumes,” says André Brandt, technical director at MN Coil. Thus, no impurities will end up on or under the plates. Moreover, the smooth cut won’t impair the material in any way. The close geometric tolerances and excellent edge properties warrant for good forming results, which in turn assure process reliability and quality.

CNC-machining centre VISION-L-TT at MN Coil Servicecenter.



The second plant from Reichenbacher: HPR 3000 Linear.

Coils in various sizes, widths and thicknesses, which have been supplied by roller plants from all over Europe, are stored on site.

“It was obvious that, under production-related considerations, the systems had to be improved and the lines had to become more productive to enhance this USP and to meet the automotive industry’s increasing demand for bigger components, for example for entire lateral components,” explains Brandt. “First of all this aims at higher speeds; while feeds have so far been at 10-15 metres, we wanted to reach 20-30 in the medium term and up to 50 metres in the long term,” states Brandt. Moreover, the spindle of the new Reichenbacher Hamuel machining centre VISION-L-TT works at speeds of up to 60,000 rpm. In addition, they attached great importance to innovative clamping technologies, an efficient extraction system and a table structure with bigger dimensions, which permits multiple use and a considerable gain in flexibility. Thus, the new line increases efficiency, both with respect to product diversity and component size, as well as to order volumes.

The production flow is likewise convincing: the pre-cut plates are placed into one of the two storage areas for the CNC-machine. From there the robot, which is equipped with individually controllable suction cups, will put the required plates onto the milling machine. After machining, the components will be removed by means of a conveyor belt. Depending on the size of the component, up to 20 individual components can be milled from one plate, specific to the customer and order in question. Distribution is effected by an optimisation cutting programme, which reduces material waste to a minimum. Dimensions of the biggest components are up to 2,300 x 4,000 mm, for example for the lateral vehicle parts for the A-/B- or C-pillar or for window cut-outs.

The technical director provides an explicit summary: “Calculations have shown that with the new CNC-machining centre from Reichenbacher we are working up to 30 percent faster than before. The advantages of ‘milling’ over other separation technologies are striking: angular and clean cutting edges, plus great dimensional accuracy of the component, profile machining also at the end faces of the component, no material or surface hardening at the cutting edges, and many more.”

Feel-good factor on wheels

Feeling at home while on the road.

Regardless of the destination – a mobile home, no matter of which type, offers a home, even if only on a temporary basis. This precisely is the reason why people perceive its interior, just like in a car, as their individual living space, which should satisfy their particular necessities of life.

Caravan builders have long ago responded to this fact, and the big players in the German caravan industry and their suppliers are in a position to offer high-value products to all market segments. Stengele Holz- und Kunststofftechnik GmbH at Kisslegg is such a company, whose components are installed in all vehicles built by their major clients, such as Hymer, Carthago, Dethleffs, Fendt and others. Their production sector uses most advanced technologies, such as the 5-axes CNC-machining centres from Reichenbacher, to ensure continuous top machining quality.

As early as in 1967 the Allgäu-based company specialised in caravan building, although it had originally been a cabinet maker's shop dating back to 1927. The fact alone that for years the four company locations have steadily been expanding and that the total premises of the company have grown to about 17,580 square metres shows that this decision had been the right one. Currently, 230 employees are manufacturing everything needed by a producer of mobile homes to individually adapt the interior of such a home to customer requirements. At the moment, about 8,000 product items are available, while over the years the total repertoire has added up to 80,000 articles.

© HYMER

Brilliant teamwork (left to right): Thomas Elison and machine operator Matthäus Kling from Stengele, Florian Mauch from Reichenbacher.

The 5-axes machining centre type VISION in operation at Stengele.

Lightweight construction is essential for caravan building

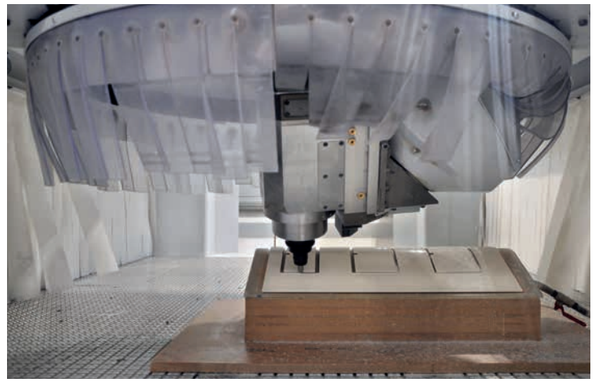
Based on five decades of experience and jointly with the vehicle manufacturers the experts from Stengele are constantly developing new products for various requirements, all of which have one thing in common: lightweight construction. This applies to structural components, such as floors, wall, rear or roof panels, as well as to PVC-coated wooden components, such as treads or pedestals, which are used to compensate for height differences inside the vehicle. Mostly sandwich or lightweight panels are installed, which weigh little and are extremely stable nonetheless. The other product group are the so-called fitted components, a term by which the experts relate to furniture fronts and flaps, storage areas and shelves, tables, bed frames, kitchen worktops, shower gratings and sleeping systems. Almost none of these articles is still made from pure wood, but they are made from plastic or solid surface material or from a mixture, which is due to the above lightweight construction requirements.

The reason being that a vehicle mustn't exceed the maximum weight of 3.5 tons, but is yet to offer any convenience you might wish for. This balancing act can only be successful when using special lightweight construction materials. Depending on the component and its function, deep-drawn or vacuum-formed materials are chosen: for washbasins e.g. acrylic glass or plexiglass, for bigger components like a table rather hot-formed solid surface material. No matter whether the surfaces are matt or with high-gloss lacquer finish, those surfaces mustn't be damaged during the final operation when contours or recesses are milled or holes are drilled.

Complex geometries prevail
There are almost no more limits to creativity in interior and product design where geometries, radii and materials are concerned. In addition, there are high expectations as to consistently excellent machining results, and this is why those responsible at Stengele are well aware of the fact that demands to the CNC milling machines for finishing need to be equally high. Florian Mauch, Reichenbacher sales manager Germany South, too, confirms that this can only be realised by adopting a very specific machine configuration when stating “Standard solutions won’t yield the desired results here.”

The expansion of their production areas involved also the investment into modern machinery, which actually forms the basis for their wide range of products and impresses by short cycle and manufacturing times. This is supplemented by a QM-system that fixes optimised production processes and parameters to ensure the consistently high quality. At the moment, sixteen CNC-machines from various manufacturers are working in 2-shift-operation; in addition there are large format laser cutters, a painting line, several press lines and many other machines. This permits the milling, laser-cutting or bending of plastic or wooden materials as desired.

Production manager Thomas Elison emphasises that it had always been their declared objective to reach the final component by 3- 4 steps starting from the raw material in a slim 1-line production unit. Moreover, additional finishing operations should not be necessary after the last step, the milling process. Therefore, the CNC-milling units must provide for completely machined edges and prevent surface damage during processing, as only then the customer can receive high-quality goods just in time so that he can immediately install them in the vehicle.



▲ *Machining of the outer panel of a spice rack from acrylic glass.*

◀ *The panel for the spice rack before and after machining.*

Various washbasins after machining. ▼

Hot-forming and deep-drawing are also possible. ▶

5-axes machining of plexiglass
Plexiglass, which is frequently used in caravan building, is a very demanding material and the often intricate geometries are also not to be dismissed. As Stengele is working with company-specific clamping devices, a high Z-stroke is a necessity for the machines; it amounts to 700 mm for the VISION. This fact along with the requirement for possible nesting in alternate operation favoured the decision for a 5-axes machining centre of type VISION.

The two Reichenbacher lines are almost exclusively responsible for the processing of components from solid surface material, plexiglass and HPL, which renders low-vibration machining a prerequisite, because any disturbance would show in the material. This requires an extremely stable machine bed and, in view of plate sizes of 3,050 x 2,100 mm and alternate operation, the grooved aluminium tables need to be rather long. Thus, Stengele is in a position to machine structural components up to a maximum of 6,940 x 2,170 mm on these machines. Another feature is the special blasting nozzle with ionisation, which accounts for the fact that the milling dust mustn’t stick to the sensitive surfaces, as even very small inclusions would immediately be visible on the often high-gloss surfaces.

In 2017 they had reached an utilisation of 100 percent for the first line. Stengele consider a 100 percent delivery guarantee a decisive factor for maintaining a competitive edge. This is why they relied on the known equipment also when acquiring the second machine, as it ensures the best possible synchronisation. Moreover, they had purchased a particular CAD-CAM programme for 5-axes milling, as some customers rather often redesign the outlines of individual components and those have to be adapted to the manufacturing process at short notice. According to Thomas Elison, in-house programming makes them even more flexible and independent and enables them to advance their own development work, too. Moreover, modern CNC-technology provides the opportunity of utilising the machine otherwise, if required, and of manufacturing components for other industries, too. Thus, they have opened up prospects for the future, just in case caravan building were to suffer setbacks one day.

Staircases with a personal touch

Elegant simplicity or rustic charm.

„Wood is a one-syllable word, but it stands for a world full of fairy-tales and miracles." Who would have thought that this quote was coined by Theodor Heuss, the first President of the Federal Republic of Germany. To this day, wood has lost none of its fascination and has remained an indispensable raw material for staircase construction.

„Building a staircase calls for circumspection, experience and a great deal of passion." This is a statement by Gregor Meyer, managing director of Meyer & Grave. „The craftsmanship of a manufactory combined with the efficiency of modern mechanical engineering and computer technology," this is how he describes the company's philosophy. Having had to compete with numerous other staircase manufacturers, Meyer & Grave have specialised in building staircases where others have long jumped ship. And ships bring to mind their special niche product: namely staircases that can be admired on board of many luxury yachts. Particularly striking on board of these swimming luxury homes are fascinating curved stairs, both below and on deck, with double flights, as you would normally expect to find only in an opera house or castle. Four of the about 40 employees alone are exclusively handling the staircase production for upscale yacht building.

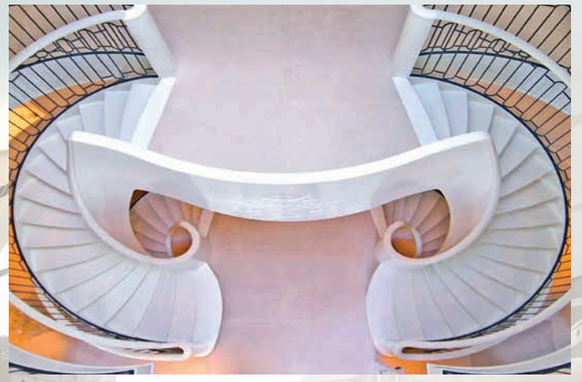
Apart from the above, also all other types of staircases are manufactured. All of them have one thing in common. The premium staircases from solid wood are always individually customised to the clients` wishes and requirements. No matter whether the project in question is a town villa in Berlin, the renovation of a castle in the Black Forest or a yacht in Barcelona: everywhere the perfect interaction between staircase and space will generate an immaculate impression. As top quality is of importance for them, the use of modern machinery is a must.

For many years, Meyer & Grave have been using CNC 5-axes technology in their production. When a replacement investment became necessary in 2017, they wanted to take a major technical step forward in order to be capable of implementing even more challenging projects in the future.

The technical requirements had clearly been defined according to production manager Markus Bilstein, as there should be the possibility of machining also aluminium plates and plastic components apart from wood. Moreover, the machine must handle the large data volumes of the electronic system. The machining centre VISION-ST-H supplied in 2017 also possesses an impressively high Z-stroke of 700 mm, a perfect feature for the machining of heavy and high components, such as big string wreaths or their own clamping devices required for the production of 3D-parts. It is an interesting aspect that apart from the main unit Reichenbacher use three additional milling motors in their staircase manufacturing centres. This provides the advantage that the machining processes can be assigned to the various units in an optimum way and tool changing times be minimised.

At Meyer & Grave everything is from one source: planning, design, drawing, programming, purchase of materials, structural calculations in compliance with all regulations applicable in the country in question, such as fire protection and safety against falls. This applies from the handrail via the steps up to the strings – for any type of staircase, for any type of material desired.

Left to right: machine operator Dirk Dasenbrock, production manager Markus Bilstein, junior manager Henrik Meyer and managing director Gregor Meyer.



Their particular speciality: wide curved stairs on board of ships, both below and on deck.

Machining centre with 5-axes unit and 3x vertical spindles, which has specifically been designed for staircase manufacturing, in the Meyer & Grave factory.

Machining of the log on the CNC-machining centre VISION-ST-H took eight hours.

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