

Courage to strike out for new horizons: Panel cutting including finish processing

Regnauer Fertigbau GmbH based in Seebruck am Chiemsee recently took the step of investing in a new panel cutting solution. Instead of sticking to a panel saw, the timber construction experts opted for a change of tack in the form of a CNC processing center with 5-axis spindle from HOMAG. Here's why: Far more efficient processing of facade panels, insulation elements and add-on components with time savings of up to factor 6. The quantum leap achieved by the new system is down to the combined execution of different work steps.

Regnauer GmbH in Seebruck am Chiemsee produces what can best be summed as feel-good homes for the private residential market and innovative contemporary public and commercial buildings. But what is behind the finished buildings goes far deeper, and is the combination of more than 80 years of experience in the field of timber construction, outstanding product quality and highly developed awareness of efficient, resource-saving production.

The company's energy efficient houses – which Regnauer calls its “Vitalhäuser” – are enjoying ever growing popularity among private home builders. Anyone aiming to plan and build their own unique future home can enjoy an enormous degree of freedom with this manufacturer, while those who prefer to stick with tried and tested designs will also find what they are looking for. And anyone attaching particular importance to energy saving will be delighted with its range of Eco-Line homes which comply with the stringent passive house standard. Customers enjoy the benefit of individual advice from Regnauer's competent staff – from the idea, through planning to implementation.

With a workforce of 220, Regnauer generates an annual turnover of around 40 million Euro. Its Vitalhäuser eco homes account for around half of this. The other half comes through commercial and public building construction. In rough terms, this covers all types of energetically heated buildings – including for instance office complexes or nurseries.

From four-story buildings to squash court panels

“Where we score in the field of commercial and private building construction is that we provide a complete service from the bare plot to the turn-key building”, explains Markus Leppin, Head of Engineering at Regnauer. “We take charge of everything to do with the building envelope for the customer, from the wood fiber insulated walls through to issues such as fire protection – and that applies to both private homes and commercial projects. We are currently working on a very interesting project, for instance: A four-story residential complex with 36 apartments in Regensburg.”

A small part of the company’s portfolio deals with a highly unusual specialist product: Regnauer produces panels for squash courts, which it sells around the world, from the USA to New Zealand. “The panels have to be specially constructed and composed to withstand the brutal impact of squash balls slammed at high speeds over many years”, explains Leppin. Markus Leppin has been working at Regnauer for 14 years, and since 2008 has been Head of Engineering. As a lecturer on production planning, he also works part time at Roshenheim University, teaching the final semester of the planning seminar attended by students taking their degree in Wood Building and Construction.

Modern CNC technology instead of a panel saw?

A lot has been happening as regards technology at Regnauer over recent months. A new panel cutting solution was urgently needed. The original idea had been to invest in a saw for high-speed panel dividing. Instead, Regnauer took the decision to invest in a CNC processing center from HOMAG. But why a router and not a saw? “Although actual panel cutting is slower on the CNC machine, it does offer substantially greater processing scope. We are able to complete several steps on one machine, meaning vastly improved speeds overall. We took the considered decision to enter into a higher investment, and we are already clearly seeing the evidence that the choice we made was the right one.”

Alongside panel cutting, the processing center also takes care of all other processing steps such as producing any recesses required for later installation of anything from sockets through to the extractor fans.

The fifth axis was “a must”

“We enquired with a number of machine manufacturers, but in the end everything pointed towards a HOMAG”, recalls Leppin. “Norbert Dittmar from HOMAG Bavaria understood what we were after right from the start, and provided excellent advice.”

Regnauer was also able to call on positive past experiences with HOMAG Group machines, as a number of WEINMANN machines have done stalwart continuous service in its workshop for decades.

The processing center picked by Regnauer is a BMG 511 with 5-axis spindle, which is capable of performing routing operations on panel dimensions of 7400 mm by 3250 mm. The machine is designed to permit alternating processing: While a workpiece is being processed on one side, a new element can be positioned on the other side of the machine table.

The new BMG is equipped instead with a 30-slot chain changer which is ideally suited for large tools, and a double gripper which makes for extremely short tool changing times. Equipment features on the new BMG also include a 5-axis DRIVE5C+ processing spindle with 15 kW output. What did Regnauer need the fifth axis for? As Lepping explains, the BMG processing centre is also used for the miter cutting of thick insulating panels. “We aim to deliver finished surfaces. We do as much of the preparatory work in the factory as possible, so that a top quality finish can be guaranteed when it comes to assembly on site. The external insulation at the house corner is miter cut so that it only has to be grouted on the building site itself. Where possible, facade panels also have to be applied at the same time in the factory. We aspire to achieve accuracy down to the last tenth of a millimeter”, Leppin explains.

The Regnauer team view the buildings they produce almost as items of furniture. “We want to avoid any need for manual finishing at the edges. The edge must be absolutely neat and tidy – no matter what material we are processing”, explains Lepping. This is something he can achieve with CNC.

As is the case in many other house construction companies, the staff previously worked using conventional methods, which entailed the use of a dividing saw, followed by finishing work using a table-top router and automatic series hole drilling machine at

a manual workstation. “There were a lot of work steps involved, and we needed space for intermediate element storage. Our previous machines were also not linked to the data processing network, which meant programming took up a lot of time”, Leppin recalls. “We wanted to achieve a major leap forward in terms of speed, efficiency and processing accuracy.”

In the meantime, Regnauer is now achieving major reductions in processing time, which in some cases has been slashed to just one sixth compared to the previous set-up.

Data flow: From the office directly to the machine

Production preparation also plays a central role. This entails the automated generation of programs on the basis of SEMA timber construction data using the GranIT converter. These can be subsequently tested using HOMAG’s wood**Motion** software. The software simulates the machine’s work steps at the office PC, depicting every workpiece processing operation on screen. This allows the programmer to check every step and detect possible collisions between tools and clamping elements in advance. The simulation is based on a virtual machine with real CNC core, which is actuated using original BMG 511 data. The finished data is then transmitted directly to the machine, ensuring a seamless flow of data and CNC programs which are capable of running without problems.

Since its installation, the processing center has completely transformed the surrounding work processes. “The machine was delivered in February 2014, but after only six months, working together with the specialists from HOMAG we had already achieved our planned performance in full. All our stipulated time goals had been reached, and even exceeded. We have optimized work processes surrounding the machine by around 30%”, reports Leppin.

Handling also exerts a major influence on productivity. Here, Regnauer works with a rail-mounted Schmalz vacuum lifting device for handling large-format components with weights of up to 200 kg and formats of up to 2.8 x 6m.

Processing all kinds of materials

To eliminate any processing or material-related restrictions, protected drives and

guides were integrated into the BMG which would allow the trouble-free processing of even the most abrasive materials. This has allowed Regnauer to process practically any kind of material, from insulating materials through plasterboard to facade panels. Special cleaning air jets in the dust hood take care of improved surface cleaning at the same time.

The elements are positioned on a grooved aluminum grid table, which allows reliable fixture using high clamping forces. Here, vacuum transmission through the table construction optimizes vacuum distribution.

By deciding in favor of the BMG 511 from HOMAG, Regnauer has taken a bold step towards a new horizon in production. “The timber construction industry tends to take a very element-based approach divided according to roof, ceiling and walls. Previous CAD-driven production technology came to an end with the unfinished elements. To continue to improve our economy, we have taken experience gathered from other fields such as furniture production and are using this in the production of facades and add-on components. The quantum leap here is achieving the automatic production of these labor-intensive articles automatically with the building model, creating them in a single work step without the need for manual finishing processes.

In combination with the accuracy needed for component finish processing, process speeds of up to 50 m/min are ideally suited to our needs. Using the BMG 511, we are introducing the quality and speed achieved in furniture production to the world of timber construction. This is the first time that a timber construction company has ventured to take such a consistent step forward right through to the individual component. The processing time required for individual and series production of panel materials has improved by a factor of between 2 and 3. Where processes such as facade panels and window sills have been combined to create a single work step, this factor increases to between 4 and 6. To achieve this level of success, what is urgently necessary is a competent team of well trained staff.”

[Zitat in separatem Kasten mit Portrait Regnauer]

“Our HOMAG 5-axis processing center BMG 511 enables us to improve the efficiency of our facade panel, insulating element and add-on component processing operations. For us, the quantum leap comes from the combination of different work processes. This has allowed us to process facade panels, for instance, in just one sixth of the time it used to take – and with a higher standard of quality.”



Pictures courtesy of: HOMAG Group AG / Regnauer Fertigbau GmbH



Fig. 1:

The new Ambienti+ show home was the proud recipient of Germany's premier timber frame house construction award, the "Golden Cube", in 2014





Figs. 2-3:
New office building in Jülich over a usable area of 684 sq.m.



Fig. 4:
With the new HOMAG BMG 511, Regnauer processes panels up to six times faster than previously.



Fig. 5:
5-axis processing of insulating panels



Figs. 6-7:
Markus Leppin, Head of Engineering at Regnauer Fertigung GmbH

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