MAKA

INFO 03

MAKA

CNC Spezialmaschinen

Dear Readers,

The natural raw material, wood, fascinates everyone who comes into contact with it professionally day in, day out. The possibilities that it offers are enormous and become particularly apparent in structural timberwork. The timber consumption in this sector has been rising for years. Acceptance for the material is high, and the objects produced from it attract attention in the media. That is predominantly attributable to you, the processors, who practice intensive image-building for wood with excellent products.

For the outsider and potential customer, however, it is not easy to comprehend how much development work goes into the impressive facades and breath-taking glue laminated beam ("glulam") constructions. The projects are generally complex and demand a system partnership built on trust – from the architect through the machine supplier right up to the glulam producer.

MAKA has made a good name for itself with its customised CNC solutions for the processing of structural solid timber/glulam and the handling of large parts. Our technology has proved particularly successful in high-quality applications for high capacities and guarantees maximum flexibility. We are thus able to meet growing demands on added value, such as those arising from the integration of infrastructure into wall elements. We build the machines as individually as you need them. It is you who sets the limits.

"MAKA offers solutions that other machine manufacturers come nowhere near achieving," says one of our customers in the latest MAKA Info. He is confident that with our competence, he will be able to double his market share. We are proud of that. Perhaps our success derives from the passion with which we approach our projects. It's the same passion that you feel for wood. A passion that unites and achieves optimum results. Test us. We will be happy to share our passion and know-how with you.

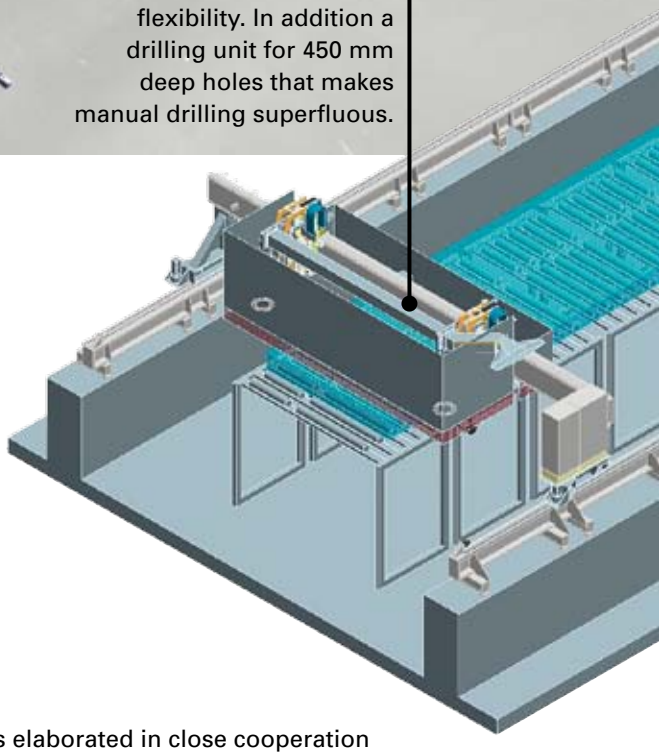
Yours sincerely,
Klaus Kern
MAKA Managing Director

MAKA is at home where progress is.

Large.

Large of course is a thing of the past.

Two 5-axis units each with 20 kW for even more flexibility. In addition a drilling unit for 450 mm deep holes that makes manual drilling superfluous.



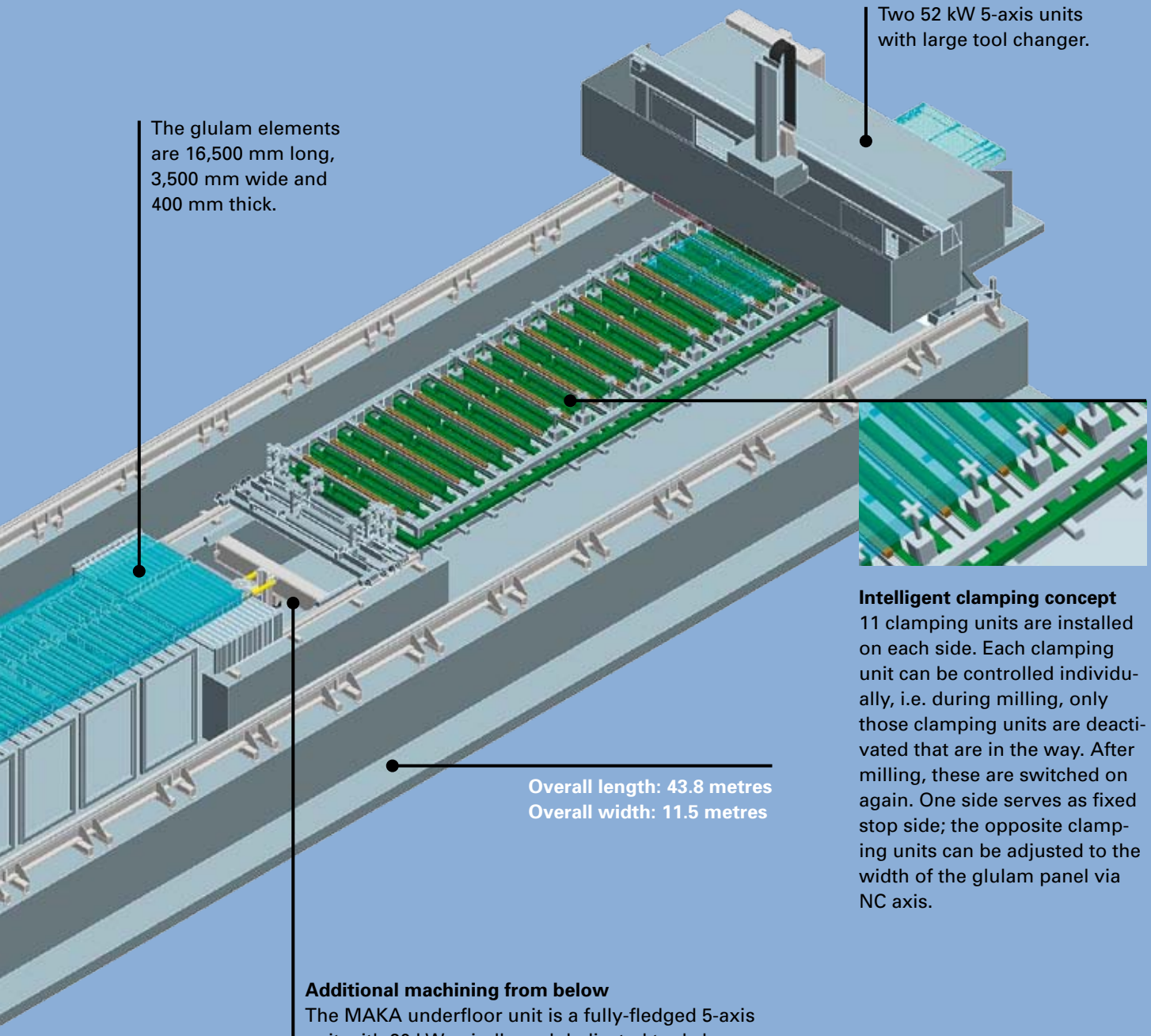
Today's market makes heavy demands on you. The machining technology for glulam and CLT must be able to mill even large parts weighing several tonnes with precision engineering accuracy and to drill holes with millimetre precision. Intelligent handling of the part is also an important aspect for the quality of your final product. Tooling competence and control know-how form integral parts of the solution. Ultimately the whole system has to fit like a glove. And it has to function under tough conditions. Day in, day out.

Your CNC specialist, MAKA, offers you a package that is tailored precisely to these needs. The basis provided by sturdy portal machines opens up a practically unlimited variety of individual concepts. Single or two-portal machines are available, depending on the machining operation. They are fitted with perfectly matching 5-axis units for milling as well as drilling and sawing units. The five-sided machining can be easily expanded to include the sixth side. MAKA has launched a pioneering development here with the underfloor unit. With a flexible table configuration, MAKA can offer the optimum solution for even your application. When it comes to the clamping technology, you benefit from MAKA's many years of experience in part handling.

Every project is elaborated in close cooperation with the MAKA product developers. The MAKA application engineers accompany you right up to the installation and later ensure an extremely high availability of your machine. Outstanding profitability and productivity ensure a rapid ROI.

Leading glulam producers have been working with MAKA machines for many years. Our customer for example, Mayr-Melnhof Holz, on the right-hand side shows how individual a typical MAKA solution can be. But as always with MAKA, the motto still applies: It is you who sets the limits.

Heavy. Challenging.

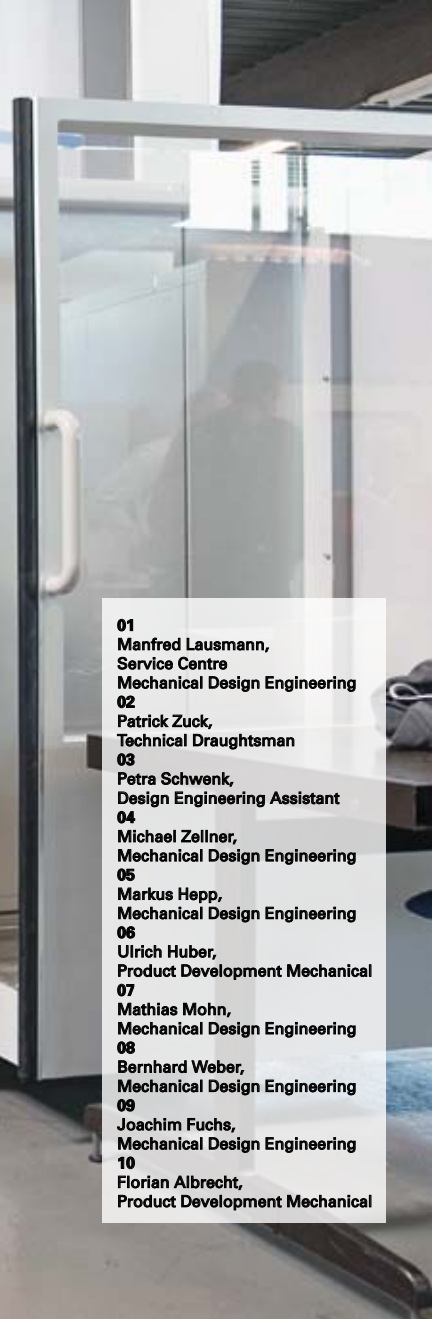


Intelligent clamping concept
11 clamping units are installed on each side. Each clamping unit can be controlled individually, i.e. during milling, only those clamping units are deactivated that are in the way. After milling, these are switched on again. One side serves as fixed stop side; the opposite clamping units can be adjusted to the width of the glulam panel via NC axis.

Additional machining from below
The MAKA underfloor unit is a fully-fledged 5-axis unit with 20 kW spindle and dedicated tool changer. Every conceivable machining operation is thus possible on the machine without the glulam panels having to be rotated. The movement in x direction is achieved by the panels being clamped between the portals and transported over the unit. The movement in y direction is performed by a dedicated NC axis of the underfloor unit.

Overall height: 6.80 metres
In order to create space for the underfloor unit, the machine was mounted on 2 metre high pillars. Measured from the floor, the construction is therefore actually 8.80 metres high.

The masterminds behind it all!



01
Manfred Lausmann,
Service Centre
Mechanical Design Engineering
02
Patrick Zuck,
Technical Draughtsman
03
Petra Schwenk,
Design Engineering Assistant
04
Michael Zellner,
Mechanical Design Engineering
05
Markus Hepp,
Mechanical Design Engineering
06
Ulrich Huber,
Product Development Mechanical
07
Mathias Mohn,
Mechanical Design Engineering
08
Bernhard Weber,
Mechanical Design Engineering
09
Joachim Fuchs,
Mechanical Design Engineering
10
Florian Albrecht,
Product Development Mechanical

The uncompromising realisation of individual customers' demands is MAKA's real trademark. The product developers in design engineering are therefore faced with new challenges almost every day. These cannot be mastered without in-depth know-how – and not without a passion for design.

Many years of experience, creativity and enthusiasm are what MAKA concepts are made of. In the Design Engineering department, this spirit is reflected in a healthy mixture of old and young. The brain trust consists of the three-man project development team. It is headed by 35-year old Björn Drück. The graduate mechanical engineer has been with MAKA for 10 years. Ulrich Huber, on the other hand, contributes not only his indispensable know-how, but also a good 27 years of loyalty to MAKA. Both of them have already handled a large number of demanding projects. Florian Albrecht stands for the "young rebels". The 27-year old is still in the process of learning, as he says himself, but already has excellent CNC skills and is an ideal complement to the team. A further six employees are responsible for the Mechanical Design Engineering. At the computer monitor, they transform into concrete technology what had previously been drafted in long internal meetings or together with the customer.

The project normally starts with an enquiry from a customer. Standard is generally not enough for those who come to MAKA. The first question is therefore normally: "Can you do that?" That is when the planners come into their own. In a preliminary meeting, the project is presented to all the departments that will later be involved in it. "Up to 15 colleagues can be sitting around the table at this meeting," says Florian Albrecht. These include the electronics specialists as well as the production engineers and the application engineers. "As a fairly small company, the coordination is relatively easy. The external communication is thus made clearer. That is our advantage compared with other service providers – a fact often confirmed by our customers," says Björn Drück. The project then takes on its concrete forms in numerous internal meetings. This also includes a rough cost calculation. "If the customer's expectations don't fit into his budget, we try to find an alternative," explains Florian Albrecht. Parallel to this work, the MAKA project developers meet with the customer's technicians a number of times. A requirements specification is presented more and more often. "Around 50 percent of our customers work in this way in the meantime – and rising," reports Björn Drück. It is always a great help, even if the content is not set in stone: An average of around 70 to 80 percent of the later realisation is already defined in the basic concept, estimates Björn Drück. The rest still has to be clarified. "A project develops," says Ulrich Huber, speaking from experience. The exchanges between the experts around the table create new ideas. That is how the six-sided machining using an underfloor unit came into being. "That didn't exist in this form before," says Ulrich Huber and adds: "Our customers like us because MAKA is always ready to improve on the state-of-the-art, and MAKA technology can thus give them the crucial lead over the competition."

A further trump is the legendary sturdiness of the MAKA machines. Almost all the machines are still in operation 20 years later. That is attributable predominantly to the sturdy design, but also to the competence in 5-axis technology that has been developed over the years. Broad know-how in CNC, control system technology and tooling come together at MAKA in a huge knowledge pool that ensures the customer a perfect and – more importantly – innovative comprehensive solution.

The MAKA product developers are proud of the contribution that they can make to the success of a project. And they live for their job. "I can't stop thinking about a project like this even when I'm at home," admits Ulrich Huber. He and his colleagues are full of enthusiasm when it comes to developing and implementing a concept. This attitude and a close personal relationship that only a small company can offer pay off for the customer with that crucial touch of added value. "Once I drove overnight from the Ligna Trade Fair to a customer because he wanted to have a meeting with me," says Ulrich Huber looking back. "That is typically MAKA," comments Björn Drück.

MAKA HE
TO BUILD
SUCCESS

In the building industry of the future, wood will play a vital role. With the right production solution, you can put your market position on a sound footing. Decide in favour of added value. Produce using a customised MAKA CNC solution.

ELPS
O YOUR
S

1

INSTALLATION ENGINEERING TO MEET EVERY REQUIREMENT

Our solutions are just as varied as the demands of our customers. Be it glulam beam or wall element. We have the optimum system constellation for you. From the number of portals through to the tooling, table configuration and clamping concept, including open Siemens control system. The polymer concrete-filled steel substructure of the MAKA machines minimises vibrations and oscillations.

2

5-AXIS MACHINING ON ALL SIDES

We want you to be efficient. The six-sided MAKA machining in a single pass makes you efficient. Rotation of the components is eliminated – as is any loss of precision due to reclamping of the parts. Clamp once. Press the button. Finished. That is MAKA.

3

RELIABLE PART HANDLING

Different dimensions mean changing demands on the clamping system. MAKA combines pneumatics with linear drives, as required. Each clamping element can be individually controlled and is only deactivated during machining. That means the best possible clamping at all times for high productivity, but without the risk of collisions.

4

INTEGRATED SYSTEM SOLUTION

A production chain is only as good as its weakest link. At MAKA, strong production components are combined into a power cell with maximum availability. You benefit from a sturdy portal design, machining units with high operation feed rates and reliable automation of the processes in work scheduling. CNC-integrated use of robotics rounds off the complete solution, if necessary.

Huge scenario

The visitor to Mayr-Melnhof Holz in Gaishorn am See, Austria, is welcomed by an impressive natural landscape. Equally as impressive is the production shop where CLT elements measuring up to 16.5 metres in length and weighing up to 12 tonnes are moved and machined. High-performance MAKA technology provides the necessary efficiency and precision – today and in the future.

Mayr-Melnhof Holz is one of the leading players in the timber processing industry, producing at six international sites. The company covers the whole added-value chain – from sawmill through to pellet and briquette production. One of the plants in which cross-laminated timber (CLT) is further processed is in Gaishorn am See. Glulam and timber elements of any dimensions are produced against the overwhelming mountain backdrop in the Steiermark with its endless forests. CLT from Mayr-Melnhof Holz has arrived in the construction of single family houses, and is increasingly being used also in the construction of multi-storey residential buildings. "A further expedient field of application with growing importance is the addition of storeys to buildings in large cities," reports Sebastian Knoflach, responsible for international product management. Here the "construction material of the future" benefits not only from its low weight in relation to its density, but also from the fact that the material requires no setting or hardening time immediately after installation, hence significantly shortening the construction time. "Thanks to the lower wall thicknesses, CLT construction offers approx. 5% more net floor space by comparison with conventional materials – and that with the same construction costs and half the construction time," says the specialist.

In view of the growing importance of wood in the building sector, the perspectives for the company are good. "We are planning to double our CLT production," says plant manager, Wolfgang Gollenz. In order to achieve this ambitious goal, Mayr-Melnhof Holz has once again secured the support of MAKA. The investment in the first MAKA production system dates back to 2007. That machine is still successfully in production even today – predominantly for wall elements that are formatted and provided with the necessary openings for doors, windows and infrastructure. High flexibility is demanded from the machining technology in order to fulfil the wide range of architects' individual drafts.

"We are extremely satisfied with our MAKA," emphasises Wolfgang Gollenz. He highlights in particular the performance and reliability. "The machine has an availability that others on the market are far from achieving," he says. The basic configuration of the new machine evolved "from day-to-day practice", explains Wolfgang Gollenz. The focus of the project planning was predominantly on increasing productivity and adapting the technology to the changes in market demands. The decision in favour of MAKA was taken after comprehensive market research. "All the competitors were already out of the race after the presentation of their system concept," says the plant manager in retrospect. "It was a pure technical exclusion process – and we hadn't even talked about the price," says Wolfgang Gollenz.

During the course of numerous meetings with the MAKA development technicians, a solution was evolved that had very little in common with the original basic machine, the BC 570. "That's normal," grins MAKA Managing Director Klaus Kern. "One of MAKA's key trumps is that we don't try to market standard products and always have an open mind for any new customers' wishes."

In a few months' time the new machine will replace the old one in Gaishorn. A look inside the huge workshop shows clearly: Sturdy technology is needed here that is a match for any workpiece, no matter how heavy. That applies to the part handling

01
The CLT elements are transported on a roller table with cross-transfer conveyor to the MAKA machine.

and to the machining. Elements with dimensions of 16 x 3.5 metres are not unusual at Mayr-Melnhof. The machining process in the CLT production is really something to see, and commands respect from anyone who has never seen it before. The machining units had to be correspondingly dimensioned, the motors designed to be extremely strong. MAKA had already found a tailored solution on this basis back in 2007.

Based on a similar concept, however, the new machine now represents a major step forward. The highlight of the machine is the underfloor unit. “Until now, we have machined the workpiece from five sides as normal,” explains Wolfgang Gollenz. Machining from the underside wasn’t necessary until a few years ago. But growing quality demands from the customers and profitability considerations have now changed the situation. This led to the idea of 6-sided machining in one clamping. This was intended to ensure the highest precision during machining. This cannot be achieved if the workpiece has to be turned and clamped again. “Minimal shifts in position can then occur,” admits Klaus Kern. On the other hand, the underfloor unit makes a major contribution to increasing efficiency. In conjunction with the upper unit it is even possible to make a centre cut in the panel. The two panels are separated so that the cut surfaces can also be machined.

Wolfgang Gollenz is full of praise for this solution that MAKA developed specially for Mayr-Melnhof Holz. “The logic of this configuration is thanks to the MAKA engineering skills,” he says. “In this constellation, the MAKA machine is far superior to everything else on the market.” Sebastian Knoflach is particularly impressed by the support from MAKA. “We would like to take this opportunity to say thank you for the many hours that MAKA has invested in this project. We are already looking forward to the moment when we deliver the first panels with this 21st century technology to our customers,” says the product manager.

Technology Special

In the case of Mayr-Melnhof Holz it is a complex and highly customised CNC 5-axis solution. The basic machine, a single-portal BC 570, was extended to include a second portal for this application. Instead of one unit as standard, a total of five units and two lateral drilling units are used for machining. The main portal is equipped with two 52 kW milling spindles. The secondary portal has a further two 5-axis units and a tool changer that eliminates the need for manual changing of the milling cutters. A particular challenge here was the six-sided machining that was solved using an underfloor unit. That necessitated a special design of the table that had to be designed higher. Due to the weight and the huge dimensions of the glulam elements, a special clamping concept was developed that combines pneumatics and a linear drive to handle the differing widths of the workpieces. For fully automated machining, the workpiece is clamped between the two portals and transported over the table. Preparation of the machine for production is performed completely at the office PC and requires no manual intervention.

“Our MAKA offers unique availability.”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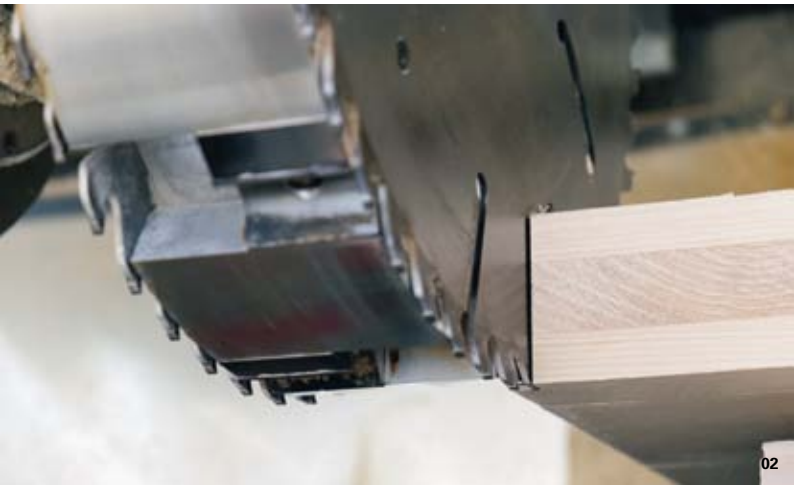
02


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04


05

01
High demands on part handling
02 - 03 - 04
The up to 400 mm thick CLT elements require the use of particularly powerful milling cutters, drills and saws
05
Automation of the processes in work scheduling
06 - 07
Complex machining with the highest precision


06


07

Production with just two clicks

A system is only as good as the orders are prepared. DPS offers a software package with which CNC programs can be generated fully automatically in the office. It is used at Mayr-Melnhof Holz.

Carrying out the settings for CLT/ structural solid timber production on the machine is still widespread practice. The disadvantage: In some cases, extensive modifications have to be made to the software supplied by the machine manufacturer. This results in down-times and reduces the productivity.

MAKA adopts a different approach. We separate the work scheduling organisationally completely from the machine. This presupposes a close interaction of powerful 3D CAM and advanced 5-axis CNC technology. The aim is to hand over the necessary data to the machine so that the machine only has to carry out the work for which it was purchased: production.

The Siemens 840 DS L used by us as standard has proved to be a great advantage here. The Siemens controller is an open system and can thus be easily interfaced to the CAD/ CAM software in the office. All that is now needed is a software package that transfers the design data to the machine. DPS Software in Wetzlar markets just such a system. The powerful tool consists of several modular components that can be combined as required. In the case of Mayr-Melnhof Holz, the following specifications had to be satisfied:

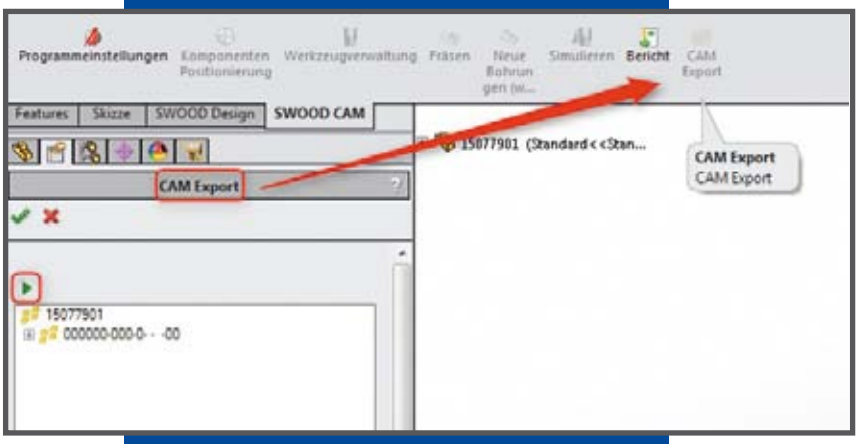
- Minimisation of the number of interfaces
- Integration and implementation of the company-specific macros (work processes)
- Support for both the existing machine and the new machine that has different kinematics
- Incorporation of the company-specific manufacturing strategies into the system

The 3D CAD software SolidWorks is used here. The CNC machine is controlled via SWOOD CAM, a tool 100% integrated into SolidWorks. Simple operation and excellent visualisation are among the outstanding features of the system. SWOOD CAM automatically detects the contours to be machined and optimises the assignment of the machining operations. The software allows all wood-specific units to be controlled. Multi-face machining and milling with 5 axes simultaneously are possible.

In practice that looks like this (see screenshots below): The operator selects the data export in the menu bar on the screen. A mouse click displays the CAD/CAM data on the screen. SWOOD CAM analyses the part and generates the program for the machine fully automatically from the existing macros. The huge advantage: Processes that otherwise have to be defined laboriously by hand are available without any intervention by the operator thanks to the 3D contours. In order to be sure before the last crucial click, the operator can now carry out a simulation. He can thus test the program under real conditions and check the correctness of the machining operations before they are carried out. He then transfers the data to the NC-HOPS machine program and production can start.

After initial scepticism, Mayr-Melnhof was quickly convinced of the possibilities offered by the software combination of SolidWorks and SWOOD CAM. The system is now in use in the glulam production in Gaishorn am See. The experience to date is very good: After the conversion and customised adaptation of the processes, time savings of between 60 and 70% are possible in work scheduling.

Jörg Rudig, Head of the Competence Center CAM at DPS: “We are convinced that our technology is geared for the future. Fully automatic generation of machine-specific CNC programs at the press of a button and without manual intervention will establish itself in the structural solid timber / glulam sector with all processors faced with complex and demanding applications.”



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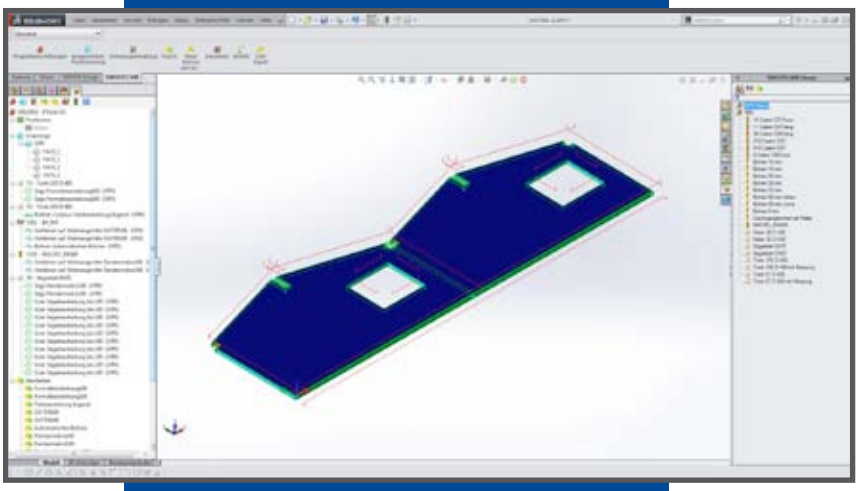

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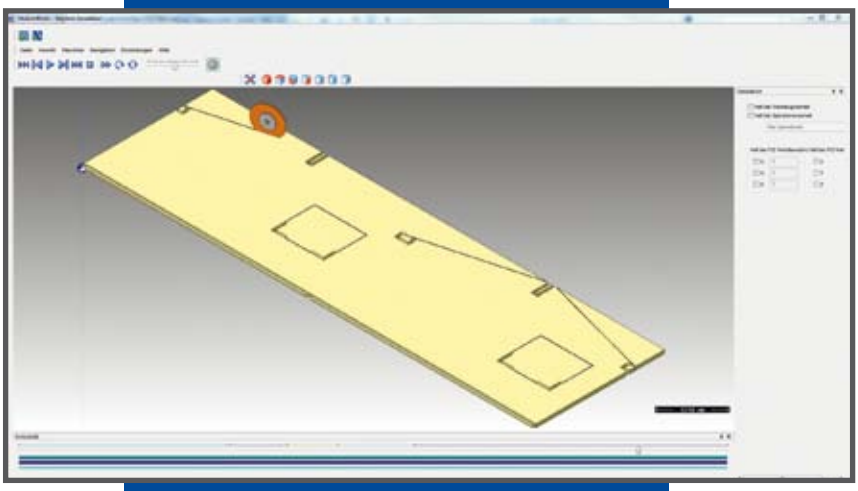

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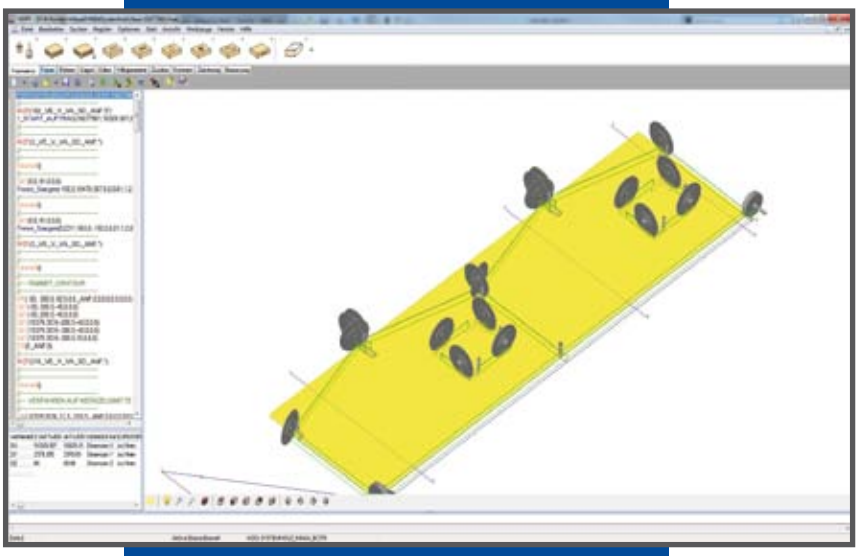

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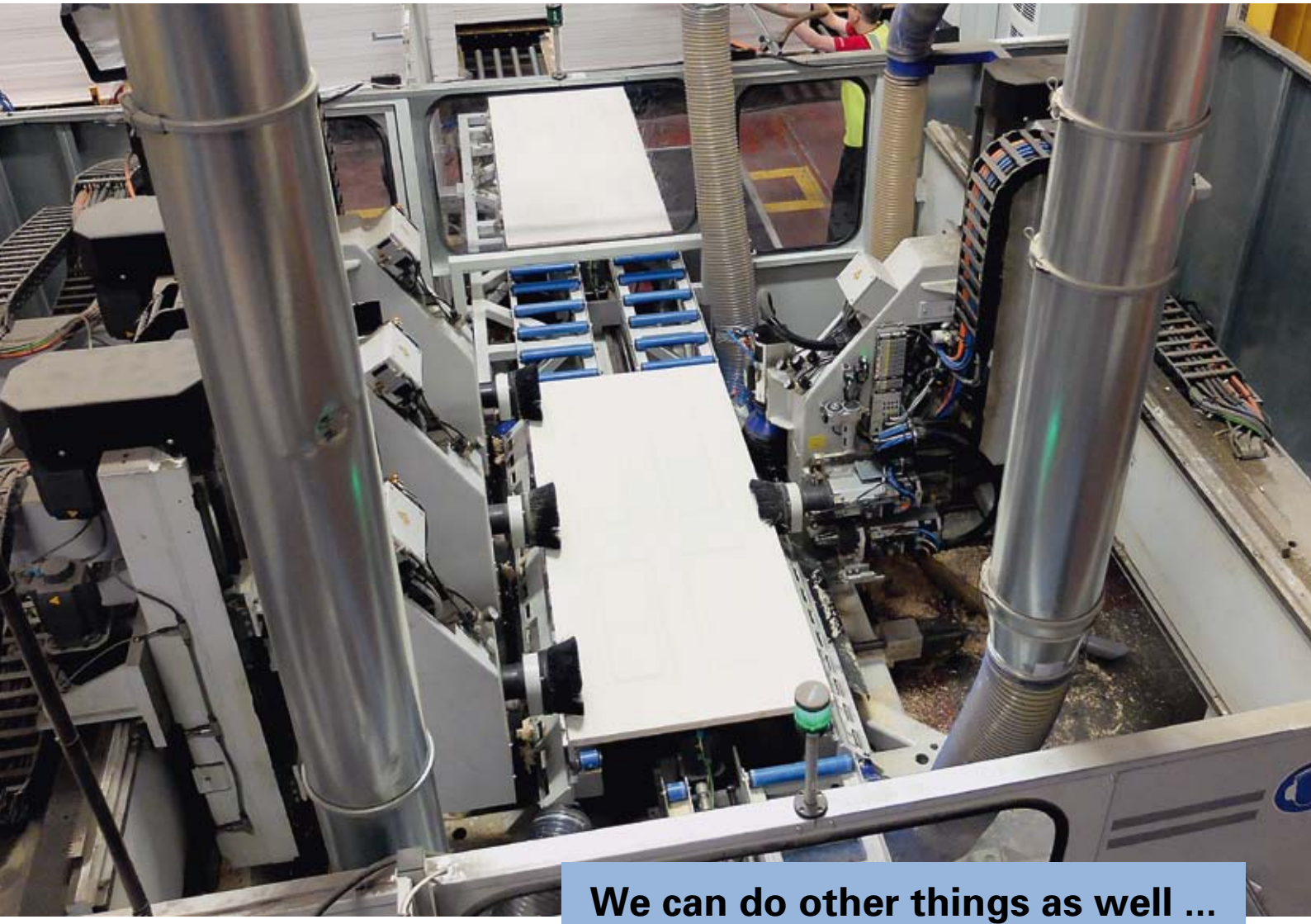
01
The design data are imported into SWOOD CAM with a click of the mouse

02
The software analyses the part on the basis of the 3D contours

03
One last check by means of simulation ...

04
... then the NC program is written for the machine



We can do other things as well ...

MAKA is the right address even if you do not produce structural solid timber or glulam. Our competence in wood can be applied wherever high-quality solutions are called for. For example in door production. Complex processes take place here - from milling through to automated insertion of a wide variety of fittings. The choice of production technology determines how many seconds of machining time can be saved. With the MAKA machines tailored flexibly to the requirements, a wide variety of different door types can be produced particularly efficiently and cost-effectively.

But the name MAKA stands not only for high productivity and precision. Our sturdy machines also guarantee maximum availability – an important criterion in door production where the machines generally run in tough 2 or 3-shift operation! By the way, the components installed, such as drives, controller, motors, etc. are the same ones as installed in their "big brother" in glulam processing. The technology transfer also extends to the chain-type tool changer with shuttle, the MAKA spindle developed in-house and the portal design.

MAKA is currently working on a number of orders for leading European door manufacturers. "Thanks to our extensive CNC 5-axis competence, we are confident of winning further customers in this sector in the near future," says Managing Director Klaus Kern.

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