

PURE WOOD - other than BeA nails and staples

Alpnach, May 2023: If you visit the KÜNG HOLZBAU AG in Alpnach and look between the new office building and the 'Holzpur' factory, in good mountain weather, you will see Mount Pilatus at a height of 2,128 m. Despite the impressive view and the architecturally impressive buildings, KÜNG is rather down-to-earth. Their success is pure wood: 'Holzpur'. With the all-wood system construction method developed specifically for this purpose, not only do the buildings grow up to five stories high, but so do the orders. That's why an almost fully automatic floor production with BeA Autotec devices was created in the new factory hall.

The floor elements for the solid wood system are manufactured using the TechnoWood TW-Mill E 4000 2U machining center. The glue-free elements are statically stiffened with planking using Funderplan panels or with gypsum fiber boards from Fermacell. The Funderplan panels are fixed using the BeA Autotec Jumbo-Coilnagler 45-90 device with 50 mm long BeA nails, spaced 80 mm on centre. Areas that cannot be fastened automatically due to the material-saving processing of the planking are fastened by René Barmettler using the BeA 14/65-830 C nail gun. Using the BeA Autotec device with SL TRC3C K 155/25-65 interchangeable cassette, the gypsum fiber boards are fastened with type 155 staples (50 mm long), spaced 80 mm on centre.



The dowel-laminated timber elements are processed on the new TechnoWood TW-Mill E 4000 2U system.

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"The 'Holzpur' philosophy stands for buildings without metal, without glue and without any chemicals. We only make an exception for the nails and staples for fastening the planking," explains Peter Odermatt, head of joinery technology at KÜNG HOLZBAU AG. The company therefore opted for Funderplan panels instead of the commonly used OSB panels. The wood fiber boards are manufactured using a wet process, in which the wood's own lignin is dissolved and used as a natural binding agent.



"Due to the special manufacturing process, we have already tested the pull-out resistance values when fastening magazined nails together with the manufacturer. These meet the requirements," confirms Manfred Dabrunst, sales manager at BeA-HVV AG who provided advised Peter Odermatt in selecting the suitable Autotec device for the TechnoWood system and supported it during commissioning. "It's good to know that you have an expert at your side who knows the applications and the material properties," says Peter Odermatt.

The laminated elements are connected with wooden dowels without any glue.

The floor elements serve as a base for the company's underfloor heating system 'Lignotherm'. The heating pipes are laid in the cutouts in the tongue and groove boards made of beech wood. Due to the good insulation capacity of the system in combination with the self-made solid wood floors, no heat conducting plates are installed. Stephan KÜNG, managing director at KÜNG HOLZBAU AG, had a vision in 2006: "to build houses from solid wood without glue, chemical building materials and metal". He consistently realized and implemented this vision with the 'Holzpur' solid wood system. The wood is harvested 100% in high forests in Switzerland, mostly in the local canton of Oberwalden. Especially in December and January, when the trees contain the least sap and are not attacked by fungi and pests. The 'moonwood', which is felled shortly before the new moon during the Christmas season, is considered particularly durable and stable.

The wall and floor elements are stacked crosswise on the production table in a fully automatic process, leaving openings for doors and windows. Using a CNC-controlled dowel portal, the dowel holes are drilled at the intersections of the board layers and the beech wood dowels are pressed-in precisely. The machining center then mills the contours, recesses for cables and sockets and calibrates the elements. The inside of the wall elements are sanded or brushed to create a structured surface. Depending on the different wall structures, the wood fiber insulation and, in the variant with facade plaster, the plaster boards are installed. "Automatic fastening is not only faster, but also more precise and reduces the workload on employees," says Manfred Dabrunst.



Passionate about wood construction: KÜNG HOLZBAU in Alpnach

Solid-wood-system 'Holzpur'

The cross-laminated, dowel-connected solid wood elements with a density of 430kg/m³ are characterized by high stiffness and enable buildings with up to five storeys. The load-bearing exterior and interior walls have fire protection suitability according to REI90 without additional structural fire protection. The static thermal conductivity is 0.084 W/mK.

The air tightness is achieved using raw felt cardboard, which consists 50% of recycled paper fibers and recycled textile fibers. The wall and floor elements are made of spruce and fir wood in thickness of 150, 180, 210 and 240 mm. In addition to the solid wood variant, variants with a compact plaster and wooden facade or ventilated wooden cladding are offered.



The glue-free 'Holzpur' wall elements are made from cross-laminated boards with processed surfaces.

KÜNG HOLZBAU

In 1977, Walter Küng and a business partner founded their own carpentry and joinery business in a barn in the Alpnach hillside of Schoried. Just five years later, Walter Küng took the step forward and built a new hall for 15 employees. The stock corporation Walter Küng AG was founded in 1986. With the development of the 'Holzpur' system in 2006, the company grew significantly. In 2013, the award-winning 'Holzpur' workshop was built with state-of-the-art machinery. In 2017, Walter Küng handed the company over to his son Stephan, who has been working in his parents' business since 2005. The new office building opened in 2020, and the second production hall was put into operation in 2022. The company currently employs 100 people.



A strong team: TechnoWood AG and KÜNG HOLZBAU