

the art of wood machining



TWOODS-Line

Production line for element houses



techno
wood



The plant

Every of the three production stations can be used independently as well.

The TWOODS-Line has been developed for producing TWOODS® solid wood elements. The entire plant consists of three portal CNC machines.



production line



TW-Layer - The planting portal



TW-Fix - The drill and dowel portal



TW-Mill - The cut-off portal

TW-Layer

The planting portal

- 5 NC axles
- variable boxes
- external operating station
- additional remote control
- any tier possible
- 3 boards / stroke
- automatic box recognition

TW-Fix

The drill and dowel portal

- 10 NC axles
- drilling and doweling in one tension
- variable hole depth
 - continuous
 - uncontinuous
- composing depth accurate to the millimetre
- dowels protruding or countersunk
- dowels processible without prior treatment
- element thickness 50–400 mm
- condensing and moistening during the press-in process
- patent by TechnoWood

TW-Mill

The cut-off portal

- any handling incl. fly-cutting
- processing from 5 sides
- 2 complete 5-axes units
- high-torque saw
 - up to 1000 mm
 - horizontally inclinable
- 24 kW spindle
- HSK 63 F infeed
- tool changer with up to 30 seats
- low-collision design
- 1000 mm travel length of the z axle
- possible passaging width of 3500 mm and more
- arbitrary length (depending on the rail length)
- all axles with linear slide and circulating ball trolley
- linkup to CAD/CAM using Lignocam (any editing possible)
- the worldwide prevalent ISO-CODE is the programming interface

Examples



oblique sectioning und rebate with saw on TW-Mill



frontal tenons



window opening with saw and finger shaper



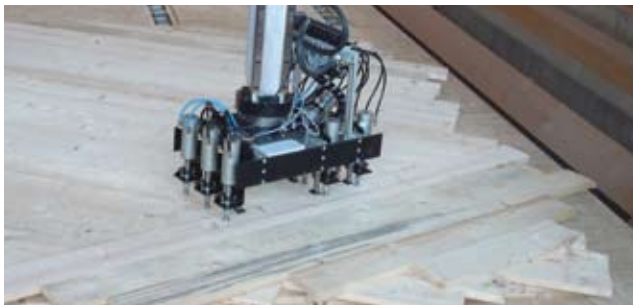
element with binder and rebate



TW-Layer

The planting portal

On this machine, rough-sawn and dried boards from pre-sized containers are grasped and lined on the processing table. The programming system determines the standard for the planting design. Openings for windows and doors are recognized by the system and thus not planted, reducing short timber pieces to a minimum. Too long boards are automatically recognized and trimmed to their appropriate length.



clamping claw



wall element with large window opening



trimming of too long boards



operating station with portal

TW-Fix

The dowel portal



TW-Fix resembles a fully automatic dowelling centre. The board layers planted on the TW-Layer planting portal are pushed to the dowel portal. There the boards are tensioned and holes with a diameter of 15 mm are drilled.

As an option, the holes can be either drilled through completely or not. The dowels are invisible on one side for the elements not drilled through. In addition, this method does not affect the machine table and wearing plates become dispensable.

As soon as a hole was drilled, the dowel portal starts and presses a dowel of 16.2 mm diameter into the hole. Tension is applied during this process, thus preventing the boards from shifting.

The dowels are automatically compressed on the plant prior to pressing in and then pressed into the hole accurately to the millimetre. This procedure was designed and applied for patent by the TechnoWood GmbH.

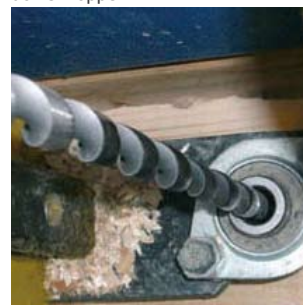
Not even one drip of size is required for the entire process. A completed element is thus composed of natural materials to 100%.



dowel hopper



1 dowelling and 2 drilling units



drilling unit with guided auger bit



large gantry-motor to generate the pressure of the serrage

TW-Mill

The cut-off portal

Portal cut-off system with two independent 5-axes units



In the operating centre, any items like hard wood plates, solid wood plates, laminated timber, board stacks, sandwich plates and other panels can be processed rationally and accurately to the millimetre. Large elements like box beam, roof, ceiling and wall elements can be completely handled. The individual layout with tools at will leaves almost nothing to be desired further. The robust portal is equipped with two 5-axes units. You can supply the facility individually with 30 tools or more.

The high-torque, flangeless 1000 mm saw can be tilted down to horizontal position, if required. In addition to all conceivable cuts, this saw is capable of cutting jags, skew notches, grooves, slots, etc.

2 complete 5-axes units, a high-torque saw and a 24 kW water-cooled high-performance spindle with HSK tool holder are situated in the portal. The saw with a diameter of 1000 mm remains permanently clamped, while the spindle automatically gets the required tools from the tool changer. Tooling speeds of 0-24000 revolutions/minute can be freely programmed for every tool.

The cut-off portal TW-Mill is equipped with the company-own machine control TW-Control and is linked to the Lignocam programming system by default. As the machine interprets the globally standardized ISO-CODE DIN 66025, the portal can be connected to almost every CAD. Additionally, the control is capable of high-level language, i.e. loops like «IF» «WHILE» «FOR» etc. can be programmed.



tool changer



C-axis revolvable for 440°



water-cooled high-performance spindle with HSK tool holder



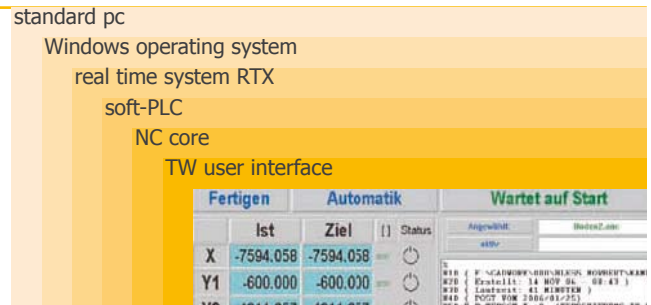
flangeless saw can be swivelled for up to 92°

Control and programming system



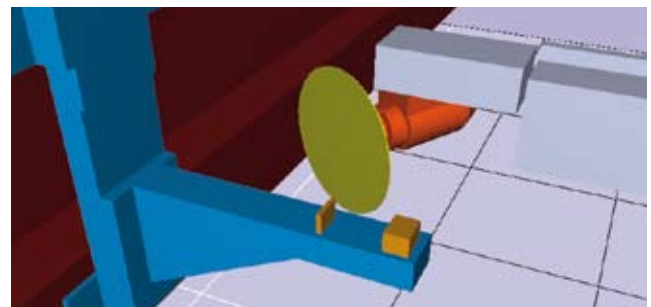
TW-Control

A standard PC with Windows operating system is able to run the machine control. A real-time system monitors the maximum of 64 NC axes concerning their absolute synchronicity. The control interprets the worldwide standardized ISO code in accordance with DIN 660250. The flexibility of this control almost knows no limits with its additional 34 mathematical functions and an integrated high-level language. Basic configuration standardly comprises automatic tool correction and practice-oriented tool and neutral point data management. All of our controls are implemented using digital technology. The single components use a real-time EtherCAT network for communication.



Kollisionsüberwachung TW-DCD

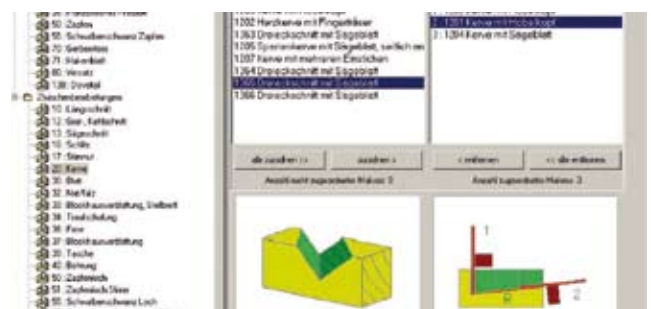
We supply the control including the dynamic collision monitoring unit TW-DCD. TW-DCD offers a comprehensive simulation for machine and production facilities. It combines behaviour, kinematics and dynamics simulations as well as collision observations. TW-DCD is operated on the control itself or on a secondary computer system. The objects to be moved are linked to the planting and path preparation information details of the control. This prevents eventual collisions before actually occurring. In case collision-monitored parts come below a certain spacing, a warning or error message is triggered stopping the travel lengths. Of course, TW-DCD shows the operator those parts of the plant which are heading for a collision. There is no way to be closer to reality with a simulation or a collision observation.



stops with the tools prior to collision with trolley or tensioner

Lignocam

The Lignocam programming system is responsible for controlling all three stations. You benefit from the short lead times and vast compatibility. Due to its post-processor, Lignocam allows for very flexible and individual adaptation to almost every machine. Practically all workings being common practice in timber processing are feasible. Additional workings can be implemented quickly and easily. Data can be imported from all established CAD systems.





Technical data

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Dimensions

Overall system

- rail length x-axe: *48000 mm
- portal passage y-axe: *3500 mm
- element thickness planting dowelling: 400 mm
- working height cut-off Z axle: 1000 mm
- table height approx.: 600 mm

* bigger size possible

TW-Mill - The cut-off portal

- length approx.: 3000 mm
- width approx.: 6500 mm
- height approx.: 5000 mm

TW-Fix - The drill and dowel portal

- length approx.: 3000 mm
- width approx.: 6500 mm
- height approx.: 2000 mm

TW-Layer - The planting portal

- length approx.: 2000 mm
- width approx.: 9000 mm
- height approx.: 2000 mm

Services

TW-Mill - The cut-off portal

- spindle performance: 24 kW
- speed max.: 24000 rpm

TW-Fix - The dowel portal

- number of dowels/tier: 1600
- press-in force: up to 45000N

TW-Layer - The planting portal

- number of boards/stroke: 3
- rotation angle of the boards: 0-360°

Tools

- saw blade diameter: 1000 mm
- dowel drill: 15 mm
- face-milling cutter diameter: 360 mm
- infeeds: any HSK

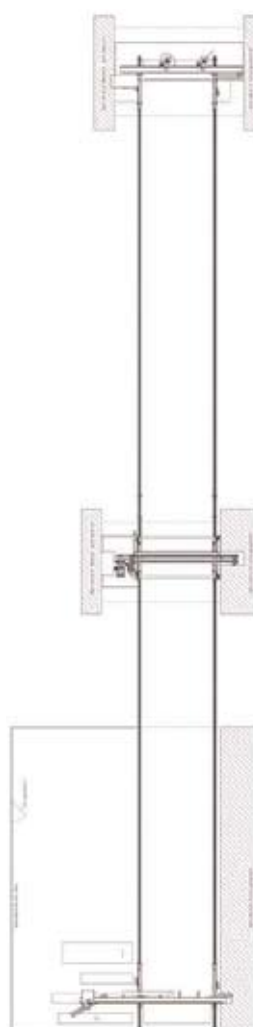
Throughput

- production time for 1 m2 of solid wood element, thickness 180 mm, approx.: 8 min.

Product, production

The solid wood elements can be manufactured from rough-sawn or planed boards. A solid wood element consists of at least 4 layers, the boards of which can be planted in arbitrary direction. Layer thicknesses and board widths are variable.

Dowels or drills are uncontinuous to prevent fraying. Element tensioning is preserved during drilling and dowelling. The dowels can be put into the stack without pre-machining. They are compressed and moistened in the unit.



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