

Window producer Bieber opts for CNC machines from HOMAG

The company Bieber has opted to equip its new production workshop with two CNC machines from HOMAG. A manufacturer of bespoke low-energy windows and doors, Bieber is now producing on the BOF 322 and BOF 700 powerProfiler processing centres.

The wooden window market is currently undergoing a process of industrial transformation characterized both by groundbreaking technical innovations and a need to streamline the means of production. This process is culminating in improved product quality hand in hand with reduced costs. To keep pace with this rapid pace of development, manufacturer Bieber has invested a total of 2.3 million Euro in a new production plant with a surface area of 6,000 sq.m in Waldhambach in Alsace, which it has equipped with two CNC machines from HOMAG. This move is also designed to address the growing demand for low-energy timber components which will comply with more stringent heat insulation legislation due to come into force in 2010 and 2012.

Ambitious requirement profile

The demands made on the new production plants were clearly defined: A total of 17 existing window systems (**Fig. 1**) has to be integrated in the CAD/CAM system and their production executed with the highest possible degree of automation and the lowest achievable number of operator interventions. The low-energy window systems produced are made of wood or wood and aluminium with a wide range of different cross-sections and thicknesses ranging from 48 to 78. The triple glazed units used for installation in eco homes are up to 88 mm in thickness and have a glass rebate depth of up to 54 mm. To comply with this highly challenging assignment profile, Bieber opted in favour of the BOF 322 and BOF 700

power**Profiler** processing centres from HOMAG.

power**Profiler B700 processing centre**

Right from the first cutting operations in the timber store, the individual components for each window are marked with an imprint, sorted on a window-by-window basis into the slot rack, which transports them to the planing process and from there to the processing centres. The power**Profiler (Fig. 2)** at Bieber processes between 360 and 400 window components per shift. For window components with mortise and tenon joints, tools with larger diameters are used, while in window systems using a dowel connection, the boreholes are executed with a high degree of precision using special units.

The individual window components are deposited on the loading table in the order set out in the work plan shown on screen. The length, width and thickness of the elements are checked by a laser measurement system integrated in the loading table, to prevent any malfunction or collision in the machine. In addition, a buffer zone at the infeed and outfeed takes care of an optimum continuous flow of parts and also allows the machine to produce without operating staff for up to 30 minutes.

At the end of the buffer zone is a loading unit which engages up to six individual parts or a single element of six metres in length. The loading unit traverses while the raw parts are being engaged, permitting simultaneous cutting to length in a sawing station (**Fig. 3**). Then the loading unit positions itself in front of the first longitudinal console, from where it transfers the parts to the three-step clamping elements of the first longitudinal console.

The clamping plates of the 3-step clamps are pneumatically cleaned before each clamping operation, in order to prevent chip markings being

impressed into the wood. After the part transfer, the loading unit returns to its starting point to allow a new part series to be engaged and cut to length. At the same time, further processing of the raw parts takes place on the first longitudinal console, with transverse and longitudinal profiling of workpieces.

The parts are then transferred to the next console to allow them to be profiled on the other side and all drilling and trimming operations performed for the corner connections, sash bars, transoms, mullions and hardware. When ready, the elements are placed on a conveyor belt, cleaned and transported to the outfeed table, labelled and deposited back in the transport rack.

Machine concept

A single gantry supports the two working spindles with their independently operating axes for simultaneous processing of two parts on the two consoles (**Fig. 4**). The gantry can optionally also be equipped with 5-axis spindles, for example for the production of shift cuts for the construction of conservatories or upright/transom constructions.

The MultiChain tool magazines (**Fig. 5**) are positioned on both sides of the gantry and are capable of engaging up to 6 chain changers with 72 slots each. If the changer capacity is ideally utilized, this allows 432 tools and units to be directly accessed and so a wide range of different window systems produced without the need for manual resetting.

The tools, designed by Oertli and implemented on the basis of indexable carbide inserts, feature a cutting edge geometry optimized specifically for use on processing centres. The cutter head bodies are made predominantly of light alloys in order to minimize the weight carried by the changer.

HOMAG has addressed the familiar problem of chip disposal by equipping some of the tool sets with a chip baffle plate whose movement is governed by a numerical axis. This positions the plate at 360° around the tool to concentrate a maximum number of chips in the direction of the extractor. The particles and chips which are not picked up by the extractor drop into the machine bed where they are pushed by cleaning pushers onto a chip conveyor belt and then automatically disposed of.

BOF 322 processing centre

The power**Profiler's** smaller brother is used as a way of extending capacity for an additional 200 window components and is also deployed for the production of arched components and front doors. The BOF 322 (**Fig. 6**) processing centre is fitted with 2 trimming spindles which both access a chain changer with 72 slots. This double spindle technology allows one spindle to set up a tool while the other is operational. The time required to exchange one tool for another is under 3 seconds.

The machine also features a clamping system with automatic set-up facility. This eliminates unnecessary set-up time and allows the processing centre to also be operated independently and unmanned for up to 30 minutes.

Up to 600 window components per shift with just one operator

Both processing centres are operated and supplied with material (**Fig. 7**) by just a single operator. Another helping hand is only required when producing front door leaves and large arches, for example with a gauge length of over 1,500 mm.

All good things come in threes

Alongside the two processing centres, the basis for this low-manned production lies in optimum data preparation (Klaes) and competent project processing. These factors together ensure the optimum interplay between data generation, machine, hardware technology and tooling technology. Excellent results experienced since 2005 with another processing centre from HOMAG prompted Bieber to enter into this significant investment with every confidence of success.



Fig. 1:
One of 17 different window systems



Fig. 2:
power**Profiler** processing centre



Fig. 3:
Infeed unit with cross-cutting saw



Fig. 4:
Simultaneous complete processing of several workpieces



Fig. 5:
multiChain tool changer with 17 window systems



Fig. 6:
Processing centre BOF 322 with automatic positioning table

Leistungsstufen für den Fenster- und Fassadenbau

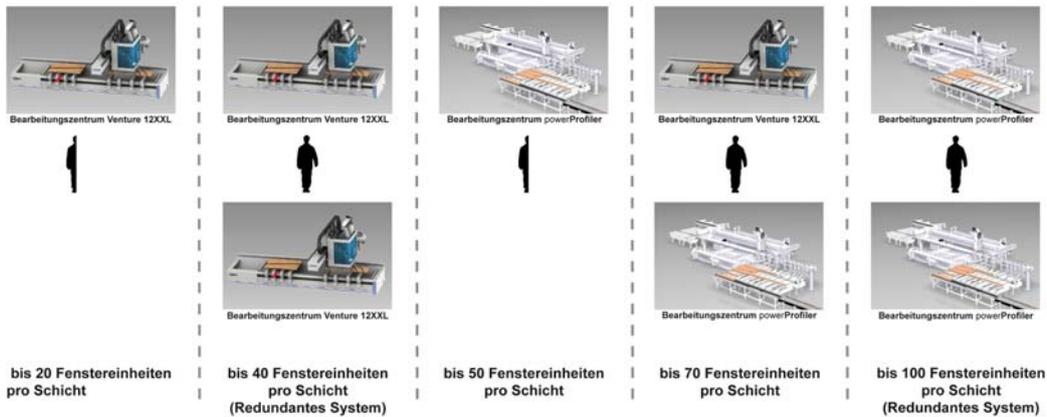


Fig. 7: Performance stages for window and facade construction

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