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Up the wooden hill with HOMAG

Upstairs, downstairs – staircases are there to move people across height differences in buildings. But staircases have long since represented far more than just a means to an end: they are required to fulfil different expectations of form and function and provide visual appeal. Individual custom-specific design is just as important as convenience and functional quality.

Staircase producer Reiner Voß has long since moved principled thinking up a step to evolve a personal code of values which he applies to the production of his solid wood staircases: Always in keeping with the principles of skilled craftsmanship and to an exceptional standard of perfection. Although both these challenging standards are put into practice on ultra-modern processing centres from HOMAG, practically every single staircase produced here is unique.

This skilled master joiner soon came to realize shortly after founding his company in 1990 that the only way not only to comply with valid standards and stringent personal quality criteria but also to offer customers individual solutions in line with their own specific requirements at realistically affordable prices was by using modern CNC technology. So his first move was to purchase CNC staircase components from a supplier, until such time as he came across what was at the time the very latest highly flexible 'BAZ 20' processing centre from HOMAG. His new acquisition also came with the benefit of extreme operating simplicity. "This machine finally gave us the breakthrough we had been looking for, allowing us to produce over 600 staircases in a year for the first time", recalls Reiner Voß, explaining what motivated him to push ahead with the purchase of a second CNC machine only shortly afterwards.



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This second purchase was a gantry machine – the **profiLine** 'BOF 230' also from HOMAG, and was used specifically for processing curved components and stair treads. This new machine represented an enormous leap forward in terms of output. The combination of the split extending console tables and two parallel processing stations for alternating workpiece loading with the five-axis trimming spindle and two-spindle sawing/drilling unit plus vertical trimming unit permits the production of even more different staircase models with more versatile detail designs without additional expense. The new machine has also meant drastically shortened cycle times, as the parts can be processed on all sides in a single sequence without the need for reclamping.

This purchase allowed the staircase manufacturer to go ahead and implement his vision of supplying unique, custom-designed staircases to address customers' individual needs. After all, a view of the staircase is often the first impression which impacts on a visitor when first entering someone's home. Staircases make a big impression on spaces and can create an atmosphere of extravagance. At the same time, they are an expression of the owner's unique personal style. Reiner Voß classifies the staircases he creates as timeless classics offering a unique inherent worth expressed by features such as

- Profiling work on stair treads and stringers
- Connections to and between different parts of a staircase
- Implementation of customer-specific geometries
- Use of only A-class wood qualities coupled with a constant level of wood moisture content ranging between 8 and 10 % right through from purchasing to processing
- Continuous monitoring of wood quality both optically, particularly at the surfaces, and also for breaking strength
- Use of woods harvested from sustainably managed forestry sources optionally certified in compliance with FSC (Forest Stewardship)



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Council) regulations

- Most popular wood species: Beech, oak, spruce, cherry wood, as well as wenge, merbau and walnut
- Optionally also combinations with other materials
- Surface: Alternatively colourless lacquer seal or oiled using hard oil from vegetable-based resins.

The diversity of staircase types grew with the increasing number of staircases supplied, and the company's own staircase studio was soon opened to provide customers with a first-hand impression of different "effects". To further increase volume output and achieve even greater flexibility in the execution of orders, the first 'BAZ 20' was swapped for a processing centre selected specifically to perform nesting operations (HOMAG 'Optimat BOF 211' with grid table).

The nesting process permits the use and optimum utilization of largerformat finished panels (5,000 x 1,200 mm). This alone meant the achievement of material savings in the region of 20%. Other benefits included the practical elimination of material waste and intermediate breaks in operation for time-consuming clearing work. The nesting process is used for the cutting waste-optimized cutting of staircase treads and stringers. Cutting waste optimization is carried out "automatically" by the software, which suggests a standard nesting solution. This suggestion can be either accepted by the operator or if necessary manually adjusted. "The material savings alone meant that the machine investment was recouped within three years", confirms "cost calculator" Voß with satisfaction.

As the success of Voß staircases grew, so did the aspirations – on the part of both Voß with his passion for staircase construction and of the company's clientele. It was to address these increasingly ambitious demands that the company took the decision to install another processing centre less than two years later. Again from HOMAG, and this time



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another extension arm machine, the **profi**Line 'BOF 322' with two working spindles (four and five-axis technology). These are used in the main for processing staircase stringers and handrails including paling holes and rails with omega profiles. This allows single workpiece lengths (in the X direction) of up to 6,000 mm to be clamped in position, or up to 2,550 mm for alternating processing. Multiple-station positioning of up to nine workpieces is also possible. The suction cups travel automatically to the correct position in accordance wit the data read from the bar code label (entered into the software in the production engineering department).

The "DRIVE5+" five-axis working spindle executes all sawing, drilling and trimming operations on any optional level, making use of a 72-slot chain changer available for tools and units. A 4-axis processing unit is located on the opposite side of the extension arm. The availability of dual spindles permits fast tool changing from the tool storage system.

Armed with this machine outfit

- Gantry machine with console extending table predominantly for staircase treads and curved components ('BOF 230')
- Extension arm machine with grid table for cutting waste-optimized tread and stringer nesting on finished 5000 x 1200 mm panels ('BOF 211')
- Extension arm machine with automatic console clamping table predominantly for staircase stringers and handrails up to a working length of 6000 mm ('BOF 322')

the staircase producer has the assurance of an ideal set-up to cope with every conceivable requirement.

On the one hand, this configuration ensures substantially higher volume output while avoiding costly shift working. At the same time, all staircase



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designs which differ in terms of type and dimensions can be processed at the same time on a parallel basis. This in turn provides the capability to deliver any type of required staircase installation within just 24 hours. And another underlying factor in any cost consideration is the compatible software (HOMAG and Compass) used to operate all three machines jointly. The result: only a single interface for everything, less programming work and fewer sources of error, one and the same training program for all the machines, allowing one operator to work with equal ease at any one of the processing centres.

Against this backdrop, the staircase principles cultivated by Rainer Voß are more than just a vision, they are a vocation: One which is put into practice on a daily basis thanks to the effective use of hightech CNC engineering.



Specific characteristics	• • •	
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of the HOMAG gantry p	rocessing centre , 'pro	fiLine BOF 230'
 Processing tables 2 independent console tables w workpiece dimensions of up to 4, Staircase treat clamping fixture 	vhich can also be used co 200 x 1,600 x 500 mm es	oupled for larger
 Processing units 4-axis trimming spindle with 15 5-axis trimming spindle with 11 2x 12-slot plate changers with c 	kW output kW output hip-to-chip times of unde	er 10 secs.
<u>Specific characteristics</u> of the HOMAG extension a	rm processing centre	'Optimat BOF 211'
 Processing tables Aluminium grid table with large gluelam panels (nesting process) Maximum workpiece dimension 	vacuum system for secu) s 5,240 x 1,300 x 210 m	re fixture when dividing
 Processing units 4-axis trimming spindle with 11 2x 12-slot plate changers with c 	kW output hip-to-chip times of unde	er 10 secs.
Specific characteristics	rm processing centre '	profil ine BOE 322'
 Processing tables Automatic positioning console t system Maximum workpiece dimension 	able with integrated vacu s 6,175 x 1,730 x 300 m	num and pneumatic

- 4-axis trimming spindle with 15 kW output
- 5-axis trimming spindle with 15 kW output
- 72-slot chain changer with chip-to-chip times of under 8 secs.



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The company		
Treppenbau Voß GmbH & Co. KG, Grootkoppel 23-25,		
D-23858 Reinfeld		
www.treppenbau-voss.de		
Founded	1990	
Chief Executive	Reiner Voß	
Products	Stringer staircases, mortised and surface-mounted	
	Spiral staircases, cantilever staircases,	
	helical staircases, space-saving staircases	
	staircases in solid wood, material combinations with	
	glass, steel, stainless steel	
Workforce	40, of which 6 master joiners, 6 trainees	
Size of premises	Site: 4.500 m ²	
	Production area: 2800 sq.m.	
Turnover	4.5 million Euro	
Annual output:	min. 2,000 – max. 4,000 staircase installations/year	
Sales	Through 4 self-run staircase studios (90 %),	
	joiners, property developers	
	Radius: Whole of North Germany as far as	
	Lower Saxony	
Quality certificate	Valid regulations in compliance with CE and DIN	
	as well as stipulations issued by the Federal	
	Static Stability and Safety Federation	
Services	Delivery of staircases directly to the building site,	
	installation, loan of carcase staircases for the	
	building phase	









Fig. 2: Processing a staircase stringer



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Fig. 3:

Three HOMAG processing centres for complete processing of staircase components



Fig. 4: Craftsman's finishing touches





Fig. 5:

5-axis processing of a curved handrail component



Fig. 6:

Cutting waste-optimized division of gluelam panels using the nesting process



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