05/19
BM: Customer Call Voltomic

Endless volume

Voltomic perfects the 5-axis nesting process thanks to end-to-end machining

Endless volume

It all started in a garage ten years ago. The machine pool: a portable circular saw, a grinder and a cordless screwdriver. Nowadays, there is a Format-4-CNC able to nest and completely machine complex volumes for climbing walls in almost any shape as part of a comprehensive end-to-end process with no less than a spectacular 5 axes at Voltomic's premises. **BM EDITOR IN CHIEF CHRISTIAN NÄRDEMANN**

BM-photos: Christian Närdemann

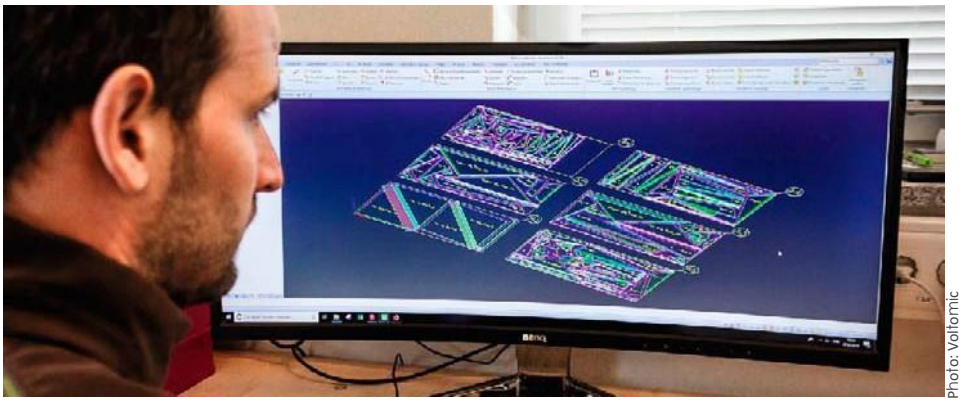


Photo: Voltomic

/ The CAD/CAM system Alphacam is the paramount software tool. Its high-performance nesting tool optimizes the arrangement of the many individual parts in the panels and generates all required CNC programs.

/ „I saw a CNC machine for the first time two years ago." Today Stephan Müller relies on the combination of powerful software and 5-axis nesting using a Format-4 Profit H 500 MT. There is almost nothing above that.

Photo: Voltomic

/ Volumes for climbing walls in countless individual shapes are Voltomic's core product.

Established in 2010, Voltomic produces high-grade timber volumes, volume handles (mini boards), wall volumes, climbing wall profiles, structures, boulder walls and many more products at the company's premises in Rosenheim. The base material for their applications is multiplex birch panels that are bonded with PU before they are screwed together. In this process, the sophisticated perforation pattern is equipped with durable flange nuts that are tightened at either end. Until about a year ago, the team still did all this manually using a portable circular saw, orbital sander, cordless screwdriver, etc.

Increasing demand, continuous new shapes

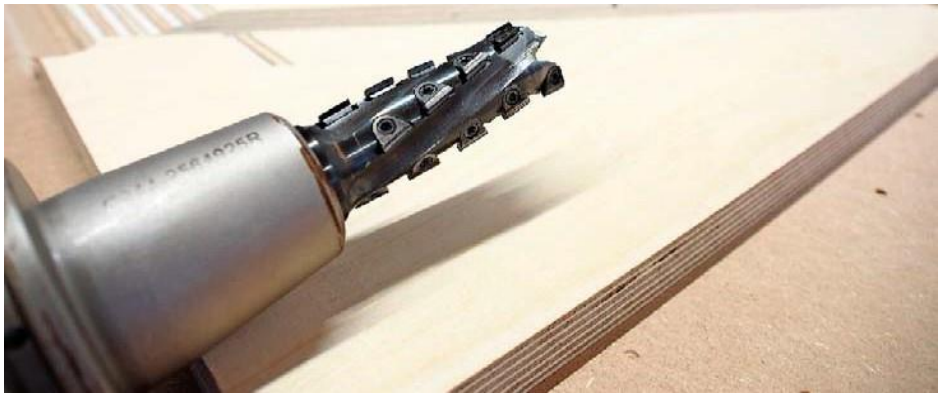
As both managing directors – Stephan Müller (fully qualified carpenter) and his brother Thomas (responsible for the commercial side of business) – have clearly hit the heights with their top-quality, trendy products, demand for volumes grew (and continues to grow) very quickly. Both reached a point at which they had to take a technologically new approach to guarantee the company would continue to grow. Stephan Müller himself is a passionate climber and boulderer. I myself learned during the interview that bouldering is a type of climbing involving no ropes and harnesses, i.e. there is no „safety net".

From naught to CNC

As we are walking through the new facility during the plant tour, Müller tells me that two years ago he had never seen a CNC machine in action before. Hardly imaginable when you witness production at Voltomic nowadays. The times in which Stephan Müller went through a handful of portable circular saw blades every day to machine multiplex birch panels, are well and truly over. The brothers have implemented a highly consistent process – from freely defined volumes to a 5-axis nesting process including comprehensive machining on a Format-4-CNC. I am amazed because I myself have never seen this type of application in action before. Voltomic offers a vast number of different volume shapes. In addition to now 1,500 standard shapes (prior to purchasing the CNC machine they offered a mere 50) the company can easily configure almost any new shape.

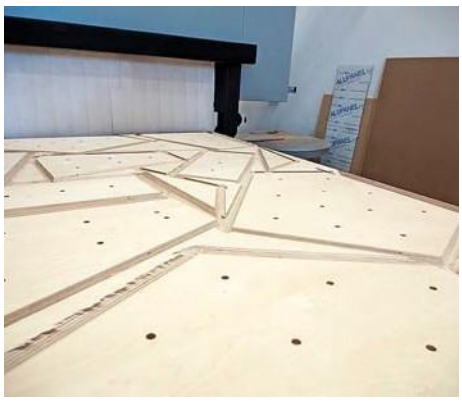
Volume models become CNC program

Stephan Müller uses Sketchup and Alphacam as his software tools. He only needs Sketchup to model a previously non-existent, new volumes from so-called planar sections. This process is quick and easy. Then Alphacam enters into the equation. STL Hans automatically identifies these planar sections within the three-dimensional space and prepares them for panel generation. The Alphacam panel macro uses it to automatically generate panels with the specified thickness featuring connectors and the required miters before it automatically splits all panels into individual component files. Automation Manager, a tool that has been integrated into Alphacam as standard, then compiles production jobs from any number of these components. All that it needs now is a click on Start and all parts are fully automatically machined and ideally arranged within the panels by the high-performance nesting tool



/ *High performance, easy handling: The Konstantin Mini from Aigner has a diameter of 25 mm. The 23 slide cutting edges can be changed by the user himself, drilling and circumferential cutting edges are identical.*

/ *Spectacular: The saw blade is also used as part of the nesting process on the Format-4-CNC machine.*



/ *The new nesting process saves up to 15% in material compared with the former process.*

/ *Alphacam enables rational complete machining thanks to a sophisticated machining strategy.*

/ *It goes without saying that the 5-axis CNC technology is predestined for the production of handles.*

that has been integrated into Alphacam. In this process, the system also generates all CNC programs. That's all it needs to kick off CNC machining: position the job's first panel, press Start and off you go...

CNC machining: Machining to please the eye

Then the type Format-4 Profit H 500 MT 5-axis CNC machine starts up. The first step (what will later be the volumes' outsides are at the top) is to drill (including blind holes to subsequently sink screws). The panel is then rotated before the system takes care of any other required CNC machining. In this process, the saw blade, end mill, drill and other tools are all applied as part of a sophisticated machining process. Would we be scoring the machining, I would give the system full marks. But seriously, the sequence is complex and you will only be able identify many exciting details once you've had a closer look. For instance, as part of 5-axis formatting around 0.5 mm are left at the bottom. This guarantees that even the smallest parts can be safely machined without slipping out of place. The final cut is only made once all CNC machining has been completed.
A number is milled into each of the 20 to 30 parts from one nest to make sure it's clear where they subsequently belong. The complete panel machining process takes around 45 to 60 minutes. The fully equipped CNC machine features a camera to stream machining images straight to the office. Field specialists also use these camera images for servicing.

Not just a girl's best friend...

Particularly formatting multiplex material with the end mill wears out the blades pretty quickly. For this reason, hardened metal is not really an option for Voltomic. It takes diamonds. The disadvantage here is that once tools need to be sharpened or repaired, they are unavailable for a certain period. Consequently, they would need several of these costly tools to always keep production running. Stephan Müller thinks it was a stroke of luck that when they purchased the CNC machine, tool manufacturer Aigner introduced Konstantin Mini, an end mill featuring replaceable diamond blades. It features 23 identical drilling and milling blades they can simply replace themselves. Plus they only have to stock one type of blade. According to Aigner the downtime for applied multiplex panels is 20 to 30 times higher when using HM tools. Good times ahead as Voltomic produces around 5,000 of these volumes annually and production figures are on the up. Half of the company's output is exported.
Stephan Müller: „The Japanese market is particularly interesting for us. Climbing is really popular here. And considering climbing will become an Olympic sport as of 2020, we are looking forward to some hard graft and successful times."

www.voltomic.de
www.felder-group.com
www.de.alphacam.com
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