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Taking the lead with composites

Bike Ahead is a premier supplier of bicycle parts made from carbon fiber. Established in 2012, this young enterprise has relied from the start on state-of-the-art digital cutting equipment from Swiss manufacturer Zünd. The precision and reliability of the Zünd G3 are one of the reasons Bike Ahead has been competing successfully against suppliers in the Far East. (Text: Zünd Systemtechnik AG, Images: ©Bike Ahead)

While many well-known bicycle manufacturers have long since moved their production to the Far East, Bike Ahead, a young company in Würzburg, Germany, has successfully been bucking the trend. The company's founder and mastermind, Christian Gemperlein, has a degree in plastics engineering in his pocket, a passion for biking in his blood. Gemperlein lay the foundation of his company in 2010 with a six-spoke carbon wheel he developed as part of his degree requirements. With the help of a private investor, he started Bike Ahead two years later and is now building carbon bicycle frames on a contract basis while continuing his own production. Bike Ahead has grown to a staff of 17, four of which, including Gemperlein, in engineering, marketing & distribution, while the others are involved in production.

A complete production workflow - all in house

Bike Ahead takes care of its entire value chain in house. In doing so, the company benefits from a unique competitive advantage: "From idea to development and all the way through the production process, we have everything in house. This makes us a perfect candidate for customer-driven projects, especially in prototyping for applications that go well beyond bicycling, i.e. sports-related automotive, machine design & construction, as well as medical technologies," explains Christian Gemperlein. Nevertheless, 75% of our turnover comes from building bicycles in small series. Our team has a wealth of knowledge in each phase of production. "We have come to be intimately familiar with the carbon fiber materials themselves and the way they behave in relation to the particular part we are building."

"Reliable and precise since the very first day"

For cutting pre-preg parts, Gemperlein put his money from the start on state-of-the-art digital cutting technology made by Swiss manufacturer Zünd. The G3 L-2500 cutter has been at the center of the production workflow from the very beginning, points out Gemperlein: "The G3 cutter was our most important start-up investment besides the autoclave. I already had some experience with digital cutting and it quickly became clear to me that Zünd technology was the only way to go. From day one, the Zünd cutter has been operating with exceptional precision and reliability." Another plus was the intuitive user-interface and workflow software that comes with Zünd Cut Center – ZCC. The software is well designed and exceedingly user-friendly. Because of this, the time it took to train the operators and have them become comfortable with the equipment was very quick. The open interface also makes the Zünd G3 very easy to integrate in an existing production workflow.

Even though "carbon manufacturing", as the name implies, involves many steps that are still performed manually, cutting by hand was out of the question. After all, the Zünd cutter is able to process the material so much faster than would be possible manually, using templates. Nevertheless, for Gemperlein, production speed was not the primary concern. "Even more important than performance were the precision and reliability the Zünd G3 cutter could offer. For the super light-weight parts we make, fiber

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orientation is extremely important. The cuts have to occur at precisely the perfect angle to the fiber. At the same time, the cutter's high precision also guarantees perfect repeatability."

The company also depends on the Zünd G3 cutter for maximum material usage and a high level of automation. State-of-the-art nesting functionalities ensure optimal parts placement even with parts with highly complex contours. This reduces setup time, optimizes yield, and reduces waste. "It quickly runs into some serious money when you mis-cut materials and end up creating twice the amount of labor. This hasn't happened to us in the five years we have had a Zünd cutter." What's more, once we have started a cutting job, the cutter completes it all by itself, without any further intervention. This frees up the operator for other tasks. "The machine operates so reliably, we can let it run all by itself without any qualms."

In the rare event a technical problem arises, things have to get taken care of quickly. Because of Zünd's extensive service and distribution network, we can count on a technician being here in short order. This, along with the easy serviceability of the machine, helps keep downtime to a minimum.

From zero to hundreds of thousand

Five years after its founding, Bike Ahead has become a known entity well beyond the borders of Germany; nonetheless, resting on its laurels is not what the young team surrounding Gemperlein is fond of doing. It is determined to once again make European manufacturing of bike components for the premium market viable and profitable. "This will only be possible if we continue to minimize the manual components of our production processes, which is why we must continue to automate. The way things are, we have enough capacity to make a few hundred bike frames per year, besides our other manufacturing projects. Within five years, we would like to be able to produce a few thousand per year. At that point, we become interesting even to producers geared towards higher volumes. The production numbers in Asia continue to be out of reach, but Gemperlein is nonetheless convinced there are many companies who would like to bring more manufacturing back to Europe. Modern technologies, flexibility, top-quality design and construction, as well as shortened supply chains, are just a few of the advantages he believes the European market has to offer. And these should only gain in importance as time goes on.

Text box

The G3 cutter is a perfect match for the high standards digital cutting systems have to meet when processing carbon fiber materials. All the electronics on the machine are protected against damage that can be caused by conductive carbon fiber particles. In addition, the recommended tooling for carbon fiber applications was developed specifically for this purpose. These tools, too, are protected with positive pressure from abrasive dust and any resulting damage.

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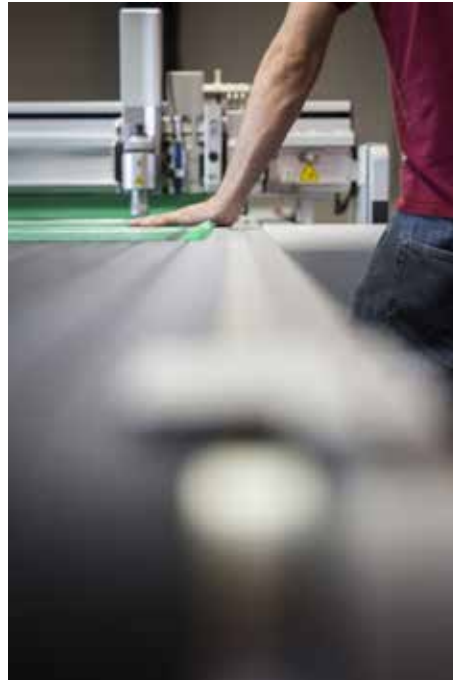
"Made in Germany" – carbon-reinforced composite wheels are known well beyond German borders.



Christian Gemperlein, founder & mastermind of Bike Ahead Composites GmbH.



Bike Ahead relies on state-of-the-art Zünd cutting technologies for cutting pre-preg components.



"The Zünd G3 cutter is extremely productive and impresses with its cutting precision and reliability".

About Zünd Systemtechnik AG

Zünd Systemtechnik AG, a family-owned business with operations worldwide, specializes in developing and manufacturing digital cutting systems. The Zünd name represents Swiss Quality and is synonymous with precision, performance, and reliability. Since 1984 Zünd has been developing, manufacturing, and marketing modular cutting systems and is globally recognized as market leader.

The Zünd customer base consists of manufacturers and suppliers in many different industries, including graphics, packaging, garment and leather, as well as technical textile and composites. Zünd maintains headquarters in Altstätten, Switzerland, where the company's R&D, marketing, and production facilities are located. Besides Zünd's own sales and service organizations in the United States, China, Thailand, India, England, Italy and the Netherlands, Zünd relies on a worldwide network of long-standing, independent distribution & service partners.

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