TRUMPF

Connova AG
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Connova is a specialist in dealing with fiber composites and provides all steps on the journey to a composite component – from development to series production. The Swiss company supplies many different industries. There is a strong focus on aerospace, the automotive industry and motor racing. But many other sectors such as medical technology as well as other industry-oriented companies are increasingly appreciating Connova's range.

INDUSTRY	NUMBER OF EMPLOYEES	SALES
Fiber composite	100	€ 17 million

Challenge

The necessary shapes and tools are manufactured and the batch production is milled and trimmed with dimensional accuracy on modern five-axis CNC machines. However, the employees have to carry out the rough pre-cuts of large parts and trim the prototypes by hand. The same applies to diverse single parts which do not go into series production. Stefan Wyss remembers how the first Fiber Composite Nibbler test machine was sent to his office for such a single-part order: "In 2018, we had an inquiry from a company wanting to reproduce an airplane from the 1960s. Many of the parts to be reproduced were made of AFRP, in other words - aramide fiber reinforced plastic. Cutting these was a particular challenge."

The company could not achieve clean and precise cutting edges with so-called handheld water jet tools. It frequently generated hazardous dust and a lot of smoke. Furthermore, the rapidly rotating discs generated an intense heat input into the material which also had to be taken into consideration as it caused delamination – which means that the fiber layers, connected by plastic, frayed at the cutting edges.

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>
> **STEFAN WYSS**
> PROJECT MANAGER

Solution

That was a good enough reason to look for an alternative procedure. Using a milling machine for this type of single-part production is just too expensive. The FCN 250 has no problem separating aramide fiber reinforced plastics (AFRP), carbon fiber reinforced plastics (CFRP), glass fiber reinforced plastics (GFRP), thermosetting plastics or thermoplastics. To make this possible, TRUMPF has, among other things, adapted the cut geometry and the cutting tools to the new material. The technology is derived from metal processing. It is a cold process without heat influence. The tool is comprised of a punch which executes punching strokes in rapid succession, and a die which absorbs this force. Delamination and fraying of the cutting edge are effectively prevented.

Implementation

Fortunately, TRUMPF approached the engineer to ask if they would like to be a test customer for the new Fiber Composite Nibbler. "This new Nibbler cut through the AFRP like a knife through butter, without smoke or dust. For a handheld tool, it achieves astonishingly clean and precise edges while cutting with an unobstructed view." The new nibbler cuts material up to 2.5 millimeters thick at a working speed of 1.9 meters per minute. Thanks to the unobstructed view of the work surface, the separating cuts can be guided along scribed lines or a template with great precision. Even narrow radii can be easily executed.
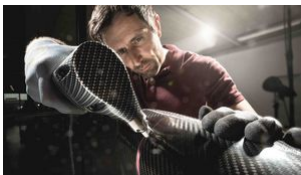
Forecast

According to project manager Stefan Wyss, the FCN 250 only reaches its limits when maximum precision is demanded or the material gets too thin: "When separating reinforced parts, we reach the limits of what the TRUMPF Nibbler can do cleanly when the material thickness is less than 0.5 millimeters. For unidirectional fibre structures, we need a thickness of at least 0.8 millimeters to achieve the cutting quality we demand." While cutting with an unobstructed view, the device cuts astonishingly clean and precise edges for a handheld tool. Wyss also thinks that the costs for TruTool FCN 250 consumables are a positive factor. This is why the Fiber Composite Nibbler offers the perfect, sustainable solution for handheld operation.

With the Fiber Composite Nibbler you can cut all types of fiber composite materials cleanly, precisely, and flexibly.