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The carbon fibre tape “printer”

CFRP preforms are easy to produce with the Crosslayer. The system is designed to provide a cost-effective introduction to automated fibre placement. Operation and programming are not difficult at all. The geometry of the fabric, the number of stacks and fibre orientation can be set at the touch of a button. This reduces cutting scrap and pushes down costs.

The Development Agency for Lightweighting Baden-Württemberg presents this innovation in the August 2019 edition of the ThinKing. Leichtbau BW GmbH uses this label to showcase excellent lightweight technology products or services from Baden-Württemberg every month.

At a glance:

- ▶ Automated fibre placement at **low system procurement costs**
- ▶ Freely definable **material, geometry, orientation and layer structure**
- ▶ **Short familiarisation phase and simple programming**
- ▶ **More process reliability, less cutting scrap and lower costs as a result**
- ▶ Combinable with **stitching process**

“The Crosslayer is a bit like **a printer for unidirectional fabrics**,” says Dr. Bettina Schrick, Project Manager at M&A Dieterle GmbH in Ottenbach. The programmed system automatically places carbon fibre tapes (“fixedTows”). A 3D printer is a good comparison: “You not only set the **geometry of the fabric and the orientation** of the ‘fixedTows’, you can also decide on the way the fabric layers are built up, explains Schrick. The Crosslayer placement head dispenses the ‘fixedTow’, heats it, cuts the tape and additively builds up the tapes to a “preform”. This provides a great deal of **design freedom** and the **ability to produce flexibly**. “Making preforms is much faster than manual placement and the **process is also much more reliable** and accurate than cutting and laying tapes by hand,” explains Schrick.

“We hope that the Crosslayer will make it easier for newcomers to get started with fibre composite lightweighting. It is a relatively inexpensive and easy to operate system for the automatic placement of carbon tapes to make fabrics,” says Schrick and adds: “In a way it is a halfway-house solution between manual placement and expensive highly-automated tape placement machines.”

Low costs also play a role in the operation of the system: automated placement **reduces cutting scrap**, material and resources, **pushing down costs in the process**. You **do not need a long time to familiarise** yourself with the system before you can use Crosslayer and its programming. In fact, Bettina Schrick is convinced “one is ready to go after just two to three days.”

The machine also places the “fixedTows” on an exchangeable frame which is compatible with stitching machines so that semi-finished materials can be processed further by means of tailored fibre placement (TFP).

Cooperation project

The Crosslayer was developed in a consortium with Filacon by **Tajima GmbH** (Winterlingen) and the Institute of Aircraft Design (IFB) at the University of Stuttgart.

Live at Composites Europe

M&A Dieterle GmbH will be exhibiting from 10th to 12th September 2019 at stand D12 in Hall 7 at the Composite Europe fair in Stuttgart.

About M&A Dieterle GmbH

The medium-sized family-owned business is specialised in the development and construction of tailor-made machinery and systems. The company focuses on machine tools, machines for the textile, pharmaceutical and paper industries as well as construction machinery. The company was founded in 1964 in the garage of Wolfgang Dieterle's parents – today the company employs around 100 people at its headquarters in Ottenbach.

Images

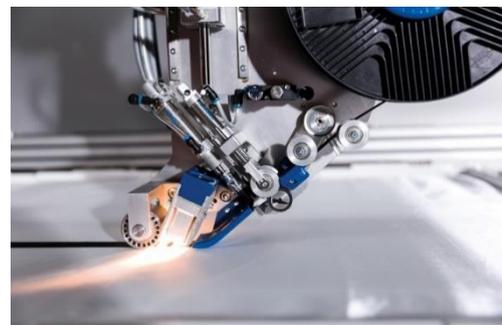


Crosslayer.png:

M&A Dieterle GmbH's Crosslayer is intended to enable a low-cost start into the world of fibre composite lightweighting. Materials, geometry, orientation and tape stacking can all be freely chosen and easily programmed.

Tapeleger_CloseUP.jpg:

Automated process: The Crosslayer placement head dispenses the “fixedTow”, heats it, cuts the tape and additively builds it up to a preform. The process is more reliable and manufacturing time is shorter than with manual placement. There is also less cutting scrap.





Tapeleger_Rahmen.jpg:

Combinable: The Crosslayer places the fixedTows on an exchangeable frame which is also compatible with stitching machines. The semi-finished materials can be processed further by means of tailored fibre placement (TFP).

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