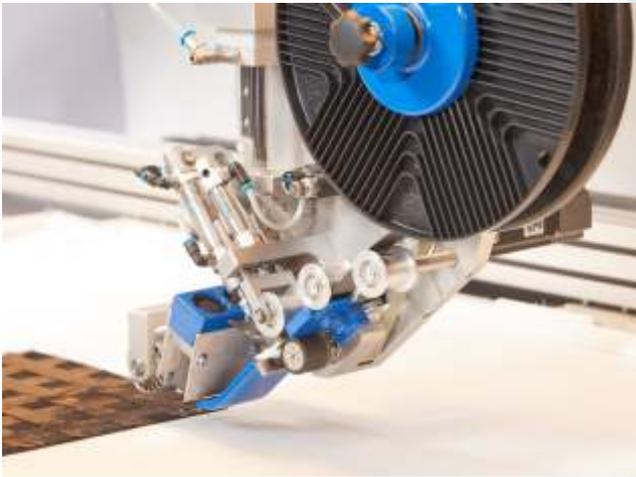


CROSS LAYER

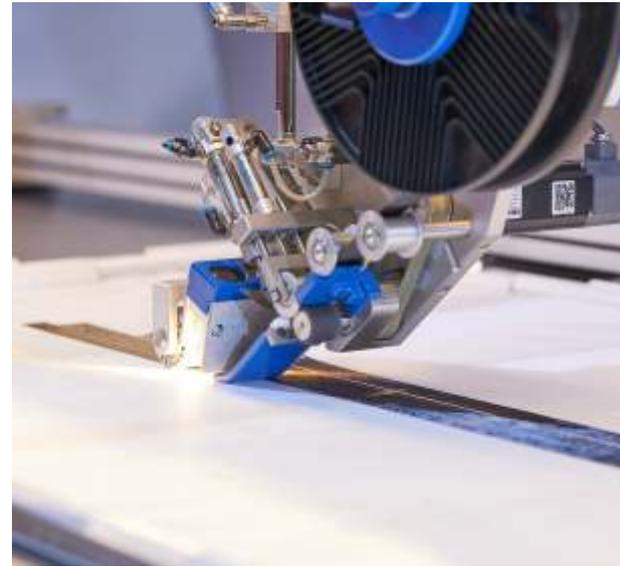


www.crosslayer.de

Process

The Crosslayer process is a preforming process. Prebindered carbon fiber tapes are fixed fully automated.

The process was developed in cooperation of Institute of Aircraft Design, M&A Dieterle GmbH and Filacon systems all located in Baden-Württemberg in the Southwest of Germany. The **CROSSLAYER** machine can produce individual and and near-net-shape fabrics with low grammage.



Features

Fast and cost-efficient

Little space for machine necessary,
smallest version: 2,5 m x 1,5 m

Easy operation

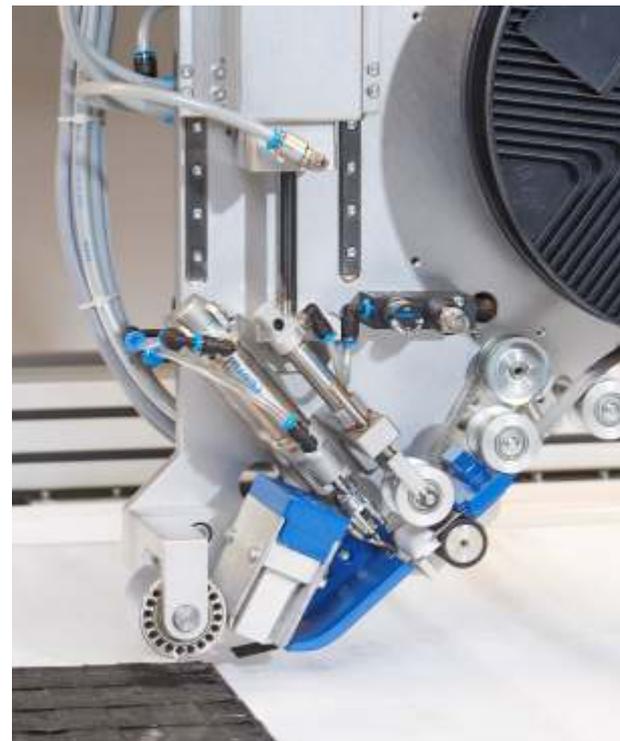
Placement of various, pre-bindered materials

Heating time adjustable

Low machine investment and easy maintaining

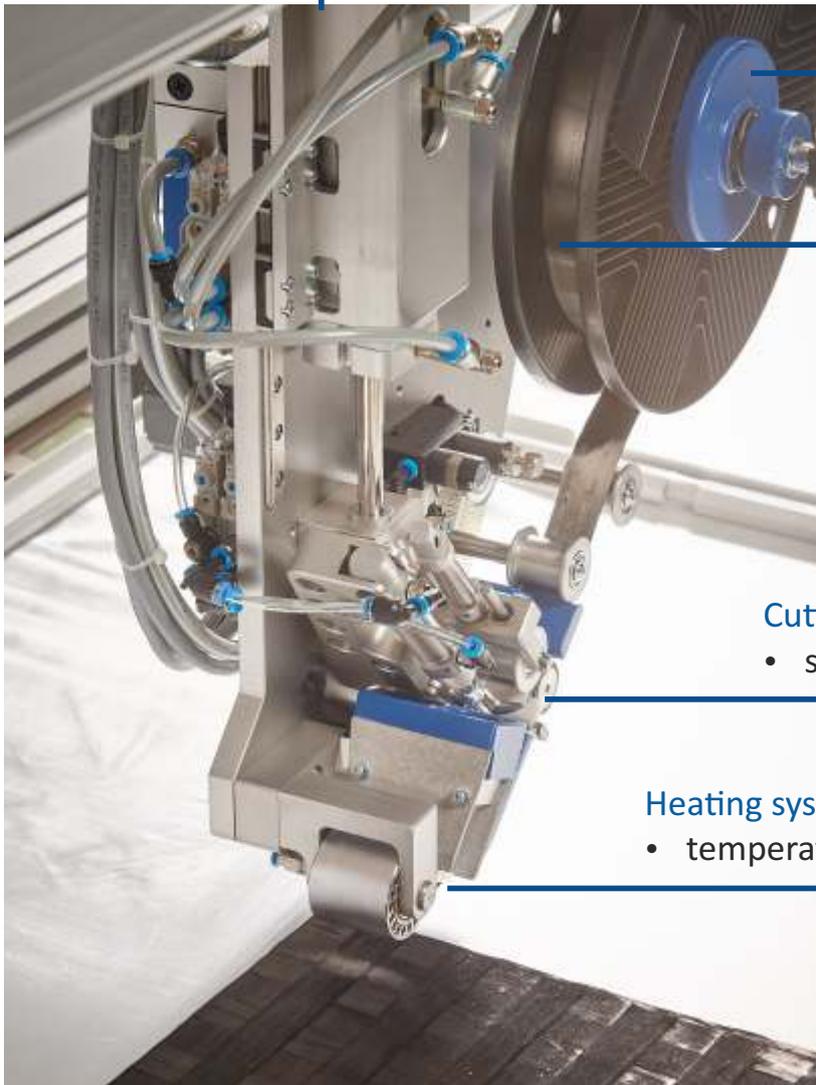
Simple programming and open system to control
your own attachments and following processes

Multi-head system possible, thereby significant
cost saving



Technical description

- 360° fast turning system



- Easy exchange of rolls

- 300 - 500 m of tape on roll

Cutter

- strong pneumatic cut

Heating system

- temperatures between 100° - 350°C

Technical specification

Crosslayer

Machine dimensions (L x D x H): Example expo machine:	2530 mm x 1670 mm x 1820 mm Depends on working area
Working Area Preform Laying Frame: (or according to customer needs)	1000 mm x 500 mm
Weight:	830 kg
Current voltage:	400 V , 3 Phase , 50 Hz (or according to customer needs)
V_{max} :	30 m/min (0,5 m/s)
$V_{average}$: Average Laying Speed for fixed Tow (24 K Roving):	1 kg/h , 10 m/min
Minimum Patch Length	130 mm
Spool size:	Ø 230 mm (450 m* fixed Tow on spool)
System control:	Linux-based G-Code
	Graphic programming tool for standard geometric patterns

*without release liner 24 K carbon fiber at 8 g/m²

Standard material for preform laying

Carbon fixed Tow

Materials:	Carbon fiber, Glass fiber, Kevlar *
Fiber width:	12 K - 50 K spreaded tow
Width:	15 mm - 25 mm
Areal weight:	min. 60 g/m ² - 150 g/m ²
Roving type:	variabel
Binder content:	ca. 8% by wt or 7 g/m ²
Binder type:	variabel

*Customer-specific fixedTow producible upon request

Skateboard example



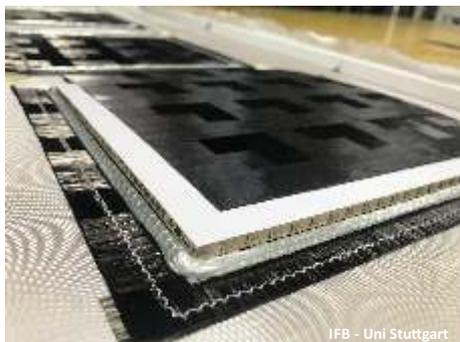
Skateboard



Fiber laying



Reinforcing



Preforming



Impregnation-
pressing

Design software

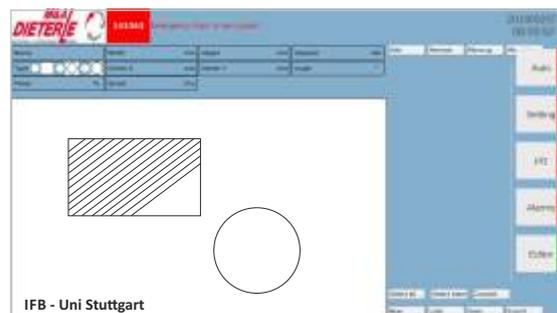


Macro editor

Several macros are available on the machine for simple preform geometries. Three geometric shapes (rectangle, diamond and circle) can be filled with paths. Adjustable parameters are:

- angle
- path distance
- position
- laying speed

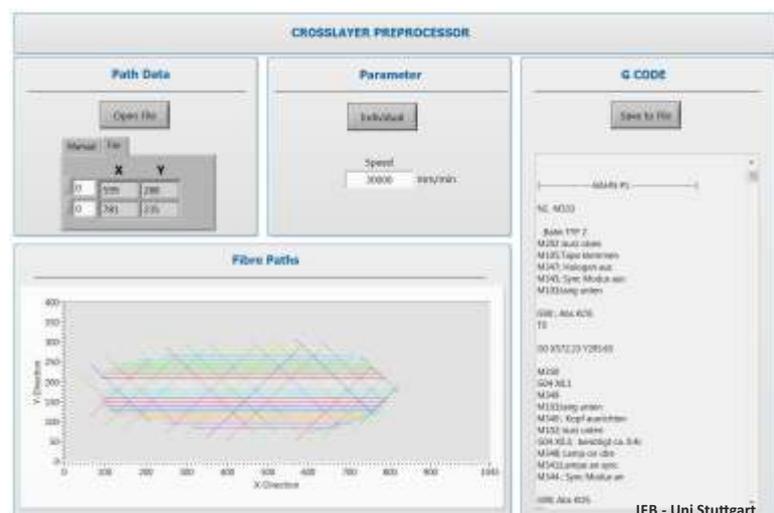
The individual shapes can be joined to one design as a layer and the machine can therefore be operated without additional software.



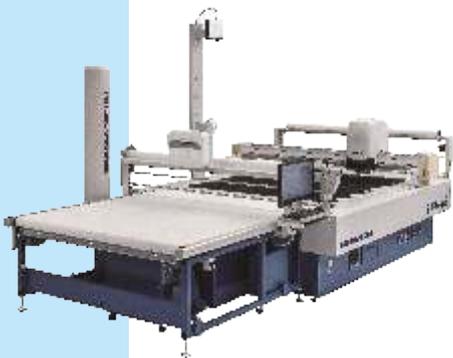
Preprocessing for complex preforms

For the production of more complex preforms, an easy-to-use preprocessor is available. It creates a G-Code machine program in the form of a text file by reading in start and end points. The start and end points of the paths can be exported from a 2D CAD into a .txt file or manually entered into a list. The preprocessor automatically converts these points into a machine program (G-code) and is then loaded into the machine via the USB interface.

The software was developed in cooperation with the Institute of Aircraft Design of the University of Stuttgart.



Process description



FixedTow production

- binder variation
- adjustable spreading size

Crosslayer

- fast and cost efficient

TFP-machine

- reinforcements
- thickness variation
- z-direction strength

Cutting

- precise
- fast
- effective
- camera detection

Injection

- different resins
- different systems

We present ourselves:

M&A Dieterle

Since 2015 we have developed compact and flexible machines for dry textile-based semi-finished products, such as fixedTows, spreadTows, tapes, multiaxial non-crimp fabrics and thin ply sheets:

fixedTow production line: spread and powder fixed roving = fixedTow

Crosslayer: fixedTow tape placement for preforms and multiaxial non-crimp thin ply sheets and fabrics

Modular R&D Machines: spread and impregnate fibers by dispersion, extrusion, powder, etc.

Fiber reinforced plastics (CFRP) is an emerging growth market. They are continuously integrated in more and more application areas:
Aircrafts, cars, sport equipment machines, construction and medical applications

FILACON systems by TAJIMA GmbH

Filacon Systems, located in Winterlingen in Southwest Germany is specialised in manufacturing and development of fiber laying and wire laying machines. Filacon is working in this special textile machinery field since 1995 and has sales offices in all major industrial countries all over the world.

Filacon is the exclusive, worldwide sales representative for the **CROSSLAYER** machine.

The main customers of Filacon Systems are companies out of aircraft and automotive industry, machine and medical engineering.



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