cevotec

SAMBA Series: Modular 3D fiber lay-up systems

Fiber Patch Placement is a very scalable and flexible technology. Based on three key modules for material feeding and cutting, placement, and mold manipulation, we customize SAMBA systems to your requirements.

SAMBA Pro modules

SAMBA Pro systems feature an automated material feeding and cutting unit combined with at least one placement robot and a tool manipulator. They are designed for a fully automated, quality-controlled series production of fiber laminates. The modules can be combined flexibly to create a production set-up optimized to your requirements.

Feeding & cutting units

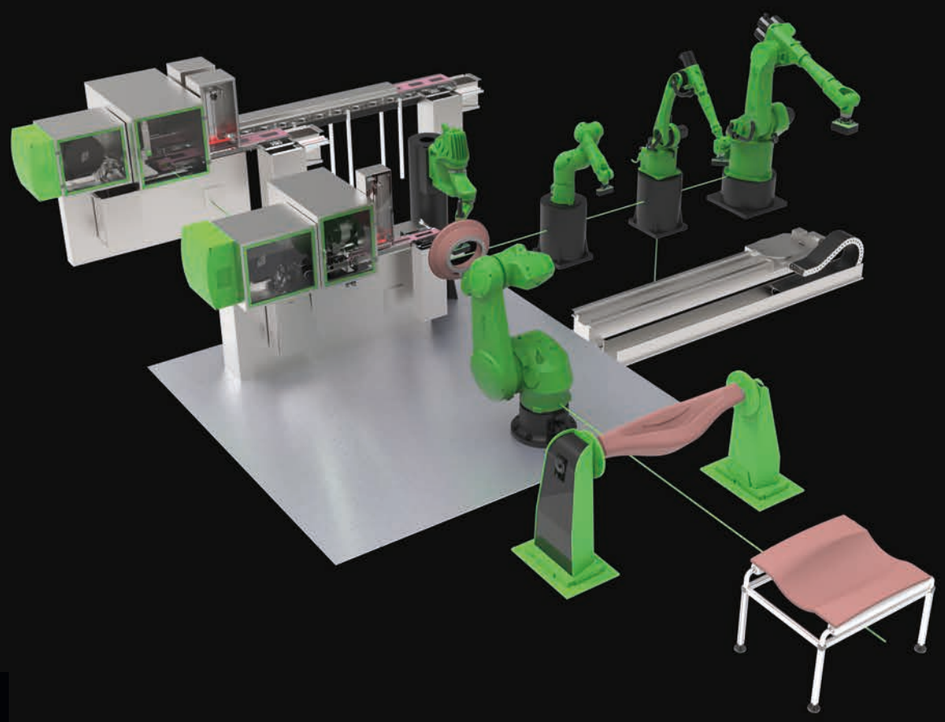
Modules for material feeding and cutting are compatible with a wide range of materials. They feature a single or double material feeder in a temperature-controlled housing. Tape width is customizable. Patches are cut from the fiber tape by ultrasonic knifes from GFM. A high-precision camera with dedicated image processing computer checks every patch for quality before further processing.

Placement units

Placement modules are individually designed to fit specific applications, along with customizable Cevotec patch grippers mounted to the placement robot. Standard robots are Stäubli and Kuka, additional brands on request. A linear axis for extended reach can be optionally chosen. A high-precision camera monitors the positioning of the patches and, if necessary, an in-process correction will be executed. The placement units also feature heating units for prepreg processing.

Tool holders and manipulators

Tool holders and manipulators are specific to each application and can be exchanged. Quick-mount tooling systems are available for flexible production set-ups in combination with e.g. 6-axis tool holder (perfect for batch production of smaller components).



Sample configuration for composite tanks

SAMBA Pro PV-1

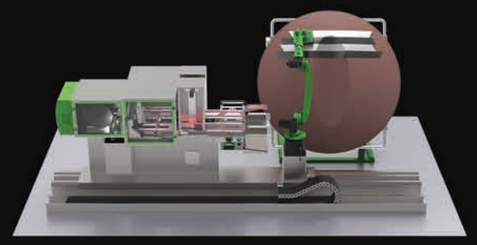
- 2x 6-axis placement robots for simultaneous patching of both tank domes
- Linear rail for length variation, adjustable to tank sizes of 1.5 m to 3 m length
- In-process raw material inspection and documentation
- Self-corrective positioning control, fully automated lay-up process
- GFM ultrasonic cutting unit, cooled material storage
- Comprehensive monitoring of process parameters

- System optimized for fast cycle time and high vessel throughput
- Compatible with a broad variety of carbon fiber and glass fiber materials
- Fully automated robot offline programming with digital twin in ARTIST STUDIO

Optimized for pressure vessel reinforcements

Sample configuration for aerospace

SAMBA Pro Multi



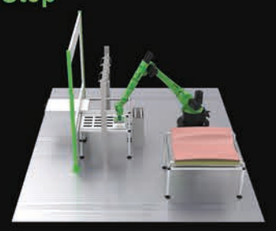
- Large 6-axis placement robot with long reach
- Additional linear rail for extended reach across large tools
- Component sizes of 3 m x 2 m or more
- Double feeding unit for processing different fiber tapes simultaneously
- Scaled patch grippers for patches up to 300 mm x 200 mm
- Force-torque sensor for controlled fiber placement e.g. on honeycomb cores
- Automated, in-process patch gripper exchange
- In-process raw material inspection and documentation
- Self-corrective positioning control, fully automated lay-up process
- GFM ultrasonic cutting unit, cooled material storage
- Advanced sensor package for comprehensive monitoring of process parameters

- System optimized for large, complex 2D / 3D component lay-up
- Compatible with a broad variety of carbon fiber and glass fiber materials, as well as adhesive prepreg, insulation layers, lightning strike protection materials
- Fully automated robot offline programming with digital twin in ARTIST STUDIO

Ideal for multi-material composite aerostructures

Sample configuration for research & development

SAMBA Step



- One 6-axis placement robot (size customizable)
- Maximum material flexibility by tray system to feed pre-cut patches
- In-process raw material inspection and documentation
- Self-corrective positioning control, fully automated lay-up process
- Overall degree of automation customized to requirements
- Advanced sensor package to analyze placement operations available

- System optimized for application development, prototyping, material testing, R&D activities for the development process
- Fully automated robot offline programming with digital twin in ARTIST STUDIO

Ideal for application development, prototyping, R&D