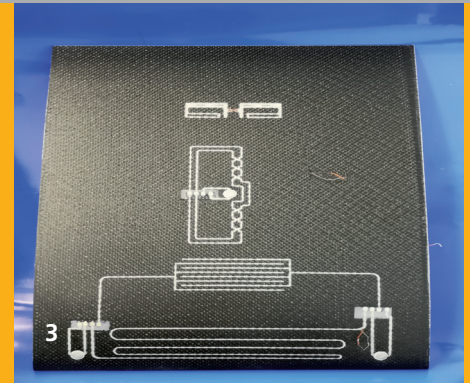
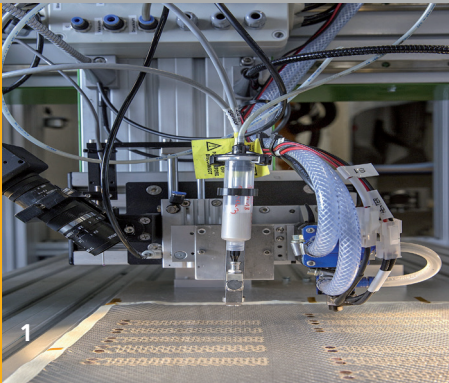




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- 1 Functionalized glass textile using dispensing technology for use in fiber reinforced composites.
- 2 Automated functionalization of large sized fiber reinforced composites.
- 3 Wing profile with integrated heaters, impact-sensors, capacitive ice detection, UHF antenna and LEDs (Project: Go Beyond 4.0).

FUNCTIONALLY INTEGRATED FIBER COMPOSITE MATERIALS

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The special properties of fiber composite materials/fiber reinforced plastics (FRP) make the integration of sensors on or in the component attractive prospect, but the integrity of the fiber composite structure must not be compromised. By using printing processes and suitable printable materials, custom-printed electronics, contacts, and sensor structures can be applied directly to the non-woven mats or meshes that are used as impregnable textile layers in the fiber composite manufacturing process. The chief advantages of this approach are:

- It has a minimal influence on the mechanical properties of the composite materials
- An individualized layout and production of sensor structures becomes possible
- It enables the ideal placement of sensors on or in the component
- It can be integrated into the manufacturing process for the composite material, avoiding the need for manual steps

Applications

Functionally integrated lightweight components made of fiber composite materials can be used in aircraft and satellite construction, automotive applications, and wind turbines. Depending on the application, the following functionalization options are possible:

- Heating structures
- Cracking, strain, temperature, or moisture sensors
- Antennas and circuits
- Contacts, integration of SMD components and connection to energy sources or data transfer

Portfolio

The Fraunhofer IFAM provides R&D services on the topics of functional integration in and on FRP in the context of consultations and feasibility studies up to the stage of pilot production.