Locally optimized temperature control, ice removal, or heating of components and surfaces play a critical role in many applications, such as in the aerospace, automotive, and medical technology fields. Resistive heating elements or film heaters can often be difficult to integrate into a component or onto a 3D surface, requiring additional manual-process steps.

Advantages

- Individual layout and production of heating structures (suitable for individual or mass production, depending on the printing process)
- Optimal placement of heating structures on or in the component
- Direct contact between the heating structure and the 3D surface of the component, for optimal heat transfer (without glue layers or air bubbles)
- Integration in the manufacturing process of the part, avoiding the need for manual steps, while simultaneously replacing cables and plug connectors with printed feed lines

Portfolio

Fraunhofer IFAM offers the following R&D services, throughout the process, from the consultation stage, through feasibility studies, to pilot production and knowledge transfer:

- Selection of printable materials and use of suitable printer technologies and adapted pre-treatment and post-treatment processes
- Determination of power output and heating behavior of the materials using thermography
- Characterization of the reliability and long-term behavior of the materials