Temperature monitoring is an important aspect of many industrial applications. At Fraunhofer IFAM all common types of thermocouple pairs (e.g. type T: Cu-CuNi or type K: NiCr-Ni) can be applied to components or substrates using functional printing methods. The achievable level of accuracy is within the tolerance range specified in EN 60584.

Advantages

- Individual layout of the thermocouple structures (redundant structures, sensor networks)
- Structure widths of less than 100 µm are possible
- Direct contact between thermocouple structures and the substrate surface for optimal thermal coupling (monitoring of components, battery cell monitoring)
- Integration into the manufacturing process of the component, avoiding the need for manual steps and possible replacement of cables and plug connectors with printed feed circuits

Portfolio

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

- Selection of printable materials and use of suitable printing technologies, as well as adapted pre-treatment and post-treatment processes
- Determining of the thermoelectric performance of the thermocouples
- Characterization of reliability and long-term behavior