

ENAMEL - Encapsulating Materials and Processes for E-Textiles

International Collective Research Project - 35. CORNET call



Project partners: Fraunhofer IZM Berlin
Hochschule Niederrhein / University of Applied Sciences Krefeld
University of West Bohemia Pilsen
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Project Coordinating Association: Forschungskuratorium Textil e. V. - FKT (DE)

Participating Association: Clutex – cluster technical textiles (CZ)

Solution term: 01/2024 - 12/2025

Project focus

ENAMEL project aims at the research and development of encapsulation technologies for electronic system integrated into textiles with a focus on long-term reliability, durability, industrial production options and standardisation.

New materials and processes will be applicable in the emerging market sector of smart and electronic textiles (e-textiles).

Specific goals

The development of technologies for encapsulation of hybrid threads with the thermoplastic materials and their implementation into the conductive textile ribbons as well as (selective) covering of embroidered, woven or knitted conductive tracks in textiles incl. subsequent integration and encapsulation of electronic elements.

The project supposes the development technology for custom-made 3D printed thermoplastic housings with precisely defined cavities for electronic components or modules.

Suitable and improved electrically conductive threads, textiles for integration of conductive tracks electronic components suitable for integration into textile materials as well as materials for encapsulation will be developed within the individual work packages. These materials will be tested and subsequently optimised for their applicability in smart and e-textiles.

Planned outputs:

1. Highly conductive hybrid yarns/threads based on metallic microwires individually insulated with thermoplastic polymer - functional sample
2. Fully encapsulated flexible conductive ribbon with integrated electronic components or modules - functional sample.