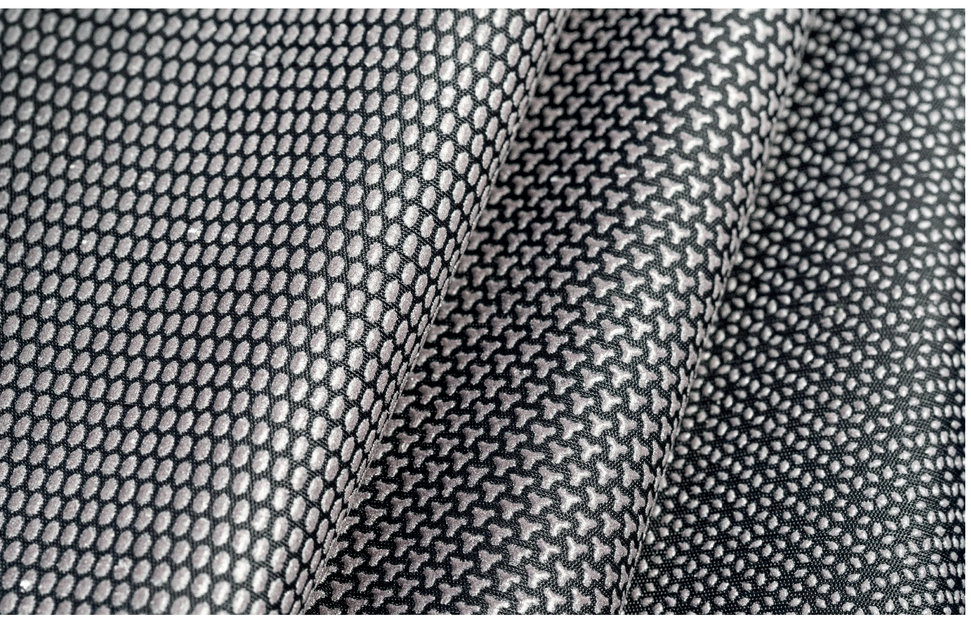
Sächsisches Textilforschungsinstitut e.V.

Development of an eco-friendly, flame-retardant, abrasion-resistant, and segmented protective coating for use in firefighter clothing

OBJECTIVE

The project SeFiPro focused on the development of a sustainable, eco-friendly, flame-retardant, abrasion-resistant, and segmented protective coating. Firefighter clothing was identified as a primary area of application. However, applications in personal and occupational safety are also interesting. The goal of this development was to improve the durability and comfort of protective clothing.



Examples of segmented coatings using rotary screen printing



Integration into protective suit



Integration into firefighter clothing

APPROACH AND RESULTS

The project partner, Theodolf Fritsche GmbH, was responsible for developing the textile substrate materials. A fabric made of a Kevlar stretch-broken fibre material was selected, which was treated with a hydrophilic pretreatment to ensure good adhesion of the segmented protective coatings.
The STFI's primary task was to develop the coating materials and subsequently test the resulting functionalities. A formulation was selected that included a biopolymer-based binder system, additives for high strength, and mineral flame retardants. Functional samples were produced on the Kevlar fabric using this coating formulation. These samples demonstrated high abrasion resistance in accordance with DIN EN 388 as well as very good flame-retardant protection (DIN EN ISO 15025).
The project partner, Mayer GmbH TechConcepts, was responsible for developing the industrial application process for the efficient coating of the textile substrates. The focus was on rotary screen printing as a continuous roll-to-roll process for producing three-dimensional segmented coatings. This led to the production of functional samples, which were integrated into firefighter clothing and a protective suit for demonstration purposes.

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