Fraunhofer EMFT

SensPflast

Patch with integrated Sensors for diabetes patients

Flexible sensor patch for integration into textiles. ©Fraunhofer EMFT/Bernd Müller

Applications

Diabetes is one of the most prevalent diseases of civilization. Around 15-25% of patients develop diabetic foot syndrome during the progression of the disease: nerve damage and circulatory disorders, particularly in the feet. As those affected have a reduced or no sensation of pain in their feet, pressure points, blisters or cuts often form unnoticed, which can result in an open ulcer if not treated in time. In future, a patch with integrated sensor technology should help to detect critical conditions and the need for treatment at an early stage.

Technical innovation

In the SensPflast project, researchers at Fraunhofer EMFT are working together with the Fraunhofer Institutes ISC and IIS on a diagnostic and therapeutic patch based on flexible film substrates with integrated sensor technology. The sensor modules should be able to detect various medically relevant parameters at the same time and can be integrated into dressings, stockings, bandages or seat cushions - individually tailored to the person being treated. The partners are pooling their expertise in the fields of sensor technology, packaging, electronics and communication for medical care.

The Fraunhofer EMFT research team is responsible for integrating the flexible sensor modules with the carrier textile, such as a stocking. Reliable contact between electrically conductive structures (e.g. threads) in the textile and the sensor modules is particularly important here. The sensor modules must also be embedded as softly as possible to make them as comfortable as possible to wear.

As a technology demonstrator, a sensor patch is being developed for diagnostic and therapy-supporting purposes for diabetic foot syndrome. The smart patch enables continuous, digital and networked therapy monitoring of pathological pressure and temperature conditions. Based on this information, treatment needs can be identified at an early stage and the necessary medical measures optimized, thus reducing serious secondary complications and, as a result, the corresponding follow-up treatment costs.

Flexible sensor patch for integration into textiles.
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Outlook

A comparable solution does not yet exist on the market, yet the application and utilization potential is huge. In order to pave the way for a rapid market transfer, small and medium-sized companies active in the field of medical technology are to be given access to a technology portfolio that allows the realization of tailor-made multi-sensor patches.

Funding

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