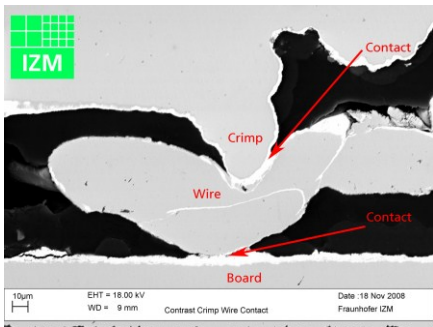


+++++++ Textile Wire-to-Board Technology ++++++

**INSITEX project:
Active Passenger Security
through Technical Textiles**



Crimped textile-integrated insulated wire



Cross section polishes of contact in SEM

**Fraunhofer-Institut für Zuverlässigkeit und
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Insitex is a three-year research project which has started in March 2007. It is funded by the Federal German Ministry of Education & Research and coordinated by VDI/VDE-IT. The projects members are Daimler AG, FZI Karlsruhe, W. Zimmermann GmbH, Fritz Moll Textil KG, I.G. Bauerhin and Fraunhofer IZM.

Background

In Insitex the application of intelligent technical textiles in automobile for the increase of active passenger safety has been investigated. In this context innovative applications for the prevention of accidents has been realized by the integration of textile sensor elements into components of the automotive (seat, steering wheel, ceiling etc.). Especially applications for the recognition of the driver's condition, vigilance measurement and the recognition of the seat occupation have being considered.

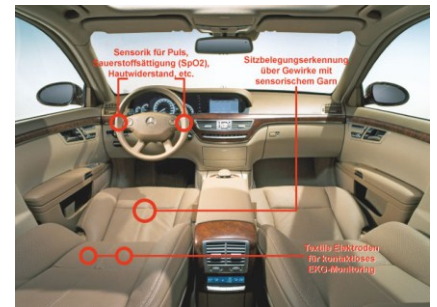
The project focuses of Fraunhofer IZM was the development of a solderless technology for the interconnection of textile-integrated insulated wires with electronic systems, as well as their qualification of the expected norms within the automotive industry and technology transfer to the industry.

Results

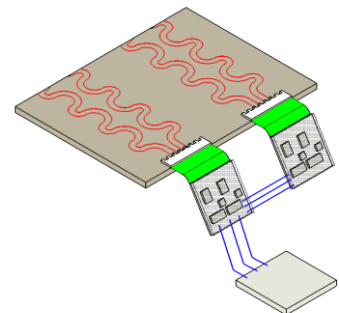
Based on well-established crimp technologies a modified method for electronic in textiles applications has been developed and tested. In this crimp process a thin metal ribbon with a jagged structure in the area of contact is used as interconnection material for a special designed thin and insulated litz wire which is woven into textiles.

In the process, the structured ribbon is crimped around the textile wire and a contact pad which is part of the printed circuit board. During the crimp process, the ribbon structure is used to penetrate the polyurethane insulation of the conductor. Thus, the partially stripped textile wire is clamped between crimp and contact pad and so electrically and mechanically connected.

In the framework of Insitex crimp design rules and process parameters for a novel insulated conductive wire have been found. Furthermore, climatically reliability tests as well as wash tests have shown very good results for the interconnection.



INSITEX concept overview



Concept for textile seat occupation sensor realized by crimp interconnection