Sächsisches Textilforschungsinstitut e.V.

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VaDiTEST – Test device for combined testing of stitch- and cut resistance

Objective

So-called "tarpaulin slashing" causes high economic damage in connection with the theft of cargo goods from lorries in private and business environments. As a result, the interest in innovative protective textiles against vandalism and theft (e.g. backpacks, transport bags for cargo bikes) is increasing. The basis for the development of such technical solutions with a high protective effect is suitable testing and test methods for evaluating the degree of protection. For textiles used for protection against burglary and theft, there has been no test method for a combined assessment of the stitch and cut protection effect until now.

Approach and results

The focus of the development of such a test method was to carry out the test of stitch- and cut resistance in a combined test sequence and to carry out a quantitative measurement of the acting puncture and cut forces. In order to understand the motion sequence in such a destruction scenario and, if necessary, to be able to simplify it for transfer to a mechanical test procedure, the motion sequence was examined at the beginning of the project within the framework of an experiment on several test persons. In order to develop a suitable clamping system, solutions for fixing textiles that have been established on the market were tested and evaluated.

Close-up of the test blade being pierced

Through the design of a test fixture and the development of a suitable measurement and control technology, it was possible to develop an innovative test stand that has the following advantageous features for the stitch and cut test process:

- Stitching and cutting take place in direct succession of movements, so that a resilient evaluation of textile surfaces for use as protective textiles is possible.
- The clamping frame of the test stand is designed to be transportable to ensure easy and quick sample preparation.
- The size of the clamping frame allows a cutting length of up to 180 mm.
- The clamping force of the clamping frame is large enough to test different textiles with different surfaces and thicknesses up to 30 mm.
- The test run is closed and automated so that no intervention by the test technician is necessary.

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