

## TEKSTILNOZARES ATTĪSTĪBAS INOVATĪVI RISINĀJUMI

### INNOVATIVE SOLUTIONS IN TEXTILE DEVELOPMENT

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Currently the "traditional" textiles are mainly produced in Asian countries. Therefore during the last ten years in Europe the traditional textile industry has changed its strategy to support the innovation and the creation of new products and their functionalities. Smart textiles provide ample opportunities that may be realized in the textile industry, in the fashion and clothing sector, as well as in the technical textiles sector. These developments are a result of active collaboration between the varieties of disciplines: engineering, different areas of science, for example, chemistry or IT, design, business or marketing.

The aim of this research is to explore the potentialities of textile industry in Latvia to focus on new manufacturing sectors and untraditional inventions. With practical examples illustrated problem areas are theoretically analyzed considering into account the existing scientific studies of textile innovations and the experience in Europe.

Consequently, in Latvia the companies in sector of textile should also think about their products that could be able to compete in the free market. Contrary to the European concept based on the development of innovations and non-traditional textile, Latvian textile industry priorities include production of natural fibre and their processing, but innovations are neglected.

The application area of smart clothing is very various, for example:

- Health/comfort - clothing that cares about the well-being of people and protects their health;
- Protection/security - clothing that enhances the person safety and protection;
- Information/communication - clothing, which is able to "communicate" or helps to inform;
- Fashion/sports - clothing that visually makes more interesting the fashion design or everyday entertainment;
- Business, collaboration - clothing that makes the working environment more comfortable.

The integration of Light emitting diodes in the textile products allows assign additional functions, such as the visibility on the street, or may serve as a fashion design. There are also offered some practical textile solutions with integrated electrical systems and LEDs. The main economic indicators referable to the smart textile with integrated electronics production include: work costs (additional specific operations) and material consumption,

where the additional costs create the electronic components. Material costs are mainly related to the material of conductive elements, for example, silver coated polyamide yarns cost many times more than the stainless steel multifilament yarns of the same electrical conductivity, as well as costs vary, depending on the quality and suitability for integration in the textile.

The most problematic and still completely unexplored field of smart textiles is ecological problem area both in the process of wear, such as the negative impact of electromagnetic field radiation or waste water pollution, and recycling of products after the wear.

Overall, the results of the research allow conclude that production of technical and smart textiles could enlarge the range of consumers and widen the possible textile application areas. However, additional costs of new kind of textile machinery, specific technologies, special materials and components, as well as potential ecological problems should be also taken into account. Smart textiles are still at the process of research; their production and commercialization is not widely represented. It enables also the textile manufacturers in Latvia to offer innovative solutions with added value on the market.