Insulation of Flexible Light Emitting Display for Smart Clothing

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The concept of communication apparel may be perceived as the result of a convergence of two industries: textiles and electronics. Flexible light emitting textile can be used as output interface integrated into communication clothing by representing different animated images directly on clothing. Since smart clothing/textiles are still under development, many problems have occurred due to the absence of the standardization of technology. It is important to make safe textile light emitting display, so besides functionality of the system it is significant to design safe electronic system. The aim in intelligent textile improvement is to embed electronics directly into textile substrates. A challenging topic for electrotextile development is to get well functional and safe electrotextile with unchanged visibly. Insulation of textile-based circuits is relevant part of system what provides safety of the circuit – protects system from short circuits, elements from corrosion and mechanical and physical impact of external environment and smart clothing wearer from the system as well. During research insulation of textile-based circuit have been performed using three different liquid silicon resins and one polyurethane film. For test samples textile circuits with sewn and interwoven copper yarns and attached light emitted diodes (LED) have been prepared. Electrical properties of electronic elements have been tested by measuring intensity of LEDs emitted light before and after insulation as well as electrical resistance of 3 different conductive yarns. Geometrical (weight and thickness) and physical-mechanical (washability and resistance to wear) properties of samples have been measured as well. Given techniques can be applied to other parts of the electronic elements system insulation into smart clothing or smart textiles and could help develop and improve smart clothing technology in general.

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