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P79. Preliminary Study on Smart Humidity Sensor Development

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Determination of relative and absolute humidity is essential for industrious, in-home, healthcare and a number of other applications. Although there is a large variety of commercial sensors and advanced R&D developments, some specific applications might require solutions that are flexible, cover large-areas, relatively low-cost, simple in production and reliable. Some innovative solutions may be brought by smart textiles that are the field of a great potential for areas facing challenging requirements and combine different disciplines and technologies. Smart textiles have already convinced of their potentials for sensor development and opportunity of bringing improvements to different aspects in construction, operation, physical or other properties [1-3].

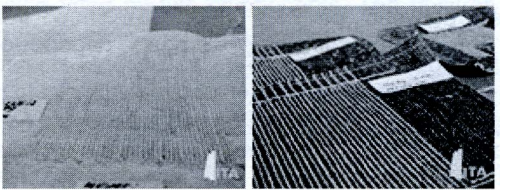

Fig. 1. Designs of embroidered humidity sensors

This report presents a preliminary study on the concept of a textile humidity sensor, its design and development issues cohered with particularities of further applications. Several designs of the sensor have been implemented by embroidery on a textile substrate using conductive yarns. In order to achieve efficient operation of the sensor with available materials and technologies, investigations on the choice of the appropriate design of the prototype including the specific pattern for the embroidered capacitor, yarns and substrate materials, have been performed and solutions for improving the initial prototype of the sensor are suggested.

Keywords: *textile humidity sensor, embroidered capacitor, smart textiles.*

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