

Strain sensitivity in conducting textiles

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Abstract:

The variation of resistance of conductive textiles under strain/relaxation was measured to evaluate the possibility of use as sensors.

Experimental:

The textiles sample (61% PA, 25%CO, 12%EA) tested were coated by PEDOT-PSS. For the strain sensing study, the electrodes were placed at a distance of 10mm apart. The external mechanical strain was applied by Instron 4501 equipment and the corresponding resistance was measured on a digital multimeter Fluke 45. The measurement was carried out in 3 repeated strain/relax cycles.

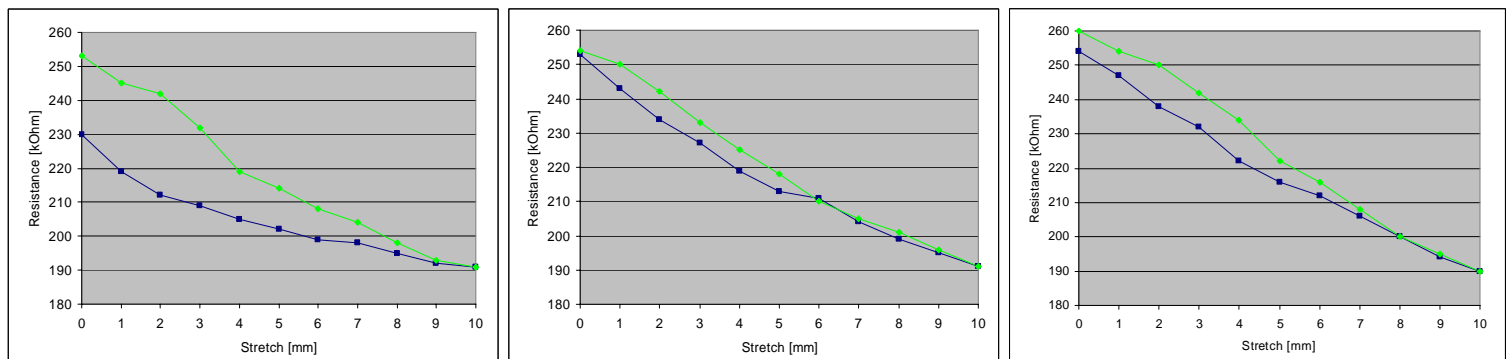


Fig.1- Three runs - Resistance of textiles vs percentage stretch: (blue) stretch;(green) recovery.

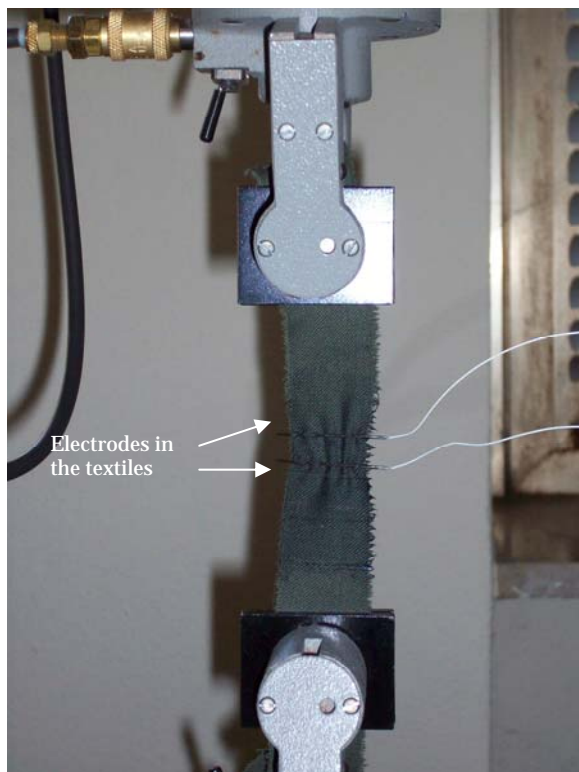


Fig.2. Details of textile sample applied to Instron 4501 equipment.



Fig.3 Measurement set up in conditions of constants temperature and humidity.

Conclusions:

The use of these sensors appears promising due to the relationship between strain and resistance, in addition only slight hysteresis was noticed. These results reveal a promising potential for use in the field of smart textiles in deformation measurements.