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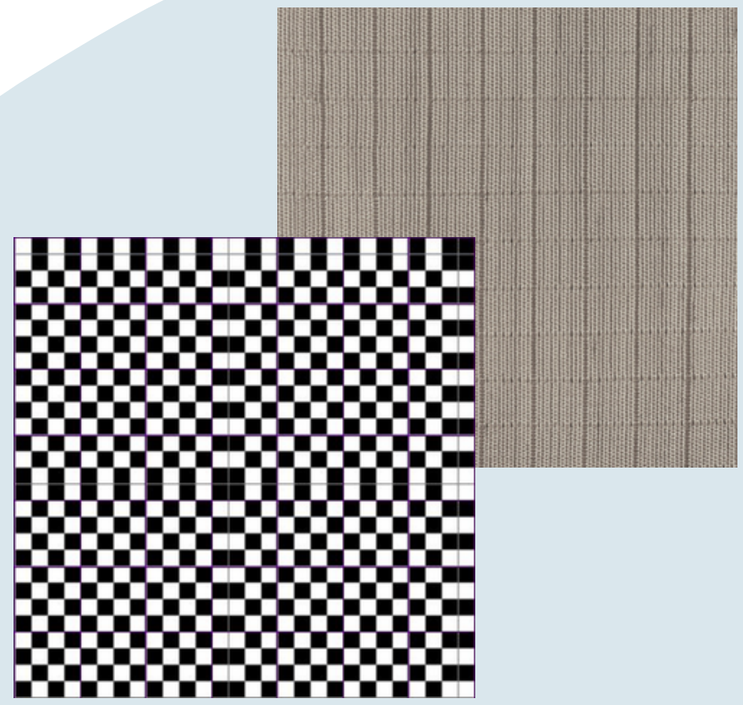
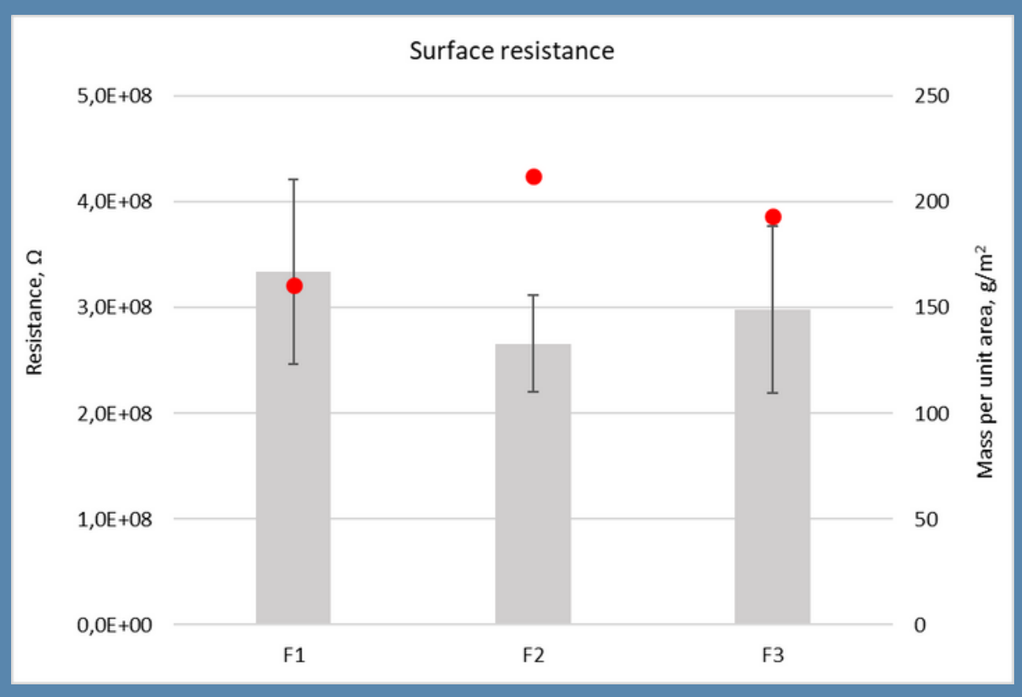
INFLUENCE OF YARN FINENESS ON FABRIC CONDUCTIVITY



1

The application of conductive fabrics is extremely wide and applies primarily to areas such as protective textiles, smart textiles, e-textiles, textile for medical applications, etc. The influence of conductive spun yarn, made from carbon and aramid fibres blend, on fabrics conductivity was investigated.

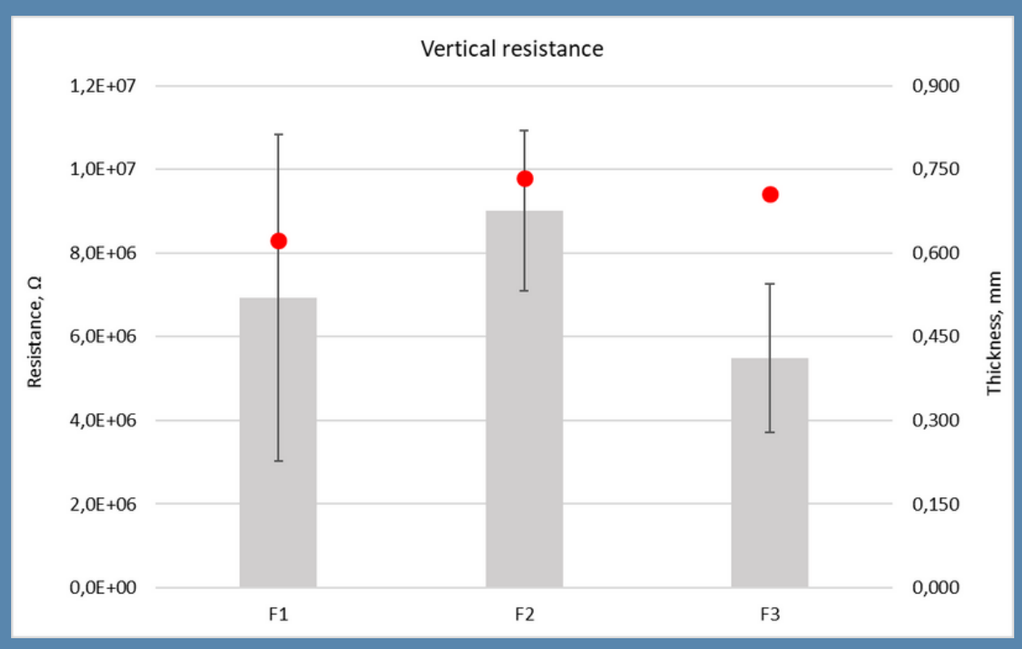


2

For the purpose of this research, three fabric samples were woven, intended for protection against static electricity. For all samples the same type of yarn was used for warp - aramid yarn of nominal fineness Nm 70/2, while weft yarn, composed of a blend of aramid and carbon fibres, differed in fineness and structure (single ply yarn of nominal fineness Nm 50/1 and 2-ply yarns of nominal fineness Nm 50/2 and Nm 60/2). Fabric samples were woven in a ripstop weave, with the same warp (36 threads/cm) and weft (19 threads/cm) density.

3

The relevant properties of the yarns were investigated, as well as the properties of the woven fabrics, which fully contribute to the fabrics conductivity properties. This was confirmed by testing the surface and vertical electrostatic resistance of the fabric, i.e. conductivity.



From the obtained results, the differences between surface and vertical conductivity, which are influenced by individual fabric parameters, conditioned by the fineness of the yarn, are clearly visible. The coarsest yarn results in the highest mass per unit area of the fabric and thus the highest share of conductive carbon fibres per fabric weight, which directly affects the highest electrostatic conductivity properties through the material. On the other hand, weaving with finer twisted yarn (less unevenness compared to the single yarn) results in lower fabric thickness, which reduces the path of resistance, and thus provides the better conductivity of the fabric, i.e. protection from the electric shock.

4

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