RESEARCH THE CHANGE IN THE THICKNESS OF TWO LAYERS OF COTTON FABRIC, IN RELATION TO THE PRESSURE ON THEM

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The present study is a continuation of the author's previous scientific publications, developed both independently and as a team. The purpose of the study is to establish the type of graphic dependence - change in the thickness of two layers of one cotton fabric in the warp-warp direction from the facing side about the pressure - at 200 g, 300 g, and 400 g. Apart from that, the aim is to use the Trend line function through graphic forecasting in Excel to establish the trend of the graphic dependence - change in the thickness of two layers of fabric in the direction base-base and front side and at pressure values that were not used in the experiment – less than 200 g and more than 400 g.

Measurements were made with a Textil-Dikenmesser J-40-T digital indicator. The thickness of one layer of fabric and the thickness of two layers of fabric in the warp direction from the facing side of one layer of the fabric on the warp facing side for the other fabric layer are measured. The contact area of the pressure disc of the digital calliper is 20 cm2, the mass of the digital watch with the pressure disc is 0.200 kg. Measurements were made at normal pressures of 200 g (own mass of the pressure disc), 300 g (+100 g) and 400 g (+200 g). By placing additional weights of 100 g, the pressure changes.

The experimental study was carried out with cotton fabrics 100% cotton, with different weave, basis weight, etc. differences. The fabrics are produced in Strumatex factory - Blagoevgrad, Bulgaria.

As a result of the experiment, it is established:

When analysing the graphic dependencies, it is found that a logarithmic function - close to the linear one - perfectly describes the dependency - a change in the thickness of two layers of fabric in the base-base direction from the front side, in relation to the pressure.

The graphic dependence of the thickness of two layers of fabric in the warp-warp direction from the front side for cotton fabrics is logarithmic, and as the pressure increases, the thickness of the two layers of fabric decreases.

It is found that at pressures of about 25 g to 50 g, the graph is steep, with the beginning of the steep section corresponding to a thickness equal to the algebraic sum of the thicknesses of two tissue layers measured individually at 200 g pressure (from the mass of calliper pressure disc).

All graphs are at high confidence coefficient $R^2 > 0.99$. The values of the confidence coefficient R^2, which can be seen below the graphical equations in graphs, characterize the convergence as excellent and ideal quality, with a confidence norm above 0.85.

For fabrics with a 3/1 twill weave, the dependence of the thickness of two layers of the fabric in the warp-warp direction from to the face about pressure can be approximated by the following equation
$y = 0.2 \ln(x) + 2$.

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