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INDICATORS OF THE FABRIC STRUCTURE THAT AFFECT THE PROPERTIES OF THE FABRIC

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Abstract

Based on the high-quality production of complex terry fabrics, of course, it is necessary to study the process from raw materials to the finished product and to determine the parameters that affect it. To do this, the effect of geometric and physical-mechanical properties of complex terry fabrics on their performance in the technological process was studied. The hygroscopicity, air and vapour permeability, electrification, optical and thermal storage properties of materials used in the group of geometric, and physical properties of the fabric, as well as the tensile strength, elongation and deformation properties of the mechanical properties, are determined and their effect on the weaving process studied.

Keywords: Terry woven. Warp yarn. Weft yarn. Ground yarn. Terry warping. Surface density. air permeability. breaking force. Deformation. Elongation.

Introduction

In the production of high-quality textile products, towels have an important place in our country, and there are certain experiences and scientific works on creating ready-made products with the necessary properties [1-4]. Nevertheless, taking into account the available raw materials in the production of towels, in the process of forming a ready-made quality product, its mechanical properties cause a change in the surface gloss of the products and a decrease in their price. It is one of the main tasks to obtain high-quality products using these features of towel products to meet the demands of the current consumer.

We know that towels come in different sizes and uses. Each towel item is washed several times and its mechanical properties change.

For this purpose, the mechanical properties of towel fabrics woven from yarns of different linear densities and different spinning methods were studied.

The mechanical properties of textile materials, which affect the properties of the fabric, indicate their response to the influence of various forces. These forces can be large or small and can act once or repeatedly. Forces can act in the direction of the length and width of textile fabrics or at a certain angle relative to them. As a result, bending, stretching, twisting and other deformations appear in the gas. According to the classification of Professor G.K. Kukin, the mechanical properties of gases are divided into three classes - half-cycle, single-cycle and multi-cycle properties. "One period" means that gases are under the influence of force (loading), released from the influence of force (release) and rest (rest) [5-9].

The properties of textile samples produced at the "ARTSOFT HOLDING" LLC enterprise in Namangan city were determined. 4 different tissue samples were taken. Tissue samples J-9500 were woven on the loom of the ITEMA company (Italy).

The following numbers of yarns were used in the woven fabric samples and the spinning method used:

1st sample, ground thread -34/2 Nm, tuft thread -27/1 Nm, hem thread -27/1 Nm, woven from yarn spun on spinning machines;

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Sample 2 ground thread -34/2 Nm, tuft thread 27/1 Nm, hem thread 27/1 Nm, woven from thread spun on pneumatic spinning machines;
Sample 3 ground yarn - 34/2 Nm, woolly tanda yarn 40/2 Nm, jute yarn 27/1 Nm, woven from yarn spun on folk spinning machines;
The 4th sample is woven from yarn spun on pneumomechanical spinning machines.
All mechanical properties of all woven samples were conducted based on GOST-11027-2014. All experiments were carried out in the modern laboratory of weaving and textile fabric testing established under the Namangan MTI [10-17]. These properties are used to indicate the absolute mechanical capability and quality of gases. To determine them, rectangular samples of 50 mm width and 200 mm length, i.e. 50x200 mm, are prepared. For textile fabrics, it is determined separately in transverse and longitudinal directions. Tests are conducted on the PT-250M cutting machine. [16-21]
The obtained values were processed and their average values, dispersion and coefficients of variation were calculated and presented in Table 1.

Table 1. Absolute mechanical capacity and quality indicators of gases

Fabric properties	Example 1 Increase. 34/2 Nm in body 27/1 Nm in Tuk Tan (folk spinning)			Example 2 Increase. 34/2 Nm in body 27/1 Nm in Tuk Tan (pneumomechanical spinning)		
	Average value	dispersion	coefficient of variation	Average value	dispersion	coefficient of variation
Fabric surface density (M2)	327.4	0.74027	0.226355	413.2	0.5787918	0.140075471
Fabric thickness (mm)	0.367	0.52345	1.5653	0.166	0.000791	0.476247
Fabric properties	**Example 3 Increase. 34/2 Nm in body 40/2 Nm in Tuk Tan (folk spinning)**			**Example 4 Increase. 34/2 Nm in body 40/2 Nm in Tuk Tan (pneumomechanical spinning)**		
	Average value	dispersion	coefficient of variation	Average value	dispersion	coefficient of variation
Fabric surface density (M2)	442.2	0.01349	0.01284	350	0.13594	0.26485
Fabric thickness (mm)	0.508	0.10315	0.072316	0.244	0.1024	0.16421

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The fabric density (geometric) property indicators of the obtained tissue samples were processed and presented in the form of a diagram in Fig. 1.

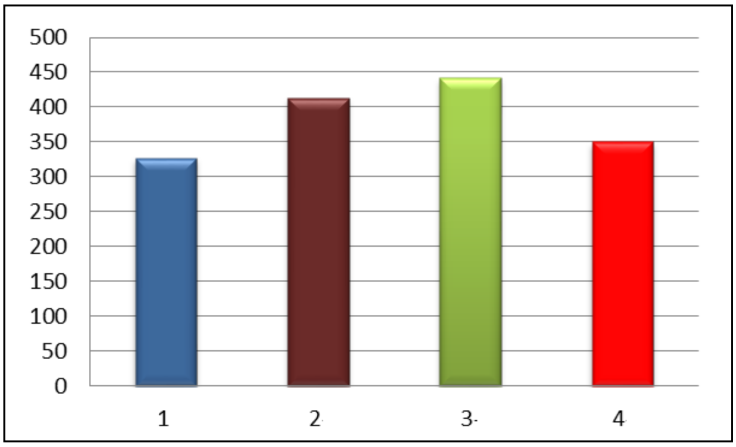

Figure 1. The surface density of the fabric

As can be seen from Figure 1, the surface density of the obtained hair tissue samples is the highest in sample 3, 442.2, and in sample 1, the lowest is 327.4, the reason for this is that sample 3 is the ground yarn Nm = 34/2 and the hair yarn is Nm = 40/2. The 1st sample is obtained by the method of ring spinning in the warp yarn Nm = 34/2 in the pile yarn Nm = 27/1 in the pile yarn Nm = 27/1 for the one-layer section. In the 1st sample, the surface density is low, and in the remaining 3-4 samples, the average results are close to each other [19-22].

Fabric thickness (geometric) property indicators of the obtained fabric samples were processed and presented in the form of the Figure 2 diagram.

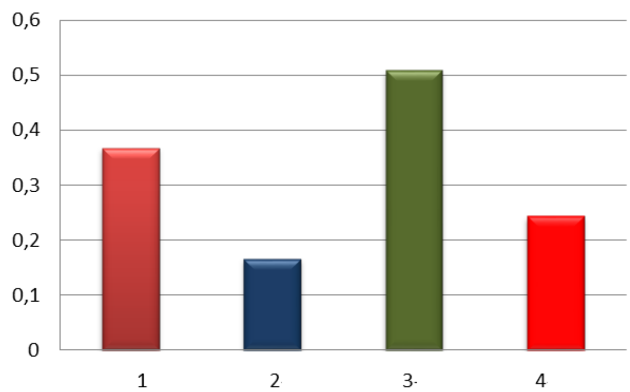

Figure 2. Fabric thickness

As can be seen in Figure 2, the thickness of the obtained fabric samples is high in sample 3, that is, the ground and pile yarns in the sample are double-layered, woven from yarns obtained by the round spinning method, and the surface density is high, because of this, the thickness of the sample is also increased, and it is low in sample 2. The thickness of the 2nd sample turned out to be lower because the ground fabric is two-layered and the tufted fabric is single-layered from threads spun by the pneumomechanical method. The thickness of the remaining 3-4 samples turned out to be medium.

Conclusion

When we analyzed the tensile strength of the hair tissue samples obtained by the warp threads, samples 3-4 have a high value of 267-265 (N), which is the reason for the use of high-thickness warp threads in these samples.

Similarly, in the analysis of the results of the shear strength of the pile fabric samples, it can be seen that sample 4 has a value of 261 (N), which is higher than the other values. It can be concluded that the surface density of the fabric is different compared to the rest of the samples.

In our experiment, it was observed that the coarseness of the yarn in the fourth tissue sample and the fact that this yarn was spun from pneumatic spinning machines affected its mechanical properties.

So, it was determined that there is an effect on the mechanical properties of towel fabrics woven from yarns of different linear densities and different spinning methods.

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