Physical and Mechanical Analysis of Two Layers of Cotton Silk in Knitted Tissues

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Abstract: In the work under study, the influence of indicators of the numerical values of the linear densities of cotton and silk yarn and the percentage in the structure of cotton, silk, two-layer knitwear for physical and mechanical properties.

Keywords: camshaft part, elastic deformation, plastic deformation, varies from, double-layered, relaxation.

ВВДЕНИЕ

In addition to the raw material consumption indicator for the knitting under study, it is important to study the quality indicators.Indicators such as breathability, ripeness, extensibility, accessibility, resistant and elastic deformations and friction resistance can provide information about the quality of knitting and its functional use.

In conclusion, it turned out that the stretching indices at the joint in height and width of knitting depend on the structure of the knitted fabric and numerical indicators of the linear densities of the threads in its composition, the type of raw materials and the number of threads in the fabric. Knowing what properties of creasing the presence of knitted fabrics is also one of the important factors in the design of products [101].
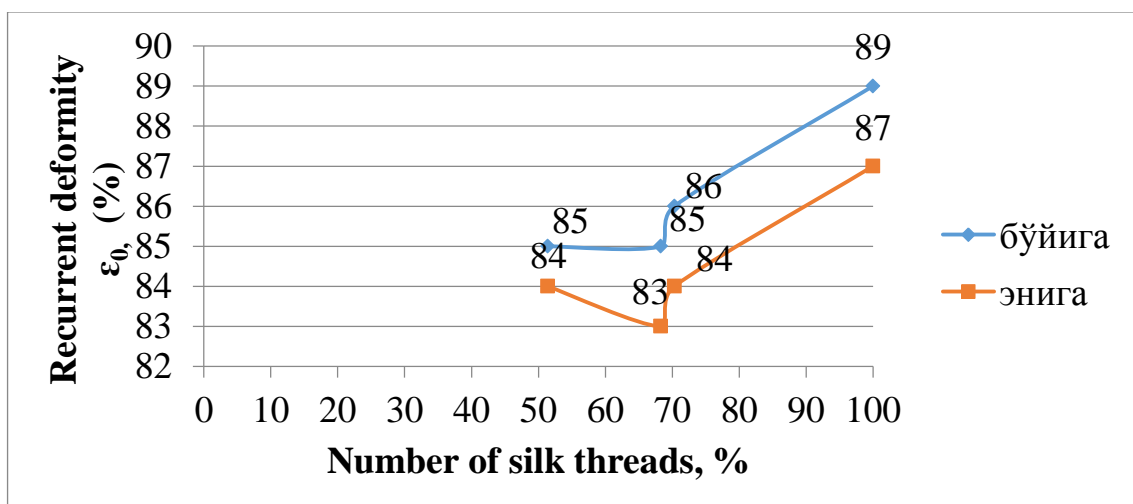

Figure 1. Double layer cotton silk returns the amount of silk threads contained in the knitting tissue to deformation dependency diogram

Complete deformation ε will consist of the following parts:

➢ the camshaft part ε_c returns at high speed after the loads are removed from the samples being carried out in the experiment;

➢ elastic deformation ε_e develops at a small speed, is associated with the passage of the relaxation process;

➢ plastic deformation ε_p does not return after the loads are removed from the samples.

$$\varepsilon = \varepsilon_{\kappa} + \varepsilon_{\scriptscriptstyle{э}} + \varepsilon_{n}, \% \tag{2.1}$$

In cotton-silk double-layered knitted tissue samples, the proportion of longitudinal reversible deformation varies from 21% to 33.3% at the threshold, while the proportion of recursive deformation in width varies from 25% to 40% (Table 1, 1.-image)
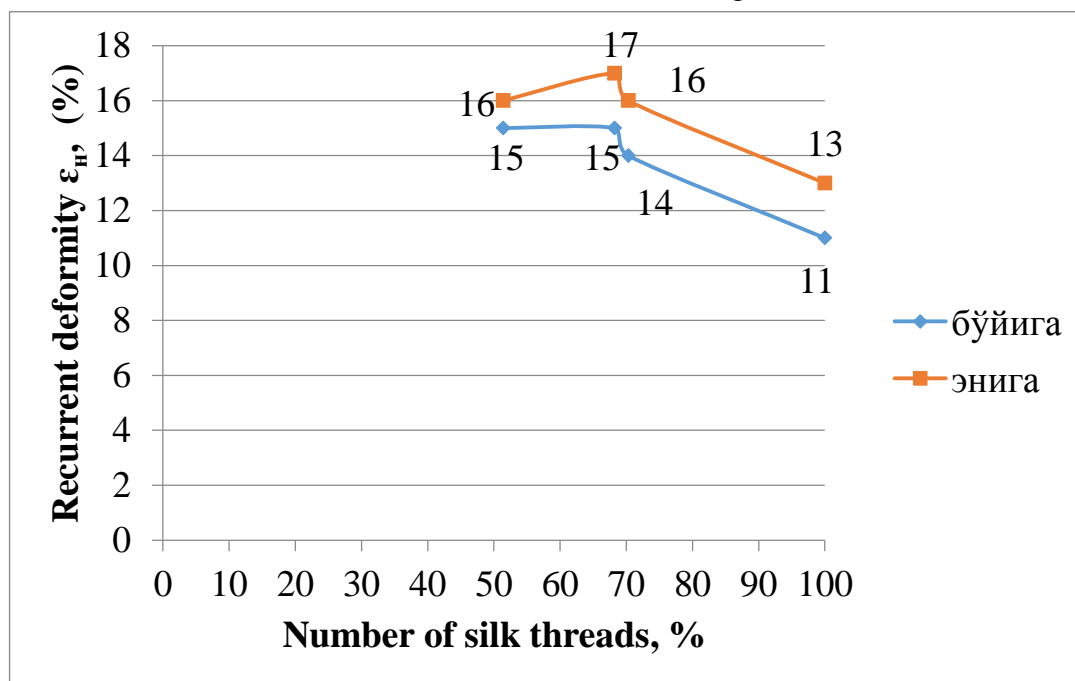

Figure 2. Diagram of irreversible deformation dependence of the amount of silk threads in the composition of two layers of cotton silk knitting tissue

Such indicators of the share of reversible deformation indicate a rapid return to the initial state after stretching cotton-silk two-layer knitting tissues.

Figure 2. a diogram of the dependence of the amount of silk threads in the composition of the double-layer cotton silk knitting tissue on the irreversible deformation of knitting is presented. In this diagram, it can be seen that knitting does not change its initial state as the linearity densities change in the texture of the raw materials.

In the process of wetting on knitted fabrics (washing, clotting), a decrease in their size is called-penetration, and an increase is called tensile. In a wet state, access to knitted fabrics when processed will be associated with an increase in the diameter of the cross-section, on the one hand, with swelling of the fibers, and on the other, with an increase in the length of the cross-section, which eliminates the stretch caused by undesirable effects in the production of yarn or fabric. In the external structure of knitted fabrics with a very sliding structure (depending on the type of fabric), the process of non-slip relaxation is quite noticeable compared to the process of non-slip relaxation in the internal structure of the tissue (inside the thread). The introduction of knitted fabrics is considered one of the main indicators that characterize their form storage indicators.

Studies have been carried out with the aim of studying the amount of cotton and silk threads in cotton-silk double-layer knitting tissues, the effect on the sensitivity of the input.

From the results of the introductory process study of knitted tissue samples with a cotton-silk pattern, it became known that the entry of knitted options into the neck changed from -1% to -1.3%, width -1% to -1.7% (Table 1). Despite the fact that the structure of the knitting tissue is the same, it was known that the number of linear densities of the threads in it and the amount of raw materials varies, affecting the nature of the knitting accessibility.
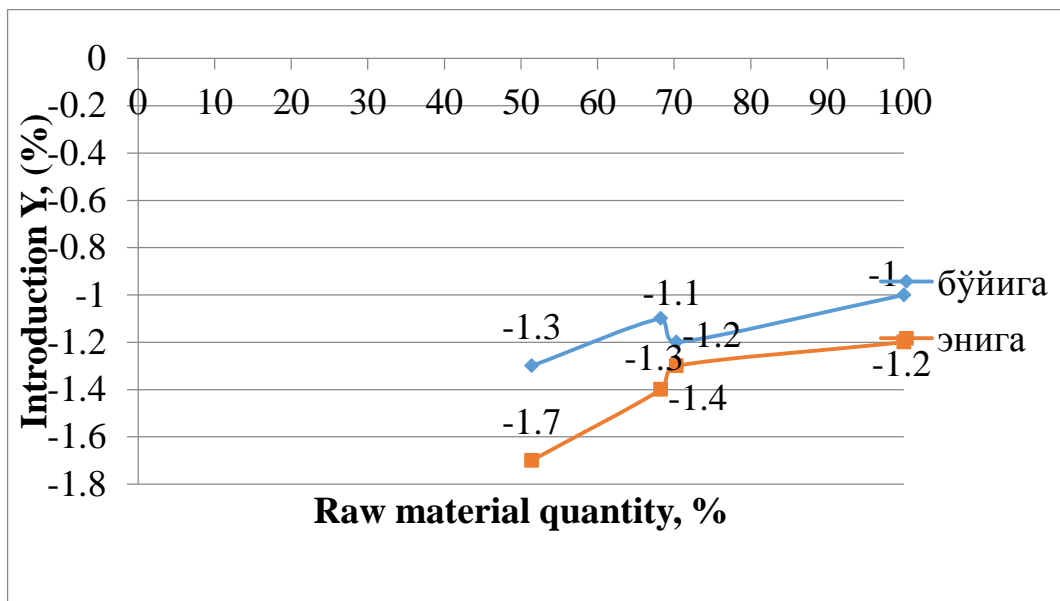

Figure 3. Cotton-a diogram of the dependence of the amount of cotton and silk threads in the composition of Silk two-layer knitted tissues on the specificity of accessibility.

In the process of using knitted products, fabrics undergo abrasion when adjacent to the bodies around them, and as a result, certain parts of the product become unsuitable for wearing [102, 132-147 B]. In a number of scientific works, the influence of various external factors on the property of absorbency of knitted fabric is studied. For example, the fact that the density of knitted tissue affects its absorption resistance indicator is researched and concluded that with an increase in the density of knitting, the absorption resistance indicator of knitted tissue increases. It is established that the density of knitting does not have a much greater effect on the indicator of the resistance of the fabric to friction, but will also depend on the density of knitting, that is, the number of linear densities of the threads in the knitting and their quantity, as well as the index of resistance to abrasion by the thickness of For this reason, double-layered knitwear used threads with a cotton thread of 20 teks x 1, 20 teks x2 and 20 teks x3 and silk threads with a linear density of 16.7 teks x1, 16.7 teks x 2, 16.7 teks x 3 and 16.7 teks x 4.
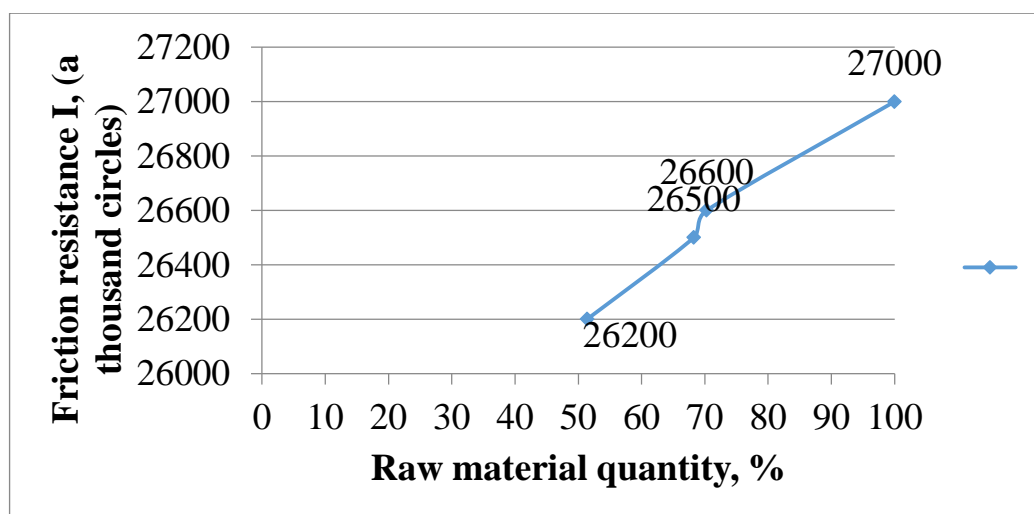

Figure 4. Diagram of the dependence on friction of the amount of silk threads in the composition of the two-layer cotton silk knitting tissue.
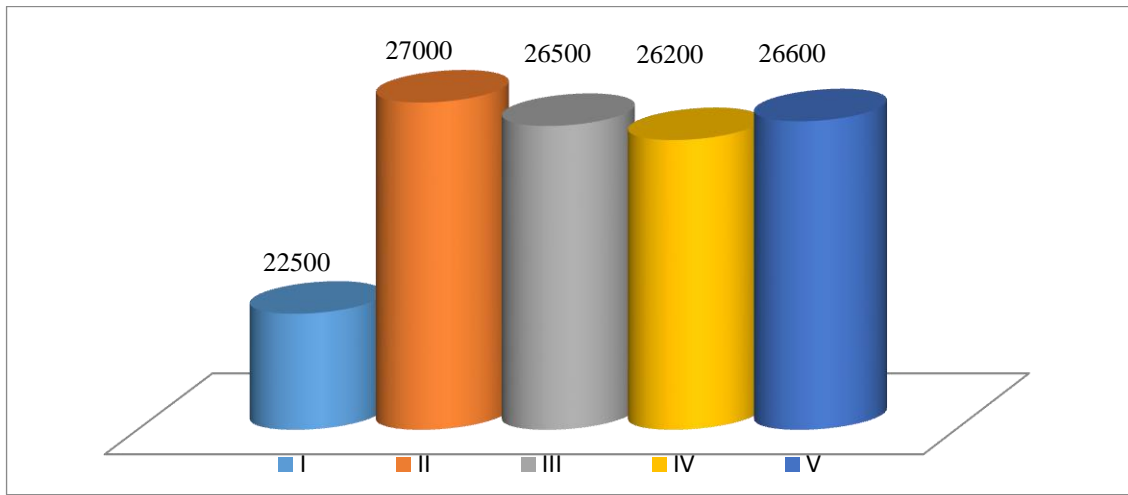
Figure 5. Histogram of the dependence on friction of the amount of silk threads in the composition of the two-layer cotton silk knitting tissue.

The index of resistance to friction is 22 thousand. 500 ayl. from 27 thousand.ayl. the results obtained in the gacha Horde are given in Table 1

The largest friction resistance indicator is that of Option II, 27 thousand.ayl. organizes. I-option friction resistance indicator 22ming.500.ayl. is equivalent to. When comparing these two options with each other, it turned out that the friction resistance indicator of Option II is 20% higher than that of option I. Because the tissue of variant II is woven from 100% silk thread, and the ripeness of the thread in its composition is 605 higher than the ripeness of cotton thread. Table 1.1

Table 1.1 Results of research on the physical and mechanical properties of two-layer cotton silk knitted fabric

Tissue type		Two layer I-option	Two layer II-option	Two layer III-option	Two layer IV-option	Two layer V-option	Meory documents
Raw material type and linear density, teks	Cotton	20 tex x 3 press, smooth surface		20 tex x 3 press	16.7 tex x 4 press	20 tex x 1, 16.7 tex x 2, press	
	Silk		16.7 tex x 4 press, smooth surface	16.7 tex x 4 smooth surface	20 tex x 3 smooth surface	16.7 tex x 2, 20 tex x 1, smooth surface	
Raw material type and quantity, (%)	Cotton	100		31,75	48,29	29,69	
	Cotton		100	68,25	51,40	70,31	
Ҳаво ўтказувчанлик B, (см³/см²*сек)							
Friction resistance I, (a thousand circles)							
Breaking force P, (N	Length	213	980	821	706	881	GOST 28554-90, not less than 80 N
	Width	175	720	626	716	586	
Stretch at	Length	67	48	39	39	46	GOST

							28554-90 I-0-40%, II-41-100%, III-above 100%.
the junction L, (%)							
	Width	80	55	44	73	51	
Recurrent Deformasia ε_0, (%)	Length	91	84	86	85	83	
	Width	85	86	89	86	90	
Irreversible deformation ε_n,(%)	Length	9	16	14	15	17	GOST 28882-90, not more than 5-20%
	Width	15	14	11	14	10	
Introduction Y, (%)	Length	-2,5	-1	-1,1	-1,3	-1,2	
	Width	-1	-1,2	-1,4	-1,7	-1,3	

IV - option friction resistance indicator 26ming.200.ayl. ni, while the friction resistance indicator of the V-variant is 26ming.600.ayl. founded ni. So, it turned out that the V-option friction resistance indicator is 4.13% higher than the IV-option friction resistance indicator. This is due to the use of silk threads in the line of glad and press rings containing the V-variant.

Thus, the increase in the amount of silk threads in the trkib of the knitting tissue and the increase in the number of indicators of the linear densities led to an increase in the resistance of knitting to friction.

Thus, it became known from the results of the research of the above-mentioned cotton-silk double-layer knitted fabrics that the amount of silk threads spun in the fabric and the linearity density-increases the rini number indicators, as well as their displacement in the knitting structure, affects the technological indicators and physico-mechanical properties of knitting-the result was known.

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