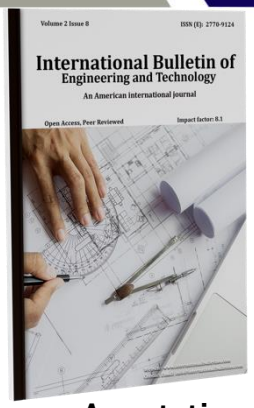

INCREASING THE AIR PERMEABILITY OF SUITING FABRICS

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Annotation. The article shows that the breathability of a fabric depends on its density, fiber content in the threads, weave and filling percentage. Increasing the breathability of the fabric leads to an increase in its water permeability and wrinkle resistance. It is noted that a decrease in the percentage of threads filled with fabric leads to the expansion of pores and the passage of air.

Key words: thread, fabric, breathability, weave, water absorption, wrinkle resistance.

Introduction. Given that in developed countries around the world, great attention is paid to improving the quality, physical, mechanical and hygienic properties of shirt fabrics and increasing their durability, the impact of the production process of mixed-composition fabrics, including the use of mixtures of various fibers in their production, necessitates the introduction into practice of shirt products [1]. In this regard, the use of various fiber mixtures is of great importance in improving the consumer properties of the fabric and increasing the competitiveness of textile products in the world market.

In our republic, comprehensive measures have been implemented to organize the production of a wide range of high-quality sewing products from a new assortment of shirt fabrics, expand the use of local natural raw materials, as well as increase the export potential of manufacturers of various mixed products, and certain results have been achieved.

Finding ways to reduce the amount of cotton fiber in the process of weaving shirting fabrics in accordance with the season, using the raw materials available in our republic, is one of the most important main issues facing the textile industry, and it is important to obtain a new composite fabric by mixing high-performance, new, cheap and effective various chemical fibers with cotton fiber.

Theoretical part of the study:

Increasing the air permeability of a mixed composition shirting fabric can be achieved by increasing the density of the fabric in the warp and weft at a minimum cost. It can be produced by changing the density in the warp from $P_T^{/}$ =320 ip/10cm to $P_t^{/}$ =260ip/10cm, and from $P_a^{/}$ =280ip/10cm to $P_a^{/}$ =220ip/10cm.

1. The density of the shirt fabric in the warp and weft is determined as follows, ip/10cm: In the warp

$$P_T^{//} = P_T^{/} \frac{\sqrt{T_T^{/}}}{\sqrt{T_T^{//}}} \qquad (1)$$

By Arkag $P_a^{//} = P_a^{/} \frac{\sqrt{T_a^{/}}}{\sqrt{T_a^{//}}}$ (2)

where: $T_T^{/}$ and $T_T^{//}$ - the linear densities of the warp and weft yarns in the current and planned process; $T_a^{/}$ and $T_a^{//}$ - the linear densities of the warp and weft yarns in the current and planned process; $P_T^{/}$, $P_a^{/}$, - the densities of the warp and weft yarns in the current process.

2. We determine the percentage of filling of the fabric in the current process. The percentage of filling of the fabric with warp and weft yarns is determined as follows:

$$E_T^{/} = P_T^{/} \cdot d_T \cdot 100\% \quad (3)$$

$$E_a^{/} = P_a^{/} \cdot d_a \cdot 100\% \quad (4)$$

3. The diameter of the warp and weft threads is determined as follows:

$$d_T^{/} = ck\sqrt{T_T^{/}}, мм \quad (5)$$

$$d_a^{/} = ck\sqrt{T_a^{/}}, мм \quad (6)$$

where: d_T, d_a , -diameter of warp yarn; c -coefficient; k -coefficient depending on the fiber composition.

4. The percentage of filling of the fabric with warp and weft yarns is determined as follows:

$$E_t^{/} = P_t^{/} \cdot d_t \cdot 100\% \quad (7)$$

$$E_a^{/} = P_a^{/} \cdot d_a \cdot 100\% \quad (8)$$

5. The percentage of fabric filling is determined as follows:

$$E_{Tyy}^{/} = E_T^{/} + E_a^{/} - \frac{E_T^{/} \cdot E_a^{/}}{100},\% \quad (9)$$

where: $E_T^{/}$ and $E_T^{//}$ - filling of the actual and projected fabric with warp threads; $E_a^{/}$ and $E_a^{//}$ - filling of the actual and projected fabric with weft threads.

Experimental part of the study:

During the research, a fabric with high strength and air permeability was produced by using 18.5 tex tanda and linoleum yarns with a mixed composition of 70% cotton and 30% lavsan, and the obtained results are shown in Table 1 below.

Table 1

The effect of different fiber content on the physical and mechanical properties of shirting fabrics

№	The fiber composition of the fabric	Air permeability,dm^3/s m^2 ·s	Disruption of fabric power, N		Elongation at break of fabric,%		Water permeability, mm,s,ust.	No creasing, %	
			body	back	body	back		body	back
1.	66.6% cotton + 3.3% lavsan fiber	61,1	578	491	26,8	20,5	126	52,2	50,5
2.	40% cotton + 60% linen fiber	50,4	636	562	34,3	34,6	115	67,1	65,8

3.	73% cotton + 27% lavsan fiber	72,2	500	415	23,6	18,1	130	49,1	40,7
4.	100% viscose	93,2	505	392	21,2	17,1	232	30,0	32,2
5.	87% cotton + 17% lavsan fiber	81,7	468	401	20,2	16,8	142	38,2	34,8

Based on the results in Table 1, Figures 1-5 show the graphs of changes in the tensile strength, elongation at break, air permeability, water permeability, and anti-wrinkle properties of shirt fabrics obtained from a mixture of fibers with different composition.

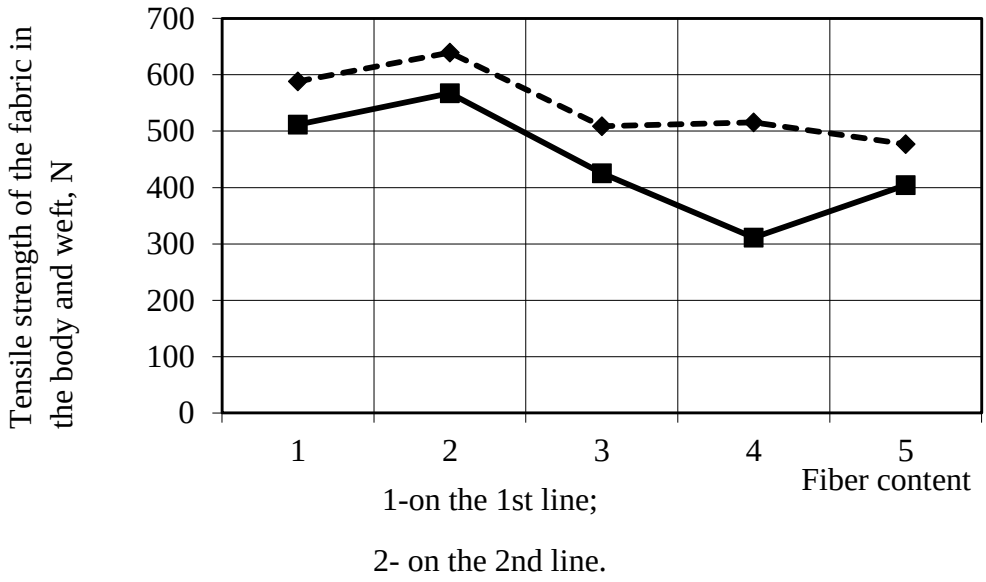
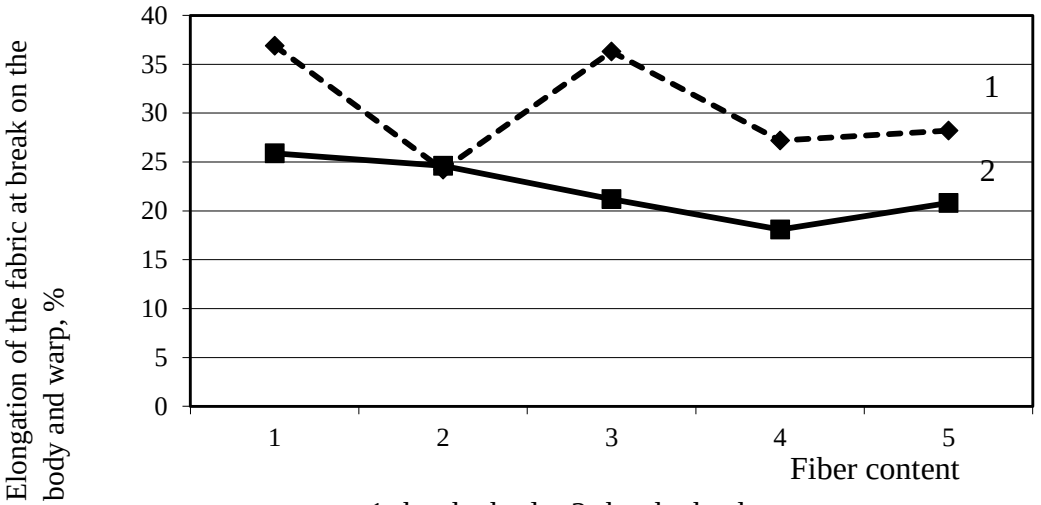
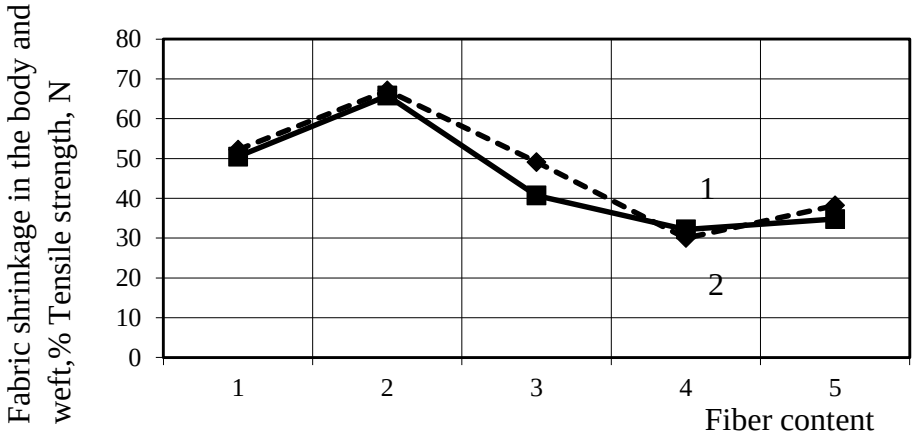


Figure 1. Variation of tensile strength of shirt fabric with different fiber content on warp and weft.



1- by the body; 2- by the back.

Figure 2. T-shirt fabrics with different fiber content and the change in elongation at break along the rope.



1- by the body; 2- by the back.

Figure 3. T-shirt fabrics with different fiber content and changes in the wrinkle resistance of the yarn.

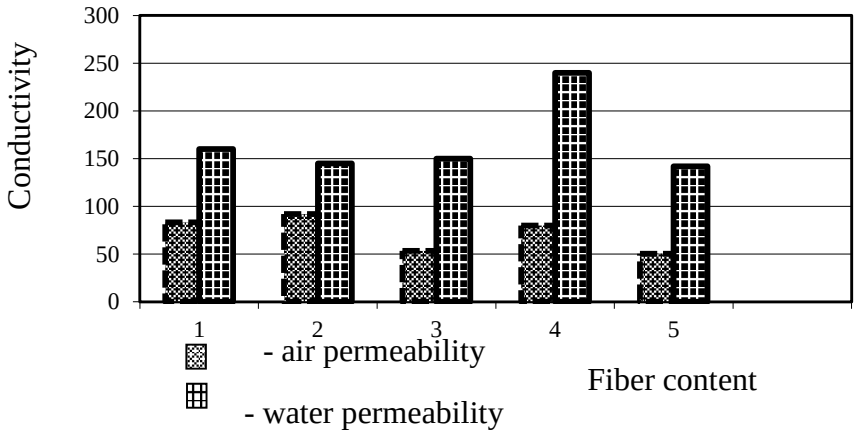


Figure 4. Shirt fabrics with different fiber content changes in air permeability and water permeability.

Inconclusion, it should be noted that according to the results of the experiment, according to the analysis of the physical-mechanical and hygienic properties of the fabrics, the air permeability of the fabric with 87% cotton + 17% lavsan fiber is 25.2% compared to 66.6% cotton + 33.3% lavsan fiber, 38.31% compared to 40% cotton + 60% lavsan fiber, 73% cotton + It was found that it increased by 11.63% compared to 27% lavsan fiber, and decreased by 14.1% compared to 100% viscose fabric

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