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# Changing the Physical and Mechanical Properties of the Materials for the Special Clothes

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**ABSTRACT:** This article describes the physical and mechanical properties of fabrics produced in different countries and designed for different types of fibers

**KEYWORDS***:* air resistance, dry and wet friction, elongation, light and weather, distillation and sea water, soap and soda solutions, washing and ironing.

## I. INTRODUCTION

Improving our economic performance through the production of high-quality and custom-made fabrics using local raw materials is one of the key issues of the day [1].

The textile industry produces a wide variety of fabrics. They differ in their structure, purpose of use, composition and properties of the fiber [2]. One of the main features of textile fabrics for the textile industry is air permeability, strength, friction resistance, color strength and so on. It has the ability to transfer air, water, gas, steam, dust, smoke, and radioactive powders from special fabrics [3-4].

Air permeability is the ability of the sample to pass through the air as measured by the air permeability coefficient. During the experiments, the difference in air pressure on both sides of the sample is observed. This difference is consistent with the air pressure under clothing and the ambient air pressure [5-6].

Air permeability depends on the fiber composition, variety and density of the fabrics [7]. If the higher the density of the fabrics for special clothes in the direction of the warp and the weft, the lower the air permeability coefficient. For this reason, the production of fabrics for all types of military clothing is carefully tailored for the season [8-10].

## II. METHODOLOGY

The scientific-research works were carried out to define the physico-mechanical properties of fabrics. There were studied physico-mechanical properties of military fabrics produced in various countries [11].

The following criteria were used to construct the charts based on the results of the study: 1 - fabric made from a mixture of 68.4% cotton fiber and 31.6% lavender fiber produced in Uzbekistan; 2- Fabric mix of 64.7% cotton fiber and 35.23% lavender fiber made in Uzbekistan; 3- fabrics made from a mixture of 65.76% cotton fiber and 34.24% lavender fiber made in Uzbekistan; 3- fabrics made from a mixture of 65.76% cotton fiber and 34.24% lavender fiber made in Uzbekistan; 4-wool, made from Turkey 12.0% wool + 11.0% lavender and 77.0% cotton fiber; 5-Fabric made of 14.8% cotton fiber and 85.2% lavender blend; 6-100% lavender fibers made in China. The test results are shown in Figure 1-3.

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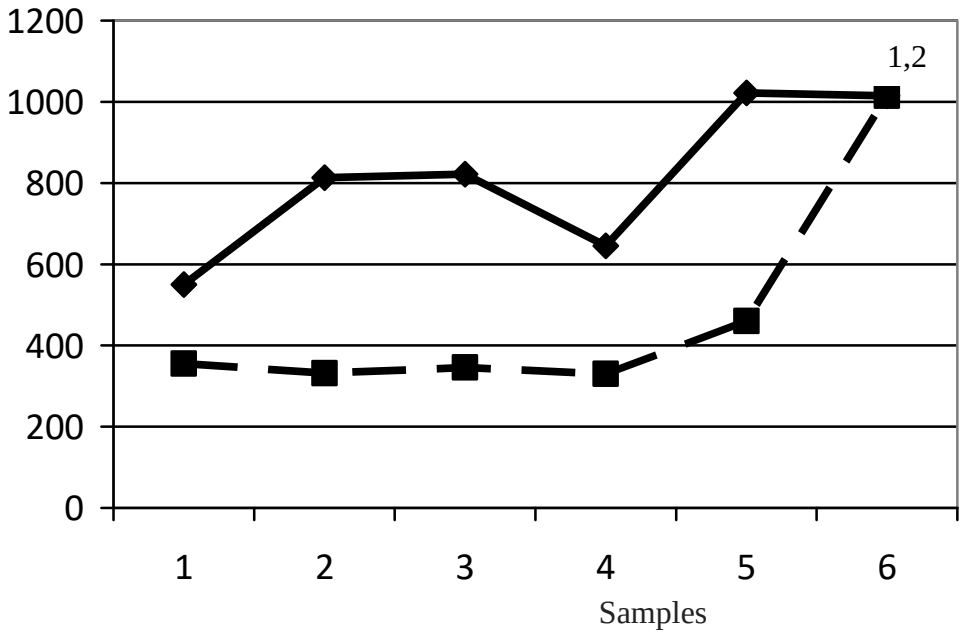


Figure 1. Changes in shear strength of a mixture of different fibers in body orientation and weaving of fabrics for military clothing.
In the 1st warp, in the 2nd weft line.

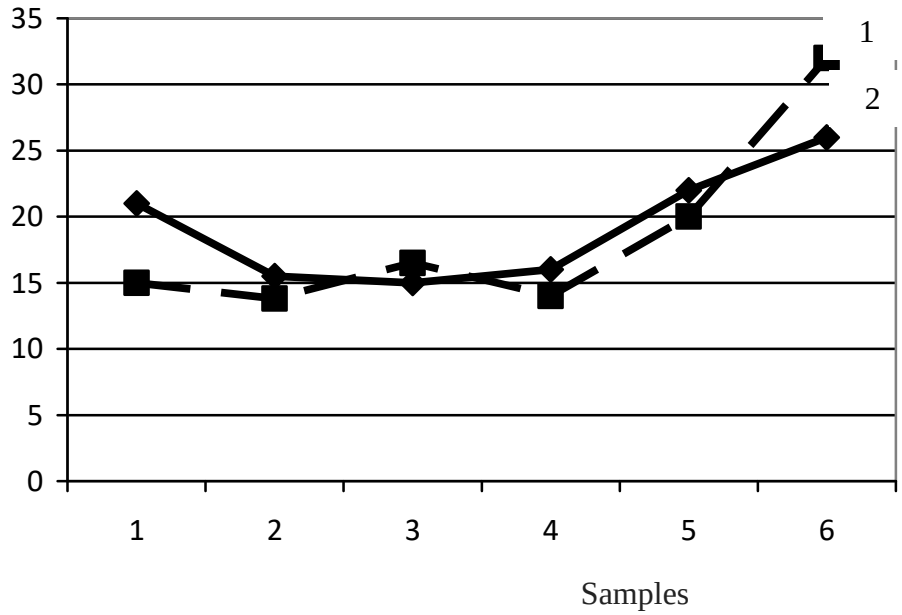


Figure 2. Changes in elongation of the mixture of different types of fibers in the wear and torsional direction of fabrics for military clothing.
In the 1st warp, in the 2nd weft line.

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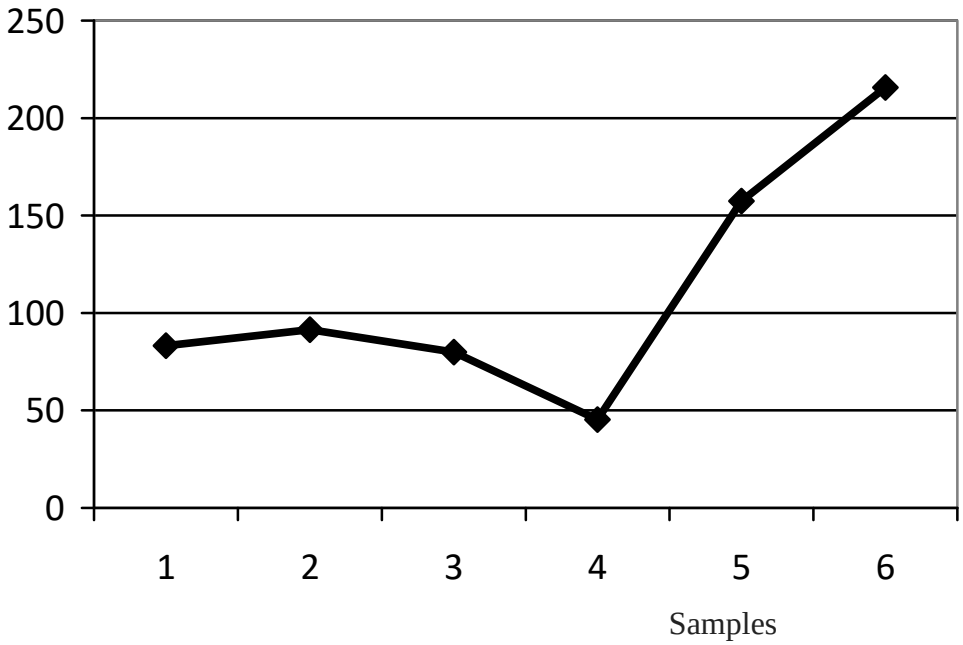


Figure 3. Changes in air permeability of fabrics for military uniforms of mixed composition fibers.

## III. RESULTS AND DISCUSSION

Comparing the results of the study to the fabric of military clothes made from 68.4% cotton fiber and 31.6% lavsan blend made in Uzbekistan, mix of fabrics 64.7% cotton fiber which produced in Uzbekistan and 35.23% lavsan fiber made for military uniform fabric breakeage strength of the cloth increased by 32.3%, the tensile strength of the weft yarn decreased by 6.5%, the elongation of the warp yarn by 26.2%, the breakage elongation of weft decreased by 8.0% and the air permeability by 8.9% increased, the wear strength of the fabric for military clothes made of 65.76% cotton fiber and 34.24% lavsanr fibers increased by 33.1%, the tensile strength by 2.5%, the elongation in weft length reduced by 28.6%, warp breakage elongation increased by 9.1%, air permeability decreased by 4.1%, military apparel made in Turkey 12.0% wool+11.0% lavsan and 77.0% cotton fiber weft tensile strength increased by 14.7%, for warp - by 7.1%, weft elongation at the break was reduced by 23.9%, the elongation at the warp decreased by 6.7%, and the air permeability decreased by 46.6%, tensile strength of the fabric for military uniforms made of 14.8% cotton fiber and 85.2% lavsan blend is 46.1%, warp breaking 22.8%, weft elongation by 4.5%, warp elasticity increased by 31.9%, air permeability increased by 47.1%, tensile strength of 100% lavsan fabric made in China 45.9%, and warp interruption strength 65,1% body elongation, 19.2%, warp breakage increased by 53.1%, air permeability increased by 61.4%.

Analysis of the test results shows that the higher the amount of lavsan fiber in the fabric, the higher the tensile strength of the fabric.

After result of bending and compression deformation under various technological processes in the textile industry, the fabrics become creased, which creates wrinkles and creases. Creases on fabric only can be removed by ironing. The creasing of fabrics depends on the fiber content, the thickness of the threads used in their texture, the type and density of the yarn and finishing.

One of the disadvantages is the irritability of fabrics for military clothing. It distorts the look of the item. Flexible wrinkles can easily break down because of the fact that they are much more friction when folded.

It is clear that the fabrics intended for military uniforms are not wrinkled - they resist to crunching and return to their original state after the creasing.

During the use of fabrics the first dyed color should not be deteriorated for a long time. According to the strength of the dyeing, linen fibers are divided into groups of dyed and specially stained. The rest of the fabrics are divided into simple, durable and specially dyed groups.

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Depending on the use of fabrics, their dye is exposed to various physical and chemical effects: light and weather, dry and wet friction, distilled and sea water, soap and soda solutions, washing and ironing, resistance to sweat, etc.

The durability of the fabrics is very important in determining their variety sort. If the actual stiffness of the dye is below the set level, the grade of the fabrics will be reduced.

Besides this, research was carried out to determine whether the clothes for military uniforms weren't creased, dye resistant and waterproof. For this, it has been experimenting with samples of military clothing from various countries. The test results are presented in table 1.

Table 1

Uncreasing of fabrics of various combinations for the uniforms, change of dye strength and waterproofing

| n/p | Produced country | The composition of the fiber | Twisting | Do not crease % | | dyeing strength, score | | Waterproofing, mm.wat.res. |
|---|---|---|---|---|---|---|---|---|
| | | | | weft | weft | dry | wet | |
| 1. | Uzbekistan | cotton + 31.6% lavsan | 1/3 of twill | 62,2 | 55,5 | 4/4 | 3/3 | 160 |
| | | 64,7% cotton+35,23% lavsan | 1/3 twill | 50,0 | 58,3 | 4/4 | 3/3 | 260 |
| | | 65,76% cotton +34,24% lavsan | 1/3 twill | 56,1 | 50,0 | 3/3 | 2/2 | 100 |
| 2. | Turkey | 12,0% wool+11,0% lavsan +77,% cotton | linen | 60,3 | 59,8 | 2,5/3,5 | 1,5/2,5 | 170 |
| 3. | China | 14,8% cotton +85,2% lavsan | 1/3 twill | 81,0 | 79,6 | 4/4 | 3,5/3,5 | 160 |
| | | 100% lavsan | 1/3 twill | 76,4 | 77,2 | 4,5/4,5 | 4/4 | - |

Looking at the comparing the results of the study with the indices of military clothes made of 68.4% cotton fiber and 31.6% lavsan fiber made in Uzbekistan, 64.7% produced in Uzbekistan for 35.23% lavsan fiber made from cotton fiber, non-woven fabric of the warp fabric decreased by 19.7%, non-twisting of the fabric for military clothes made of a mixture of lavsan fiber - by 8.8%, waterproofing by 38.8% - by 65.76% in Uzbekistan, by 8.8%; for sloping by 9.1%, waterproofing by 37.5%, fabrics of Turkey made from a mixture of 12.0% wool + 11.0% lavsan fiber and 77.0% cotton fiber, with non-twisting 3.1%, welding 7.2%, waterproof 5, increased by 9%, non-woven clothes for military clothing made of 14.8% cotton fiber and 85.2% lavsan fiber 23.2%, wool creasing increased by 30.3%, waterproofing remained unchanged, 100% lint made of China cloth increased by 18.6%, slip-on-28.1%, waterproofing was not expected at all.

Dry-resistant dye strength for military clothing made of 68.4% cotton fiber and 31.6% lavsan fiber produced in Uzbekistan consists of 4/4, 3/3 of dyeing resistance on wet friction, dry-resistant dye strength for military clothing made of 64.7% cotton fiber and 35.23% lavsan fiber made in Uzbekistan consists of 4/4, 3/3 of dyeing resistance on wet friction, dry-resistant dye strength for military clothing made of 65.76% cotton fiber and 34.24% lavsan fiber made in Uzbekistan consists of 3/3, 2/2 of dyeing resistance on wet friction, dry-resistant dye strength for military clothing made of 12.0% wool fiber + 11.0% lavsan fiber and 77% cotton fiber mixture which produced in Uzbekistan consists of 2,5/3,5; 1,5/2,5 of dyeing resistance on wet friction, dry-resistant dye strength for military clothing made of 14.8% cotton fiber and 85.2% lavsan fiber produced in China consists of 4/4; 3,5/3,5 of dyeing resistance on wet friction, dry-resistant dye strength for military clothing made of 100% lavsan fiber produced in China consists of 4,5/4,5; 4,5/4,5 of dyeing resistance on wet friction.

## IV.CONCLUSION

1.Results of the analysis shows that the Chinese fabric with 14.8% of cotton fiber and 85.2% of lavsan fiber, and 100% of lavsan fiber has a higher tensile strength and air resistance than other fabrics.

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2.85.2% lavsan, and 100% lavsan fabric made with 14.8% cotton fiber in China were found to be higher than other fabrics.

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