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Changes in the Physical Properties of Costume Fabric Obtained Based on Improvement of Ip Obtaining Technology

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Abstract: In this article, suit fabrics were obtained in 2/2 twill weave from yarns obtained from blends of 100% cotton fiber, 50% cotton and 50% polyester fiber, 50% cotton and 50% modal fiber, 50% cotton and 50% viscose fiber, 25% modal, 25% viscose and 50% cotton fiber, and their physical properties were determined

Key words: air permeability, hygroscopicity, penetration and heat retention, elasticity, bright colors, low density

1. INTRODUCTION

Nowadays, it is important to take into account quality indicators in the production of textile products of various compositions. In this regard, special attention is paid to the fiber composition of yarns to improve the quality indicators of suit fabrics. Extensive scientific research is being carried out to improve the technology and technology of producing finished quality products, to create their scientific basis. In this direction, great attention is paid, in particular, to creating effective technologies that increase the quality and competitiveness of fabrics, to developing methods for optimizing fabric parameters, and to creating highly efficient technical means and technologies at textile enterprises. Therefore, obtaining quality yarns and fabrics to satisfy consumer demand and taste plays an important role in conquering the world market. At the same time, satisfying consumer demand for quality suit fabrics is one of the current issues.

In the global textile industry, research and development work is being carried out aimed at developing new scientific and technical solutions for the efficient use of raw materials and resource-saving technologies and technical means for competitive textile production. In this regard, special attention is paid to the development of effective technologies for obtaining high-quality raw materials for suit fabrics and the development of energy- and resource-saving technologies that save energy and resources, the production of finished products from the obtained raw materials, and the justification of its technological process, parameters and operating modes.

Suit fabrics should have a beautiful appearance, be resistant to abrasion and dimensionally stable, have bright colors and be resistant to weather and abrasion. Important characteristics of suit fabrics are given. Suit fabrics containing synthetic fibers are treated with antistatic agents to prevent electrification and reduce their accumulation.

The surface density of fabrics depends not only on the linear density of the warp and weft threads, but also on the density of the threads and the fiber composition.

General requirements for suit materials: wrinkle resistance, shapeability, wear resistance, stretch resistance, resistance to dry cleaning. Hygiene requirements are strictly regulated only for materials for summer suits. For example, the air permeability of such materials should not be less than 150 dm^3 / (m^2s).

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Fabrics used for the manufacture of suits have various fiber compositions. The most common fabrics are wool. They can be pure wool or semi-wool, combined with cotton, viscose, acetate, lavsan, nitron, nylon fibers and yarns. Both fine and wide fabrics are used.

Suit fabrics make up a large share of all fabric production. This is especially true for woolen suit fabrics, since their properties best meet the requirements for suit fabrics. Fabrics used for the manufacture of suits must be resistant to abrasion, have a beautiful appearance, have high color fastness to light and water, and retain their shape well when worn. Depending on the season and age and gender, different fabrics are used to make suits, which have additional requirements. Thus, cotton, linen, silk and light woolen fabrics are used for spring-summer suits, and wool and less cotton fabrics are used for autumn-winter suits. Suit fabrics for the spring-summer season should be light, elastic, soft, light-colored and have increased air permeability. For men's suits, fabrics of the highest density and wear-resistant are used, for women's suits - high softness and elasticity, bright colors, low density, for children's suits - beautiful, low density fabrics.

Since costume fabrics cover a large part of the human body, they must fully meet hygienic requirements, taking into account the seasons, climatic conditions, and age. Here, taking into account the healing properties of some natural fibers gives good results in the design of costume fabrics.

In addition, the aesthetic properties of costume fabrics are also of great importance, and when designing fabrics, designers must take into account what the fabric is intended for (festive, everyday), what season it is intended for, and what age group this fabric is intended for.

Fabrics intended for costume are twill weave and are produced in many textile factories around the world.

The most important characteristics of fabrics in this group are wear resistance and breathability. In turn, the abrasion resistance and air permeability of the fabric depends on many important factors, namely, the abrasion resistance of the thread, the type of fibers, the composition of the thread and its linear density, the density of the fabric on the body and warp, the thickness of the fabric, etc. In any conditions, the friction resistance and air permeability of the fabric depends on its structural parameters.

2. METHODS

The physical properties of a suit fabric include air permeability, hygroscopicity, permeability and heat retention.

The physical properties of suit fabrics are understood to be the ability to pass air, water, gas, steam, dust, smoke liquids, radioactive particles through it. The air permeability coefficient shows the amount of air volume passing through a surface of 1 square meter in one second under conditions of a known difference in air pressure on both sides of the sample. When fabrics are exposed to thermal energy, a number of properties occur in them: the ability to conduct heat, the ability to absorb heat, the ability to change or retain their properties under the influence of heat. These properties are of great importance in the process of wet-heat processing of materials in tailoring, the use of finished products in various climatic conditions, and mainly in the design of heat-retaining clothing.

The thicker the fabric, the better its heat retention properties. Therefore, heat-retaining clothing is sewn in multiple layers. If the fabric density is low, air permeability increases, and heat retention properties deteriorate. For example, when washed, wetted, ironed wet, or stored in air with high relative humidity, the dimensions of the fabric change. As a result of shrinkage of the fabric, the size of the items and parts of the items made from them may shrink and become deformed. When fabrics are washed, wetted, ironed wet, or stored in air with high relative humidity, the dimensions of the materials change, that is, shrinkage occurs. Depending on the fiber composition, fabrics can shrink and become positively or negatively.

3. RESULTS

Suitbop fabrics were produced in 2/2 serge weave (Fig. 1).

O‘rilish rapporti $R=n_t+n_a=2+2=4$. Siljish $S=\pm1$.

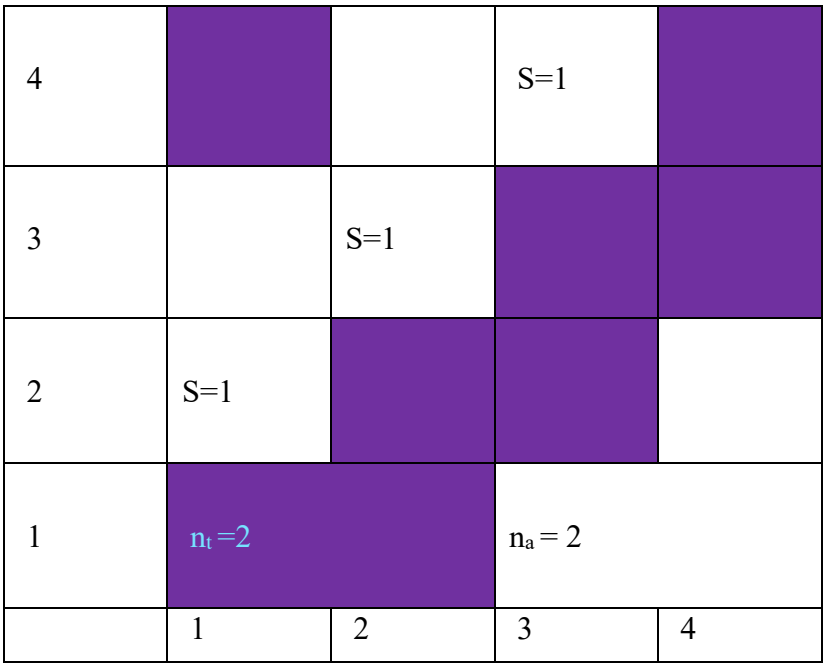


Fig. 1. Sarja mowing.

Research was conducted to determine the physical properties of suit fabrics. The results obtained through testing are presented in Tables 1-2.

Tables 1 Changes in the physical properties of the suit fabric obtained on the basis of emulsification of threads according to the 1st option (300 br/m)

т/р	indicators	composition content,%					GOST 29223-91. Dress, dress-suit and suit fabrics made of chemical fibers. General specifications	difference, %
		fiber composition of warp and weft 100% cotton	main thread 100% cotton, weft thread 50% cotton 50% polester	warp thread 100% cotton, weft thread 50% cotton 50% modal fiber	main thread 100% cotton, weft thread 50% cotton 50% viscose fiber	main thread 100% cotton, weft thread 25% modal, 25% viscose and 50% cotton fiber		
1.	air permeability, $dm^3/m^2 \cdot sek$	966	833	945	980	877	500	+39,9
2.	hygroscopicity, %	5,73	3,38	4,16	5,14	5,24		
3.	shrinkage, %							
	based on	+1,5	-2,5	+1,5	+1,5	+1,5	+1,5	
	by duck	-2,5	-1,5	-2,5	-2,0	-2,0	-2,0	

Tables 2 Changes in the physical properties of the textile fabric obtained on the basis of emulsification of threads according to the 2nd option (400 br/m)

т/р	indicators	composition content,%					GOST 29223-91. Dress, dress-suit and suit fabrics made of chemical fibers. General specifications	difference, %
		fiber composition of warp and weft 100% cotton	main thread 100% cotton, weft thread 50% cotton 50% polester	warp thread 100% cotton, weft thread 50% cotton 50% modal fiber	main thread 100% cotton, weft thread 50% cotton 50% viscose fiber	main thread 100% cotton, weft thread 25% modal, 25% viscose and 50% cotton fiber		
1.	air permeability, $dm^3/m^2 \cdot sek$	994	842	957	988	904	500	+40,6
2.	hygroscopicity, %	5,43	3,26	3,88	4,87	4,78		
3.	shrinkage, %							
	based on	+1,5	-2,5	+1,5	+1,5	+1,5	+1,5	
	by duck	-2,5	-2,0	-2,5	-2,0	-2,0	-2,0	

The graphs of changes in the physical properties of the suit fabric obtained based on different twists and emulsification of the threads are presented in Figures 2-5.

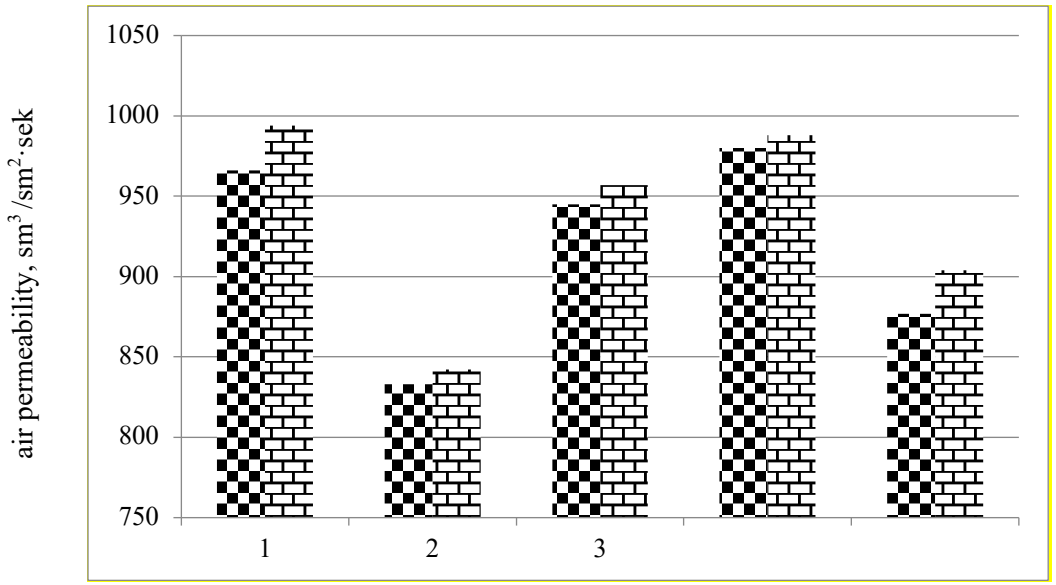
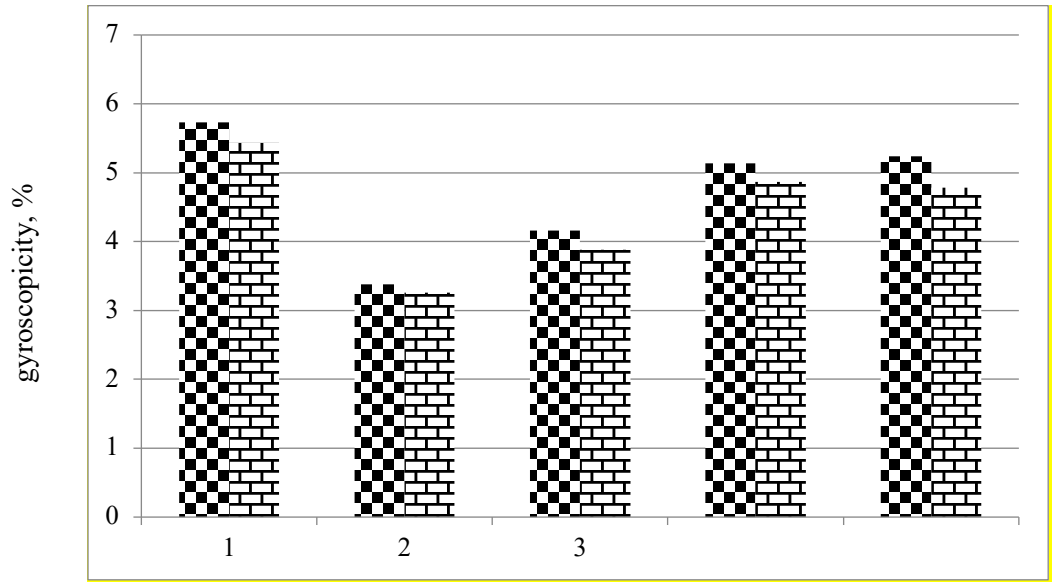
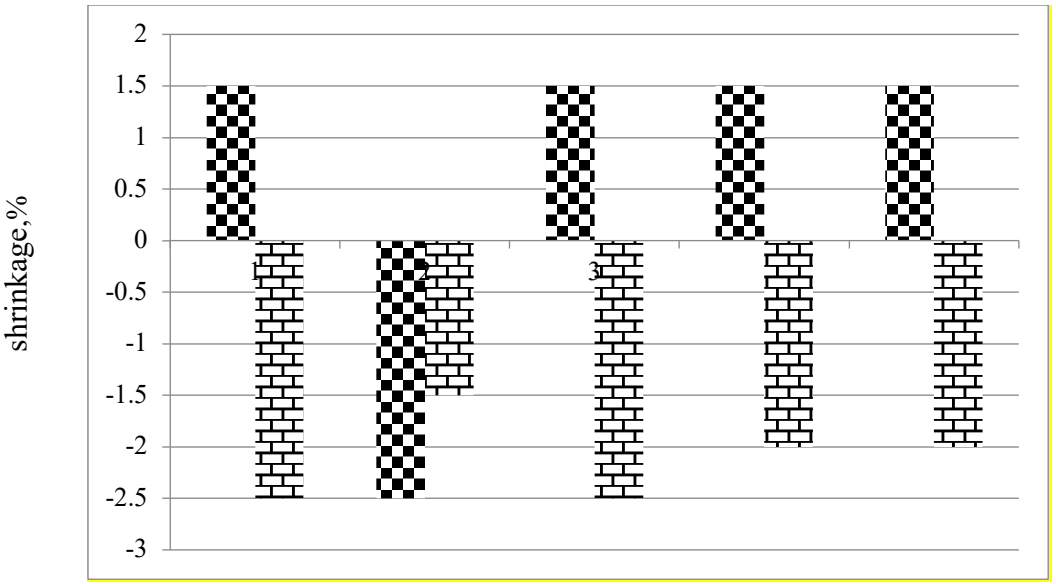


Figure 2. Effects of fiber blends and emulsification with different fiber content on the air permeability of apparel fabrics.



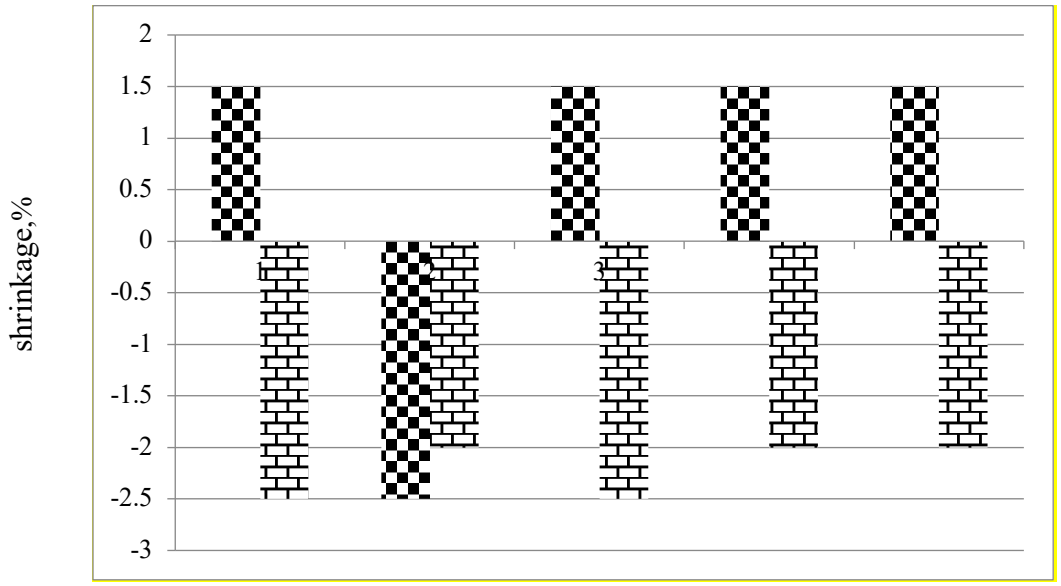
-according to option 1;
- according to option 2.

Figure 3. Effect of fiber blends and emulsification on hygroscopicity of different fiber compositions.



1- based on; 2- by duck.

Figure 4. Effects of fiber blends and emulsification with different fiber content on the post-wash penetration of garment fabrics on the body and warp (300 br/m).



1- based on; 2- by duck.

Figure 5.Effect of fiber blends and emulsification on the wash-in and wash-out characteristics of suitbop fabrics with different fiber compositions (300 br/m).

The analysis of the research results shows that, compared to the indicators of the fabric made from 100% cotton fibers in the warp and weft, the air permeability of the suit fabric made from 100% cotton in the warp and 50% cotton and 50% polester fibers in the weft decreased by 13.8% and hygroscopicity by 41.1%, the air permeability of the suit fabric made from 100% cotton in the warp and 50% cotton and 50% modal fibers in the weft decreased by 2.2% and hygroscopicity by 27.4%, the air permeability of the suit fabric made from 100% cotton in the warp and 50% cotton and 50% viscose The air permeability of the suit fabric produced increased by 1.4%, and the hygroscopicity decreased by 10.2%. The air permeability of the suit fabric produced from a mixture of 100% cotton in the warp and 50% cotton in the weft yarn with 25% modal, 25% viscose and 50% cotton fibers decreased by 9.2%, and the hygroscopicity decreased by 8.6%.

At the same time, compared to the indicators of the fabric made of 100% cotton fibers in the warp and weft, the air permeability of the suit fabric made of 100% cotton in the warp and 50% cotton and 50% polester fibers in the weft decreased by 15.3% and hygroscopicity by 30.9%, the air permeability of the suit fabric made of 100% cotton in the warp and 50% cotton and 50% modal fibers in the weft decreased by 3.7% and hygroscopicity by 28.5%, the air permeability of the suit fabric made of 100% cotton in the warp and 50% cotton and 50% viscose The air permeability of the suit fabric decreased by 0.7% and the hygroscopicity by 10.4%. The air permeability of the suit fabric made from a blend of 50% cotton, 25% modal, 25% viscose and 50% cotton fibers with 100% cotton for the warp yarn and 50% cotton for the weft yarn decreased by 9.1% and the hygroscopicity by 11.9%.

4. CONCLUSION

As it can be seen from the analysis of the test results, due to the emulsification based on the 2nd option, it was found that air permeability decreased from 0.7% to 15.3%, and hygroscopicity decreased from 10.4% to 30.9% compared to the parameters of the fabric obtained from 100% cotton fiber.

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