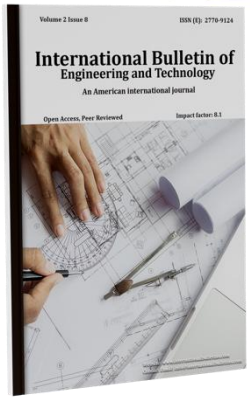

STUDY OF PHYSICAL PROPERTIES OF SUITING FABRICS WITH DIFFERENT FIBER CONTENTS

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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

Keywords: elasticity, shape stability, wear resistance, air permeability, hygroscopicity, penetration and heat retention

1. Introduction

A wide variety of materials are used for the production of clothing, among which textile materials are widely used and diverse. In order to form a rational structure of the outerwear assortment and improve product quality, it is considered expedient to study in detail the consumer properties of textile materials and clothing, the factors that form the consumer properties of textile materials, and the factors that shape the population's demand for clothing. Suit fabrics should be made of textile materials that are stable in shape and resistant to abrasion.

The history of the emergence of suit fabrics dates back to the Middle Ages. Initially, the material was used for caftans, and later, for several centuries, coats were made from it. In the 19th century, as a result of the industrial revolution in England, a mechanical loom appeared that simplified the production of fabrics from cashmere, wool, bouclé and other fibers. This led to a significant reduction in production costs and made suit fabrics available to the masses.

The range of suit fabrics is diverse, depending primarily on their purpose, the second of which determines the composition of the raw materials, the nature of the artistic and color design. Traditionally, these suit fabrics are mainly pure woolen fabrics or semi-woolen fabrics with the addition of chemical fibers. Linen fabrics occupy an important place in the range of suit fabrics, and in recent years there has been a tendency to increase their production in the total volume of world production.

Today, the possibilities for choosing suit fabrics are very large. The quality of the fabric should be such that the suit is not only durable, but also comfortable to wear.

The range of suit fabrics is diverse, which primarily depends on their purpose, the second is determined by the composition of the raw materials, the nature of the artistic and color design. Traditionally, these suit fabrics are mainly pure woolen fabrics or semi-woolen fabrics with the addition of chemical fibers. Linen fabrics occupy an important place in the range of suit fabrics, and in recent years there has been a tendency to increase their production in the total volume of world production.

Suit fabrics can be pure woolen or semi-woolen. However, the mixed composition is very diverse - cotton, viscose, linen, silk, polyester, elastane fibers are added to wool.

Depending on the density, elasticity, shape stability, wear resistance and quality of the woolen fabric, everyday or business suits (classic suit wool), status models or for special occasions (for example, crepe wool).

Suit fabric is a broad term that includes a variety of materials. The common quality of all suit fabrics, without exception, is aesthetic appearance and resistance to abrasion.

When choosing a suit fabric, you should pay attention to the time of year when you will wear the garment, as well as the season. The most popular suit fabrics are: wool, viscose, polyester, satin, cotton, and others. Most of them can be used to make suits for everyday wear, while others are suitable for creating suits for special occasions, such as weddings or ceremonies.

Suit fabrics can include fabrics made of wool and semi-wool, linen, cotton, viscose: satin, gabardine, denim, jacquard, corduroy, and velvet. In other words, it can be almost any fabric (natural and synthetic). It is important to understand that only the highest quality materials are selected for sewing suits. Products made from cheap fabric will never fit your figure perfectly and will last very little.

Suit fabrics are not only a material for clothing, but also an art of creating comfort and style. In recent years, due to the development of technology and the creativity of designers, the range of suit fabrics has expanded significantly. They have become popular not only among fashion industry professionals, but also among lovers of high-quality and beautiful clothes.

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

The physical properties of suit fabrics include the ability to pass air, water, gas, steam, dust, smoke liquids, radioactive particles through them. The air permeability coefficient shows the amount of air 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 heat energy, they acquire a number of properties: the ability to conduct heat, the ability to absorb heat, and the ability to change or retain their properties under the influence of heat. These properties are of great importance in the processing of materials by heating and humidifying, in the use of finished products in various climatic conditions, and, above all, in the design of heat-retaining clothing.

2. Methods

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

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% polyester	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 suit fabric obtained on the basis of emulsification of threads according to the 2 nd option (400 br/m)

т/р	indicators	composition content,%					GOST 29223-91. Dress, dress-suit and suit fabrics made of chemical fibers. General	difference, %
		fiber composition of warp and weft 100% cotton	main thread 100% cotton, weft thread 50% cotton 50%	warp thread 100 % cotton, weft thread	main thread 100% cotton, weft thread 50%	main thread 100% cotton, weft thread 25%		

			polyester	50% cotton 50% modal fiber	cotton 50% viscose fiber	modal, 25% viscose and 50% cotton fiber	specifications	
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 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% polyester 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% polyester 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

In short, it can be seen from the analysis of the test results that due to the emulsification based on the 2nd option, it was found that the air permeability decreased from 0.7% to 15.3%, and

the hygroscopicity decreased from 10.4% to 30.9% compared to the parameters of the fabric obtained from 100% cotton fiber.

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