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RESEARCH OF THE RESISTANCE AND PENETRATION OF NONWOVEN FABRICS WITH DIFFERENT COMPOSITIONS

Patxullaev Sarvarjon Ubaydulla o'g'li,
Ph.D., Associate Professor

Islambekova Nigora Murtozaevna,
Professor

Abstract
In the article, non-woven fabrics of various variants are produced from a mixture of cotton spinning yarn, silk spinning yarn, and mulberry fiber, and the effect of the composition of secondary raw materials on their air, heat, and electrical conductivity is studied. It was determined that the air permeability of non-woven fabrics is higher compared to other fabrics in the 2nd option, the properties of electrification are reduced, they are resistant to friction and have low penetration when washing.

Keywords: non-woven fabric, air permeability, thermal conductivity, abrasion resistance, washing penetration.

Introduction

Currently, in world practice, scientific research is being carried out aimed at the production of new techniques and technologies, identifying the important factors that affect the technological processes of the production of non-woven fabrics. In this field, the effective use of secondary resources involves the establishment of fiber separation methods from mulberry tree bark, the wider involvement of secondary raw materials and waste, the study of the influence of the composition of secondary raw materials on the technological performance of non-woven fabrics, the improvement of the quality indicators of non-woven fabrics, the study of the influence of the composition of secondary raw materials on the physical properties of non-woven fabrics. is an important issue [1]. The issue of increasing the volume of production of non-woven fabrics and the type of products in the republic, as well as the comprehensive solution of the issues of effective use of local raw materials, are of great importance in the development of light industry.
[2-5].

Research Methods

In the research process, the methods of determining the physical and mechanical properties of non-woven fabrics, comprehensive evaluation of quality indicators, processing and analysis of research results based on mathematical statistical methods were used.

Analysis of the Obtained Results

One of the main indicators of non-woven fabrics is abrasion resistance and permeability.

Erosion of non-woven fabrics is mainly caused by friction. The abrasion resistance of non-woven fabrics depends on their fiber composition and surface structure. First of all, the ends of the fibers protruding from the surface of the fabric are affected by friction. The fibers protruding into the bent places of the threads in the fabric begin to crumble. Some areas of the fiber surface are damaged and the fibers are broken. By strengthening the support surface of fabrics, it is possible to increase its resistance to erosion. Erosion of non-woven fabrics obtained by knitting-sewing method is also mainly caused by friction. In the process of friction, the structure of the fabric is damaged due to the fact that the fibers in the fiber package of the fabric are not well connected with each other, and the threads connecting the fibers are rubbed and eroded. Frictional deterioration of fabrics containing short fibers, especially synthetic fibers, usually begins with pilling, where soft balls of tangled fibers form in the most frequently rubbed areas of the fabric. First, the ends of the fibers come to the surface of the fabric. Then they get confused. When tangled, some fibers are pulled out of the fabric structure. Later, the fibers in the piles will break off from the surface of the fabric. As a result, the thickness of the fabric decreases and it is easily absorbed.

Non-woven fabrics change their dimensions when they are washed, soaked, wet ironed, stored in air with high relative humidity. In this process, the dimensions of the fabrics are often reduced. The input in this case is a positive input, otherwise it is a negative input. In weaving, the dimensions of materials are reduced or increased when they are wet-heated. As a result of ingress of fabrics, items and parts of items made from them may shrink and become deformed. If the main material, the lining and the layer of the garment are different, the outer appearance of the garment will deteriorate, wrinkles and folds will appear in it. In the research work, non-woven fabric was produced from a mixture of four different compositions: option 1 - spinning rate 100%; Option 2: spinning yarn 50%, silk spinning yarn 30%, mulberry fiber 20%; Option 3: spinning yarn 70%, silk spinning yarn 15%, mulberry fiber 15%; Option 4: spinning yarn 75%, silk spinning yarn 10%, mulberry fiber 15%.

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Research work was carried out to determine the air, thermal conductivity, electrical conductivity, abrasion resistance and adhesion of non-woven fabrics. (Tables 1-2).

Table 1 Air, thermal and electrical conductivity of non-woven fabrics

Вариант лар	Нотўқима матонинг ҳаво ўтказувчанлиги, sm^2/sm^2 sek	Нотўқима матонинг иссиқлик ўтказувчанлиги, %	Нотўқима матонинг ҳаво ўтказувчанлиги бўйича вариация коэффициенти,%	Электрўтказувчанлиги, volt	
				ўз-ўзига ишкалаш	синтетик матога ишкалаш
1-вариант	119,9	56,5	19,6	245	394
2-вариант	79,4	40,1	18,3	190	704
3-вариант	94,9	48,9	23,2	159	432
4-вариант	60,71	48,3	16,3	391	624

Table 2 Abrasion resistance and penetration of non-woven fabrics

т/р	Кўрсаткичлар	Нотўқима мато таркибидаги иккиламчи хомашё таркиби			
		1-вариант	2-вариант	3-вариант	4-вариант
1.	Киришиши,%				
	бўйламаси бўйича	+3,5	+4,5	+5,5	+6,0
	дисперсияси, σ	2,2	0,97	5,1	5,17
	вариация коэффициен-ти, C ,%	1,13	0,51	2,69	2,75
2.	кўндаланги бўйича	-5,0	-3,0	-6,5	-7,0
	дисперсияси, σ	10,3	4,53	4,53	5,31
	вариация коэффициен-ти, C ,%	4,90	2,19	2,12	2,48
3.	Ишқаланишга чидамлилиги, давр	3300	5750	3000	5545

If we compare the results of the conducted research with the parameters of the non-woven fabric obtained according to the 1st option, the longitudinal penetration of the non-woven fabric obtained according to the 2nd option increased by 22.2%, the dispersion decreased by 54.9%, the coefficient of variation decreased by 54.9%, friction resistance It increased by 42.6%, the transversal penetration of non-woven fabric decreased by 40.0%, the dispersion decreased by 56.1%, and the coefficient of variation decreased by 55.3%. The longitudinal penetration of the non-woven fabric obtained according to option 3 increased by 36.4%, dispersion by 56.9%, coefficient of variation by 58.0%, friction resistance decreased by 9.1%, The transversal penetration of non-woven fabric increased by 23.1%, its dispersion decreased by 56.1%, and the coefficient of variation decreased by 56.7%. The lengthwise penetration of non-woven fabric obtained according to option 4 increased by 41.7%, dispersion by 57.4%, coefficient of variation by 59.0%, friction resistance by 40.5%, transverse

penetration of non-woven fabric by 28.6% increased, variance decreased by 48.4%, coefficient of variation decreased by 49.4%. It can be seen that the non-woven fabric obtained from silk waste and mulberry bark fiber has high abrasion resistance and low penetration.

From the analysis of the test results, it was found that the abrasion resistance, longitudinal and transverse penetration of the non-woven fabric obtained according to the 2nd option is low compared to other non-woven fabrics.

Summary

It was observed that the air permeability and heat retention property of the non-woven fabric is higher in the non-woven fabric obtained according to the 2nd option compared to other fabrics.

According to the results of research on determining the electrification properties of non-woven fabrics, compared to option 1, in option 2, the electrification of non-woven fabric in self-rubbing decreased by 22.4%, the electrification of non-woven fabric in friction with synthetic fabric increased by 44.1%, in option 3, the electrification of non-woven fabric in self-rubbing 35 , decreased by 1%, electrification of friction against synthetic fabric increased by 8.9%, and in option 4, electrification of non-woven fabric against self-rubbing increased by 37.3%, electrification of friction against synthetic fabric increased by 36.9%. In option 2, it was found that the friction resistance, longitudinal and cross-sectional penetration of non-woven fabric is low compared to other non-woven fabrics.

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