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Influence of the Composition of the Mixture and the Type of Processed Fibers on the Quality Indicators of Fabrics

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Abstract

This article presents the results of studies to determine the influence of the type of fibers and recycled fibrous waste on the quality indicators of fabric. For this purpose, in production conditions, a sliver with a linear density of 5000 tex was obtained on a JFA-226 carding machine, and in the laboratory of the Department of Spinning Technology, slivers were also obtained in three versions on an HSR-1000 brand draw machine. To obtain twill weave fabric on a Picanol loom, warp threads were mixed with yarn consisting of 100% cotton, and weft thread was mixed with yarn consisting of recycled fibers and the quality parameters of the fabric were examined.

Keywords: *abrasion resistance of fabrics, fiber composition, fabric density, fineness or thickness of threads, supporting surface, wrinkle resistance of fabrics, abrasion resistance*

Introduction

The range of fabrics produced at textile enterprises is diverse, and they differ from each other in their structure, fiber content and properties. In addition, these gazalami are produced depending on the season. Seasonal yarns are produced from yarn obtained by carding and re-combing.

Fabrics produced for the summer season should be light, air-permeable, durable, and fabrics made for the winter season should be dense and thicker and have high heat retention properties.

The structure of textile fabrics is determined by the interweaving and connection of warp and weft threads. The appearance, properties and purpose of textile fabrics depends on its structure.

Density is one of the indicators of the structure of gasses, and the other is their shearing.

The density of gauze is determined by the number of threads per unit of length, usually 100 mm. If the density of the gas is different on the body and on the back, the density of such gas is called uneven gas. If they are equal to each other, the density is a uniform gas. Generally, gases have a higher bulk density than their bulk density. However, in some cases it is the opposite.

The density of gases varies widely. The thinner the threads of the gauze of the same density, the more sparse the gauze, that is, the less it is filled with threads.

The density of gases varies depending on the purpose of their use. For example, as the density of gas increases, its tensile strength, air permeability and friction resistance increase. In addition, the fiber content of the gas has a different effect on its properties.

The mechanical properties of gauzes include tensile strength, elongation at break, resistance to abrasion, and resistance to wrinkling. The mechanical properties of gasses depend on the amount of secondary fibers in the composition. For example, if the amount of secondary fibers in the gauze increases, our obtained gauze will be rough and its hairiness will increase. In addition, one of the main indicators of gas is its resistance to friction. The abrasion resistance of gauzes depends on the fiber composition, density, thinness or thickness of threads, thickness and other parameters. For example, the more gauze is rubbed, the structure of the gauze is broken, the threads in it are broken, and the breaking strength decreases.

Erosion of gases occurs mainly as a result of the effect of friction. The abrasion resistance of gauzes depends on their fiber content and surface structure. First of all, the ends of fibers protruding from the surface of the gauzes are affected by friction. Fibers protruding into the bent places of the threads in the gauze begin to crumble. Some areas of the fiber surface are damaged and the fibers are broken. Yarns are also broken due to individual fibers or fiber parts coming out of the yarn composition.

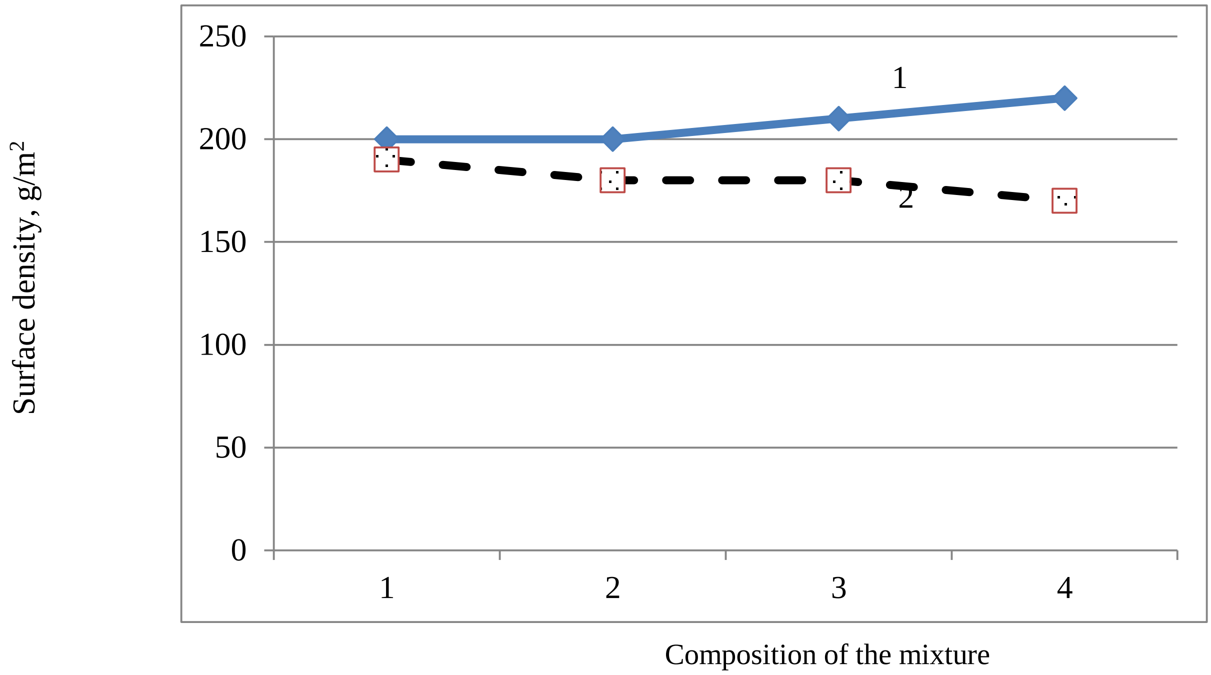
The bent areas of the threads protruding from the surface of the gauzes are the first to be eroded by friction. These areas are considered as the base surface of the gaskets, that is, the larger the base surface of the gaskets, the better its resistance to erosion. By strengthening the base surface of the gaskets, it is possible to increase its resistance to erosion. For this purpose, windings with a long coating (satin, satin), friction-resistant fibers (kapron, lavsan) or finishing processes (apreting) are used. Frictional deterioration of gaskets containing short fibers and especially synthetic fibers usually begins with pilling. Soft balls-pillars are formed from tangled fibers in the most frequently rubbed areas of the product. First, the ends of the fibers come to the surface of the gauze. Then, they get tangled up. When entangled, some fibers break out of the gauze structure. Later, the fibers in the cocoons break off from the surface of the gauze. As a result, the thickness of the gas is reduced and it is easily absorbed. One of the main indicators of gauze is that they do not wrinkle.

Under the influence of various technological processes in the textile industry, as a result of bending and compressive deformations, gauzes are wrinkled, that is, they form folds and wrinkles. Wrinkles and creases can be removed only with wet ironing. The non-creasing of gauzes depends on their fiber content, the thickness of the threads used in their structure, the type of cutting and finishing, and their density.

The non-creasing index of gauze is one of their negative properties. It spoils the appearance of the item. Easy-to-crinkle gauze wears out quickly, because it rubs a lot in places where it is bent and creased. Non-creasing of fabrics means that they resist creasing and return to their original shape after creasing.

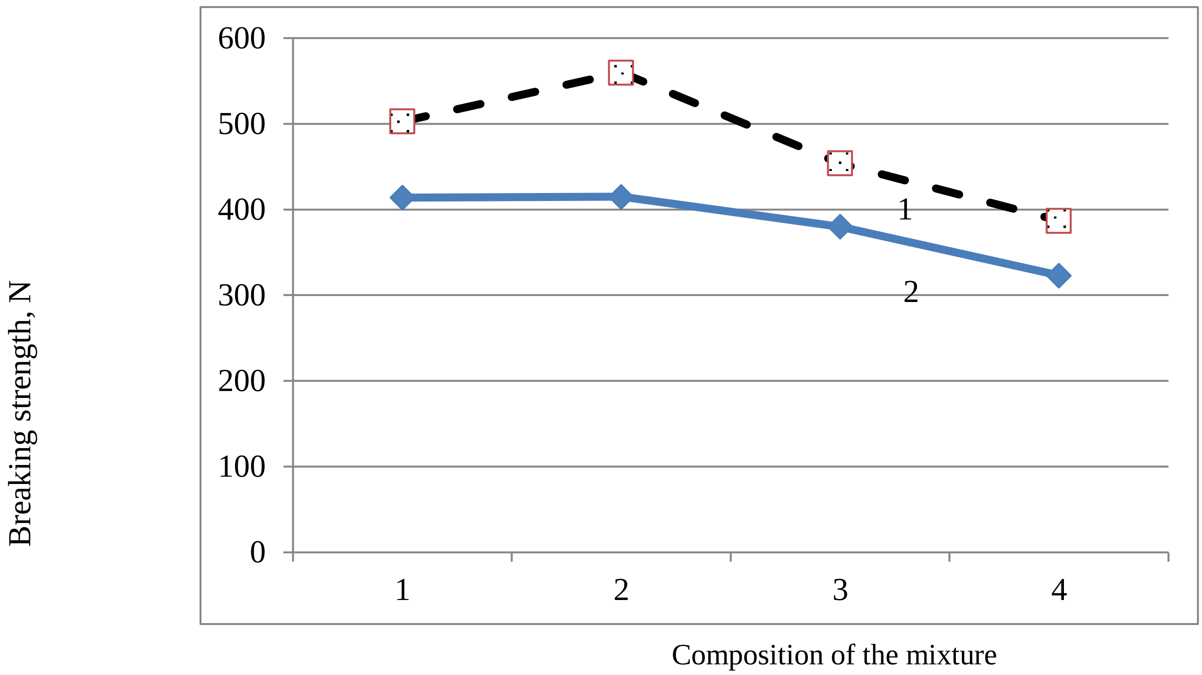
Research work was carried out to determine the technological indicators and mechanical properties of gasses. For him, 66.4% cotton fiber, 28.8% secondary fiber and 4.8% cotton fiber in 3 variants based on the scheme obtained from a mixture of 10% nitron, 60% cotton and 30% secondary fibers under production conditions and presented in the laboratory conditions on a carding machine.

a wick from a mixture of nitron fibers and a yarn yarn on a pneumomechanical spinning machine were produced and quality indicators were determined. The obtained research results are presented in Figures 1-4 below.



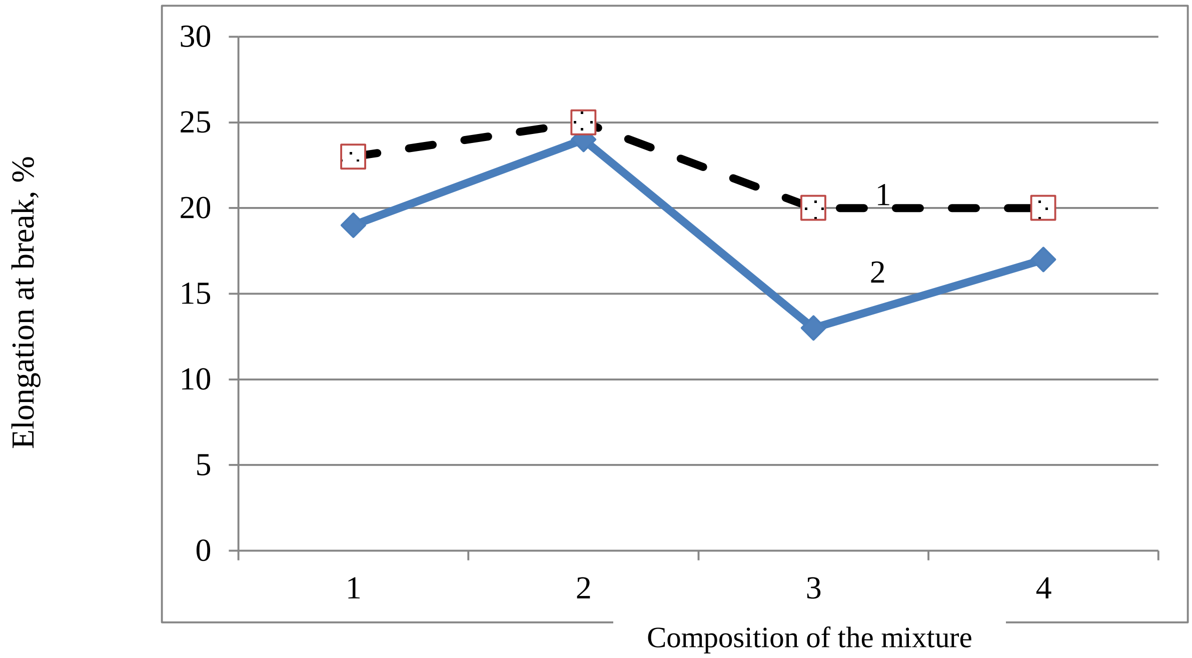
1- based; 2-by duck

Figure 1. Variation of the density of the gas obtained from a mixture of different composition and processed fibers in the direction of the body and the warp.



1- based; 2-by duck

Figure 2. Variation of the tensile strength of the yarn obtained from a mixture of different composition and processed fibers in the warp and weft direction.



1- based; 2-by duck.

Figure 3. Variation of the elongation at break in the warp and weft direction of the yarn obtained from a mixture of different composition and processed fibers.

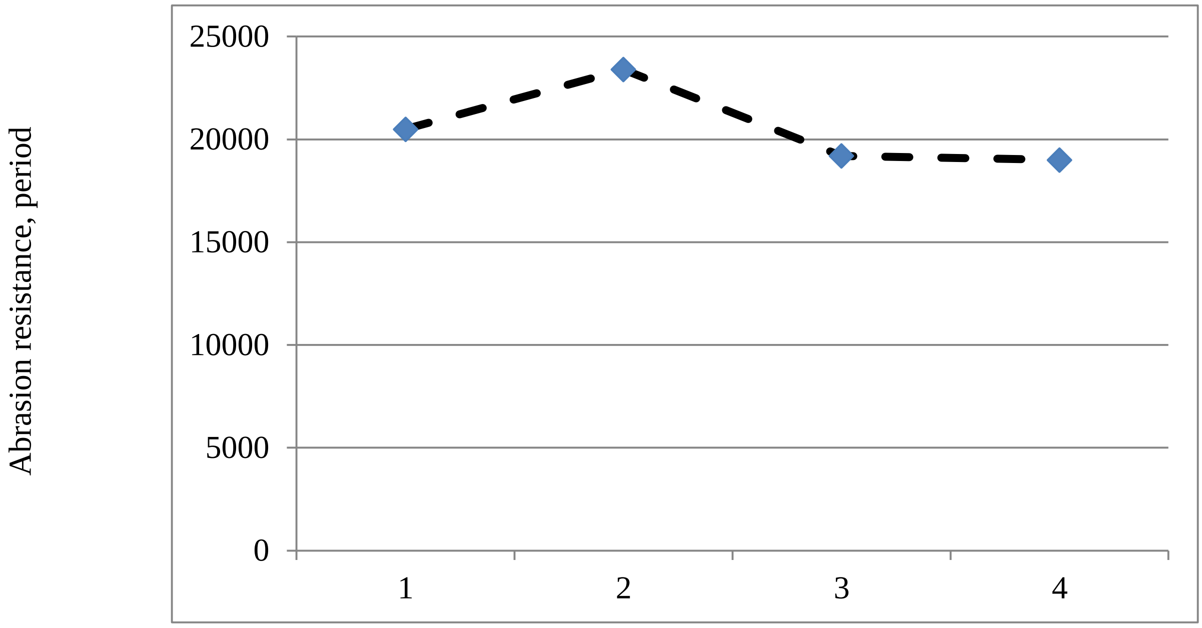


Figure 4. Variation of the friction resistance of gas obtained from a mixture of different composition and processed fibers.

If we compare the results of the research with the parameters of the gauze obtained from a mixture of 10% nitron, 60% cotton and 30% secondary fibers under production conditions, the density of the gauze obtained according to the 1st option did not change, the density of the gauze decreased by 5.3%, the tensile strength of the gauze was reduced by 5.3% by 0.3%, tensile strength by 10.2%, elongation at break by 20.9%, elongation at break by 8.0%, abrasion resistance by 12.4%, according to option 2 The density of the resulting gas increased by 4.8%, the density of the gas did not change, the tensile strength of the gas decreased by 8.2%, the tensile strength of the gas decreased by 9.7%, the elongation at break of the gas decreased by 31.6%. , the elongation at break by 13.1%, friction resistance decreased by 6.4%, the density of the gas obtained according to option 3 increased by 9.1%, the density by 10.5%, the tensile strength of the gas by 10.5% By 22.0%, tensile strength by 23.1%, elongation at break by 10.5%, elongation at break by 13.1%, abrasion resistance by 17.1%.

It has been proven that the parallelization of fibers in the outermost part of the piles in the process of adding piles in the braiding machine is better compared to other adding processes, and that it has a positive effect on all the quality indicators of the gas produced from it.

The results of the conducted research showed that the tensile strength of the gauze obtained according to the 1st option is from 0.3% to 10.2%, abrasion resistance is up to 12.4%, in production conditions of 10% nitrone, 60% cotton and 30% it was found that it increased compared to the indicators of the gas obtained from the mixture of secondary fibers.

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