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Change of the Mechanical Properties of the Gases Obtained from the Mixture of Fibers with Different Compositions

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ABSTRACT
in this article, 5000 tex pelts were made on the JFA-226 carding machine at the production enterprise, 3 types of pelts were made on the HSR-1000 type pelting machine in the laboratory of TTESI under the "Spinning Technology" department, JAT of the Japanese company "Toyota" in the laboratory under the "Textile Fabric Technology" department On the 810 loom, yarn made of 100% cotton fibers was thrown into the warp thread, and yarn mixed with secondary fibers was thrown into the loom yar.

KEYWORDS: *pilta, base surface of gasses, bulk density, bulk density, bulk tensile strength, bulk density, abrasion resistance, bulk tensile strength, bulk tensile strength.*

I. INTRODUCTION

With the development of scientific and technical progress in the world, the volume of production of various materials increases, and the amount of secondary material resources also increases. At the same time, as a result of the creation of waste-free technology in the textile industry, the consumer demand for raw materials will increase. As a result of effective use of such raw materials in production, the cost of the finished product will decrease.

When knitting production scraps are taken as yarn count, sock knitting scraps are up to 7%, underwear production scraps are 12-20%, outerwear production scraps are 15-20%.

Globally, fibers obtained from waste and secondary material resources from the sewing process make up 25% of all textile raw materials. This is a huge stock that can be used for production. However, only 10% of these scraps are used. Basically, they are processed into materials that cannot be used for various purposes, or they are made into simpler, lower-cost ropes, furniture and technical fabrics, for wiping and other purpose.

Increasing the competitiveness of textile products, optimizing the assortment and structural characteristics, as well as reducing the consumption of materials and the cost of raw materials, cannot be imagined. The rational and efficient use of textile and garment scraps and secondary material resources (IMR) received from the population and enterprises has a direct impact on the development and recovery of the local textile industry. Universal technologies and equipment developed on the basis of newly created or modernized existing aggregates and mechanisms used in textile production are of particular importance.

The increase in the standard of living of the population is achieved by the exponential growth of the gross domestic product at the expense of non-renewable natural resources. Only 2% of them are used as finished products, and the remaining 98% pollutes the environment in the form of secondary material resources. Therefore, urgent and drastic measures are needed to repeatedly reduce the consumption of non-renewable resources and environmental pollution.

The most important direction in this regard is the reuse of secondary material resources in production, which means obtaining a finished product that significantly reduces the use of natural resources and, as a result, environmental pollution. Because the amount of work and energy spent on processing secondary material resources is 2-3 times less than on primary production.

Modern technological equipment of light industry minimizes the release of harmful substances into the atmosphere during use, and some of them completely dispose of and recover production waste. However, these environmentally friendly technologies are very expensive (sometimes the price of cleaning devices is up to 25% of the product price), because. these networks have many additional devices, which require more human, material and energy costs and cannot fundamentally solve environmental problems.

The rational use of raw materials and material resources in the sewing and knitting industry is one of the main problems, and in solving them, not only enterprises, but also higher education sciences, scientists and specialists should actively participate in the creation of waste-free and low-waste technologies.

A large amount of waste is generated in the production of fabrics and products in the sewing and knitting industry. It depends on the assortment, the equipment used in weaving the canvas, the type of location and the organization of work on the normalization of fabric consumption. As a result of equipment malfunctions, insufficient care and skilled maintenance of machines, defects such as distortion of the pattern, the formation of piles of loops or enlarged loops, crooked rows of loops, defects such as wrong-colored weaving loop rows in jacquard fabrics, shift of rapport, formation of unaligned folds in combination woven fabrics appears.

The structure of textile fabrics is determined by the interweaving and connection of warp and weft threads. The appearance, properties and uses of textile fabrics depend on their 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 same density gauze, 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, abrasion resistance, and creasing resistance in the body and warp direction. 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 pulp increases, the resulting pulp becomes coarser and its hairiness increases.

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 the 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, fabrics are wrinkled as a result of bending and compressive deformations, 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.

II. METHODOLOGY

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 mixture of nitron fibers was produced in a wick and a pneumomechanical spinning machine, and its mechanical properties were determined. The results of the study are presented in Table 1 below.

Table 1. Changes in technological indicators and mechanical properties of gasses obtained from a mixture of different composition and processed fibers

т/р	Indicators	Made from a blend of 10% nitron, 60% cotton and 30% secondary fibers received	A mixture of 66.4% cotton fiber, 28.8% secondary fiber and 4.8% nitrone fiber was obtained according to the scheme of placing wicks in the braiding machine		
			1	2	3
1.	Density, pcs				
	based on	200	200	210	220
	by duck	190	180	180	170
2.	Surface density of gas, g/m^2	193,0	192,8	192,7	192,5

3.	The tensile strength of gassing, N				
	based on	414,0	415,0	380,0	323,0
	by duck	503,0	560,0	454,0	387,0
4.	Elongation of gas at break, %				
	based on	19,0	24,0	13,0	17,0
	by duck	23,0	25,0	20,0	20,0
5.	Abrasion resistance, cycle	20500	23400	19200	17000

III. RESULTS AND DISCUSSION

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%.

IV.CONCLUSION

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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