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The Influence of the Mixture of Fiber Composition and Secondary Material Resources on the Technological and Mechanical Properties of Fabric Intended for Special Clothing

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ABSTRACT

in this article, 66.4% cotton fiber with 27.0% viscose fiber+6.6% nitron fiber secondary material resources for hemp yarn, 66.4% cotton fiber with 27.0% lavsan fiber+6.6% nitron fiber secondary material resources, 66.4% cotton fiber with 27.0% nitron fiber+6.6% cotton fiber secondary material resources, 66.4% cotton fiber with 27.0% lavsan fiber+6.6% viscose fiber secondary material resources . 100% cotton fibers were used as a thread to produce sari weaves and their technological and mechanical properties were determined.

KEYWORDS: *secondary material resources, low-waste and zero-waste technologies, uneven texture, tensile strength, air permeability and abrasion resistance, elongation at break.*

I.INTRODUCTION

Currently, secondary material resources are generated in all types of light industrial enterprises. Such secondary material resources are generated in large quantities and are not accepted by the preparation and processing organizations, but are disposed of, which worsens the ecological situation of the country. Therefore, an important scientific and technical problem arises, which is the development of technological processes using textile secondary material resources.

The possibility of processing secondary material resources in production is relevant not only from the point of view of environmental protection, but also from the point of view of economic benefits, since secondary material resources are cheap raw materials.

Secondary material resources of textile production are the secondary material resources of technological processes for the production of fibers, yarns, fabrics and garments.

4-6% of the secondary material resources produced in the textile industry are thrown into landfills.

One of the promising directions for solving the global problem of reducing energy and material costs in the production of industrial products is the maximum use of secondary material resources. In this regard, it is important to introduce new resource-efficient technologies and scientific and technical achievements aimed at increasing the efficiency of the use of raw materials, new machines, low-waste and zero-waste technologies.

The rational use of textile waste is of great economic importance, since most of the fiber raw materials used in the Russian textile industry are imported from abroad. Ensuring complete recycling of textile industry and consumer waste into materials and products useful for society should be considered as the main task of scientific and technical development in the field of secondary resource

utilization. This helps to save primary raw materials while eliminating the negative impact of waste on the environment and obtaining maximum economic efficiency.

Currently, textile, chemical and light industries have accumulated large reserves of fiber production waste, which can be used for good purposes. As a result, the effective use of textile waste significantly reduces the negative impact on the environment associated with the production of fiber raw materials and waste disposal.

The assortment of fabrics with different amounts of returns produced in textile enterprises is different, and they differ from each other in their structure, fiber content and properties. In addition, these tissues are produced according to the season. Seasonal returns are produced from yarns obtained by the method of carding and re-combing of various textures.

II. METHODOLOGY

The structure of the tissue is determined by the interweaving and connection of the threads of the body and the yarn. The appearance, properties and purpose of the tissue depends on its structure.

One of the indicators representing the structure of tissues is density, and the second is their shearing. The density of the fabric is determined by the number of threads per unit of length, usually 100 mm. If the density of the fabric differs from one another in the body and the rib, the density of such a fabric is called uneven fabric. If they are equal to each other, the density is called uniform tissue. In general, the density of the tissue is greater than the density of the body. However, in some tissues it is the opposite.

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

The density of tissues varies depending on the purpose of their use. For example, as the density of the fabric increases, its tensile strength, air permeability and abrasion resistance increase. In addition, the fiber composition of the tissue has a different effect on its properties. Therefore, the technological indicators of fabrics obtained from yarns with different composition of secondary material resources were studied, and the obtained test results are presented in Table 1.

Table 1. The influence of the mixture of fiber and secondary material resources with different composition on the technological parameters of the fabric intended for special clothing

p/p	The fiber of the fabric composition	Density, n/dm		Surface density, g/m^2
		based on	by duck	
1.	Secondary material resources for based yarn is 100% cotton fiber and 66.4% cotton fiber with 27.0% viscose fiber + 6.6% nitron fiber for duck yarn	200	170	166,3
2.	Secondary material resources for based yarn is 100% cotton fiber and 66.4% cotton fiber with 27.0% lavsan fiber + 6.6% nitron fiber for duck yarn	200	170	165,8
3.	Secondary material resources for based yarn is 100% cotton fiber and 66.4% cotton fiber with 27.0% nitron fiber + 6.6% cotton fiber for duck yarn	200	170	166,5
4.	Secondary material resources for based yarn are 100% cotton fiber and 27.0% lavsan fiber + 6.6% viscose fiber with 66.4% cotton fiber for duck yarn	200	170	165,6

5.	Secondary material resources for based yarn are 100% cotton fiber and 66.4% cotton fiber with 27.0% viscose fiber + 6.6% lavsan fiber for duck yarn	200	170	166,0
6.	Secondary material resources for based yarn are 100% cotton fiber and 66.4% cotton fiber with 27.0% cotton fiber + 6.6% viscose fiber for duck yarn	200	170	166,4

The density of the tissue is important. The higher the number of threads in the fabric, the lower its air permeability, the higher the tensile strength and abrasion resistance. The density of the fabric depends on the season for which it is intended.

As can be seen from the results of the study, it was found that the density of the tissue in all variants is the same in the direction of the body and the back.

In addition, the physico-mechanical properties of the fabric intended for special clothing, obtained from a mixture of fiber and secondary material resources of different composition, were studied.

The mechanical properties of tissues include indicators such as breaking strength, specific breaking strength, elongation at break. The breaking strength of the fabric depends firstly on the fiber content and secondly on the finish. The strength of the fabrics depends on their fiber content, the structure and linear density of the forming threads, the type of weaving, density, and finishing.

Research work was carried out to determine the mechanical properties of tissues, and the obtained test results are presented in Table 2.

Table 2. Changes in the mechanical properties of the fabric intended for special clothing, obtained from a mixture of fiber and secondary material resources of different composition

p/p	The fiber of the fabric composition	Tensile strength of tissue, N		n tissue breakdown elongation, percentage	
		based on	by duck	based on	by duck
1.	Secondary material resources for based yarn is 100% cotton fiber and 66.4% cotton fiber with 27.0% viscose fiber + 6.6% nitron fiber for duck yarn	348,7	270,6	28,6	34,2
2.	Secondary material resources for based yarn is 100% cotton fiber and 66.4% cotton fiber with 27.0% lavsan fiber + 6.6% nitron fiber for duck yarn	421,0	377,3	31,7	44,76
3.	Secondary material resources for based yarn is 100% cotton fiber and 66.4% cotton fiber with 27.0% nitron fiber + 6.6% cotton fiber for duck yarn	312,6	265,5	26,4	30,2
4.	Secondary material resources for based yarn are 100% cotton fiber and 27.0% lavsan fiber + 6.6% viscose fiber with 66.4% cotton fiber for duck yarn	357,5	284,2	27,4	33,9
5.	Secondary material resources for based yarn are 100% cotton fiber and 66.4% cotton fiber with 27.0% viscose fiber + 6.6% lavsan fiber for duck yarn	367,8	280,8	28,8	35,7

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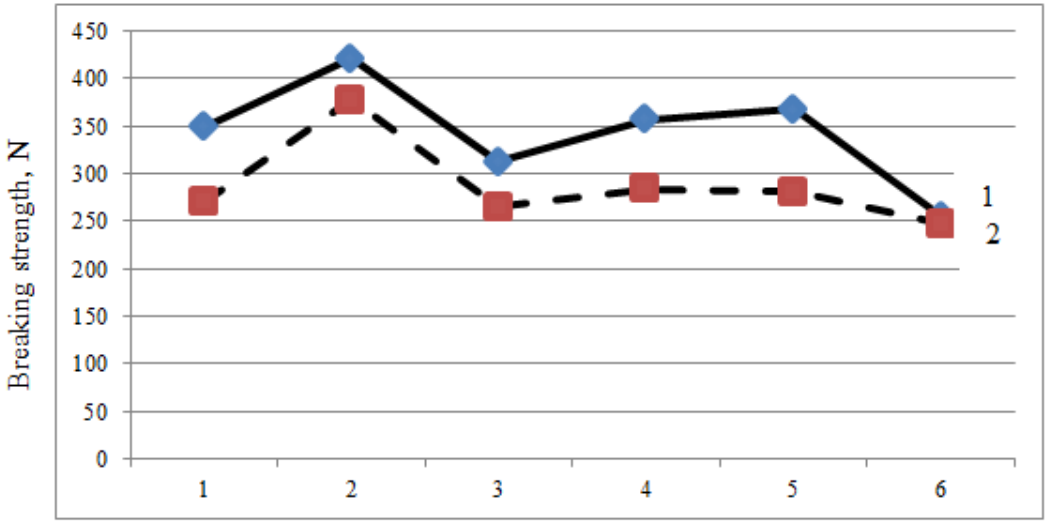
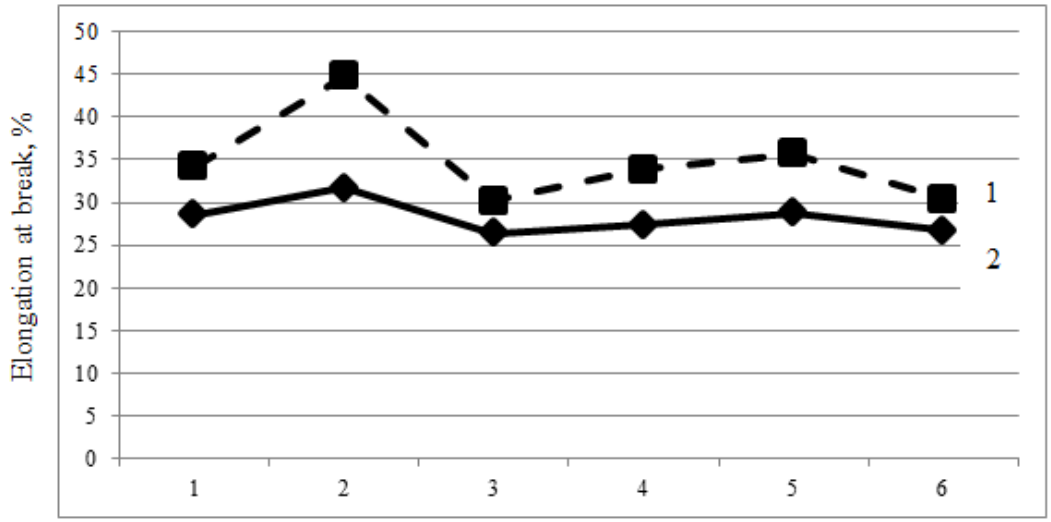
6.	Secondary material resources for based yarn are 100% cotton fiber and 66.4% cotton fiber with 27.0% cotton fiber + 6.6% viscose fiber for duck yarn	255,4	247,9	26,7	30,4

Based on the results of the research, the changes in breaking strength and elongation at break of tissues with different amounts of secondary material resources are presented in the form of graphs in Figures 1 and 2.



1- based on; 2- by duck.

Figure 1. Variation in warp and weft breaking strength of fabrics intended for special clothing, obtained from a mixture of fiber and secondary material resources of different composition.



1- based on; 2- by duck.

Figure 2. Variation of elongation at break along the warp and weft of special clothing fabrics obtained from a mixture of fiber and secondary material resources of different composition.

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III. RESULTS AND DISCUSSION

According to the results of the research, if we compare with the parameters of the tissue obtained according to the 1st option, the tensile strength of the tissue obtained according to the 2nd option is 12.7%, the tensile strength is 28.3%, and the elongation at break is 9.8%. , the elongation at break on the warp increased by 23.6%, the tensile strength on the warp of the fabric obtained according to the 3rd option decreased by 10.4%, the breaking strength on the warp by 1.9%, the elongation at break on the warp decreased by 7.7%, The elongation at break on the warp decreased by 11.8%, the breaking strength of the fabric obtained according to option 4 increased by 2.5%, the breaking strength on the warp increased by 4.8%, the elongation at break on the warp was 4.2%, the breaking strength on the warp increased by 4.2%. elongation decreased by 0.8%, the tensile strength of the fabric obtained according to option 5 decreased by 5.2%, the tensile strength by 3.4%, the elongation at break by 0.7%, the elongation at break by 4%, increased by 2% and the tensile strength of the fabric obtained according to option 6 increased by 26.8%, tensile strength by 8.4%, elongation at break by 6.7%, elongation at break by 11.1% decreased. It can be seen that the quality indicators of the fabric obtained from the mixture of secondary material resources with 66.4% cotton fiber and 27.0% lavsan fiber + 6.6% nitron fiber for the 100% cotton fiber linden yarn are higher than the quality indicators of the other options.

IV.CONCLUSION

From the analysis of the test results, it can be seen that the tanda yarn is obtained from the mixture of 66.4% cotton fiber and 27.0% lavsan fiber + 6.6% nitron fiber secondary material resources for 100% cotton fiber gin yarn, and the tanda yarn is 100% cotton fiber gin yarn. It was found that the tensile strength of fabrics obtained from a mixture of secondary material resources with 66.4% cotton fiber and 27.0% lavsan fiber + 6.6% viscose fiber is higher than that of other fabrics.

REFERENCES

1. Isaeva L.K. The effect of harmful and harmful ecological factors on the human body. Metrological aspects. - M.: VNIIPI. - 1997. - T. 1. – 510 s.
2. Urumova A.G. Ispolzovanie i pererabotka ugarov i vtorichnogo syrya v BNR // Tekstilnaya promyshlennost. - 1978. - No. 2. – S. 38-40.
3. Textile factories. - URL: http://recyclers. ru/modules/ section/item.php?itemid=190 (data processing: 10.03.2020).
4. Izmesteva L.K. Technology izgotovleniya shveinykh izdeliy. - M.: Legkaya industry, 1973. - 510 p.
5. Atanafasov Muhiddin Rakhmonovich, Ochilov To’lqin Ashurovich, Rahimjonov Husanboy Rahimjonovich “Turli tarkibli va qayta ishlangan tolalar aralashmasidan olingan piltaning notekislik ko‘rsatkichlarining o‘zgarishi” Innovative Development in Educational Activities, Volume 2, Issue 4, ISSN: 2181-3523, 2023.
6. Atanafasov M.R., Ochilov T.A., Usmonova Sh.A., Yuldashyev J.N., Hakimov Sh.H. Influence of Cotton Fiber of Different Composition and Secondary Material Resources on Single-Cycle Elongation Deformation of Yarns // International Journal of Innovative Research in Science, Engineering and Technology – India, Volume 11, Issue 2, February 2022. pp.1135-1137. (05.00.00; #8).
7. Ashurov Khasan To’lqin o’g’li, Usmonova Shakhnoza Anvarovna, Atanafasov Mukhiddin Rakhmonovich, Elmira Talgatovna Laysheva, Sobirov Doniyor Xolmurodovich “Evaluation of Mechanical Properties of Covered Fabrics from Different Secondary Material Resources”. International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET) 2021.

8. T.A.Ochilov, D.M.Isaeva, N.A.Niyazova, Sh.P.Shumkarova, T.G'. Bobomurodov. Changes in Technological Performance of Lastic Knitted Textiles in Different Range. International Journal of Advanced Research in Science, Engineering and Technology Vol. 7, Issue 9 , September 2020. P. 14846.
9. M.R.Atanafasov, T.A.Ochilov, R.X.Norboev, M.A.Mansurova, D.A.Khalmatov. Changes in the Uneven Indexes of Sliver and Threads by Different Technological Processes. International Journal of Recent Technology and Engineering, Volume-9 Issue-1, May 2020. P.2809.
10. T.A.Ochilov, B.B.Akhmedov, T.A.Toyirova, Sh.S.Mengnarov, J.T.Xasanov. Influence of Separating Fibrous Seed Mass to Fractions to Quality. International Journal of Recent Technology and Engineering, Volume-9 Issue-1, ay 2020.p.200.
11. Akhmedov Bakhodir, Akbarov Rustam, Ochilov Tulkin Ashurovich, Umirova Robiyakhan Bakhtiyarovna. Changes in the physical and mechanical properties of shirt fabrics with different fiber content. Proceeding of International Conference on Research Innovation In Multidisciplinary Sciences, 2021 Hosted From New York USA.p.227.