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Comprehensive Evaluation of Ergonomic Properties of Non-Woven Fabrics

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ABSTRACT: The article is about samples of cotton fiber and silk waste from the carding machine at the spinning mill were taken 100% cotton fiber, 50% cotton fiber, 30% silk, 20% mulberry bark waste, 70% cotton fiber 15% silk, 15% mulberry bark waste, 75 % cotton fiber, 10% silk, 15% mulberry tree bark waste fiber mixtures were produced on the AChV-3 equipment by non-woven fabrics by the weaving method and their ergonomic properties were comprehensively evaluated.

KEY WORDS: comprehensive assessment, objective assessment, physical and mechanical properties.

I.INTRODUCTION

The assessment of the quality of non-wovens and other types of products will be based on the results obtained in the determination and measurement of its quality indicators, as well as its comparison with the standards and regulations. This is because the methods for determining product properties will be detailed in the standards and other normative documents [1].

Non-woven fabrics are often used for technical purposes. In our research work is recommended to be used as a layer between the vest clothes of young children. Therefore, our purpose is conducting a comprehensive assessment of the ergonomic properties of non-woven fabrics.

The advantage of a complex assessment of the ergonomic properties of non-woven fabrics is that when determining the surfaces from the test results obtained, it can be clearly seen that the fabric with a large surface area is good. Therefore, this method is now widely used. There are several methods of assessing the quality of non-wovens, including experimental, organoleptic, expert, sociological, calculated, differential, complex and mixed [2].

The method of complex quality assessment - the work of joint assessment of the material on individual indicators of quality sometimes leads to the need for a general assessment of several complex key properties of a material in a single indicator. As a result, this is called a general assessment of the quality of textile materials, for example, the number of raw materials of flax fiber, the quality of homogeneous wool and so on [3].

The dependence of product quality indicators on the nature of the complex assessment is divided into actual and approximate complex assessment.

True complex assessments have a defined physical purpose, which often represents the spinning ability of the fiber, as well as the service life of the item in use. A true complex assessment is better than any continuous approximate assessment. For example, the amount of defects and waste in the composition of cotton fiber is called the true complex property.

The advantage of a complex assessment is that it concludes on a number of final assessments. This assessment is not without its advantages as well as its disadvantages, so we do not have complete information about its individual properties. In order to choose the right raw material, it is necessary to know the rational use of the material during the management and use of the technological process. It should be noted that the initial properties of this or that material can have a positive impact on the quality of the product and a negative impact on the movement of the technological process.

The thinner the fiber, the higher the relative strength and unevenness of the yarn made from it, and the smoother its appearance. It should be unforgettable in mind that a comprehensive assessment of this or that quality can be obtained from different calculations of individual quality indicators.

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The average complex assessment on the level of many quality indicators may not change, some of them may be low, some may be high. Thus, it is possible to complete the complex assessment without changing the individual quality indicators of the material. There are various methods of complex assessment of quality indicators of non-woven fabrics. For example, n index is given a differential dimensionless value for m material on the indicator n, and is evaluated by the significance coefficient if it has different significance coefficients.

In order to recommend the most optimal options on the indicators of geometric, physical, physico-mechanical properties obtained in our research work, we use the graphical method of complex evaluation. The advantage of this method is that at the same time it is possible to objectively evaluate the most optimal options of generalized quality indicators of the properties of the requirements for materials.

II. SIGNIFICANCE OF THE SYSTEM

From the test results obtained to determine the ergonomic properties of non-woven fabrics with different fiber content, a comprehensive assessment of air permeability, tensile strength, surface density, thermal conductivity was carried out and shown in Figure 1.

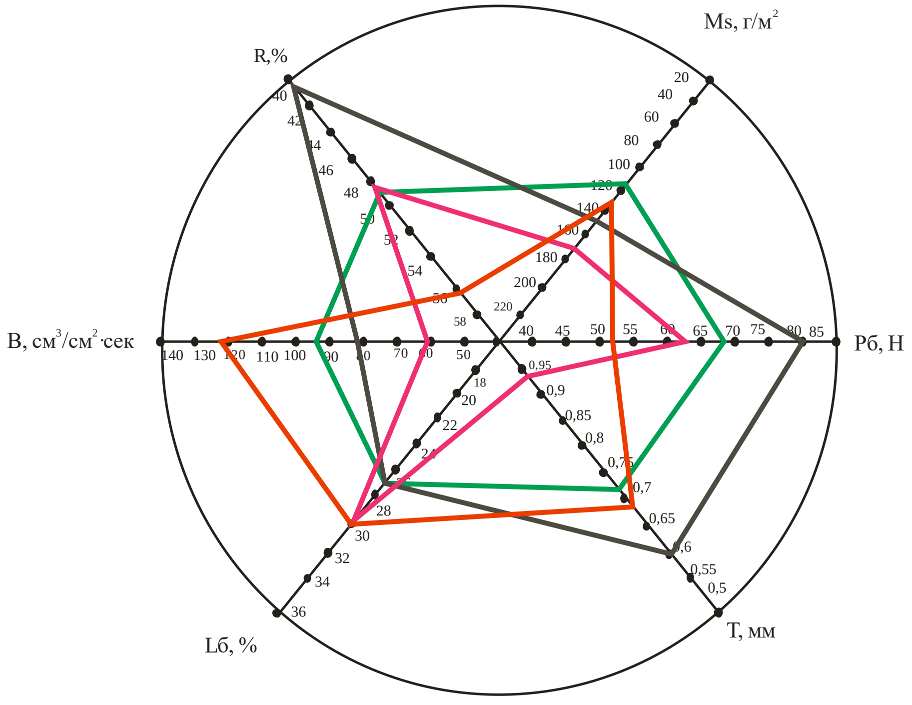
The polygons are plotted on the axes or the decreasing values are marked on the appropriate scales using radius vectors from the center (m) on the properties for evaluation.

In the distribution of axes should be taken into account the intended function of the material, physical and mechanical properties, the conformity of the accuracy to the established standards. For example, the radius vectors are determined by the surface density, longitudinal and transverse density from the center, toughness, air permeability, elongation at break.

The resulting polygons are divided into triangles, and the variants based on their surface and property indicators are the sum of the surfaces of the triangles.

$$S_{\Delta} = \frac{1}{2} ab \sin \alpha \qquad (1)$$

where: a, b are the dimensions of the radius-vectors of the triangle, mm; -angle between radius vectors.



I		II	
III		IV	

Figure 1. Diagram of complex assessment of quality indicators of non-woven fabric.

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III. LITERATURE SURVEY

After a comprehensive evaluation of the study results obtained from the determination of the ergonomic properties of non-woven fabrics with different fiber content, their surfaces were determined and the results are presented in the form of a histogram in Figure 2.

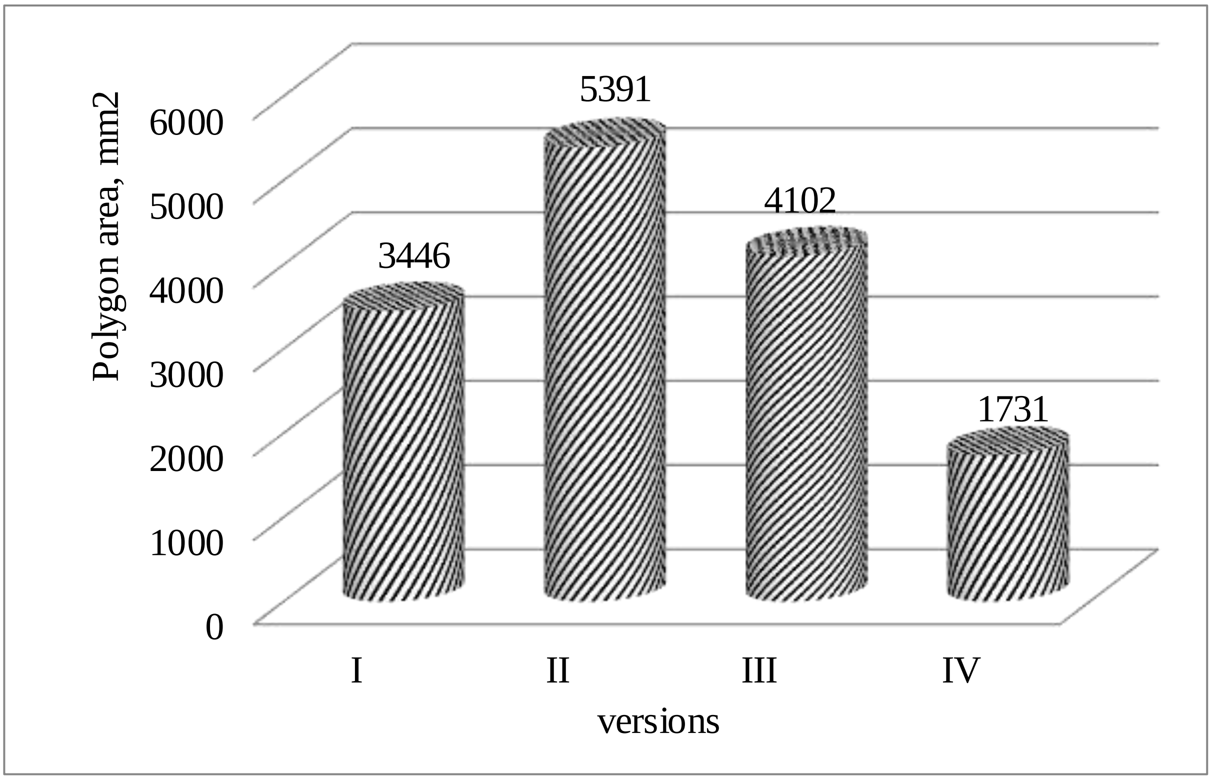

Figure 2. Comparative histogram of quality indicators of non-woven fabrics.

IV. EXPERIMENTAL RESULTS

The comparative histogram of non-woven fabrics shows that the surface of non-woven fabric obtained from 100% cotton fiber waste is 3446 mm2, the surface of non-woven fabric separated from 50% cotton fiber 30% silk 20% mulberry bark, the surface area is 5391 mm2% cotton fiber, 15% silk, 15% non-woven fabric extracted from mulberry bark. Ergonomic surface area of 4102 mm2, 75% cotton fiber, 10% silk, 15% mulberry bark non-woven fabric ergonomic the surface area was 1731 mm2.

REFERENCES

1. Non-woven textile fabrics: Reference manual/E.N. Bershev, G.P. Smirnov, B.V. Zametta, Yu.P. Nazarov, V.N.Korneev.-M.: Legprombyt-publ., 1987. - 400 s

2. A.P. Sergeenkov, T.V. Sukhova. Analysis of causal relationships in the manufacture of canvas stitches // Izv. Universities., Technology of textile industry. -2010, No. 23, p. 78-82.

3. G.L. Barabanov, V. M. Gorchakova and others. Laboratory workshop on the technology of non-woven materials: Textbook. M .: Legprombytizdat, 1988 - 416 p.