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# COMPREHENSIVE ASSESSMENT OF TWO-LAYER KNITTED FABRICS


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**Abstract**: This article provides a comprehensive assessment of the quality indicators of 6 samples of knitted fabric processed on the "WONDERFULL" knitting machine, and also proposed for the production of the best samples.

**Keywords:** element, two-layer, funny, complex assessment, histogram, triangles, radius vectors, physics-mechanical, raw materials, properties.

**Introduction.** Making full use of modern technologies in textile and sewing-knitting enterprises of our republic, changing the structure of knitted fabric and expanding the assortment of competitive knitted products is one of the urgent problems of today.

Analyzing the structure of knitted fabrics without knowing their full composition, including various elements.

In order to positively solve the above-mentioned problems and fully use the capabilities of knitting machines in knitting enterprises, methods of obtaining two-layer knitted fabrics of a new structure have been developed.

6 variants of two-layer knitted fabrics of the new structure were knitted on a 5-7 class flat needle knitting machine manufactured by WONDERFULL, China.

**Methods of researching.** Acrylic 35/2 (28.5∗2) thread was used for knitting samples of new two-layer knitted fabrics. Two independent layers are combined in a mixed way. Samples differ from each other in the pattern and elements of the fabric composition.

In order to study the influence of the technological parameters and physical-mechanical properties of two-layer knitted fabrics, the technological parameters and physical-mechanical properties of 6 variants of the knitted fabric samples obtained by the

mixed method were tested using the modern equipment available in the testing laboratory in Nam TSI Koshi. was determined and analyzed experimentally.

By changing the pattern and composition of knitted fabrics, the hardness of the fabric allows to obtain knitted products with a beautiful appearance [1].

A number of factors are important in choosing the best options for newly woven two-ply knitted fabrics. Therefore, in order to compare the obtained experimental results, the method of constructing a comprehensive evaluation diagram and a comparison histogram of two-layer knitted fabric indicators was chosen (Figures 1, 2).

In the comprehensive evaluation chart, the best option is the pattern with the largest contour on the chart, that is, the closer the contour is to the outer line, the higher the quality indicator of the knitting pattern.

**Research results.** Physico-mechanical properties of woven options and raw material-saving indicators are presented for analysis. For example, surface and volume density, deformation and abrasion resistance are such indicators [2].

The construction of a complex evaluation polygon for the quality indicators of two-layer knitted fabric consists of successively combining the separated points of the radius-vectors describing each of its properties.

To find the area of a polygon, the sum of the areas of the triangle is calculated, where the radius vectors divide the polygon into triangles.

The area of each triangle is determined by the following formula.

$$S = \frac{1}{2} \cdot a \cdot b \cdot \sin \alpha \ , \%$$

Here: a, b are the radius vectors forming the triangle, a is the angle between the radius-vectors.

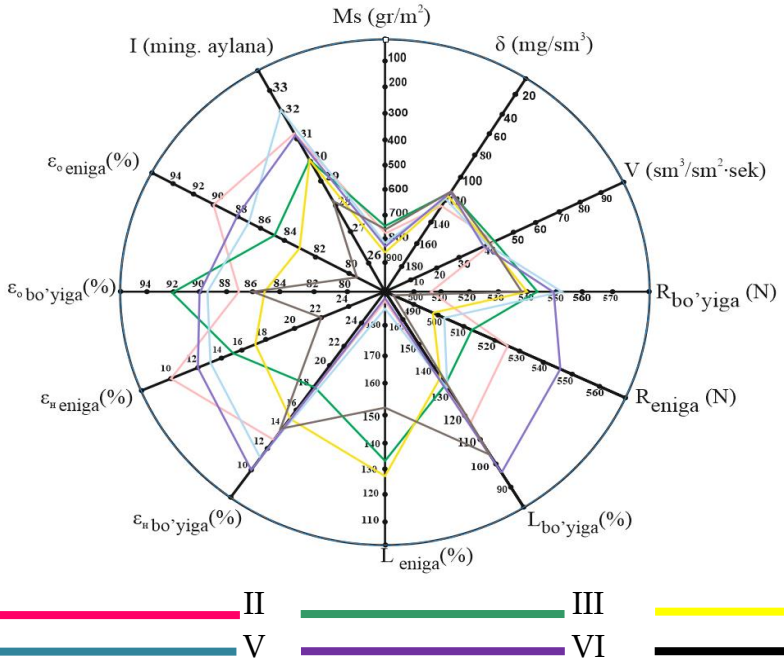


**Figure 1.** Diagram of comprehensive assessment of quality indicators of double-layer knitted fabric.

A comprehensive evaluation of the quality indicators of two-layer knitted fabrics woven from acrylic yarn and comparative histograms revealed that the best option samples are the II option sample (6322 mm²), the IV option (6310 mm²) and Variant sample was found to be (6390 mm²).

**The discussion of the results.** By using the above method of forming knitted fabric structure, new types of knitted fabrics with different patterns and mixed fabrics with different physical and mechanical properties were developed to produce high-quality two-layer knitted fabrics with low consumption of raw materials. [3-4].

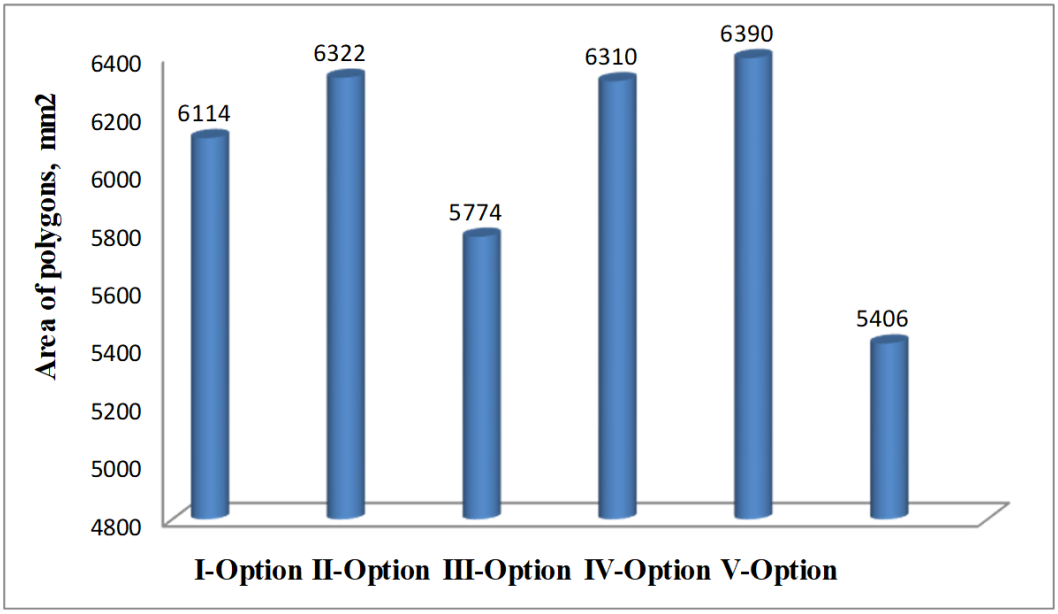


**Figure 2.** Comparative histogram of quality indicators of two-layer knitted fabrics.

Conclusion. According to the results of the experimental test, 6 variants of two-layer knitted fabric with a new structure were knitted on a 5-7 class flat needle knitting machine manufactured by WONDERFULL, China. as a result of the analysis, options II, IV and V of two-layer knitted fabric were found to be the best samples and recommended for production.

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