

**ANALYSIS OF TECHNOLOGICAL INDICATORS OF TWO-LAYER KNITTED FABRICS USED
ON FLAT FANG MACHINE**

**YASSI FANG MASHINASIDA ISHLAB CHIQLIGAN IKKI QATLAMLI TRIKOTAJ
TO'QIMALARINING TEXNOLOGIK KO'RSATKICHLARI TAHLILI**

**АНАЛИЗ ТЕХНОЛОГИЧЕСКИХ ПОКАЗАТЕЛЕЙ ДВУХСЛОЙНЫХ ТРИКОТАЖНЫХ
ТКАНЕЙ, ИСПОЛЪЗУЕМЫХ НА МАШИНЕ С ПЛОСКИМ КЛЫКОМ**

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Annotatsiya. *Ushbu maqolada yassi fang mashinasida ishlab chiqilgan ikki qatlamli trikotaj to'qimalarining texnologik ko'rsatkichlari o'rganish maqsadida ikki qatlamli trikotaj to'qimasining 6 ta variant namunalari to'qib olingan hamda ularning texnologikxususiyatlari tahlil qilingan.*

Annotation. *In this article, with the aim of studying the indicators of the physical and mechanical properties of two-layer knitted weave, 6 variants are formed on a flat-dry machine, and the resulting analysis of their technological properties.*

Аннотация. *В данной статье с целью изучения показателей физико-механических свойств двухслойного трикотажного переплетения по пученной на плоско-вяльной машине образцу 6 вариантов, а полученные проанализированы их технологических свойств.*

Kalit so'zlar: *yassi, ko'rsatkich, texnologik, orqa qatlam, old qatlam, hajm zichligi, xot ashyo, gorizontal bo'yicha zichlik, vertikal, gorizontal.*

Key words: *flat, indicator, technological, back layer, front layer, volume density, raw material, horizontal density, vertical, horizontal.*

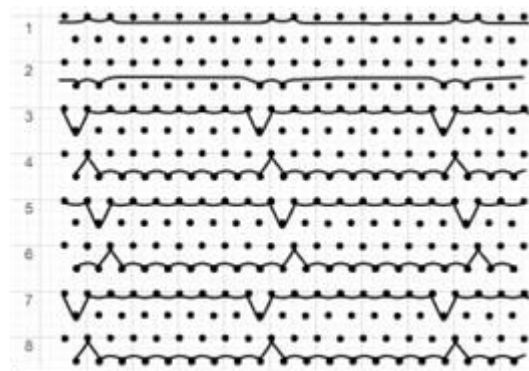
Ключевые слова: *плоский, индикаторный, технологический, задний слой, лицевой слой, объемная плотность, сырье, горизонтальная плотность, вертикальная, горизонтальная.*

To expand the range of knitted fabrics based on new structures, six variants of double-layer knitted fabric structure were developed with the aim of enhancing the technological capabilities of the Long Xing brand (China) flat needle knitting machine. The developed variants of double-layer knitted fabrics are created using the main yarn for connecting independent layers, differing from each other in pattern, rapport, and properties. The technological indicators of the double-layer knitted fabric were determined experimentally in the laboratory of the Namangan Institute of Textile Industry, and the measurement results are presented in Table 1.

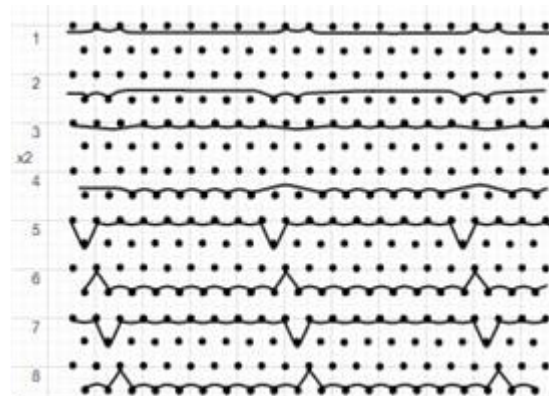
The technological indicators of the knitted fabric include: surface and volumetric density, width, density in length (number of loops per unit length), length of loop yarn, the angle at which rows and columns of loops intersect, and the thickness of the knitted fabric. The graphical representation of the produced double-layer knitted fabric is presented in Figure 1. Acrylic yarn was used for knitting the samples 1-2.

A blended fabric was used to combine the front and back layers during the knitting and patterning processes (Variants I-II-III-IV-V-VI).

Option 1



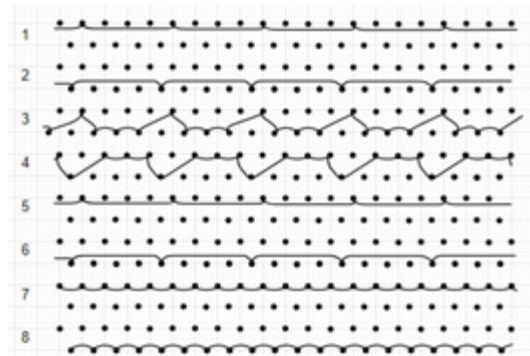
Option 2



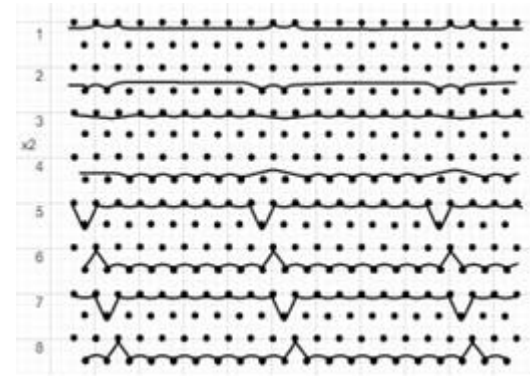
Option 3



Option 4



Option 5



Option 6

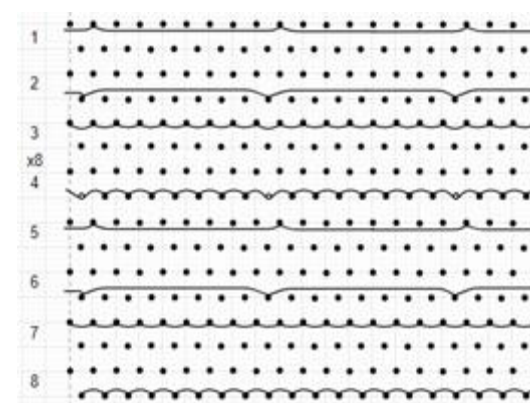
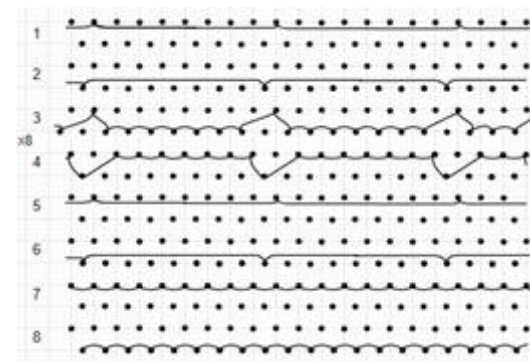


Figure 1. View and graph of two-layer knitted fabric
Technological indicators of two-layer knitted fabric

Table 1

Indicators		Options					
		I	II	III	IV	V	VI
Type of thread, line density	Back layer	Acrylic yarn					
	Front layer						
Ring pitch A (mm)	Back layer	2,6	2,7	2,9	3,3	2,7	2,9
	Front layer	2,7	2,7	3,6	2,9	3,3	2,9
Ring row height B (mm)	Back layer	1,92	2	2	2,08	2,1	2,08
	Front layer	2,1	2,08	2,27	2,1	2,27	2,08
Horizontal density (number of rings)	Back layer	19	18	17	15	18	17
	Front layer	18	18	14	17	15	17
Vertical density (number of rings)	Back layer	26	25	25	24	23	24
	Front layer	23	24	22	23	22	24
Loop thread length L (mm)	Back layer	9,1	9,7	10,9	12,8	9,2	9,6
	Front layer	9	8,8	13,3	11,5	11,4	10,3
Knitted surface density Ms (gr/m ²)		785	781	872	809	844	789
Knitting thickness T (mm)		6,4	6,6	7,3	6,7	7,2	6,6
Bulk density d (mg/cm ³)		122,6	118,3	119,4	120,7	117,2	119,5

One of the most important indicators among the technological indicators is volumetric density. The volumetric density in the obtained samples ranged from 117.2 mg/sm³ to 122.6 mg/sm³ (Table 1).

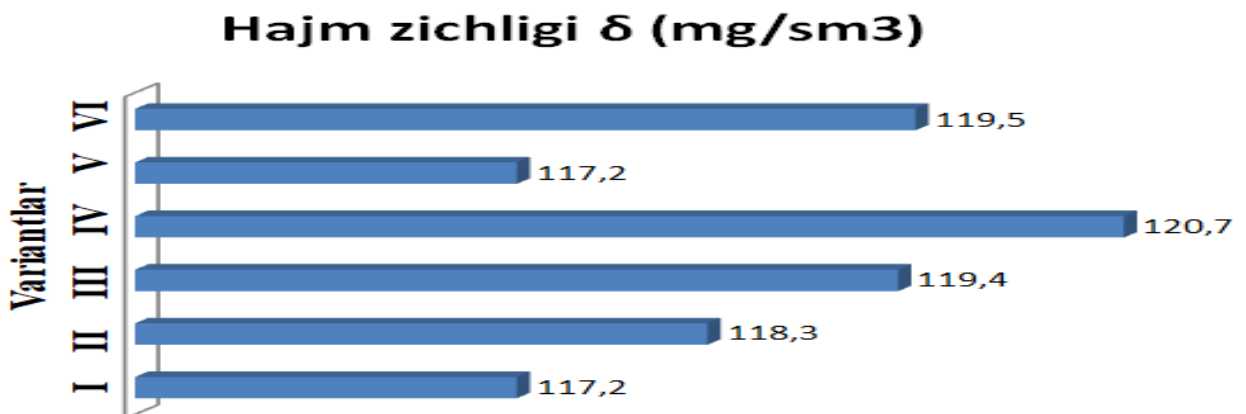


Figure 2. Changes in the volumetric density of a double-layer knitted fabric

With the change in surface density of the knitted fabric, its thickness and other physical-mechanical properties change as well 3.

To understand the raw material consumption for the knitted fabric, its volumetric density was analyzed. In the production of variant V of the double-layer knit, the raw material consumption is 4.4% lower compared to variant I. The highest volumetric density was observed in the base fabric, with a value of 122.6 mg/sm³.

In the samples taken, a raw material composition of 35/2 (28.5*2) acrylic yarn was used for all variants.

By using various elements in the weaving of fabrics, efforts have been made to produce new types of blended knitted fabrics.

It has been found that the loop step of the knitted fabric has increased by 10-20% compared to the base fabric. The height of the loop rows increased in the range of 5-10%.

The thickness of the fabric has been observed to increase by 4-12% compared to the base fabric.

According to Table 1, the horizontal density is P_g , and the vertical density is P_v . In the base fabric, the horizontal density of the back layer P_g consists of 19 loops, while the front layer density P_g consists of 18 loops. The vertical density of the front layer P_v consists of 23 loops, and the back layer has 26 loops. The horizontal density of the front layer P_g consists of 15-17 loops, indicating a decrease of 5-20% compared to the base fabric.

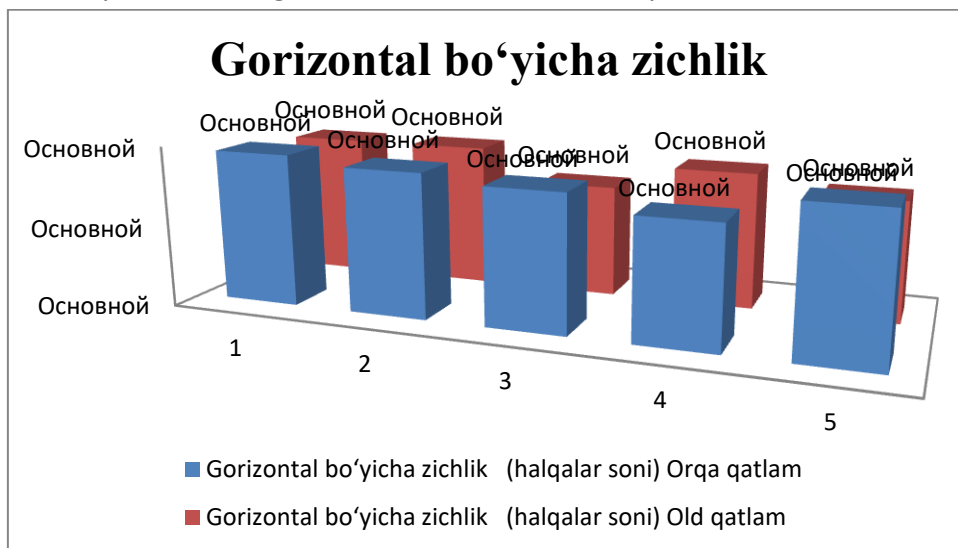


Figure 3. Histogram of horizontal density change

The fabric thickness was 6.4 mm for Variant I, 6.6 mm for Variant II, 7.3 mm for Variant III, 6.7 mm for Variant IV, 7.2 mm for Variant V, and 6.6 mm for Variant VI. It has been determined that the thickness has increased by 3-14% compared to the base sample. The technological indicators of the newly produced two-layer knitted fabrics were studied, and they are recommended for the production of outerwear⁴.

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