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Comprehensive Quality Assessment and Forecasting the Properties of Press Weaving Knitting

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ABSTRACT: The article presents the results of the influence of the number of press loops on the physics and mechanical properties of plush knitted fabric.

KEYWORDS: dimensional stability, heat-shielding properties, press weave, circular knitting machine, surface density, press sketches, air permeability, breaking load, breaking elongation.

I. INTRODUCTION

The development of knitwear production is due to the increasing demand for knitwear every day. An important indicator of the quality of knitwear for outerwear is its dimensional stability, which is usually understood as the ability of knitwear to restore its original shape during relaxation after deformations.

Among the knitted fabrics that are successfully used in the manufacture of outerwear, warm underwear, children's products, as well as products for technical purposes, plush fabrics with improved heat-shielding properties are of particular interest.

The quality indicators of plush jersey largely depend on the weave on the basis of which it is developed, and in order to obtain plush jersey with the desired properties, it is enough to choose the right base weave. Therefore, it is advisable to study the parameters and properties of the base weave. The developed samples of plush knitwear are made on the basis of a double-sided surface with a different content of press weave elements in the rapport [1].

One of the most pressing problems in the knitwear industry is to ensure the rational use of raw materials and, at the same time, the quality of the products must meet international standards.

II. METHODOLOGY

Samples of the recommended fabrics were knitted on a Class 10 SPG circular knitting machine. Cotton yarn with a linear density of 18.5 tex x4 was used as a ground thread.

The parameters and properties of knitwear have been determined. Samples of knitwear were tested according to the standard method in the laboratory "CENTEXUZ" at TITLP. The results obtained are listed in table.

The most important characteristic of a knitted fabric is its surface density. The increase in the surface density of press knitwear on the basis of a two-out weave, in comparison with the base one, is explained by the fact that the area of the

press knitwear, in comparison with the area of the base one, decreases, since the press sketches do not participate in the increase in its area.

A change in the number of press loops in the rapport of the weave of double-sided knitwear affects not only the technological parameters, but also affects the physical and mechanical properties of the knitwear.

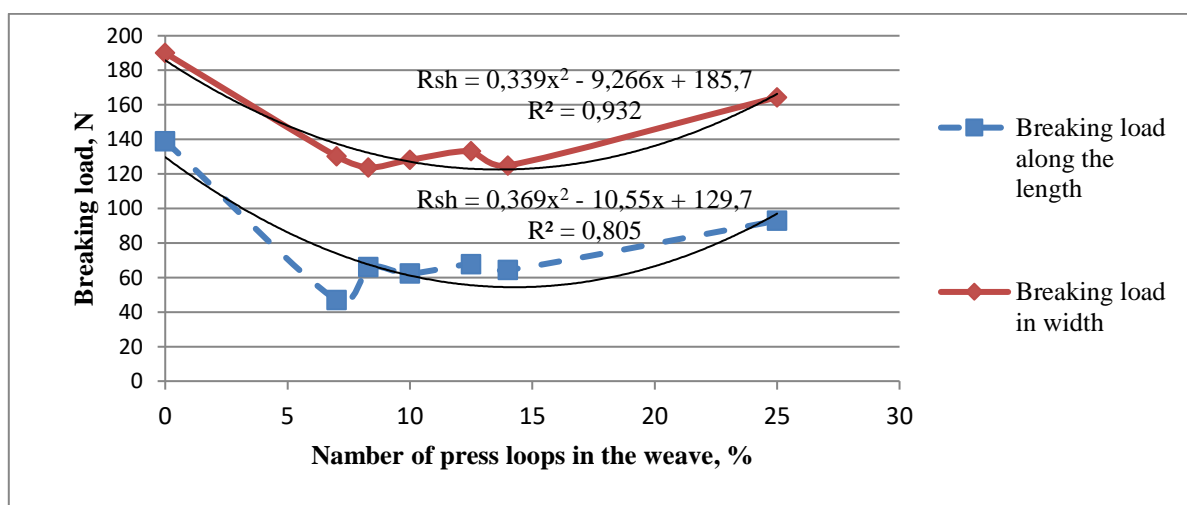
The study of the properties of samples of knitted fabrics of press weaves of various options showed that the magnitude of the tensile force applied to each loop depends on the number of loop elements involved in breaking.

Table 1

Variants	Number of press loops in weave,%	Breaking load, N		Breaking elongation, %		Air permeability, sm ³ /sm ² sek	Elongation, %	
		vertically	horizontally	vertically	in width		vertically	horizontally
1	0	190	139	103,78	141,1	210	-1	-1
2	7	130,2	46,93	55,7	151,2	223	-2	+2
3	8,3	123,7	65,99	55,3	161,6	235	-2	+2
4	10	128,1	62,39	44,77	162,3	247	-1	+ 1
5	12,5	133,2	67,75	52,27	164,1	254	-1	+ 1
6	14	124,9	64,36	46,5	165,2	268	-2	+2
7	25	164,4	92,92	41,27	183,7	273	-2	+2

The samples of press knitted fabrics developed by us on the basis of two-out weave were tested according to the standard method [2].

The results obtained were entered in Table 1, and graphs of the dependence of the strength of press knitwear in length and width on the number of press loops in the weave repeat were plotted (pic. 1).



Picture 1. Dependence of the strength of press knitwear on the basis of a double-sided weave in length and width on the number of press loops in the weave repeat

As can be seen from the graph, with an increase in the number of press cuts in the weave repeat, the strength of the double-sided knit in length and width decreases.

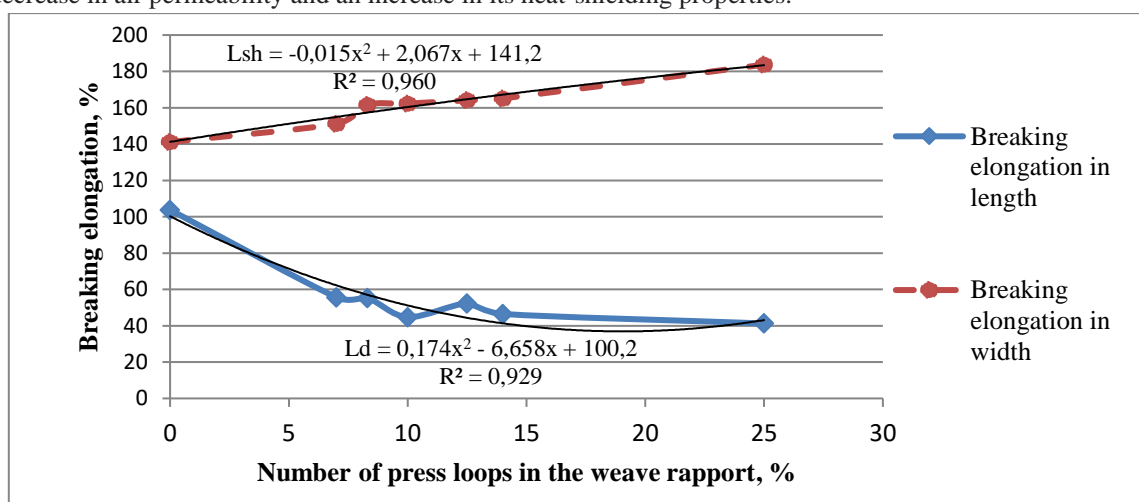
Obviously, the highest breaking load along the length is possessed by the I-variant of double-sided knitwear, which is due to the absence of press sketches in its structure, since in press knitwear based on a double-sided weave, the tensile force, first of all, is resisted by loop stitches with press sketches, and in the second looped posts with regular loops formed from ground thread.

The strength in width of a plush jersey across a row of non-press sketches is almost 2.5 times higher than knitwear with a 25% content of press sketches.

Changes in the stitch structure of knitwear due to an increase in the content of press sketches in its rapport also affect other properties - extensibility, breathability and shrinkage.

Analysis of the deformation capacity of knitted fabrics of press weave of various options showed that with an increase in press sketches in the repeat of the weave, the extensibility of the knitted fabric increases in length and decreases in width.

An increase in the number of press loops in the weave repeat causes an increase in the porosity and air permeability of the fabric. This leads to an improvement in the hygienic properties of knitwear, and, on the other hand, to a decrease in air permeability and an increase in its heat-shielding properties.



Picture 2. Dependence of the stretchability of press knitwear on the basis of a double-sided weave in length and width on the number of press loops in the repeat of the weave

An increase in the number of press loops in the weave repeat causes an increase in the porosity and air permeability of the fabric. This leads to an improvement in the hygienic properties of knitwear, and, on the other hand, to a decrease in air permeability and an increase in its heat-shielding properties.

Analysis of the air permeability of knitted fabrics of various options (table 1) showed that with an increase in the number of press sketches in the weave repeat, the air permeability of the fabrics increases.

The calculated values of the air permeability of fabrics of various samples practically coincide with their experimental values obtained as a result of testing knitwear.

One of the most important properties of knitted fabrics during the period of operation of products is their shrinkage, that is, a change in linear dimensions under the influence of atmospheric moisture, during wetting, washing, chemical treatment [3].

The main reasons for knitted fabric shrinkage are the reverse relaxation process of fiber swelling. In the process of knitting, residual internal stresses are created in the threads forming the loop. These stresses arise even during



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the formation of threads, then, in the processes of knitting and especially during dyeing and finishing, where the knitwear is constantly stretched along the length in the wet state and fixed in a stretched form in dryers - it occurs mainly along the length.

Studies of the shrinkage process in prototypes showed that in them this value, along the length, ranges from 1 to 2%. Control measurements of knitted fabrics showed that the opposite process takes place here - the width of the fabric increases to 2%.

III. RESULTS AND DISCUSSION

The work carried out on the analysis of the quality of knitted fabrics containing a different number of press loops revealed the optimal technology, in which the best quality is achieved with the maximum saving of raw materials.

To identify such technology options, it is necessary to take into account a large number of factors that form the structure and properties of the canvases, therefore, for the processing of statistical data, we used a method that allows us to identify better quality options based on the total area of the constructed polygon.

The construction of a complex diagram for assessing the quality of knitted fabrics consists in the sequential connection of points laid down on the radius vectors that characterize each of the properties.

Radius vectors characterizing properties that have a positive effect on the quality of the canvas are directed towards the center of the diagrams, and negative ones - from the center. Consequently, the most economical technology to produce a high quality canvas will have a minimum area.

To construct diagrams and calculate the areas of the polygon, the results of testing the properties of knitted fabrics, given in the summary tables, were used [4].

IV. CONCLUSION

Comparing the obtained results with each other, we can conclude that in the production of kulirny knitwear, a resource-saving weave is a double-sided knitwear containing 25% of press loops in the weave repeat

REFERENCES

- [1]. Mukimov M.M. Knitting technology. Uzbekistan, 2002.
- [2]. Torkunova Z.A. Knitwear tests. Moscow: Light Industry, 1985
- [3]. Hanhadjaeva N., Mukimov M "New Knitting Fabric Structure Made on Flat-Bed Knitting Machine" The Second International Symposium on Educational Cooperation for "Industrial Technology Education" 4.07-6.07. pp. 353-364,2008.
- [4]. Shustov Y.S. .. Fundamentals of textile materials science. M. LLC "Sovyzh Bevo" Tutorial. - M. : MGTU im. A. N. Kosygin. 302 pp. 2007