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Research of Technological Parameters of Weft Elastic Weaves

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ABSTRACT: This work is devoted to the study of the technological parameters of weft elastic weaves worked out on a flat knitting machine of the "TOYOTA" brand.

KEY WORDS: knitted weaves, elastic weaves, technical knitwear, extensibility, dimensional stability, weave structure.

I.INTRODUCTION

Elastic weaves, along with other knitted weaves, are used for the production of technical knitted fabrics.

Analysis of domestic and foreign literature has shown that on the basis of an eraser and an incomplete eraser, you can develop various types of knitted weaves [1]. They can differ sharply [2] from each other in technological and physical-mechanical properties.

The most important properties of any jersey are its extensibility and dimensional stability, determined to a large extent by the structure of the weave.

II. METHOD OF EXPERIMENT

In this paper, the influence of the structure of elastic weaves on these properties of knitwear is considered on the basis of an analysis of weaves of 1 + 1 eraser, which have a weft thread of various quantitative additions between the loop rows.

It is known [3] that a single bond provides greater resistance to deformation of knitwear than a double bond. Therefore, when it is loaded along the stitch row, stretching will occur due to soil loops to the centerline of the stitch column, as well as due to an increase in the orientation of double bonds along the canvas. In this case, the presence of weft broaches restrains the inclination of the loop skeletons, which is why further deformation of the knitwear can occur only by moving the loop stitches along the weft.

III. EXPERIMENTAL RESULTS

A characteristic feature of a worn-out web is an increase in its filling with weft broaches with an increase in their number of folds, as a result of which the possibility of tilting the soil loops during stretching decreases, i.e. the extensibility of the knitted fabric is reduced in width.

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Table
Technological parameters of weaving eraser 1 + 1 and weft elastic weaves

№	Options	Loop step, A, mm	Loop row height, B, mm	Horizontal density, Rg loops	Vertical density, Pv loops	Loop length L, mm		Surface density, M, g/m^2	Knitted fabric thickness, T, mm	Bulk density, δ, mg/sm^3
						Soil L2, mm.	Duck L2, mm.			
1	Ластик 1+1	3,3	2,5	15,5	20	10,2	-	1295,2	2,4	538,3
2	eraser 1 + 1 weft 1 addition	5	2,5	10	20	10,4	2,4	1135	2,4	473
3	eraser 1 + 1 weft 2 addition	5	2,3	10	21,7	10,2	2,4	880	2,4	366,7
4	eraser 1 + 1 weft 3 addition	5	2,3	10	21,7	10,1	2,4	1245	2,4	518,8
5	eraser 1 + 1 weft 4 addition	5	2,3	10	21,7	10	2,6	1255	2,4	523

It was found that the width of the knitted fabric removed from the machine of the weft eraser weave 1 + 1, in all variants, is 34% greater than the width of the base weave (eraser 1 + 1). It was also determined that the surface and volumetric densities of the samples are less than the surface and volumetric densities of the base weave.

With the introduction of weft, technological parameters, except for surface and bulk densities, increase or remain unchanged. The latter are reduced, which meets the requirements of reducing the consumption of raw materials.

The recommended fabrics were made from acrylic yarn 3,1Tx2 (No. 32/2) on a two-line flat knitting machine "TOYOTA" (Japan) [4] 5 class. They had a good appearance, as well as a greater width and lower surface and volumetric densities, which can be seen from the table, which shows the indicators of these properties.

IV. CONCLUSIONS

1. New types of knitted weaves have been developed based on the introduction of an eraser 1 + 1 weft into the basic weave, in various quantitative additions.

2. The technological parameters of the worked out weaves have been investigated.

3. On the basis of the study, it has been established that the production of knitwear by weft weaving on flat knitting machines will lead to a decrease in waste and economy of raw materials, without losing the quality and consumer properties of knitted fabrics.

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4. As a result of the analysis, it is possible to recommend the most economical and resource-saving option as the optimal one, as well as the one corresponding to the rest of the technological parameters - option №3. It has a good appearance, the lowest surface and volumetric densities and the highest vertical density.

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