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INFLUENCE OF THE COMPOSITION OF THE MIXTURE AND THE TYPE OF PROCESSED FIBERS ON SINGLE-CYCLE TENSILE STRAIN FABRICS

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Annotation: This article presents the results of studies to determine the single-cycle tensile strain of fabric obtained from various fibers and recycled fibrous waste. For this purpose, in production conditions, a sliver with a linear density of 5000 tex was obtained on a JFA-226 carding machine, and in the laboratory of the Department of Spinning Technology, slivers were also obtained in three versions on an HSR-1000 brand draw machine. To obtain a twill weave fabric on a picanol loom, warp threads were mixed with yarn consisting of 100% cotton, and weft threads were mixed with yarn consisting of recycled fibers and the single-cycle tensile deformation characteristics of the fabric were studied.
Key words: industrial waste, complete recycling, recovery, concentration of textile dust, single-cycle properties of fabrics

Wastes and losses generated at various stages of production in garment industry enterprises make up 25% of the raw materials used. The rational use of materials is influenced by many interrelated factors: production technology and organization, characteristics of raw materials, level of technological discipline, technical equipment.

Increasing the standard of living of the population is achieved by the exponential increase of the gross domestic product at the expense of non-renewable natural resources. Only 2% of them are used as ready-to-consume products, and the remaining 98% pollute the environment in the form of waste. Therefore, it is necessary to take drastic measures to repeatedly reduce the consumption of non-renewable resources and environmental pollution.

Modern technological equipment of light industry minimizes the emission of harmful substances into the atmosphere during use, and a part of them completely disposes and recovers production waste. However, these environmentally friendly technologies are very expensive (sometimes the price of treatment devices is up to 25% of the product price), and these industries have many additional devices that require large material and energy costs and cannot fundamentally solve environmental problems.

The rational use of raw materials and material resources in the sewing and knitting industry is one of the main problems, and solving them requires not only the creation of low-waste technologies.

A large amount of waste is generated in the sewing and knitting industry. This depends on the equipment used in weaving the fabric and the rational use of the fabric.

In existing technologies for waste processing, a significant release of inorganic and organic dust is observed. As a result, the concentration of textile dust in the production area exceeds the maximum permissible concentration. Textile dust with a high hazard class causes various accidents and reduces product quality.

Textile waste processing problems exist worldwide. Production waste in the modern textile and clothing industry accounts for up to 25% of raw materials. Yarns and gauzes cause economic damage due to the release of waste in the production.

High-quality textile waste is disposed of in garment factories. Consumer waste is processed in the following stages: disinfected with steam, ultrasound, ultraviolet rays; cleaned of dust; excess items are removed; removes residual organic residues as a result of washing; and oily waste is cleaned dry.

The main part of textile waste consists of a mixture of fibers and rags and is divided into the following groups: natural, synthetic fabrics and mixed raw materials.

Although the consumers of textile industry products are wide-ranging, the industries of their processing are mainly tailoring, sewing-knitting and footwear production. In these industries, various sizes of waste are generated in the cutting and sewing shops of gauze and knitted fabrics from the textile industry.

The mechanical properties of gaskets show their response to different forces, and these forces are different, they can be large or small, and they can be applied once or repeatedly. The forces can act in the direction of the length, width of the gas, or at a certain angle relative to them. As a result, deformations such as bending, stretching, twisting, etc. appear in the gases.

The complete elongation and its parts, which occur when the gas is stretched, are included in the one-cycle mechanical properties. The composition of one-cycle stretching deformation of gasses is divided into three bands: elastic, elastic and plastic (residual).

All parts of full extension appear and develop at the same time as the force exerts on the gas.

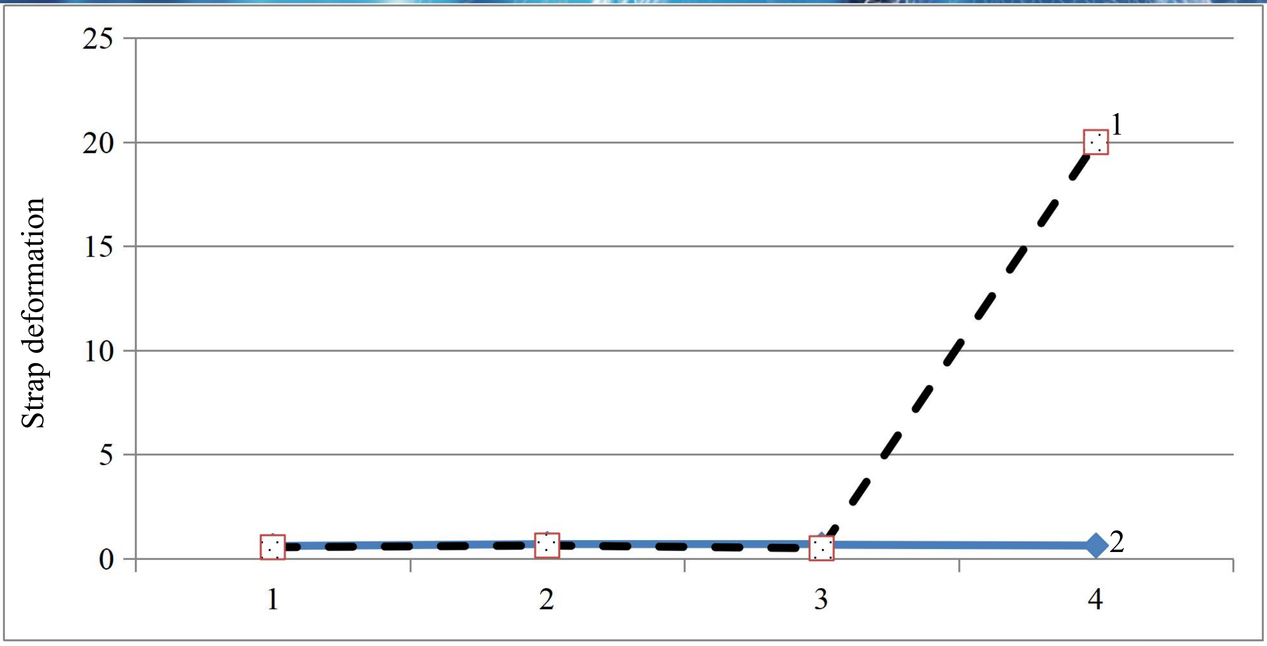
The belt part is formed at a high speed and changes the external bonds depending on the elasticity of the fibers in the gauze by an insignificant amount.

The elastic part is formed during a certain period of time, and under its influence, the connections in the structure of the gas change and new connections appear.

The plastic part is associated with irreversible changes in the external and internal bonds of the gas and changes the structure of the components that make up the gas.

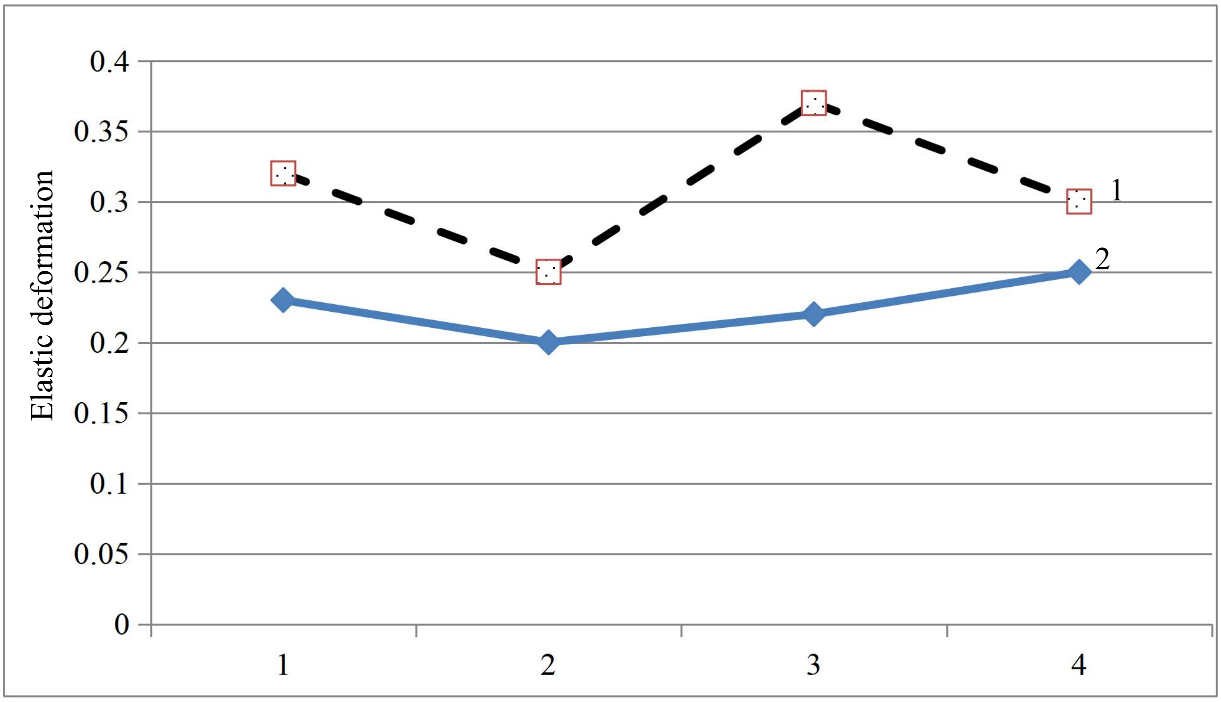
After the gases are released from the force, they return to their initial state, which is called relaxation. Belt elongation is lost as power is gained. Elastic elongation gradually disappears after the force is applied, and plastic elongation does not. The ratio of elastic, elastic and plastic elongation of gauzes depends on the fiber content and affects their wrinkle resistance and the garment's ability to maintain its shape. For example, if the gauze contains pure wool fibers or synthetic fibers, then the gauze will be strapped. If the gauze contains cotton, silk and wool fibers, the amount of elastic deformation in such gauze is greater. If the gasket contains lube fibers, such gasket will have an amount of plastic (residual) deformation.

Research work was carried out in order to study the effect of a mixture of different composition and processed fibers on the one-cycle stretching deformation of gauzes. For him, the one-cycle tensile deformation of gasses obtained from a mixture of different composition and processed fibers was determined, and the obtained test results are presented in Figures 1-3 below.



1- based; 2- by duck. Composition of the mixture

Figure 1. Variation of the elastic deformation of gasses obtained from a mixture of different composition and processed fibers.



1- based; 2- by duck. Composition of the mixture

Figure 2. Changes in elastic deformation of gasses obtained from a mixture of processed fibers with different composition.

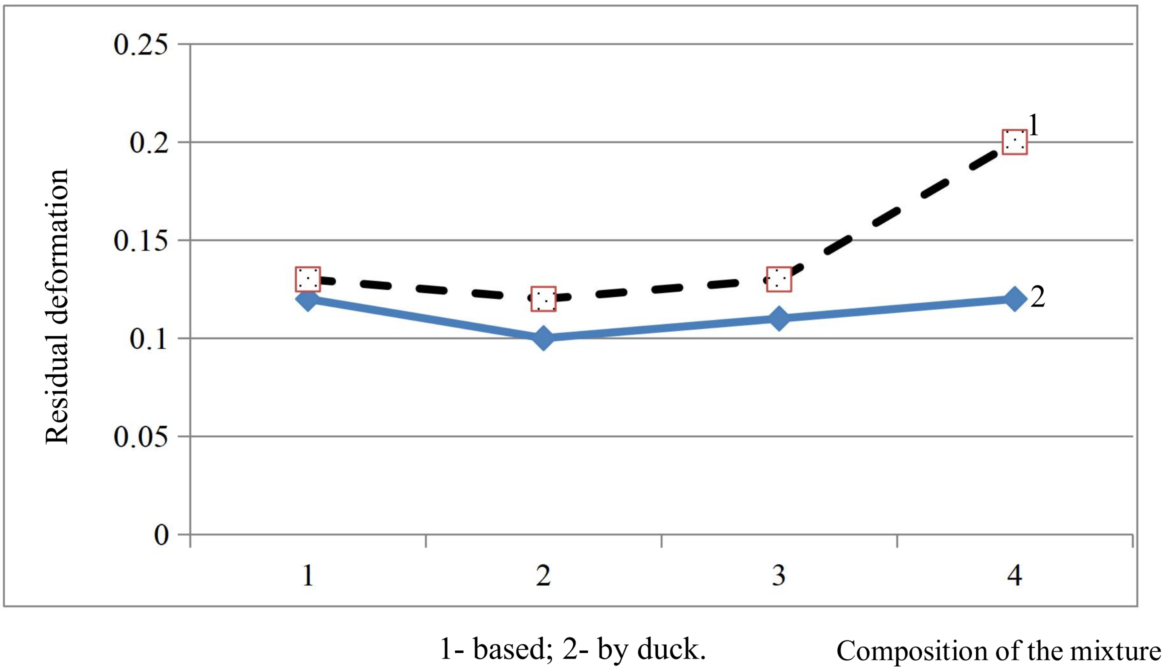


Figure 3. Change in plastic (residual) deformation of gasses obtained from a mixture of processed fibers with different composition.

If we compare the results of the research with the parameters of the gauze obtained from a mixture of 10% nitron, 60% cotton and 30% secondary fibers under the conditions of production, the deformation of the belt on the body of the gauze obtained according to option 1 increased by 12.9%, and the deformation of the belt by the cord increased by 12.7%. , the elastic deformation of the beam on the body decreased by 13.1%, the elastic deformation on the beam decreased by 21.9%, the plastic (residual) deformation of the beam on the beam decreased by 16.7%, the plastic (residual) deformation on the beam did not change, option 2 The elastic deformation of the gauze according to the body increased by 9.0%, the elastic deformation of the gauze according to the body decreased by 4.3%, the elastic deformation of the gauze according to the body increased by 13.5%, the plastic (residual) deformation decreased by 8.3%, the plastic (residual) deformation of the beam did not change, the beam deformation of the gas obtained according to the 3rd option increased by 3.2%, the beam deformation of the beam decreased by 9.1%, the gas the elastic deformation of the beam increased by 8.0%, the elastic deformation of the beam decreased by 6.2%, the plastic (residual) deformation of the beam did not change, the plastic (residual) deformation of the beam increased by 35.0%. It can be seen that in production conditions, compared to the parameters of the yarn obtained from a mixture of 10% nitrone, 60% cotton and 30% secondary fibers, the yarn obtained according to option 1 has 12.9% deformation of the belt on the body, 12.7% of the deformation of the belt on the cord. increased, it was found that the elastic deformation of the gas by 13.1%, the elastic deformation by 21.9%, the plastic (residual) deformation of the gas by 16.7%, the plastic (residual) deformation by the beam did not change.

As can be seen from the analysis of the obtained test results, it was found that the warp deformation of the yarn obtained from the mixture of secondary material resources placed from the peripheral parts of the felting machine and the yarn produced from it is higher compared to other options.

LIST OF REFERENCES

1. Frolova I.V. Study of the field of directions of pieces of fabric after a cutting machine Text./ I.V. Frolova, V.V. Makarov // Izv. universities Technol. textile prom-sti. 1998. - No. 1. - P. 56-58.
2. Frolov V.D. Technological conditions for defibering the flap in the area of the feeding device Text./ V.D. Frolov, M.D. Larionov // Izv. universities Technol. text, prom. 1999. -No. 6. - P. 52-54.
3. Ivanova N.N., Misko N.N. On the issue of processing waste textile materials from clothing production // Recycling waste from textile and light industry: theory and practice, Materials of reports of the International Scientific and Practical Conference, 2016, Vitebsk, 47 p..
4. Selezneva I. I. Resource saving in clothing production / I. I. Selezneva, R. N. Filimonenkova, E. L. Kulazhenko // Materials of reports of the 43rd scientific and technical conference of teachers and students of the university / EE "VSTU". -Vitebsk, 2010. -S. 230-231.
5. Kadnikova O.Yu., Shaldykova B.A. Management of the waste recycling process as a factor in the environmental and economic development of enterprises in the clothing and knitting industry // International bilingual scientific journal "Science and World" No. 3 (31).- Volgograd, 2016. - P. 54 - 56.