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The Effect of the Mixture of Different Composition and Recycled Fibers on the Single-Cycle Tensile Deformation of Gases

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Abstract: in this article, 5000 tex pelts were made on the JFA-226 carding machine at the production enterprise, 3 types of pelts were made on the HSR-1000 type pelting machine in the laboratory of TTESI under the "Spinning Technology" department, JAT of the Japanese company "Toyota" in the laboratory under the "Textile Fabric Technology" department On the 810 loom, yarn made of 100% cotton fibers was thrown into the warp thread, and yarn mixed with secondary fibers was thrown into the loom yarn.

Keywords: defibration of textile waste, shredded fibrous waste of "sintepon" and cotton fabrics, non-woven materials, friction and flexibility, elastic, elastic and plastic deformation, irreversible waste.

I.INTRODUCTION

In the last decade, the production of technical textiles has developed rapidly in the world, including non-woven fabrics for the needs of road, civil and housing construction, safety equipment, filter materials, special and protective clothing, environmental accident and disaster relief tools, etc.

In the production of non-woven materials, which do not have a significant impact on the quality of the initial raw materials, and in the production of textile products that require a lot of raw materials, the cost reduction is especially significant in the use of waste.

As a sample of textile waste, crushed (up to 4-5 mm) waste of synthetic non-woven material "sintepon" and shredded fiber waste of cotton fabrics were taken. Gypsum boards are made from construction plaster "Alabaster" (GOST 125-79) with the addition of textile waste in various proportions. Samples were dried at 4300C for 24 hours. It was found that gypsum tiles containing textile waste have a longer solidification period, that is, textile waste provides high mobility in the gypsum mixture, which provides opportunities for binders to regulate the plastification process and create optimal conditions for product formation.

The addition of textile waste led to a slight decrease in the breaking load, but the failure occurs with the formation of a crack, which is a positive moment in terms of eliminating the brittleness of gypsum tiles. At the same time, the addition of textile waste improves the soundproofing properties of the obtained materials.

Defibration of flat textile wastes from woven, knitted or long fiber nonwovens is associated with high fiber damage and shrinkage. By treating the material with water vapor heat and humidity, the mutual friction and elasticity of the fibers can be reduced.

As a result of the improvement of production technology and techniques, the type of some types of waste is changing. For example, with the introduction of new types of filters,

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opportunities were created to capture waste that was previously considered irreversible. Examples of these include the introduction of pneumatic systems for waste collection, and filters for the purification of technological wastewater.

In the textile industry, depending on the type of fiber raw materials, waste is divided into yarn waste (during processing of cotton fiber), wool, lube fibers, chemical fibers and natural silk.

The largest part of the waste of the yarn industry is accounted for by the spinning production enterprises. The main reason for this is that it is necessary to separate defects, short fibers and fluff from the fibers received for spinning in technological processes. In terms of spinning processes, in addition to the above unusable constituents, fibers suitable for spinning are also separated into waste.

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 single-cycle mechanical properties. The composition of the one-cycle stretching deformation of gasses is divided into three parts: 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 due to its influence, the bonds in the structure of the gas are changed, and the bonds of a new form 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.

II. METHODOLOGY

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 this, 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 Table 1 below.

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Table 1 The effect of a mixture of fibers of different composition and processing on one-cycle tensile deformation of gauzes

т/р	Indicators	Made from a blend of 10% nitron, 60% cotton and 30% secondary fibers received	A mixture of 66.4% cotton fiber, 28.8% secondary fiber and 4.8% nitrone fiber was obtained according to the scheme of placing wicks in the braiding machine		
			1	2	3
based on					
1.	Strap deformation	0,61	0,70	0,67	0,63
2.	Elastic deformation	0,23	0,20	0,22	0,25
3.	Residual (plastic) deformation	0,12	0,10	0,11	0,12
by duck					
1.	Strap deformation	0,55	0,63	0,50	0,50
2.	Elastic deformation	0,32	0,25	0,37	0,30
3.	Residual (plastic) deformation	0,13	0,12	0,13	0,20

III. RESULTS AND DISCUSSION

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. 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.

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IV.CONCLUSION

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.

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