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Evaluation of Mechanical Properties of Covered Fabrics from Different Secondary Material Resources

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ABSTRACT: This article examines the mechanical properties of upholstery fabric obtained from a mixture of 100% cotton fiber waste and 70% rogoza plant fiber waste and 30% cotton fiber waste.

KEYWORDS: lining fabric, longitudinal and transverse density, linear density of yarns, linear weight of fabrics, surface density, specific gravity

I. INTRODUCTION

The implementation of radical changes in the economy of the country, the gradual transition of the republic's economy from raw materials to the production of competitive products, the expansion of the country's export potential have set new tasks for each sector of production. In particular, the development of the textile industry, the provision of our people with high-quality bedding is one of the important tasks facing the light industry. The goal is to increase the volume of textile production in the country, meet the needs of the population in yarn and textiles, create new types of fabrics to expand production, introduce advanced technologies leading to the development of the textile industry, create new designs, dyes and embellishments in fabrics and clothing. conducting research in materials science, use of technological know-how, training of specialists and experts.

Lining fabrics obtained from secondary material resources produced in textile enterprises differ from each other in terms of fiber content, structure and quality. For example, the bedding used in our country is mostly imported from Turkey, China and other foreign countries[1].

Today, foreign and domestic market consumer demand and the global "fashion and design" industry is developing. This leads not only to the improvement of a number of consumption, hygienic, physico-mechanical requirements for fabrics currently produced in the textile industry, but also to the increased attention to its aesthetic properties.

Upholstery fabrics must fully meet the hygienic requirements, taking into account the seasons, climatic conditions, age. Taking into account the healing and positive effects of natural fibers on human health gives good results in the creation and production of new assortments of upholstery fabrics[2-3].



The produced upholstery fabrics are produced in different ways. For example, upholstery fabrics are produced on looms, knitting machines and in the form of nonwovens. Upholstery fabrics are used for different purposes and are obtained from a mixture of different secondary material resources[4].

The main technological parameters of upholstery fabrics include longitudinal and transverse density, linear density of yarns, linear weight of fabrics, surface density, specific gravity[5].

The appearance, properties and what of a fabric depends on its structure.

The density of fabrics is divided into the concepts of actual, relative and maximum density. In addition, the structure of bedding fabrics produced in the textile industry also varies depending on the purpose for which they are used. For example, high-density fabrics are used in the production of autumn and winter, and low-density fabrics are used in the production of light summer and spring clothes[6].

The smaller the density of the fabric, the higher the air permeability, the lighter, otherwise the weight of the fabric increases, air permeability decreases, tensile strength, and abrasion resistance increases. Therefore, any fabric will vary depending on what purpose it is used for[7].

Fabric structure indicators include yarn density in yarns, yarn filling, structure phase, and base surface. The density of the threads in the fabric is determined by the body and back[8].

Today, exports of yarn, fabrics and other products made of natural and chemical fibers have grown sharply. This is evidenced by the sharp increase in demand for textile products.

II. METHODOLOGY

When creating a range of new types of upholstery in the textile industry, special attention is paid to the fiber content of raw materials, the properties of fibers, and their interconnection. This is because the fibers that make up bedding are important. The products to be obtained should be obtained from natural raw materials, if possible, because they are of great importance for human health.

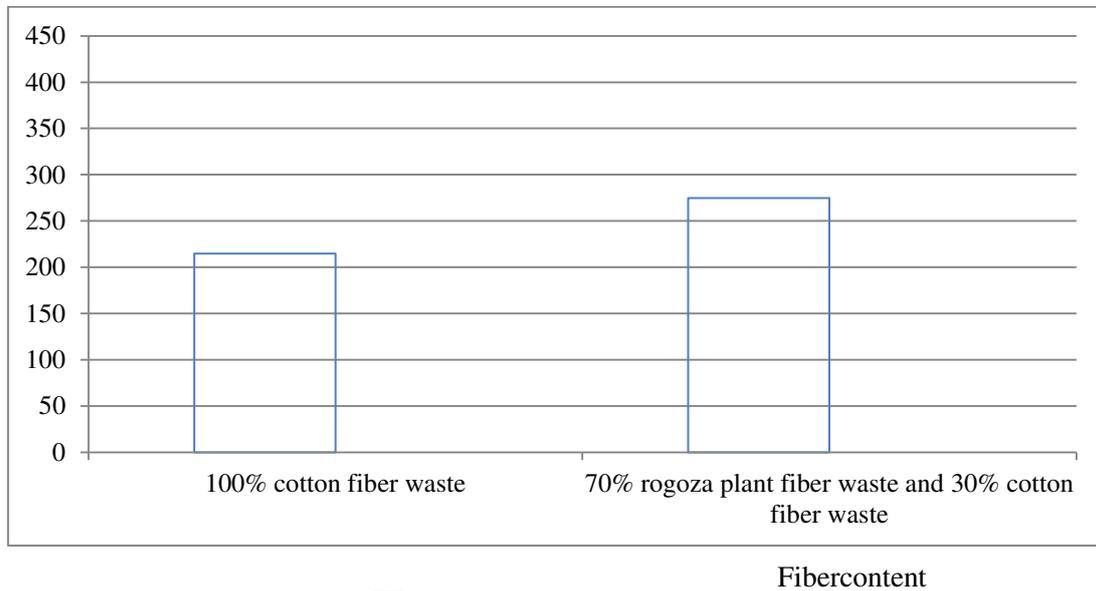
Research has been conducted to determine the mechanical properties of bedding fabrics with different secondary material resources. These fabrics were obtained mainly from a mixture of secondary material resources by the knitting method. The results of the study are presented in Table 1 below.

Table 1

Changes in the mechanical properties of upholstery fabrics obtained from different secondary material resources

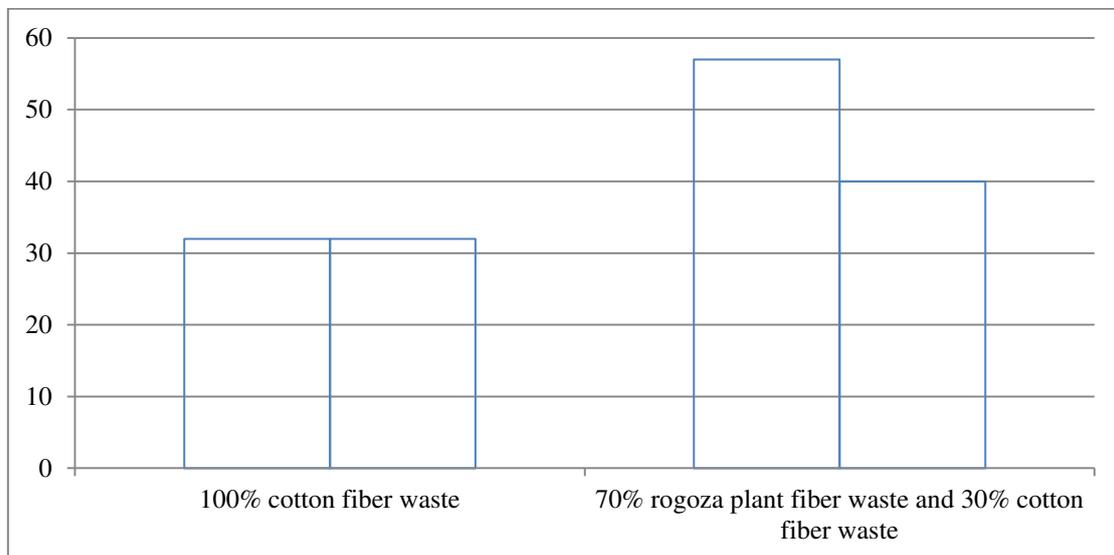
t/p	From secondary material resources of different composition obtained fabrics	Breakingforce,N		Elongationatbreak, %		Thickness, mm	Surfacedensity, g/m ²
		along the longitudinal	onthetransverse	along the longitudinal	onthetransverse		
1.	100% cottonfiber	215	390	32	32	1,0	336,7
2.	70% fiber waste from Rogoza plant and 30% cotton fiber waste	275	415	57	40	1,0	389,2

Based on the results of the study, Figures 1-3 show the longitudinal and transverse tensile strength, longitudinal and transverse tensile elongation, and the change in surface density histograms of bedding fabrics from different secondary material resources.



▨ along the longitudinal;
▣

Figure 1. Longitudinal and transverse tensile strength of upholstery fabrics from various secondary material resources.



-along the longitudinal;

▨ -on the transverse.
▣

Fibercontent

Figure 2. Changes in the longitudinal and transverse elongation of upholstery fabrics from various secondary material resources.

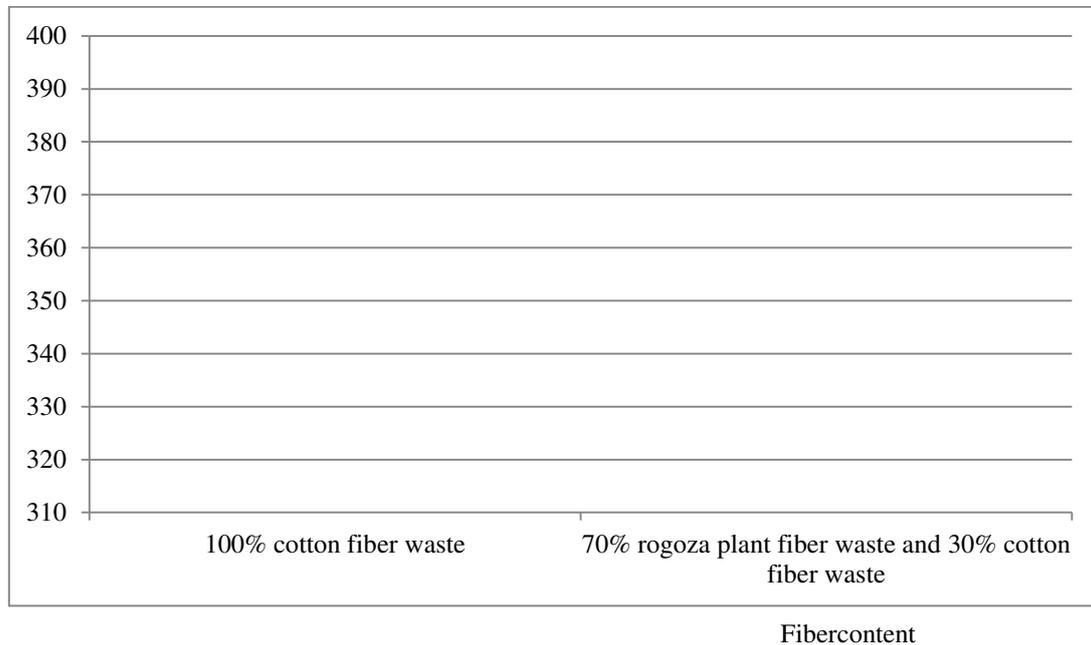


Figure 3. Changes in the surface density of bedding fabrics from various secondary material resources.

III. RESULTS AND DISCUSSION

Comparing the test results with the performance of 100% cotton fiber waste, the tensile strength of the fabric obtained from a mixture of 70% rogoza plant fiber waste and 30% cotton fiber waste was 21.9% longitudinal and 6.1% transverse tensile strength. , longitudinal elongation increased by 43.9%, transverse elongation increased by 20.0%, surface density increased by 13.5%, and thickness did not change.

IV. CONCLUSION

The analysis of the results showed that all the mechanical properties of the lining fabric obtained from a mixture of 70% rogoza plant fiber waste and 30% cotton fiber waste were higher than the performance of the lining fabric obtained from 100% cotton fiber waste.

The results of the study show that the longitudinal and transverse tensile strength of bedding fabric obtained from a mixture of 70% rogoza plant fiber and 30% cotton fiber waste varies from 6.1% to 21.9%, the elongation at break from 20.0% to 43.9%. , surface density increased from 13.5% to 100% of cotton fiber waste compared to bedding.

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