

Thus, based on the prediction of yarn index it is found that for evaluating yarn mechanical characteristics additional studies are to be carried out to determine the indicators before breaking its characteristics, in particular the modulus of elasticity.

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TEXTILE WASTES AND THE AREAS OF THEIR APPLICATION

ТЕКСТИЛЬНЫЕ ОТХОДЫ И НАПРАВЛЕНИЯ ИХ ИСПОЛЬЗОВАНИЯ

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ABSTRACT

TEXTILE WASTE, WASTE PROCESSING, NONWOVEN FABRIC

The article gives an overview of areas of textile waste utilization and it proposes one of the options of their use as an integral component for the production of heat and noise insulation materials. The proposed option allows to obtain construction

АННОТАЦИЯ

ТЕКСТИЛЬНЫЕ ОТХОДЫ, ПЕРЕРАБОТКА ОТХОДОВ, НЕТКАНЫЕ МАТЕРИАЛЫ

В статье представлен обзор направлений использования текстильных отходов, предложен один из вариантов их использования в качестве составного компонента для производства тепло- и шумоизоляционных

and engineering materials with the best properties of heat protection, noise and vibration isolation, as well as to expand the possibilities of using textile waste.

материалов. Предложенный вариант позволяет получить материалы строительного и машиностроительного назначения с лучшими свойствами теплозащитности, шумо- и виброизоляции, а также расширить возможности использования текстильных отходов.

Currently, despite the enormous efforts in the field of waste recycling, the problem of waste disposal remains very serious. According to the Ministry of Environmental Protection of the Republic of Belarus, light industry wastes amounted to 119.9 thousand tons in 2016. And 126.6 thousand tons in 2017, that is 0.26 % of all waste from the manufacturing industries. In fact 0.26 % is not much, but in just a year their volume increased by 14.7 thousand tons, which accounts for 11.6 % increase.

In the industrial production of textiles, waste is generated in the form of cabbage, end residues, tangled fibers, yarn ends, etc. We are talking about those textile waste that can serve as a raw material for other types of production.

Currently, the work of all enterprises is aimed at:

- 1) prevention and minimization of waste (rational use of raw materials, rationing of all types of materials used),
- 2) secondary use of primary raw materials (e.g. padding or production of non-core products),
- 3) recycling of waste for use as the primary or secondary component in materials mixes, etc.,
- 4) disposal (incineration, hydrolysis, disposal).

The first two directions are most preferable, but they do not make production completely waste-free. Disposal is harmful to the environment and is not a justified waste of scarce resources

As an alternative to expanding the scope of waste use, EI «VSTU» offers a technology of the production of non-woven materials by means of thermal bonding engineering and construction purposes. The technology of obtaining nonwoven materials by the method of thermal bonding includes the following basic operations: preparation of raw materials, formation of a fibrous base, fiber bonding. Table 1 shows the composition of the experimental mixtures.

Polyester fiber is a hollow highly-twisted non-siliconized fiber. Wastes of sewing production at the enterprise come in the form of cabbage and are subjected to grinding with the help of a bale plucker, after which they acquire the appearance of regenerated fibers. Figure 1 shows the appearance of the obtained samples

Table 1 – Raw material composition of the mixture of fibers

№	Fiber Composition	Percentage, %
1	– cutting waste	42
	– polyester bicomponent fiber	15
	– polyester fiber	43
2	– cutting waste	65
	– polyester bicomponent fiber	15
	– regenerated fiber (chopped cabbage in sewing production)	20

Sample No. 1



Sample No. 2

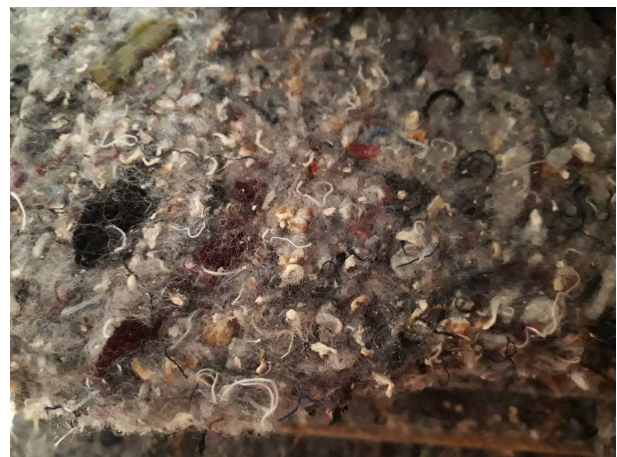


Figure 1 – Appearance of prototypes

As a result, samples of non-woven materials were obtained. Their properties and areas of their further application are presented in Table 2.

The materials obtained from polyester fibers using the cutting wastes in comparison with similar materials without the addition of waste, have a higher density, which will increase the thermal insulation and noise insulation properties. The resulting thermal insulation materials, due to the unique arrangement of fibers and the homogeneity of the products, retain their shape and size during operation, both in horizontal and vertical positions. Thus, the introduction of the cutting waste into the composition of non-woven materials made it possible to increase their weight, density, hardness and carcass.

Table 2 – properties of the samples

№ sample's	Thickness, mm	Surface density, g/m²	Domain of usage
1	50	34	Heat insulation
	40	46	
	20	65	Heat and noise insulation
2	50	59	Heat insulation
	15	46	Heat and noise insulation
	5	46	Substrate for laminate and linoleum

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