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RESEARCH ON THE IMPACT OF LOCAL WASTE ON IMPROVING THE DURABILITY OF BUILDING MATERIALS

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Abstract

The article presents experimental data on gypsum binder with the addition of test substances from local waste to improve the physical, mechanical and thermal properties. Thermal insulation properties of the final product - a composite building material. The aim of the article was to determine the effect of composite material on the strength of local waste. based on gypsum binder.

Keywords: gypsum, plasticizer, ostrich feather, local waste.

Introduction

Today in our country, building materials will play a big role in the development of culture and technology. The rapid development of the economy of Uzbekistan today involves the rational use of all types of resources, reducing their losses and the introduction of waste-free technologies.[1] If gaseous and liquid wastes are quickly absorbed by the environment, then it will take decades and even hundreds of years to assimilate solid wastes, and their storage sites will occupy large areas. The best way to improve the quality of filled binders, as well as reduce the cost of building products of thermal insulation compositions based on them, is to include multifunctional additives obtained from recycled materials in their composition. In order to develop a new technology for obtaining multifunctional building materials from cheap raw materials, the authors were given the task of preparing laboratory samples from binders with the fillers described above and studying their physical and mechanical properties. To improve the thermal insulation characteristics of these mixtures, a number of porous local organic additives were selected and their effect was studied. These include local wood chips and annual field crops: wheat straw, cotton stalk chips, sasna tree leaves, palm trunks and annual agricultural waste - secondary raw materials that act as. To improve the thermal insulation characteristics of these mixtures, a number of porous local organic additives were selected and their effect was studied. These include local wood chips and annual field crops: wheat straw, cotton stalk chips, sasna tree leaves, palm trunks and annual agricultural waste - secondary raw materials that act as. To improve the thermal insulation characteristics of these mixtures, a number of porous local organic additives were selected and their effect was studied. These include local wood chips and annual field crops: wheat straw, cotton stalk chips, sasna tree leaves, palm trunks and annual agricultural waste - secondary raw materials that act as.

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Discussion and Results

The low cost of local waste makes them an ideal candidate for particulate reinforcement of building materials. However, poor adhesion with binders causes a number of problems, the solution of which provides the building materials market with an inexpensive and durable innovative product [2]. Given the growing number of solid waste landfills, as well as the high market demand for new multifunctional building materials, there is a need to produce building materials using man-made waste. Reinforcement with fibers and microfibers is widely used in the production of building materials throughout the world [2,5].

Binder and water, mixing conditions and temperature. the presence of any additives. This condition causes a number of inconveniences, since the mixed plaster must be applied before the bite. If the biting process is disturbed, the formed crystal buds will disintegrate, and their strength will decrease sharply. Therefore, it is possible to finish using the patch before biting, either mixing it in small amounts, or adding substances to the patch that weaken the biting process. The more beautiful the building gypsum looks, the softer and faster setting molded gypsum is obtained.

By examining the nature of the fibers used and the composition of municipal solid waste, it can be seen that some components of municipal solid waste are suitable for the production of fiber additives. Some wastes are entirely fibrous in nature. For example, strong fibers with good adhesive properties can be obtained from polyethylene terephthalate bottles. Also, the technology for processing fiberglass cutlets has long been known, and today, in turn, it is widely used in the manufacture of wall panels. Paper waste is mainly composed of cellulose, which itself has a fibrous nature. [2] However, there are also specific Uzbek wastes – ostrich feathers. Today, these wastes do not find their consumers in Uzbekistan. the main part of ostrich feathers is thrown away without reuse, while in other countries ostrich feathers are a necessary raw material. Ostrich feather is a unique natural material with excellent thermal properties. One of the most important qualities of ostrich feathers is their low thermal conductivity. Another important feature of this material is its high hygroscopicity. The idea of using ostrich feathers to reinforce gypsum, which seems abstract in theory, in practice can provide a unique building material. A series of tests were carried out to determine the interaction of gypsum, ostrich feather and plasticizer. Gypsum binder G-5 B of class II was used as the main binder in the tests. Locally produced Perfectbuild 836 was used as a plasticizer. For the experiment, ostrich feathers were first treated with detergents and dried. Then the ostrich feather was crushed and pieces 6-8 mm long were obtained. The fibers were evenly distributed in the gypsum until a homogeneous mixture was formed. Then, water and a plasticizer were added to the mixture. When preparing the mixture, the water-gypsum ratio was maintained at 0.65. The resulting mixture is thoroughly mixed and poured into a mold of corrosion-resistant material designed for the manufacture of sample beams 40x40x160 mm in size. The feathers in the composite mixture are arranged randomly. When making samples, sections of the mold are filled simultaneously. After pouring the gypsum dough, the mold is shaken six times with a

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mechanical vibrator to remove incoming air [3]. The flexural and compressive strength of gypsum ostrich feather samples was evaluated according to GOST 310.4-81 and GOST 23789-79 [4].

Table 1. Sample test results after 28 days

No.	Composition sample			Bending strength, MPa	compressive strength, MPa
	Gypsum%	Reservoir%	Pat%	4.33	7.5
one	98.6	0.4	one	4.1	eight
2	98.1	0.4	1.5	4.02	8.3
3	97.5	0.4	2	3.8	8.1
4	97.1	0.4	2.5	3.4	7.5
5	96.2	0.4	3	3.98	eight
6	98.1	0.8	one	3.85	7.5
7	97.8	0.8	1.5	3.62	7.4

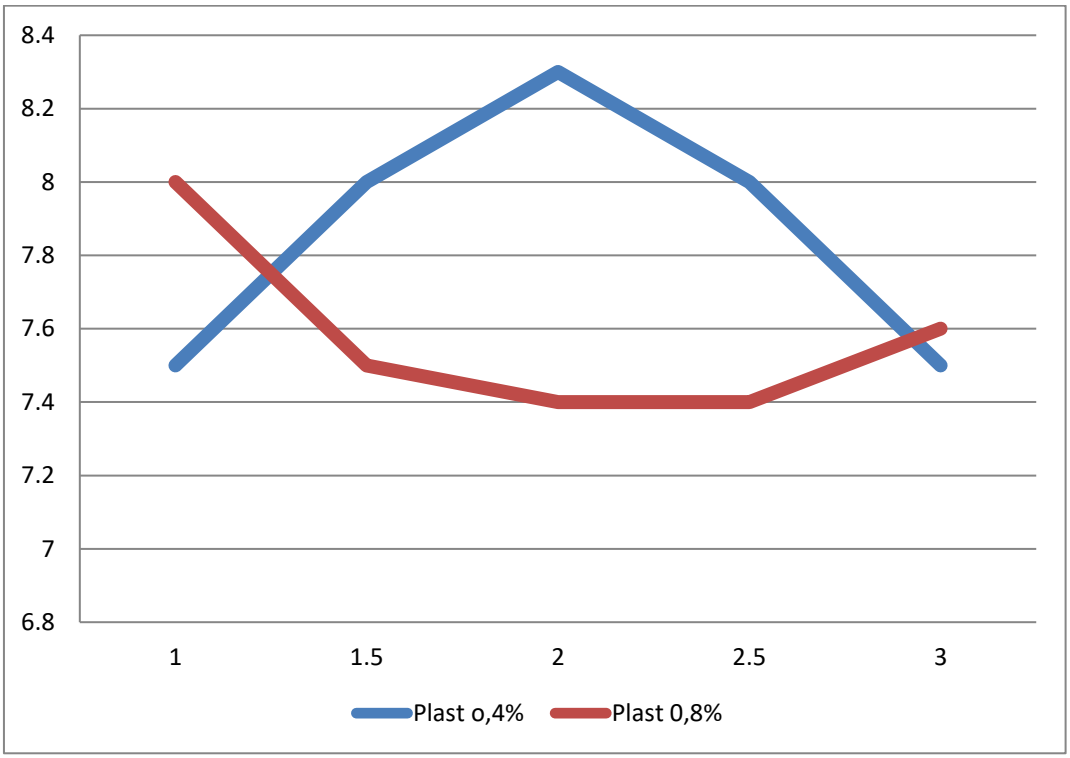

Fig. 1. Dependence of the compressive strength of gypsum wool samples on the amount of plasticizer

Conclusion

Studies have shown that the amount of fibers in the preparation of samples without the use of special methods of compression, pressing and vibration is limited in volume and does not exceed 1-2%, and with the use of plasticizers this figure increases by 1.5%.

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According to Table. 1 and drawing. 1, the addition of up to 2% ostrich feather fibers increases the strength properties of gypsum, and additional strength indicators decrease by more than 2.5%. However, during the production of ostrich feather gypsum paste, it was found that adding more than 3% fiber makes it very difficult to knead the gypsum paste, which can lead to difficulties in the production of this material. In addition, the data shows that the optimal amount of plasticizer for this compound is 0.4%.

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