

PRODUCTION OF THERMALINSULION MATERIALS

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Abstract: The production of heat insulation materials is an important issue in the construction industry of Central Asia. The organization of effective building materials and the application of these materials in construction remains a challenge. These issues are covered in the article.

Key words: construction industry, effective building material, thermal insulation material, effective, arbolit, guza-poya.

ПРОИЗВОДСТВО ТЕПЛОИЗОЛЯЦИОННЫХ МАТЕРИАЛОВ

Аннотация: Производство теплоизоляционных материалов является важным вопросом в строительной отрасли Средней Азии. Организация эффективных строительных материалов и применение этих материалов в строительстве остается сложной задачей. Эти вопросы освещены в статье.

Ключевые слова: стройиндустрия, эффективный строительный материал, теплоизоляционный материал, эффективный, арболит, гуза-поя.

Introduction

In the construction industry of Central Asia, a wide spectrum of thermal insulation materials is used. One important strategic task of development is the creation and provision of new effective building materials in the construction industry. Soglasno etomu social-economic razvitiya strany otrajeno nekhodiiost ospolzovaniya prmyshlennyx i skohohozyaystvennyx othodov v proizvodstve stroitelnyx materials, widening the range and volume of high-quality products for the emergency republic.

he density of 550-650 kg/m³ and the compressive strength of 3.0-7.0 MPa are observed in the production of building constructions made by adding organic fillers, mainly wall constructions. An example of such building materials is arbolite, which consists of organic fillers, water and various chemical additives.

As organic fillers, it consists of wood processing waste, 1-year-old agricultural plants: rice straw and chaff, sugar cane stalk, cottonwood branch. One of the important problems in the construction industry is the production of building materials in our republic, mainly the production of lightweight arbolite concrete.

At present, dozens of scientific researches are engaged in research work in the field of arbolite in construction and educational project organizations. Arbolite products and constructions are used in the construction of industrial and civil buildings. Studies have shown that, in order to determine the highest deformation of this material, additional experiments are required to determine it [1.2.3,4].

Central Asian republics have the richest source for arbolite production. In regions where there are no forests, it is used as a raw material by crushing the branches of the cypress. Chopped rice and sugarcane stalks can be used. The purpose of the work is to chop the branches of the hemp plant. its composition and method of preparation, as well as its composition and preparation

method, in the construction of load-bearing and separating wall constructions, it is possible to use arbolite with an average density of more than 650 kg/m³ to obtain VO 35-V 1 class arbolite.

It is necessary to solve the following problem from the set goal: to develop a method of the composition of additives added to arbolite, it is necessary to plan mathematical methods of artificial conglomerates and experiments to grind cotton-stem branch. It will be necessary to choose the most convenient machine for crushing cotton stalks. The grinding method is studied in the following stages:

1. It is necessary to study the mechanism of impact of juniper stems on the aqueous mixture when they are crushed, to study the increase in strength with and without cement and additives added to it.

2. Development of a convenient composition of waste, mixed and aggregated additives in the production of arbolite, crushed hemp stalks and fillers.

3. The influence of water and additives, the study of the effect of the mixture on the pores, and the effect on the physical-mechanical properties of the arbolite mixture after compaction, and the effect on the preparation properties and technology.

4. Eksperimentalnoe issledovanie physico-mechanicheskikh svoystv arbolita k shimayushchim napryazheniyam pri ispolzovanii v stroitelstve orajdayushchih konstruktsiy.

5. Razrabotat tekhnologiyu proizvodstva arbolita izmelcheniem i dobavleniem poplar klassov V 2 i V 2.5 i izuchit aspekti effektivnogo tekhnicheskogo opisania i tekhnologicheskikh parametrov.

The scientific innovations of the technology for the development of arbolite are as follows:

Development of a new competitive direction of arbolit production technology based on the preparation and crushing of hemp branches.

For the first time, the mechanism of influence of cement hardening kinetics of arbolite, prepared by grinding juniper stems with the addition of separate minerals and clinkers, was determined. The method of determining the quality of added fillers and ensuring the optimal structure of the composition added to it in the preparation of arbolite and the crushed cottonwood branches added to it.

In the preparation of arbolit, its high strength when added to it by crushing cotton-stem branch and its recommendation for construction (building) and methods of production of new additives added to it in the preparation of arbolit were developed. Based on the results of new experiments, a mechanism was developed to form the strength of samples made of arbolite to long-term loads.

It has received the right to use the composition of new additives in the preparation of industrial waste, mixed and concentrated additives for the arbolite mixture. Extensive improvement of the speed of solidification of arbolite by advanced technical and technological processes. Performance of a sample made of arbolite for long-term loads and demonstration of strength based on technical solutions [5,6,7,8].

The technology of heat-resistant arbolite shows that it is possible to achieve continuous solidification of arbolite from a mixture of crushed juniper stems and an increase in compressive strength by 50-70%, saving cement consumption. Waste-free technology requires improvement of physical and mechanical properties of arbolite product. The general conclusions are that it is promising to prepare arbolite with the addition of crushed cypress branches as a filler.

Production of light concrete by grinding the branches of the widely used in production and its wide use not only expands the base of raw materials, but also reduces the cost of concrete and improves the environment from industrial waste.

In the course of scientific research, a R 160-1500 shredding tool was invented for crushing juniper stems. If the composition of fillers is expanded, the ratio of water to cement will increase. The results obtained from the research show that in the mixture - arbolite, which is added by grinding the stem of arbolite, it acts as a filler, and in small amounts, its strength is increased by cement stone.

The mixed-arbolite product made from crushed cottonwood branches is passed through a 20 mm sieve as a filler fraction, mixed with additives (liquid glass and calcium chloride or liquid glass light gray aluminum are also added) and cemented with a force of 0.35 MPa.

210 kg of crushed cotton stalks, 350 kg of portland cement in the following composition to prepare 1 m³ of product. The components of the mathematical calculation of the addition of the research are summarized. New hydrate compounds of liquid glass and SaSl or liquid glass Al₂O₃ are formed from the additives mixed in the composition of arbolite. Based on them, the hydration stage of cement in arbolite is high.

The effect of admixtures mixed during the hardening of arbolite is that the most useful additive during the initial hardening of concrete is 1.8% liquid glass and 0.9% (Al₂ SO₄)₃. Therefore, the strength of the material increases daily when using 400-500 grade cement 1.6% Sa. The highest compressive strength with the addition of Sl and 0.8% Al₂ (SO₄) showed 2.7-3.7 MPa.

When compressive strength of arbolite was tested, the effect of urea-formaldehyde tar (black liquid substance) (KF-MT) was noticed when adding individual and mixed additives. In Fergana TETs, when dry powder of sol is used in the composition of arbolite, its compressive strength is 1.1 MPa and the consumption of cement is reduced up to 20% (Fig. 1).



Fig. 1

As the specific pressure of the mixture increases, the average density and strength of the arbolite increases, and the optimal pressure when the arbolite mixture is compacted with the addition of crushed pine branches is 5.10 kg/m³. 300-330 kg of cement is needed for 1 m³ of product to obtain V 1.5 class arbolite.

In the experiment, when a sample made of arbolite is checked for compression, some deviations are observed during the time growth of the deformation. The deformation of the prism is 0.15 KPa when the load is applied, and the deformation of the same prism is not compressed at the highest level. The above deviations were not observed in the sample made of ceramzitobeton.

The volume distribution in the mixture prepared using juniper stems is not the same as compared to expanded clay. In the first phase, the strength of the cavity formation in arbolite is

formed by the state of porosity, a one-step failure occurs, and it is here that the presence of organic additives is determined. Basically, the strength of the material deteriorates at the first stage when organic additives are added, and in the first phase, the volume of pores in arbolite is 600-650 kg /m³ (Fig. 2).



Fig. 2

If the outer walls of low-rise residential buildings made of aerated concrete blocks are made of ceramic and silicate bricks, labor costs during construction will be reduced by 2.5-3.3 times 2 times.

Calculations show that the cost of 120,000 m³ of wall blocks of class B 1.5 arbolite concrete, made by grinding cotton stalks per 1 meter of wall, is 32-37 US dollars for 1 year. Compared with wood concrete and brick, it improves the ecological atmosphere and environment, and can be used for this, it is non-combustible, durable, and the price is cheap.

There are various soluble substances in juniper branch, which have an aggressive effect on cement. There is a solution to all the above difficulties. There are currently opportunities for the production of at least 15-20 million cubic meters of arbolite blocks for walls, floor slabs and curtain walls of agricultural buildings [9].

Arbolite blocks based on juniper branches and mineral binders form a small volumetric mass and have sound absorption properties and low heat transfer properties.

Blocks prepared in this way meet the requirements of DTS. The mixture prepared by adding mineral binder and various additives can be used as a material forming a thermal insulation layer in wall panels and inter-floor covering plates.

Other products can be made from gozapoya and used for other purposes. According to the analyzes carried out at Uzglavdrevstroyprom, the cost of bringing 1 ton of cotton stalks to the warehouse from a distance of 10-12 km to the warehouse is 5.89 thousand soums.

In that case, the cost of 1 m³ of arbolit panel is 18.5-19.3 thousand soums in 1 year, if the capacity of the enterprise is 10-20 thousand m³. Therefore, 7-7.5 thousand soums will be spent on 1 m³ wall of this material. In comparison, the annual effect in the production and use of panels made of cellular concrete is about 133 thousand soums.

According to the data of scientific research institutes, 1 million m³ of industrial and agricultural waste will be saved with hard-to-find pore fillers. 100 thousand tons of heat reduces the consumption of 0.5 million m³ of wood. Special machines are organized for preparing, bringing, and storing guzapoya processing. Tashkent Polytechnic Institute Horizontal pressing, compaction presses are used. Among other technological operations that this mechanism will need:

It will be necessary to collect, trim, grind and divide the hemp branches into fractions. The main issue is the preparation of raw materials. The "Construction materials" department of TashPI

is continuing the experiments on the development of sound- and heat-shielding plates from arbolite blocks using arbolite. As a construction material, hemp has also been studied mainly as a mineral binder.

However, the long-term durability of this material has not been scientifically proven. It is not clear what kind of additives are added to the juniper branch, and when the cement is mixed, the cement brand formed as a result of the densification of the mixture structure is not clear.

There is no topic for a comprehensive study of this problem in the plan of research and scientific institutes of building materials and constructions. There is a great demand for building materials for the construction of economic facilities and residential buildings, cultural and household buildings in rural areas. Therefore, it is necessary to produce more profitable materials for development only on a scientific basis.

For example, curtain wall tiles made on the basis of mineral binders, polymer materials are deeply and occasionally soaked, dry plasters, gluing of tiles, treated with color films, and the development of tiles for covering the floor [9].

Conclusion

In conclusion, the problem and target direction in the laboratories where scientific research is conducted is the development of building material that gives an effect on the basis of guzapoya. Guzapoya is considered a raw material in the production of construction material in the Republics of Central Asia. It can be applied and used in plaster materials based on soundproofing, heat insulation material, structural and mineral binders.

After picking cotton in our republic, 6-7 million tons of cotton stalks remain in the field every year. Villagers use some of it for heating and cooking, and the rest is left in the field itself. Why is the cheapest raw material not used in the construction industry? One of the reasons for this is that there is no manual for the use of hemp.

It can be used as a filler of the stem by adding various forms of cement and liquid glass in the preparation of lightweight concretes and acoustic sound-proofing, thermal insulation.

Coarse fiber of hemp makes the highest percentage. Their processing creates technological difficulties. The use of hemp as a building material is considered one of the main factors.

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