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Study Block Brick Materials on Base Cotton Stalk and its Properties

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Abstract: *Block bricks based on cement and wood chips are distinguished by energy saving, low cost, environmental friendliness, availability of existing equipment for production. All processes consist of the process of crushing wood products, mixing them in certain proportions, shaping and drying in block filling machines. The product proved to be light, durable and non-flammable. One disadvantage is that it must be stored for at least 30 days after production in order to have sufficient strength.*

Keywords: *Physical and thermo physical, organic binders, mineral, heat-insulating structural.*

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1. Introduction

The country annually produces 3-3.5 million tons of cotton, about the same amount of cotton waste, only a part of which is used by the population as firewood. Sometimes they are burned or mixed with the ground and rot. At the same time, straw and forest hornworts are formed in the same amount. It is advisable to use this secondary raw material in highly profitable industries. One of these areas is the production of building materials. Block bricks based on cement and wood chips, depending on the area of use, are classified as gas and foam blocks. However, it stands out for its energy efficiency, production, lightness, environmental and hygienic cleanliness, low cost, and fire safety. [1].

This Regulation is based on the Laws of the Republic of Uzbekistan “On Education” and “On the National Program for Training Personnel”, the Law of the Republic of Uzbekistan “On the Training and Certification of Highly Qualified Scientific and Scientific and Pedagogical Personnel”. Decree of the Cabinet of Ministers of the Republic of Uzbekistan No. PF-4456 dated July 24, 2012 "On further improvement of the higher education system in the higher education system of the Republic of Uzbekistan" Master's thesis in accordance with generally accepted international standards developed in accordance with the Decree of the Government of the Republic of Uzbekistan dated September 10, 2007 No. 190, the main rules and procedures for the preparation of masters in higher educational institutions, designed to further improve and increase the efficiency of final work, defines the criteria and requirements for content and quality [2].

2. Materials and methods

The additive is obtained as follows: a 0.5-0.1% alkali solution is added to the cotton stalks crushed to a fraction of 5 mm at a mass ratio of cotton stalks and sodium oxide of 1: 20.2-0.5, the resulting mixture is boiled for 40.. .60 min and after cooling the mixture, the solution is separated from the fibrous mass by filtration. After determining the concentration of the solution, it is used as an additive in the composition of cement-containing mixtures. in the crusher I to a fraction of less than 5 mm and are fed into the reactor 3, where the alkali solution NaOH is supplied through the dispenser 2. In the reactor 3 at a temperature of $100\text{-}105^0$ C, the stems are processed to extract the components of their composition with a NaOH solution. The solution of extractive substances of cotton stalks after cooling in refrigerator 4 is collected in container 5. After separation of the extractable substances, the fibrous mass of cotton stalks is collected in container 6 for further use as a reinforcing component of cement-containing mixtures (not considered in this work). The effectiveness of the proposed method lies not only in the completeness of the extraction of soluble substances from the stems, but also in the simplicity of execution compared to other methods for obtaining an additive from cotton waste. For example, an additive according to the method [90] was obtained by extracting cotton leaves with a solution of sulfuric acid, followed by neutralization of cement clinker with alkali, rather than silicate ones. An increase in the rate of hydration of the C3A (3CaO-A12Oz) and C4AF (4CaO-AI203-Fe2Oz) minerals accelerates the setting of the cement paste - this is manifested to a greater extent for ordinary cements than for sulfate-resistant ones, which was noted above. The acceleration of hydration of the aluminate-containing cement phases initiates the reactions of hydration and hardening of other minerals. Due to the higher content of aluminate-containing minerals in the composition of ordinary cements than in sulfate-resistant cement, their hardening in the presence of an alkaline extract of cotton stalks in the early stages increases, therefore, the strength of concrete on ordinary cements with an additive at this time increases significantly compared to the value of the strength of the composition without additives.

The deformation parameters of concretes with the addition of an alkaline extract of cotton stalks at an additive consumption of 0.03 ... 0.25% by 5 ... 8% exceed the values of similar parameters of concrete without additives at the corresponding ages. At additive costs of 0.3 ... 0.5%, these concretes practically have the same parameters of deformative qualities as concrete without additives. When testing prism specimens with a composition of 1: 1.62: 2.7 at W / C = 0.5 and C = 434 kg / m3, made from medium aluminate cement without additives, it was found that after 7 days of normal hardening they had an elastic modulus E = 3.2-101 MPa and prismatic strength coefficient K = 0.76, after 360 days. the values of these parameters stabilize at the level of E = 3.8-101 MPa and Kp = 0.83 [3], Fig. 1 and 2.

Fig.1. Block bricks

Fig. 2. Prizms.

3. Results and discussion

It can be assumed that in the process of hardening and drying in the structure of the cotton stalk, along with constructive processes, destructive processes occur, caused mainly by significant spontaneous moisture deformations of the plant filler. The minimum strength (W) is observed in the stem of cotton saturated with water (for 48 hours) to a moisture content of 60...85%. This can be explained by the well-known position on the softening of the material under the influence of moisture. The softening coefficient for different compositions of cotton stalk ranges from 0.57 (cotton stalk without additives) to 0.60 (cotton stalk with 2.7% CaCl additions), i.e. strength loss during water saturation within 48 hours, respectively, range from 48 to 37%. When analyzing the data, the identity of the kinetics of changes in the strength of various compositions of the cotton stalk at different humidity was noted. Humidity of 15-28% corresponds to extreme values of strength. The greatest loss of strength during drying of arbolite samples to a completely dry state, compared with extreme values of 16% - humidity, had control samples without processing of vegetable aggregate and with CaCl additives: the loss was 35 and 28%, respectively. For a cotton stalk, the criterion of structural strength can be not only the softening coefficient - K, but also the coefficient of strength retention during complete shrinkage (drying to an absolutely dry state), which for wood concrete of different compositions varies from K = 0.68 for a cotton stalk without additives up to K = 0.76 for arbolite with the addition of CaCl - compressive strength of cotton stalk in a dry state, MPa; Confirmation of the reason for the decrease in the strength of wood concrete due to destruction processes when its moisture content decreases below 15, the original strength is not restored. This position was also confirmed by other researchers for arbolite on wood filler [4]. Therefore, it can be assumed that the decrease in the strength of wood concrete during drying (below W = 15 ... 18%) is caused by destructive processes occurring at the interface "cement stone - vegetable aggregate" Fig.3.

Fig.3 Cotton stalks after grinding (milling).

4. Conclusion.

Taking into account the fact that the release moisture content of a cotton stalk according to Standard 19222-84 [4] is up to 25% and the moisture content of samples when determining brand strength is not regulated, and extreme strength values are obtained at a moisture content of 15 ... 17%, to increase the objectivity of the assessment strength characteristics and comparability of results when selecting mixture compositions (for sample moisture from 5 to 25%), one should determine the maximum strength MPa - ultimate compressive strength at humidity W,%; a - the correction factor for humidity, obtained empirically, is taken with a sign (+) at W 16 and (-) at W 16); W is the humidity of the test sample, %; 16 - average humidity corresponding to the maximum strength of wood concrete. Thus, the possibility of reducing the strength of the cotton stalk due to the nature of the cellulose-containing plant aggregate itself is an irreversible process and manifests itself as a consequence of the susceptibility of the plant aggregate to significant volumetric moisture deformations and the development of swelling pressure. Influence of an aqueous solution of hydrazine on the strength of the burr stem during its heat treatment. There are various methods for hardening the cotton stalk mixture. One of these methods is the use of various vapor-air mixtures during their heat treatment. Hydrazine in aqueous solutions is easily oxidized. A strong reducing agent, for example, separates precious metals from solutions of their salts. Technical hydrazine contains water, carbon dioxide, hexane, toluene, hydrazine-carbonic acid, 1, 2-dimethylhydrazine and aniline as contaminants. Aqueous solutions of hydrazine have strong basic properties. Anhydrous hydrazine - dehydration of hydrazine monohydrate with alkalis or treatment of liquid hydrazine sulfate. Thermal decomposition of hydrazine occurs at a temperature of 250-310C. In this case, only a small amount of ammonia is formed.

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