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СВОЙСТВА КЕРАМЗИТОБЕТОНА С КОМПЛЕКСНЫМИ ПОЛИМЕР-МИНЕРАЛЬНЫМИ ДОБАВКАМИ

Аннотация: в статье описаны результаты экспериментальных исследований по выявление влияние поликарбоксилатных пластификаторов на свойства керамзитобетона. Установлена что, ввод в состав керамзито-бетона поликарбоксилатные модификаторы нового поколения в количестве от 0,5 до 1,5 % позволяют повысит прочности его 1,7 – 2,4 раза.

Ключевые слова и фразы: добавка, модификация, керамзитобетон, , проч-ность, поликарбоксилат, пенобетон, газобетон, кирпич, блок.

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PROPERTIES OF EXPANDED CLAY CONCRETE WITH COMPLEX POLYMER-MINERAL ADDITIVES

Annotation: the article describes the results of experimental studies on identification of the influence of polycarboxylate plasticizers on the properties of expanded clay concrete. It is established that the introduction of polycarboxylate modifiers of a new generation in the amount of 0.5 to 1.5% into the composition of expanded clay concrete can increase its strength. 1.7-2.4 times.

Key words and phrases: additive, modification, expanded clay concrete, strength, polycarboxylate, foam concrete, aerated concrete, brick, block.

Introduction

At the beginning of any construction, there is always a question related to the choice of construction materials. materials, their cost and quality. And expanded clay concrete blocks are gaining more and more popularity. And this is not surprising if you are familiar with the advantages of this building material.

Very relevant is the lower cost of construction and operation of buildings made of expanded clay concrete blocks are more expensive than those that compete with it: foam concrete, aerated concrete, and bricks [1,2]. Also to its the advantages include good sound insulation, low specific gravity, and the ability to absorb water. moisture.

Low thermal conductivity ensures comfortable living in a house with walls made of aluminum. expanded clay blocks due to the fact that it provides a reserve of heat and the time of its return, which means reduces the chance of temperature changes.

However, expanded clay concrete and products made from it also have a number of disadvantages. One of them is a small endurance. Because of this, expanded clay concrete blocks cannot be used in load-bearing walls during construction multi-storey buildings. Although with a small specific gravity, this strength is quite sufficient for construction of external and internal walls for low-rise construction. Also a disadvantage is excessive moisture permeability. Due to the fact that expanded clay is able to absorb moisture from It is not recommended to use it in places where it is not suitable for the environment, and therefore lose its strength over time. direct contact with atmospheric precipitation and moisture from outside, for example in foundations and plinths buildings.

In order to reduce the impact of shortcomings on the scope of application of expanded clay concrete blocks we suggest using an additive based on a complex modifier.

THE EXPERIMENTAL PART

When conducting experimental studies a new generation polycarboxylate modifier was used as modifying additives: KDj-3 developed by Uzbek

scientists [3,4].Modifiers were introduced into the binder in the form of aqueous dispersions in the amount of 0.5 to 1.5 % of the binder weight.

RESULTS AND DISCUSSION

When using this additive, an increase in strength characteristics was found received samples. This is due to the properties of the hardened cement stone and to the features of formation of its structure by adding substances with pozzolanic, plasticizing and hydrophobizing properties [3,4,5]. An increase in the adhesive strength to the surface was also observed. expanded clay concrete. This was due to the addition of substances containing polycarboxylate with a large specific value surface, which affected the increase in the contact area between the mortar layer and the substrate. More one important addition was that this composition allows to reduce the water demand of the cement plant. test while maintaining its mobility. Due to the effect that pozzolanic substances give, speed up the strength gain.

Results of comparison of the obtained sample with the control one, as well as with competing samples on market conditions (foam concrete, aerated concrete, brick) and analysis of their main physical and technical parameters, such as strength, frost resistance, thermal conductivity, water absorption, abrasion resistance, average market price for 1 m^3 They are shown in Table 1.

Table 1

Comparative analysis of physical and technical characteristics

№ n/a	Name	Frost resistance, cycles	Thermal conductivity, W/(m°C)	Abrasion resistance, g/cm2	Endurance, MPa	Water absorp-tion, %	Average price, rub/m3
1	Claydite-concrete	25-50	0,15–0,33	0,7-0,9	4-10	10	2750
2	Brick	25-50	0,15-0,3	0,2-0,33	5-15	6-15	3500

3	Foam concrete	20-25	0,2-0,4	0,4-0,5	1-5	10-16	2900
4	Aerated concrete	40-75	0,1-0,14	0,9-1,3	1,5-4	20-25	3200
5	Expanded clay concrete with an additive based on comprehensive of the modifier	60-80	0,35-0,5	0,35-0,4	15-20	6-9	2850

This analysis showed that the resulting building material has good technological properties. properties, adhesion to mineral compounds. Due to the properties of the complex modifier, resistance to external factors is ensured. aggressive environments, as well as increases corrosion resistance, frost resistance and due to substances with pozzolanic properties – sulfate resistance [6,7,8]. Thanks to the reduced abrasion resistance of the material it was possible to increase its wear resistance and, accordingly, the durability of structures with its use.

An important advantage of the new material is also increased strength characteristics – flexural and compressive strength increased. It was possible to achieve no shrinkage of the material, as well slightly increased adhesive strength to expanded clay concrete.

Conclusions

Thus, based on the conducted analysis and laboratory experiments, you can first conclude on the rationality and prospects of using expanded clay with an additive based on a complex modifier. At the same time, it is necessary to pay

attention to the fact that despite all advantages of any building material, all of them can come to naught if the necessary information is not met. technologies of production and installation of structures. Therefore, work on the construction of masonry blocks should be carried out by qualified working personnel in compliance with the technology and safety of work at the site. a construction site.

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