

The Effect Of Local Ingredients Based On The Physical-Mechanical Properties Of Ceramzite Concrete Based On Chemical Complex

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ABSTRACT

According to the results of the research conducted in this article, the introduction of complex chemical additives into the composition of expanded clay concrete mixtures significantly changes their properties. Complex chemical additives increase the properties of expanded clay concrete mixture, improve the properties of workability, reduce water demand.

Keywords:

Expanded clay concrete, complex chemical additive, physical and mechanical properties

The introduction of complex chemical additives reduces the ratio of water and cement, the reduction of water consumption leads to an increase in the strength characteristics of expanded clay concrete, all this opens up the possibilities of obtaining high-strength expanded clay concrete. Such aspects have a positive effect on the long service life of expanded clay concrete, that is, on its durability.

Portland cement PTs400 D0 and PTs400 D20 of "Kuvasoysment" JSC was used to study the effect of KDz-3 complex chemical additive on the physical and mechanical

properties of expanded clay concrete. The composition of expanded clay concrete, concrete class V7.5, prepared in factory conditions by "Fergana Vibropress Tensil" LLC, is characterized by a 4-5 cm cone slump.

The results of the research conducted in TAQU "Building Materials" laboratory and "GIDROPROEKT" JSC laboratory to determine the composition of expanded clay concrete with complex chemical additives showed that KDz-3 additive has the best operational properties.

Experimental studies were carried out at TAQU "Construction Materials" and FarPI

"QMBKICH" laboratory bases in order to approve the obtained results, to study the effect of KDj-3 complex chemical additive on the physical and mechanical properties of expanded clay concrete. All the studies conducted are based on the Interstate standard GOST 30459-2008 "Dobavki dlya betonov i stroitelnyx rastvorov. Opreделение i otsenka effektivnosti" was performed in accordance with the requirements [1; 2; 3].

Based on the results of the analysis of the experimental studies conducted on the research of the rheological properties of the expanded clay mixture, it was established that the best indicators of the investigated composition of the expanded clay mixtures with additives in the amount of 0.6-1.0 and 2.0% compared to the mass of cement have an amount of 1.0% of additives. was observed in expanded clay concrete mixes.

On the basis of experiments, the optimal amount of complex chemical additive KDz-3 for the study of physical and mechanical properties of expanded clay concrete was taken at 1.0% in relation to the mass of cement.

After preparation, they were placed in a normal curing chamber to solidify the samples. Samples were tested on days 1, 3, 7, 14, 28 of

normal hardening.

The second series of ceramsite concrete samples were tested for bulk density and water absorption. The results of the conducted tests are shown in Figures 1-2, respectively. Addition of KDz-3 complex chemical additive to expanded clay concrete in an appropriate amount leads to an increase in the density and strength of expanded clay concrete.

Based on the analysis of the conducted studies, it was established that the strength of expanded clay concrete increased by 55-60% compared to the control composition, and the water absorption decreased by 18-20%. It was found that the properties of expanded clay concrete with 1.0% KDz-3 addition are higher than those of expanded clay concrete with 0.6, 2.0% KDz-3 complex chemical additives. Accordingly, KDz-3 complex chemical additive increases the strength of expanded clay concrete during the entire period of hardening. However, the greatest increase in strength was observed in the first three days. In this case, the highest strength is provided when KDj-3 additive is added in the amount of 1.0%. For 7 days, the compressive strength reaches 48% compared to the design strength of expanded clay concrete.

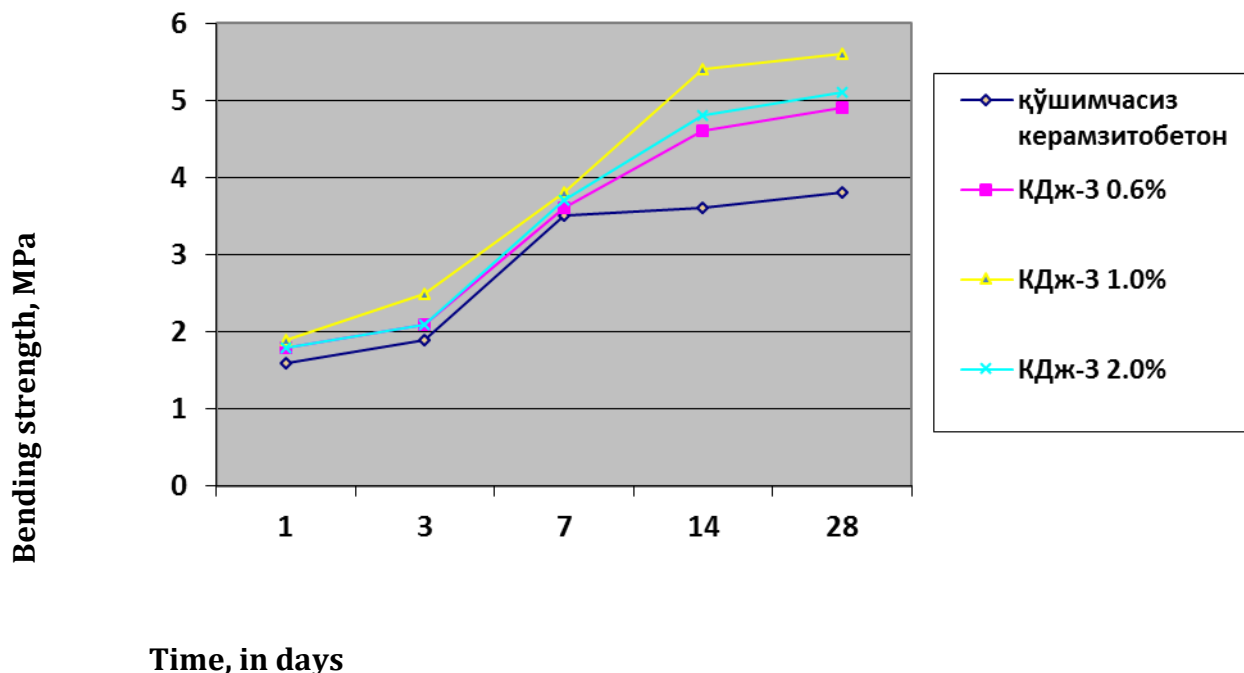
Compositions of expanded clay concrete mixtures of class V 7.5 on the example of "Fergana vibropress tensil" LLC plant.

1-table.

t/r	Naming of materials	composition of expanded clay concrete mixture, kg		
		1 m ³	Control mixtures corresponding to 7 liters of mixture	KDj-3 corresponding to 7 liters of mixture additive compounds
1	Cement, kg	353,0	2471	2471
2	Ceramsite frock 0-5 mm, kg	407,0	2849	2849
3	Ceramsite frock. 5-10 mm, kg	446,0	3122	3122
4	Water, l	260,0	1820	*1,810-1,760
5	To the cement mass relative to KDj -3, 0,6%	2,1	-	0,147

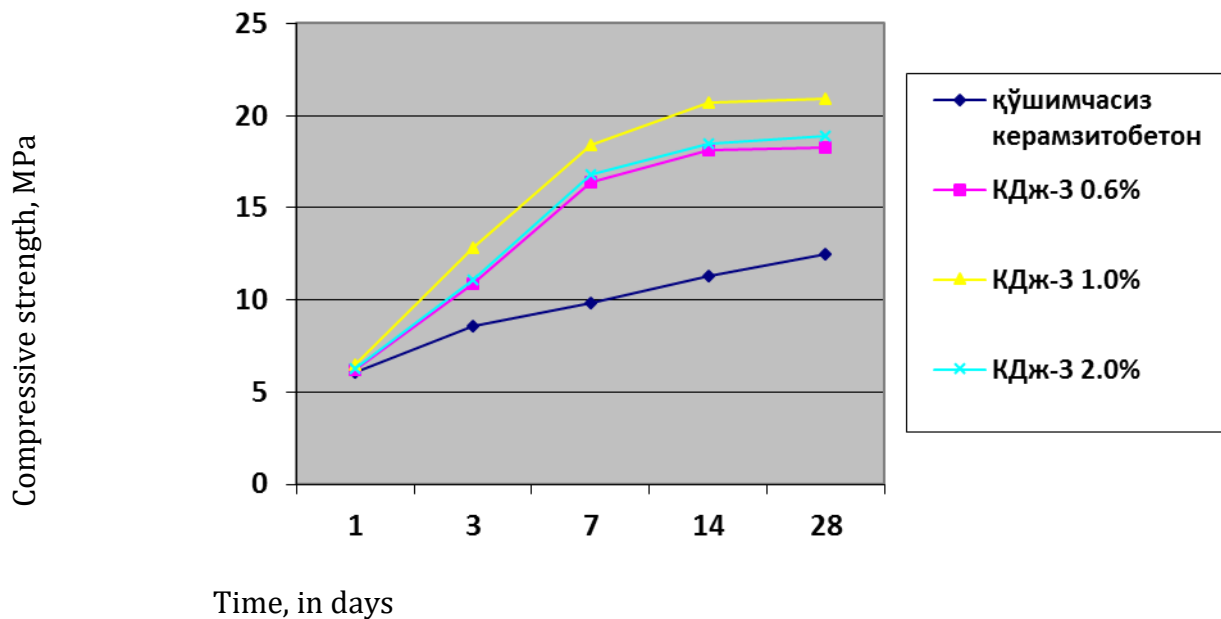
6	To the cement mass relative to KDj -3, 1,0%	3,5	-	0,245
7	To the cement mass relative to KDj -3, 2,0%	7,0	-	0,49

* the amount of water may change depending on the amount of chemical additives of the complex



1-қўшимчасиз керамзитбетоннинг эгилишдаги мустаҳкамлиги; 2- 0,6% КДж-3; 3- 1,0% КДж-3; 4 – цемент массасига нисбатан 2,0% миқдорда қўшилган КДж-3 қўшимчали керамзитбетоннинг эгилишдаги мустаҳкамлиги.

1-расм. Керамзитбетоннинг эгилишдаги мустаҳкамлиги КДж-3 комплекс кимёвий қўшимчасининг миқдорига боғлиқлиги.



1. compressive strength of expanded clay concrete without additives; 2- 0.6% KDz-3; 3- 1.0% KDz-3; 4 – compressive strength of expanded clay concrete with 2.0% KDz-3 addition compared to cement mass.

Fig. 2. The compressive strength of expanded clay concrete depends on the amount of KJ-3 complex chemical additive.

Adding KDz-3 complex chemical additive to expanded clay concrete mixture allows to reduce its water requirement by 13-18% by mass. In this case, the compressive and bending strength of expanded clay concrete increases by 55-60%, and this can be seen from pictures 1-2. It was found that the flexural strength of expanded clay concrete with KDz-3 addition for 3 and 7 days is much higher than that of the control samples. The bending strength of expanded clay concrete with KDz-3 addition is 40% higher than that of control samples.

Studies conducted to determine the effect of the KDz-3 complex chemical additive on the physical-mechanical, chemical, and operational properties of expanded clay concrete, as well as the multifunctional effect (plasticization, initial hardening speed, increase in density) showed that a higher effect was achieved than the traditional superplasticizer.

Thus, according to the results of the conducted research, it was found that the best effect on the physical and mechanical properties of expanded clay concrete can be achieved when adding KDz-3 complex chemical

additive in the amount of 1.0% by mass of portland cement.

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