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Rustam Alikhanovich Norov

Tashkent Institute of Architecture and Civil Engineering
PhD, Professor department of “Technology and Organizing Construction”

Khamza Ibadovich Yusupov

Tashkent Institute of Architecture and Civil Engineering
PhD, Professor department of “Technology and Organizing Construction” ,
Tashkent, Uzbekistan

MODERN TECHNOLOGY OF RECEIVING A CONCRETE MIXTURE WITH THE ADDITION OF ACETONE FORMALDEHYDE RESIN AT ERECTION BUILDINGS IN THE REPUBLIC OF UZBEKISTAN

Abstract: The article discusses the relevance of the use of mineral fillers, such as glizh and electrothermophosphoric slag. It has been established that mineral additives are advisable to be used in conjunction with the addition of acetone-formaldehyde resin for the preparation of concrete mixtures with high workability with reduced cement consumption. It is proved that the use of mineral fillers increases the strength properties of concrete by reducing the water-cement ratio and by increasing the proportion of cement hydration products.

It has been established that the most promising direction of using the developed concrete for structures with high rates of frost resistance and water resistance.

Key words: acetone-formaldehyde resin, electrofermophosphoric slag, adsorption, structure formation, water demand, mobility, coarse, water resistance, frost resistance.

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Introduction

One of the most important in the production of concrete and reinforced concrete products is the problem of all-round saving of material, energy and labor resources while ensuring their high quality. Concrete technology currently has a wide range of tools to reduce resource consumption without compromising its technical properties. In this direction, there is a large amount of experimental and theoretical research, considerable practical experience has been gained with the use of filler additives, such as glizh and electrothermophosphoric slag. As a result, significant reserves of saving reserves, saving cement, increasing strength, durability, improving a number of other properties of concrete [1].

The combined use of the additive ACF [2] and fillers from slag and electrothermophosphorus slag

provides significant savings in cement while improving the technological, technical and operational properties of concrete. It has been found that with a rational dispersion of 0.15 m² / g of fillers and 0.15% of an ACF additive, cement savings in a mixed binder are 28-35%. At the same time, the strength of filled cement stone is comparable to the strength of ordinary Portland cement grade 400. Let us consider in more detail the effect of glizh fillers and electrothermophosphoric slag on the properties of concrete.

Concrete mix with mineral fillers and ADC additive in a wide range of workability have less water demand with the ratio of sand to crushed stone $r = 0.33$. The plasticizing effect of the combined use of an ACF additive and coarse dispersed fillers manifests itself as a result of a decrease in the total contact

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surface, depending on the initial mobility of the concrete mixture. Therefore, as it should be expected, the water demand of concrete mixtures with the mobility of concrete mixtures of 2.6, 10 and 20 cm with fillers of slag (slime) in the amount of 25 and 50% at a binder consumption of 290, 370 and 450 kg / m², decreases by 15 -20 (10-15); 15-25 (11-16); 19-28 (17-20)%.

The water demand of a mixed binder concrete mix substantially depends on the adsorption activity of the filler. For example, the water demand of a mixture with slag is 5-10% less than with slag, which is explained by the greater activity of the latter. The effect of the quantitative content of coarse dispersed fillers on water demand is manifested depending on the flow rate, astringent in the concrete mixture. So, with a binder consumption of 370 and 450 kg / m, an increase in the content of fillers from 25 to 50% helps to reduce the water consumption of the concrete mixture, regardless of the initial workability. With a binder consumption of 290 kg / m, the water demand of the concrete mix with 50% filler is slightly higher than with 25% filling. This increase in water demand is explained by the fact that in such a mixture with such a binder content the proportion of sand increases, the hydrophilicity of which is significantly higher than that of slag and slag.

The contribution of coarse dispersed fillers to the change in concrete strength is determined by the size of the part, their adsorption activity with respect to water and ACP resins. If the reduction in water demand of conventional concrete mixtures, provided they have the same workability, leads to an increase in the strength of concrete. As a result of the structure-forming action, to a certain maximum content of the filler and a decrease in water demand due to a decrease in the total contact surface, the concrete strength increases. In this case, the addition of ACF has a significant effect on the growth of concrete strength [3]. A further increase in the amount of filler, despite the decrease in water demand and the strengthening effect of the ACF additive, due to the dilution effect and decrease in the active clinker part of cement, leads to a decrease in concrete strength.

The above opinions are confirmed by the example of a concrete mix of workability 2, 6, 10 and 20 cm, obtained on standard aggregates of Portland cement grade 400 and coarse-dispersed fillers - glizh and slag.

The relative increase in the strength of concrete with mineral filler is favorably affected by the water content of the concrete mixture. The greater the amount of water in the initial composition of the concrete mixture, the higher the increase in strength. This can probably be explained by the fact that when replacing the active clinker part of cement with mineral fillers, conditions are created for greater hydration of the binder and, as a result, fewer unreacted parts of the binder remain in the cement

stone. On the other hand, the presence of a large amount of water in concrete provides favorable conditions for the hardening of a mixed binder in a humid environment. So, if the increase in the strength of concrete with slice (slag) at a binder consumption of 290, 370 and 450 kg / m³ and P / C = 0.5 and the mobility of the concrete mixture 2 cm, respectively, is 15.35, then for cast concrete the increase is (35 -43%). With an increase in the number of fillers up to 50%, the strength of concrete with the addition of 0.15% ACP obtained from concrete mixtures with a mobility of 2-20 cm and a binder consumption of 290-450 kg / m reaches the performance of reference concrete [4, 5].

The most common glizh portland cement and slagport with electrothermophosphorus slag was obtained for the construction of hydraulic structures. Pozzolanic Portland cement with 30% glizh in concrete hardens more slowly than ordinary Portland cement and acquires 80-85% of the strength of brand at 28 days old. The same applies to slag Portland cement. Therefore, for concrete for hydraulic purposes, the brand age is extended to 180 days. Thus, a long-term increase in strength is a characteristic feature of concrete on pozzolanic and slag Portland cements. The increase in concrete strength is the higher, the lower the concrete strength at 28 days of age, and concrete on pozzolanic Portland cement with a decrease in binder consumption has a higher increase in strength over a long time.

The effect of plasticizing additives on the growth of concrete strength over time depends on the mechanism of action of surfactants on hydration and hardening processes. Additives like SDV and START do not accelerate the set of concrete strength over time. It follows that reducing the duration of the set of grade strength for concrete on pozzolanic and slag Portland cement is an urgent task. In this sense, it is preferable to use additives plasticizing action and at the same time accelerating the hardening of cement in concrete. These additives include ACF resin. The use of coarse dispersed fillers of glizh and electrothermophosphoric slag in combination with the addition of ACP can also contribute to a successful solution of this problem. The nature of the change in the strength of concrete with coarsely dispersed fillers and the addition of ACF is similar to cement stone. Portland cement with coarse clay and slag with the introduction of 0.15% ACF resin is characterized by accelerated structure formation and a shortened duration of the increase in strength.

The increase in concrete strength with coarse-grained aggregates and the addition of ACF depends on the amount of slag and slag, as well as on the water content of the concrete mixture. The relative strength gains of concrete with -25% filler content is significantly higher than that of conventional pozzolanic cement. In addition, the increase in concrete strength with 25% of the filler is much higher

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after 3 months. hardening, in comparison with the same concrete indicator on factory pozzolanic cement. As expected, the increase in the strength of concrete

with fillers is the higher, the greater the water content of the concrete mixture, the results are shown in table 1.

Table 1. The growth of concrete strength over time hardening in wet conditions

Composition of the binder in concrete		K, sm	Compressive strength, MPa, in months		
Name of cement and its consumption, m3	Type of filler and its consumption, kg / m3		1	3	6
Gliezportlandcement -320	-	2	17,2	22,4	27
Portland cement ordinary -240	Gliez -80	2	21,6	27,5	30,0
Portland cement ordinary -290	Gliez -100	2	19,5	31,8	32,4
Portland cement ordinary -240	Slag -80	2	20,2	29,3	31,7
Portland cement ordinary -290	Slag -80	2	18,6	31,2	32,2

Pozzolanic portland cement with 25-27% gliezh, along with its use in hydraulic engineering, is also recommended for the manufacture of products and structures of aerial parts of buildings and structures [5]. In this regard, it should be emphasized that coarse-grained fillers in combination with the addition of ACF contribute even more to the improvement of the weather resistance of concrete. Portland cement concrete with mineral fillers is characterized by good weather resistance and a monotonous increase in hardening strength in air. So, if for 12 months. concrete on ordinary Portland cement; in comparison with 1 month. has a strength increase of 48-53%, concrete on Portland cement with 25% slag (slag) is characterized by a growth of 66-75 (57-64), 68-77 (58-65%, respectively). Thus, the enlargement of the filler particles and the use of the ACF additive have a positive effect on the increase in concrete strength, both in wet and in natural atmospheric conditions, which expands the field of application of filled concrete. For the production of prefabricated reinforced concrete products, slag Portland cement is probably effective with ordinary Portland cement, and pozzolanic is recommended to be used for products and structures that have increased requirements for water resistance and frost resistance [6,7,8,9,10].

Under standard conditions of heat and moisture treatment of products, the strength of steamed concrete depends on the type, amount of filler and consumption of mixed binder. At 25% filling of concrete with 0.15% additive, ACF after steaming gains 85-93% of design strength. The increase in the number of fillers up to 40-45% leads to the strength of the filled concrete after steaming in the amount of 70-75%. Thus, concrete with coarse-grained aggregates -

slag and slag in combination with the addition of ACF can be effectively used for the manufacture of precast concrete products.

Based on the foregoing, the use of coarse-dispersed fillers, such as glizh and electrothermophosphoric slag in combination with the plasticizing additive ACP, had a positive effect on the water demand of the concrete mixture and on the increase in concrete strength, and improved its technological and operational properties. The study showed that when 25% coarse clay or slag and 0.15% ACF additives are added to the concrete mixture, depending on the binder consumption, the water demand of the concrete mixture with clay is reduced by 17-25%, with slag by 19-28%.

Conclusion

Consequently, the results obtained by the experimental method showed that concrete with a filler content (slag or slag) in the amount of 25% and ADC additives in the amount of 0.15 after standard heat and moisture treatment regimens gained 85-90% of the design strength.

A positive effect on the strength characteristics of concrete of coarse-grained fillers of glizh and slag was revealed. Concrete with coarse dispersed fillers on average increases strength by 20% more per month than concrete on ordinary Portland cement.

It was found that with an optimum dispersion of the fillers used — 0.15 m² / g and an optimal filling — gliezh of 25% and slag of 50% in combination with the addition of ACP in an amount of 0.15%, the cement savings in the mixed binder were, respectively: with glizh 28–33% with a slag of 25-29%.

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