

## INCREASING THE STRENGTH OF STRUCTURE BASED ON COMPOSITE MATERIALS

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### ANNOTATION

The article shows the effect of poliquaterner salts on the strength of concrete treated with heat and moisture. Immediately after evaporation, it was found that the maximum growth effect can be obtained with the combined effect of temperature and additives.

**Keywords:** Composite materials, cement, polyquaternary salt, strength, processing, modification.

### INTRODUCTION

Cement systems, in particular, composite materials for construction on the basis of concrete and reinforced concrete, high performance properties, the availability of local raw material base, the availability of a developed network of enterprises, housing, roads, bridges, hydraulic engineering and other purposes The possibility of establishing mini-enterprises for the production of products and structures is one of the broad foundations of economic development. We have developed effective composite materials for construction purposes based on cement systems by modifying the bonding structure.

Four types of cement of different alumina were used for the preparation of concrete mixes, China quarry sand (fineness modulus  $M_{cr} = 2.8-3.2$ ), Chirchik quarry granite gravel weighing 1360 kg / m<sup>3</sup>, density 2.6 g / cm<sup>3</sup>, water absorption 0.21%, porosity 1.17% and chemical additives. As chemical additives, we used aqueous solutions of polymeric quaternary salts - N, N - with benzyl chloride (ПДМАЭМА ХБ), benzyl bromide (ПДМАЭМА ББ), benzyl iodide (ПДМАЭМА ИБ), as well as with dimethylaminoethylmethacrylate (ПДМДА АХ).

The effectiveness of the studied additives was established by comparing the strength of concrete without additives, natural hardening and steamed with the corresponding modes.

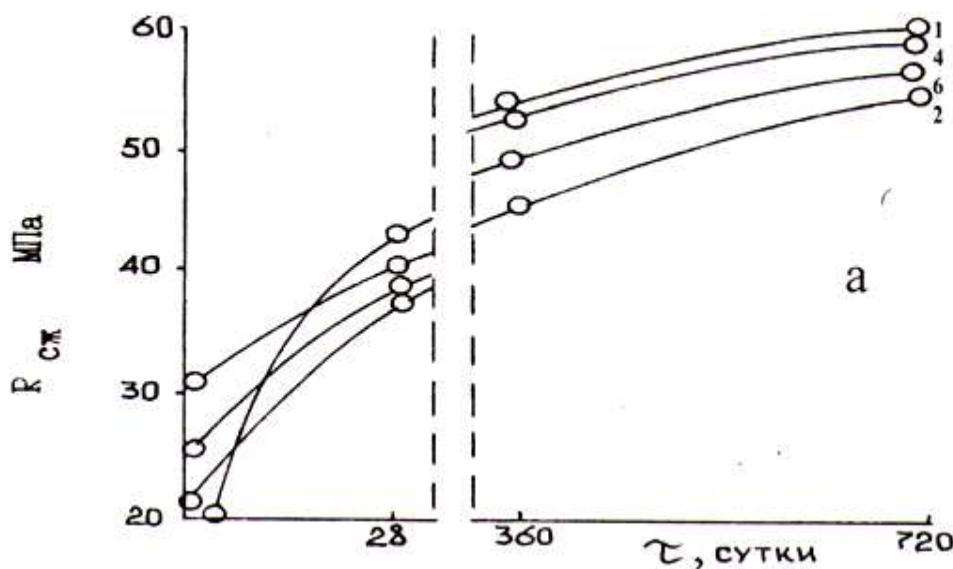
Due to the fact that the studied additives are plasticizing and air-entrapping, the studies were carried out on concrete mixtures of the same consistency.

Table 1 Physical and mechanical properties of cements

cement	NG,%	V\C	OK,cm	The beginning of setting, min	End of setting, min	Activity, MPa	Tensile strength after 28 days, MPa	
							bending	compression
No. 1 Navoi Portland cement, M-400	23,5	0,39	114	110	240	48,5	6,5	48,5
No. 2 Angren Portland cement, M-400	26,9	0,40	114	170	270	54,4	5,5	39,4
No.3 Bekabad Portland cement, M-400	24,9	0,4	111	130	290	54,6	6,8	54,6
№4 Akhangaran Portland cement, M-400	24,1	0,39	114	190	290	41,7	6,0	41,7

The concrete structure is formed before the concrete mix is adjusted, mainly during the hardening process to form a capillary-porous system, and is an interesting research object.

Figure 1 shows the results of studies of the effect of chemical additives on the strength of concrete during compression and weighing, obtained on low and high quality cement using granite rubble at isothermal resistance temperatures of 333 K and 385 K [1,2]. It is shown.



1 - natural hardening concrete; 2,3 - steamed concrete without additives; 4,5 - modified concrete ПДМАЭМА·ХБ;

6,7 - modified concrete ПДМААХ

figure 1. The effect of temperature and additives on the strength of concrete

The analysis of these data shows that steaming at  $T_{IZ}$  333 K of concrete made on cement No. 1 with the addition of ПДМААХ and ПДМАЭМА·ХБ, contributes to an increase in its strength by 21% and 34%, respectively, compared with concrete without additives. With subsequent storage of concrete under normal conditions, their strength increases. At the same time, the increase in the strength of concretes with these additives at the age of 360 and 720 days is 12% and 15% compared to steamed concrete of the control composition. As expected, an increase in the steaming temperature to 358 K and a decrease in the pre-exposure to 3 hours slightly worsened the physical and mechanical properties of concrete compared to concrete steamed at  $T_{IZ} = 333$  K. At a later age (365 days), the strength is leveled, which can be explained by minor changes in the structure of concrete. It should be noted that the use of more plastic mixtures with a / C 0.5 versus A / C 0.4 leads to a decrease in the strength of concrete subjected to heat and moisture treatment. Studies on the effect of Poliquaterner salts on the strength of concrete treated with heat and moisture have shown that immediately after steaming, the maximum gain effect can be obtained with the combined effect of temperature and additives.

### REFERENCES

1. Грушко И.М., И.М, Свиреденко Н.М и др. Применение химических добавок для улучшения физико- механических свойств бетона- Харьков: из-во Облполиграфиздат 1990.-75
2. Ершов Л.Д. Высокопрочные и быстротвердеющие цементы.-К.: изд-во Будвельник, 1995. -159с.
3. Махмудова Н.Х. Влияние модификации композиционного материала на физико- механические свойства бетона.