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Effect of silica fume and diopside microdispersed additives on the strength of concrete

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The high mechanical strength of the concrete is the most important property of its application. It is depended on many well studied factors (the water–cement ratio, porosity etc.). It is known that the strength of concrete increases with the addition of microdispersed additives of different chemical composition. However there are very contradictory experimental data about mass fraction of the microdispersed additives to strengthen concrete. In our opinion the possible reason of such discrepancy of the experimental data may be the different size of microdispersed additives used. The aim of this paper is to experimentally study the effect of the particle size and mass fraction of the different microdispersed additives on the strength of the concrete. The results of mechanical strength tests of fine-grained concrete from the dispersity and the mass fraction of additives, reactive silica fume and inert diopside are presented. It has been shown that the optimum amount providing greater reinforcement samples decreased with decrease in the dispersity of inert mineral additive. It was found that the optimal ratio of silica fume and the diopside to maximize the strength properties of the material. In this case the strength characteristics of the fine-grained concrete has the strength characteristics of 2.5 times higher than the control sample.

Biography

Valery Rudyak is a Honoured Science Worker of Russian Federation. He is Head of Theoretical Mechanics Department of the Novosibirsk State University of Architecture and Civil Engineering; simultaneously he is main Research Scientist of the Siberian Federal University. He is author of 6 monographs and more than 200 papers in reputed journals and he has been serving as an Editorial Board Member of four journals.

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