

Increasing the Durability in the Context of Green Construction in Regions with Arctic and Alpine Climate

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Abstract. The article explores opportunities of using green construction materials in the regions with frequent negative temperatures and rapid temperature changes. In the context of this article green construction material is a material produced by means of environmentally sound and resource efficient technological processes, providing (where possible) for recycling of wastes. Authors performed comparative laboratory tests of concrete samples made from cement-based binder with and without mineral slag additives. Dynamics of sample hardness and density indicators during hardening and when being exposed to corrosion factors were assessed. Certain advantages of cement-based binder with mineral slag additives were found. We explain these data by the corresponding difference in the chemical transformations occurring in the system during subsequent phases of cement stone hardening. This result was extrapolated to the durability of corresponding concretes in arctic and alpine climate zones, and the positive influence on a life cycle of buildings was predicted. Usage of such type of green material for the construction purposes on the territories with cold (and extremely cold) climate is advisable from both environmental and economic points of view.