

CONSTRUCTION PRODUCTS FOR THE CONSTRUCTION OF BUILDINGS AND SPECIAL-PURPOSE STRUCTURES

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A "safe room" is a specially equipped room in a house or apartment, which is designed to protect residents in case of emergency situations, such as rocket attacks, terrorist acts, natural disasters, etc. In Israel, "safe rooms" have been a mandatory component of any new house or apartment built since 1992 [1].

In the modern life conditions of Ukrainians, the necessity of building a "safe room" at the design stage becomes acute. In this work, the use of industrial waste as raw materials for improving the mechanical characteristics of concrete is considered.

The waste of energy and chemical companies, such as phosphogypsum, titanium gypsum, fluorogypsum, citrogypsum and desulphogypsum, can be used to produce building materials, products and structures used in the construction of residential and industrial buildings, agricultural facilities, road structures, etc. [2-4].

Studies indicate that the use of TPP ash and slag waste for the production of cement and complex multicomponent binder is economically feasible. In many works, the authors established that the amount of SiO_2 , Al_2O_3 , Fe_2O_3 , CaO and MgO significantly affects the physical and chemical properties of building materials [5-7]. Research has established that the most effective way to improve the physico-chemical and physico-mechanical characteristics of building materials is to use fly ash of the Ladyzhynskaya TPP [8], which has a basic chemical composition and has a beneficial effect on the processes of structure formation.

A large amount of ash contained in ash-containing materials can lead to an increase in porosity and a decrease in the rate of strength gain over time, as well as a deterioration in operational properties, including frost resistance and corrosion resistance [9-10]. To prevent such undesirable consequences, it is necessary to add complex additives that have a multifunctional effect to the composition of the concrete mixture [11]. These additives affect not only the kinetics of strength gain, but also the formation of the appropriate structure of the material, which affects the physical and mechanical properties and service life of the resulting concrete.

To increase the amount of ash in the binding concrete, it is necessary to activate it. The choice of the activation method depends on the chemical and mineralogical composition of the ash, its production and the composition of the

binding system. Since ash performs several functions in the composition of the concrete mixture, its amount can be increased due to the use of various activation methods. Moreover, the introduction of ash into the composition of the material as a microfiller and fine aggregate will contribute to the formation of a strong contact zone [12-13].

According to the conducted studies [14-15], the authors established that the optimal amount of ash to increase the strength of cement-sand compositions depends on the chemical and mineralogical composition and specific surface, and is from 20 to 40 percent of the amount of aggregate. In the case of fly ash and fluid ash, the pozzolanic component is 35-40 percent by weight, and the pozzolanic index exceeds 1.7. When using hydroremoval ash, the pozzolanic index is 1.3-1.7 [16-19].

In conclusion, I would like to say that considering the fact that the production of building materials is one of the most material-intensive and expensive branches of industry, the use of industrial waste as raw materials in the production of building materials will significantly reduce the depletion of natural resources, reduce the cost of manufacturing high-strength concrete and make it possible to implement construction effectively. safe rooms" at the stage of designing new buildings.

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