



PRODUCTION OF EXPANDED POLYSTYRENE BASED ON LOCAL RAW MATERIALS

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ABSTRACT

In the subject of this article, the scientific and practical work on polystyrene concrete, the raw materials used for the production of polystyrene concrete and their properties were studied. Physico-mechanical and physico-chemical properties of polystyrene concrete were studied using research methods. Air-entrained polystyrene granules, vermiculite and thermal power plant ash waste were used as the main raw materials for the production of polystyrene concrete, thus the complex properties of polystyrene concrete were studied and the optimal composition was developed.

KEYWORDS

polystyrene, concrete, granules, vermiculite, ash, waste.

Introduction

As the method of the article, the method of analysis based on the data collected for researching the alternative composition of polystyrene concrete, the experimental method for studying its physical and mechanical properties in laboratory conditions, and the mathematical modeling method for designing its optimal composition are used. The theoretical significance of the article is It is explained by the study of the formation of the concrete structure, as well as its physical and mechanical properties, thermal insulation quality indicators and resistance to external influences. is to give. Many properties of polystyrene concrete have been studied since the 1950s and 1960s. To study the thermal and physical properties of reinforced concrete products used for industrial buildings and earthquake-resistant buildings in aggressive conditions, polystyrene granules were used as a filler in concrete. Studies on polystyrene concrete were also conducted at the Ministry of Agriculture of the USSR and the Scientific Research Institute of Construction Materials Production. In 1978, polystyrene concrete with a density of 350-800 kg/m³ was produced. The difference between this concrete and other polystyrene concrete is that a secondary product (foam plastic) was used as a filler.

By the end of the 1980s, prof. V.A. Rakhmanov and V.G. With the help of Dovzhik, the properties of heat-protective polystyrene concrete were studied at TBITI (Reinforced Concrete Scientific Research Institute). Using quartz sand with a density of 500-1440 kg/m³, they produced polystyrene concrete with a strength of 16-35 kg/cm². The thermal and physical properties of polystyrene concrete were studied in the research, and as a result of the research, the amount of cement used for 1 m³ of polystyrene concrete was reduced. Before starting the research, they used 800 kg of cement per 1 m³ of concrete, and by the end of the research, they

used 250 kg of cement per 1 m³ of concrete. This is the cause of saving money from the economic point of view, and this has motivated the production of concrete on a large scale [1].

Polystyrene concrete performance indicator in various conditions is no less than other lightweight concrete.

Polystyrene concrete, obtained on the basis of air-entrained polystyrene granules, is a composite material, the study of which requires a comprehensive approach to the analysis of the physical-mechanical, physical-chemical and operational properties of concrete, as well as the microstructural, physical, mineralogical and phase-chemical properties of its components. . Control of various properties of polystyrene concrete blocks is carried out according to the methods provided by GOSTs.

The addition of thermal power plant fly ash to polystyrene concrete mixtures significantly changes their properties. Fly ash mineral filler reduces the mobility of the concrete mixture by a certain amount, but we can overcome this shortcoming by adding more fly ash to the concrete mixture, increasing the percentage of water consumption, improving the properties of cement sinking, increasing its strength and thermal conductivity. The following physical and mechanical properties are determined for polystyrene concrete:

- average density;
- compressive strength;
- cold resistance;
- thermal conductivity;

Depending on the average density of polystyrene concrete, taking into account the requirements of its compressive strength and frost resistance, it is determined in accordance with construction standards.



Indicators of changes in compressive strength of polystyrene concrete of different densities.

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