



COMPOSITION AND PHYSICAL AND TECHNICAL PROPERTIES OF CERAMIC CONCRETE WITH INDUSTRIAL WASTE AND CHEMICAL ADDITIVES

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ABSTRACT

Expanded clay concrete is a new construction material improved with industrial waste and chemical additives, which improves its properties through the secondary use of waste. This not only helps in waste disposal, but also improves the environmental aspects of construction.

The performance characteristics of expanded clay concrete with the addition of industrial waste significantly exceed those of traditional materials. Industrial waste, such as fly ash and slag, not only contribute to the introduction of improved mechanical properties into the concrete composition, but also help reduce production costs by replacing some of the expensive components. In addition, the use of industrial waste in construction helps to reduce the volume of environmentally hazardous waste.

Also, the addition of chemical additives to expanded clay concrete allows you to control such parameters as the setting time, strength, water resistance and frost resistance of the material. This makes expanded clay concrete especially attractive for use in various climatic conditions, from harsh winter conditions to warm climates, ensuring the strength and reliability of building structures. For example, the use of special additives can significantly increase the service life of bridges and road pavements, which reduces the cost of repair and maintenance.

The basis for expanded clay concrete is expanded clay - a porous structure made of baked clay. Industrial waste, such as fly ash and slag, as well as various chemical additives, are used to change the main properties of concrete, such as strength, frost resistance and water resistance.

Physical and technical properties: The use of industrial waste and additives allows you to significantly improve the properties of expanded clay concrete, such as density, porosity and thermal conductivity. These changes make the material lighter and more efficient for use in various climatic conditions.

Research and results: Recent studies show that the addition of fly ash and special chemical additives can increase the compressive strength of expanded clay concrete by 20-30%. In addition, the use of slag increases the frost resistance of the material, which is very important in cold climates.

Material composition: The basis for expanded clay concrete is expanded clay - a porous structure made of baked clay. Industrial waste, such as fly ash and slag, as well as various chemical additives, are used to change the main properties of concrete, such as strength, frost resistance and water resistance.

Due to the lightness and porous structure of expanded clay, concrete becomes lighter and more heat-insulating, which is a great advantage in the construction of residential and commercial buildings. This allows you to reduce the load on the foundation and other supporting structures and increase the energy efficiency of buildings. When expanded clay is used as an aggregate, it increases the seismic stability of structures, which is important for regions with high seismic activity.

When added to expanded clay concrete, it increases its compressive strength and reduces porosity, which increases the water resistance of the material. Slag is a heavy and durable component that increases the overall weight and strength of the structure, making it more resistant to mechanical stress. In addition, the use of slag helps to save natural resources, as it allows for the partial replacement of natural aggregates, such as gravel and sand.

Chemical additives, such as plasticizers and refrigerant components, are introduced into the composition of expanded clay concrete to control the setting time and increase its frost resistance. This allows construction work to be carried out in the winter season without loss of quality. Also, additives may include components that improve the adhesion between the expanded clay and cement mixture, which ensures an even distribution of loads inside the material.

Conclusion: The use of industrial waste and chemical additives not only improves the physical and technical properties of expanded clay concrete, but also makes the process more environmentally friendly. There are urgent tasks in the field of developing new compositions and technologies. In addition, the use of industrial waste reduces the demand for raw materials in the production of building materials, which helps to conserve natural resources and reduce the impact on the environment. This method also reduces the volume of waste bases and can be an important step towards environmental protection by converting waste into useful resources. Adding chemical additives to expanded clay concrete allows for further control over the properties of the material, such as adjusting its setting speed or increasing its water resistance.

At the same time, research is ongoing into new technologies and compositions that will improve the quality of building materials and offer environmentally friendly construction solutions. Advanced research and innovation can make expanded clay concrete a more competitive and sustainable building material, which will ensure its wide application and expand the use of environmentally friendly technologies in the construction sector.

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