

SELECTION OF WATER PERMEABLE CONCRETE COMPOSITION

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Abstract:

Choosing the composition of concrete involves finding the optimal amounts of cement, water, small and large fillers, ensuring the rheological and technical properties of concrete, its brand. The standard characteristics of the components are used when choosing the concrete composition.

Key words: concrete, plasticizers,

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The composition of concrete is selected using calculation formulas, and experimental mixes are prepared and the results are clarified. The ratio between the grade of concrete and the grade of cement is of great importance when choosing the composition of concrete. $R_b/R_{sm}=0.4-0.6$ for low- and medium-grade concretes, and 0.8-1.0 for high-grade concretes (M500, M600 and higher).

To choose a specific concrete composition, the brand of concrete, the mobility or consistency of the concrete mixture, the activity of cement, the density and bulk density of small and large aggregates, the interspace and fraction of large aggregates are necessary. When preparing the concrete mixture, the moisture content of small and large aggregates is taken into account, and the composition of the concrete used is recalculated and clarified. Concrete mixes are divided into continuous and continuous types. They are based on the free fall of the concrete mixture and its forced mixing. The most effective additives for waterproofing concrete

Plasticizers. Famous brands: "Superlasticizer S-3", "Superplast" and D5;

Colmatization. Popular additives: bitumen emulsion, calcium nitrate, aluminum sulfate, as well as iron sulfate, chloride and nitrate;

Polymer. Popular: water-soluble methylcellulose, cellulose methyl ether (MC-8, MC-16, MC-100, etc.), as well as resins: diethylene glycol DEG-1, triethylene glycol TEG-1, and polyamide C-89.

At the same time, plasticizing additives, despite the large number of types, have common principles of action - forming a waterproof film around cement particles and creating an electric charge around them. As a result, the liquid material is activated and, accordingly, better compressibility (water resistance) appears. Waterproof concrete is a special type of concrete that does not contain moisture-permeable voids. In addition, waterproof concrete has a high density that provides its unique properties. At the same time, one increased density is not enough to ensure 100% waterproofing. Therefore, for the construction of waterproof structures, it is necessary to use a special additive for waterproof concrete, which can be added to concrete mixed with your own hands, and thus you can make waterproof concrete yourself. Previously, we have already considered the main types of concrete additives.

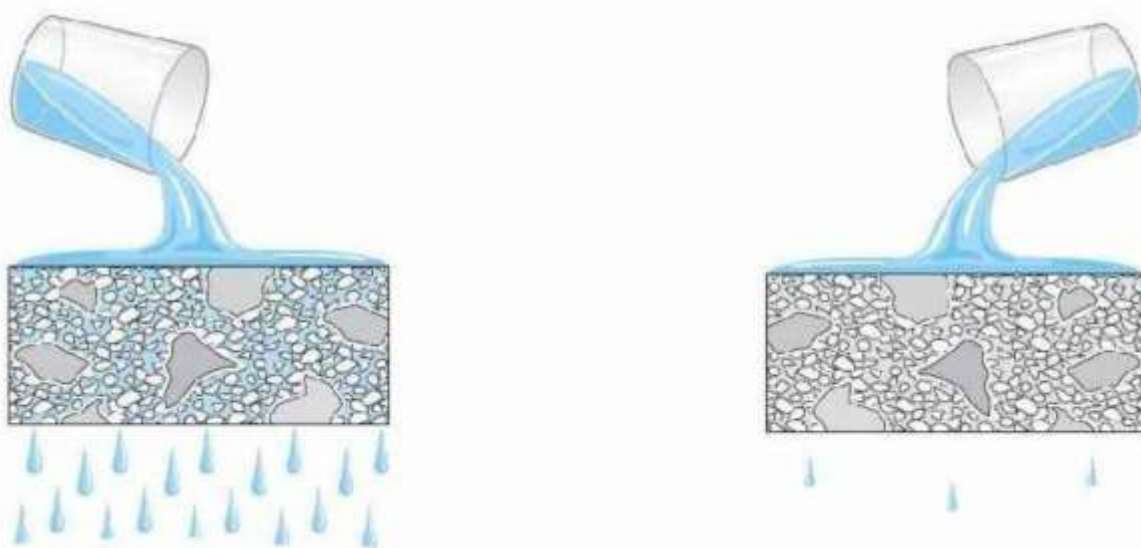
The most effective admixtures to give concrete waterproof properties

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Colmatization. Popular additives: bitumen emulsion, calcium nitrate, aluminum sulfate, as well as sulfate, chloride and iron nitrate;

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At the same time, plasticizer additives, despite the large number of types, have common principles of action - the formation of a waterproof film around the cement particles and the creation of an electric charge around them. As a result, the liquid material is activated and, accordingly, better sealed (waterproof).



Waterproof concrete process

Capillary admixtures compact the concrete and make it waterproof after the material hardens. A similar effect is provided by the chemical reaction that occurs between the additive, cement and water.

The reaction produces insoluble compounds that fill the voids and pores in the hardened concrete. Some types of colmatization additives can be added not only to concrete, but also applied to its surface after hardening (penetrating additives). In this case, the process of clogging takes place - the penetration of additive components into the surface layers and filling of pores.

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Polymer additives ensure the highest level of waterproofing of the material. A strong polymer film is formed on the particles of the components of the solution, so even a cracked concrete structure can be waterproofed with the help of polymer additives. With the help of additives, we can make only a monolithic structure waterproof. Almost 100% of precast concrete structures have seams that cannot be sealed. Therefore, it is not economically feasible to use expensive additives to fill prefabricated structures just to ensure waterproofing.

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