

Investigation of waterproof concrete with crystal and zycosilic technologies in the executive levels of the building

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Abstract

According to the properties of concrete, it is necessary to upgrade this material. In areas such as construction. Concrete has many pores and increases the amount of water penetration. One of the ways to make waterproof concrete is to use crystal and zycosil technology. The details of this technology are expressed in the form of scientific texts and images. In this article, a descriptive-analytical research method has been used. The purpose of study is to provide methods to prevent water from entering the concrete. This issue increases the architectural quality of concrete buildings. It can also be concluded that using waterproof concrete with this technology is important. This material prevents the building from damaging chemical reactions caused by water penetration. Finally, this material increases the quality of the building in execution.

Keywords: concrete crystallization, construction implementation, nanotechnology, Waterproof concrete, water penetration prevention, zycosil technology

Kulcsszavak: betonkristályosodás, építési kivitelezés, nanotechnológia, vízálló beton, vízbehatalás elleni védelem, zikozil technológia

1. Introduction

Concrete has entered the world of construction as an important material. According to studies, a new generation of concrete was introduced to the architecture [1]. Building materials have internal cracks. Water penetration is also a problem resulting from this issue. Waterproofing is a type of operation that makes the material impermeable to water. The health of concrete structures depends on some things, like the destructive reactions that occur during the life of the structure. All these reactions need water as a reactant, so if water penetration is reduced, and these reactions will be reduced [2]. Concrete penetration is one of the most important challenges of working with concrete. Researchers consider a parameter related to the health of concrete in operating [3]. Concrete elements have been more important than its components like cement and water. Due to the applications of concrete in different conditions, additives are used. Other important materials must be used to waterproof the concrete. This material closes the pores of the concrete. These materials must be present in some steps, like the hydration reactions and formation of the cement. This issue causes it to crystallize in the pore wall. Zycosil nanotechnology is the first cost-effective and friendly technology. Which is offered in both powder and liquid forms. Which is used as the best waterproof filter to fill the empty micro-spaces of the concrete. According to the introduction, waterproof concrete with crystal and zycosil technology has many advantages. If you use this waterproof concrete, you can improve the quality of the buildings, waterproof concrete is recommended in countries with heavy rainfall. Because it reduces building damage and increases its life.

2. Problem statement

What are the advantages and using waterproof concrete in the construction of buildings? Can the use of waterproof concrete technology in architecture increase their lifespan? Is it appropriate to use this type of concrete in the Iranian construction industry?

3. Research methods

In the present study, a descriptive-analytical research method has been used. Taking into account library studies, the required information has been collected. This information is about concrete with crystal and zycosilic technology in the building. This article examines the details of making waterproof concrete with new technology.

4. Research history

Mehdi Rahimi Asl and Amirhosein Alizade in 2011, wrote an article. The titles are Crystal Waterproofing Technology and ZYCOSIL (ZYCOSIL), in marine environments studied waterproof concrete. In this article, it is stated that due to many studies, and tests on concrete samples with different percentages of disturbances of elements. We came to the conclusion that crystalline chemicals improve the strength of concrete and increase the period of use of the building [4].

Abbas Doagu in 2015, in an article examined the performance of Zycosil in concrete. It is stated that the Zycosil mechanism is a phenomenon of nanotechnology of waterproof concrete, with resistance to water penetration has caused a period of

operation of structures, such as enhancing the facade of the building [5].

Hamed Javadi Tazehkand and Karim Naqdi in 2016, studied the waterproofing of concrete. This technology uses crystal and zycosil technology in Sarein urban area. This article states that construction materials are in contact with atmospheric factors. Today, with the knowledge of the latest technologies, it has introduced two products. They are crystal and zycosil technology [6].

Mohammad Reza Shojaei in this article, it is stated that water is one of the destructive factors of facades. Waterproofing makes the material impermeable to water. Zycosil has a significant role in waterproofing surfaces. achieving stability and improving the quality of the urban landscape [7].

5. Check concrete

Concrete in a broad sense refers to any material that is composed of a cementitious adhesive. This is one of the most used building materials. A variety of building materials have long been used by humans. Concrete is actually man-made. A very hard body is made from a combination of a certain amount of cement, sand, gravel, water, air. In small and insignificant tasks, concrete mixing is done. But, mechanical devices are used to produce concrete in large volumes [8]. Concrete has different types including plain, reinforced, prestressed, prefabricated, and also lightweight, polymer, waterproof and so on. To have types of concrete, chemical additives are used, that these materials are used in the structure of concrete, such as lubricating, bubbling, retarding, crystallizing additives, improving quality, and improving performance. Concrete has several advantages such as easy access to its components, easy transport, and also easy molding and formability, high compressive strength and so on. But concrete has disadvantages such as low tensile strength, high porosity and permeability. Cracking due to drying after concreting has been eliminated with significant technological advances. In construction, use of concrete is very common, and it can be used in the execution of foundations, buildings and structures. In general, the implementation of concrete in the building includes three main stages. They are reinforcement, formwork and concreting.

6. Waterproofing methods for concrete

There are various methods for waterproofing concrete. Some of them are old and traditional and some of which are modern. Especially nanotechnology in which water can't reach the interior of the concrete structure. From the beginning, they don't reach the underlying layers. Such as the use of coatings (PVC), which are called waterproofing products. In other methods, the concrete structure becomes impermeable using chemical additives. And prevents moisture from advancing. According to Fig 1, the waterproof system is activated by the entry of moisture. In the absence of water and moisture, the concrete is not waterproof. Crystallization and zycosil technologies are examples of this method. They are useful for permeable products. Infiltrators are soluble monomeric materials. And have two types of non-reactants such as oils and types of substrates reactants [2].

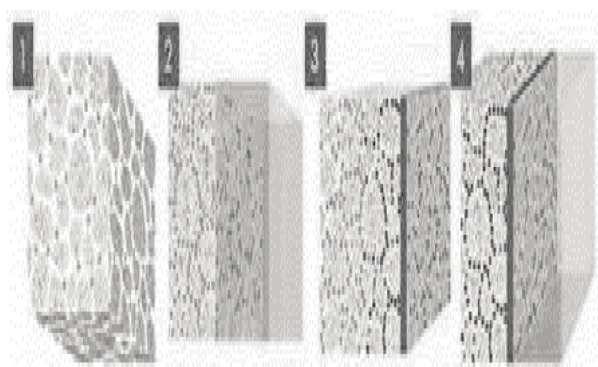


Fig. 1 Steps of forming waterproof concrete with reactive permeable products
1. ábra A vízálló beton kialakításának lépései reaktív permeábilis termékekkel

7. Waterproof concrete with crystallization technology

Crystal is a unique chemical solution for waterproofing, protecting and regenerating concrete. Crystalline concrete is the most active chemical product with a crystalline waterproofing system. And it is activated when mixed with water. This creates a reaction in the concrete and prevents water and any other liquid [9]. This type of innovation in the executive part of the building is available in three forms, covering structures, dry matter of horizontal surfaces and composite in time [10]. This valuable technology is inspired by the lotus leaf mechanism. This means that it has advantages, such as hydrophobicity of concrete and also preventing the entry of chemicals into it [6]. According to Fig 2, it takes time to convert the primary concrete to crystal concrete, and this structural change is not in place.



Fig. 2 Stages of crystallization of concrete
2. ábra A beton kristályosodásának szakaszai

8. Waterproof concrete with zycosil technology

Zaydex has recently developed a waterproofing product in India called Zycosil, which reacts with the inorganic substrate of the material. Zycosil is an organosilicon product that forms a nanometer-sized particle size in water as shown in Fig. 3 and penetrates deep into the pores of the material and becomes part of it, making the building material highly water repellent. This product has outstanding features such as long life of twenty to thirty years, environmental friendliness due to the very low entry of biomaterials into the atmosphere and dissolution in tap water, its use with brushes and rollers and therefore easy work with it.

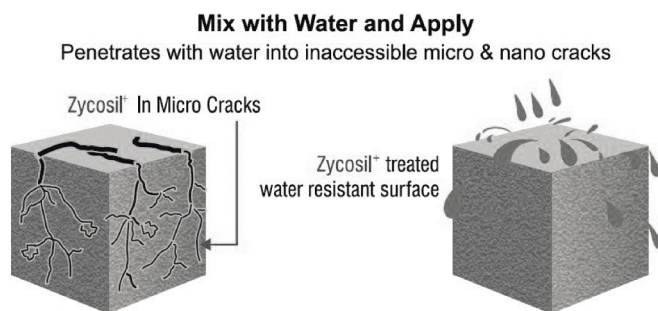


Fig. 3 How Zycosil works
3. ábra Hogyan működik a Zycosil

9. Advantages Of Waterproofing Concrete

Waterproof concrete prevents the penetration of water into the structure. It can also be used to prevent corrosion of steel used in concrete. It's important to prevent freezing and whitening of concrete in cold seasons. These advantages have increased the quality, stability and strength of concrete. It is also ready for various construction operations.

10. Uses of waterproof concrete in construction

This type of concrete is used in various construction operations. There are no restrictions on its implementation. Some buildings need waterproof concrete for special weather. Such as buildings that are located in humid climates and high annual rainfall. In these structures, the outer shell and the foundation are in direct contact with water, so the use of waterproof concrete in their structure plays an important role, this type of concrete used in water structures, such as dams, water canals and other structures built in water. In this paper, the use of waterproof concrete in residential buildings is considered. We are in a lot of contact with them every day. Waterproof concrete with crystal and zycosil innovation, like other types of concrete, it has been applicable in construction projects. And there is no need to use special rules and maintenance points are enough. And concrete execution should be observed like other types of concrete.

11. Conclusions

From this research, it can be concluded that knowledge and use of this concrete is essential. And its implementation at the

executive levels of the building is very important. Because most concrete buildings are affected by heavy annual rainfall. And over time, chemical reactions with water and sulfate lose their quality. This issue can cause irreparable financial and human losses to building users. But this, like other construction problems, has been controlled by advances in technology. Technologies such as crystallization and zycosil are emerging. And help the construction industry by forming waterproof concrete.

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