

RESEARCH ON THE TYPES AND GENERAL CHARACTERISTICS OF DRY CONSTRUCTION MIXTURES

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Abstract

Every year, businesses dump hundreds of thousands of tons of waste into landfills, polluting the environment and negatively affecting the environmental situation. It is advisable to dispose of man-made waste that is harmful to the environment and use them wisely to improve the production of new types of building materials.

The article is devoted to the analysis of works aimed at solving exactly these problems.

Keywords: Dry building mixes, asbestos cement waste, industrial waste, wet and dry waste, thermal power plant ash, silica, ecology, recycling, recycling.

Introduction

In recent years, special attention has been paid to increasing the volume of production of domestic dry mixtures in the construction market of our Republic, to the production of inexpensive and high-quality products that can qualitatively compete with foreign manufacturers. This is due to their high efficiency, abundance of need and stability on the qualitative side. Of particular importance in this is the production of imported replacement building materials, the use of industrial waste as raw materials for them [1,2,3].

The production of dry building mixtures (DCM) is one of the youngest and most rapidly developing industries in the construction industry. In the domestic construction market, DCMS lars are over 15 years old, and the bulk of the mixtures consumed at the initial stage are provided by foreign manufacturers. From the beginning of the 90s, a sharp increase in the volume of production of mixtures (according to some data, the growth was 100-150% per year [4,5]) and the gradual replacement of imported products was made possible.

Scientific research on the creation and use of DCMS in the world is actively carried out, the number of articles, patents and specialized conferences has increased significantly [6-10]. The research is mainly aimed at achieving the following goals: developing new methods for determining the qualitative characteristics of dry mixtures, reducing production costs,

expanding the raw material base for the production of building mixtures, optimizing existing compositions and individual components. However, the absence of a modern regulatory framework and an integrated approach to the design of dry building mixtures compositions for various purposes leads to the development of products that do not meet the requirements of construction and the excessive consumption of expensive components.

The leading firms and companies in the world producing dry construction blends are: Simpelkamp, Sakret-Zentrale, PCI, Knauf (Germany), Partek, Fexima, Lohja (Finland), Sika AG (Sweden), Serett (France), Atlas (Poland), etc. [11,12].

The use of modified dry construction mixtures in all regions of Russia began in the second half of the 1990s.

Initially, imported raw materials imported from Western European countries with sufficient competence in their use were used, with imported dry construction blends occupying the bulk of the market. First, the following foreign manufacturers imported their products on the Russian market: Atlas (Poland), Vetonite (Finland), Knauf (Germany) [13].

In the Republic of Uzbekistan, the same process, the time when dry construction mixtures entered our markets, in 1998 the LLC FUBER SIDE-PLAST enterprise began to produce several types of dry construction mixtures (Satingips dry construction mixture, a special mixture for gluing tiles to the base) under the name "MEGAMIX".

On January 21, 2006, the Uzbek-German joint venture "BUKHAROGIPS" in the form of an open Joint-Stock Company began to work in our Republic and consistently established the extraction of gypsum stone and the production of gypsum. As of October 2009, several types of dry construction blends (Knauf Rotband, Fugen, Perlfix, Satengips) have begun to be produced and dry construction has taken its place in the blends market.

In accordance with the existing classification, DCM is divided into the following main types: plaster, cement, plasterboard, leveling, glue, finishing, polbop (floor base leveling). The most commonly used are plasterboard and smoothing plaster mixtures, the effectiveness of which depends on a number of specific properties of plaster binders. These include their ability to regulate bite times over a wide range, the speed at which the hardened material can achieve sufficient strength and hardness, relatively low thermal conductivity and good sound insulation ability, high vapor permeability, fire resistance, environmental friendliness.

An acceptable way to regulate the properties and structure of DCM is to include fillers derived from mineral and industrial waste in their composition.

Mineral supplements are divided into active and inert (microwave) mineral supplements [14-16]. Basic principles of the theory and technology of modification of binders with Mineral and chemical additives P.P. Budnikov, A.V. Volzhensky, A.V. Ferronskaya, V.F. Korovyakov, V.I. Solomatov, L.I. Dworkin, R.Z. Rakhimov, M.S. Saduakasov, M.I. Haliullin, W.I. Developed by Morevoy and other scientists.

DCMS use lead domna and steel casting as fillers, ash, quartz sand, glass fractures, limestone, dolomite, seolithic rocks, Tuff, pumice, microcremnezem, lead ceramic brick, ceramzite, ceramzite dust.

In accordance with the rules of the multi-structural theory of filler building materials in binding compositions, the structure plays the role of a creator at the level of mutual physical and

mechanical influences [9-11]. When the filler is introduced in the optimal amount and optimal softness, a mixed structure is formed, and in the process of hardening, an artificial stone microstructure is formed, the technological defects of which are reduced as a result of reducing its volumetric deformations. When the amount of filler reaches a certain level, a sharp decrease in the strength of the artificial stone occurs as a result of the direct confluence of its grains with each other and the appearance of their defective places.

From the data presented, it can be concluded that dry construction is a requirement of the period for the production of a mixture, its types and quality, their comprehensive research at the expense of localization, and every work carried out in this direction is worthy of attention.

DCMS that meet modern requirements face some challenges in manufacturing and feature research.

A little studied topic in the research of DCMS is the systematization of accepted general methods for determining the quality of Mixtures and, on their basis, the development of modern recommendations and principles for the design of compositions of effective DCM compositions.

Experts say that the main physical and mechanical properties of DCMS should be clearly defined at the design stage.

The recommendations and calculation method given in SP 82-101-98 [17] on the selection of building mixtures in terms of strength allow the conditional development of the composition of the mixture in a particular class. In this case, it is not possible to use a lot of necessary average coefficients and take into account other important (structural, technological, etc.) indicators. In addition, the presented method absolutely does not take into account the peculiarities of the raw material components, which makes it impossible to understand the effective areas of their use. The disadvantages of the calculation method for designing the composition of dry mixtures can be partially eliminated using statistical methods [18]. Given that the composition of the mixture can consist of fractional sand (up to four fractions), binder (complex composition), fillers and water, the number of independent factors can reach 5-8, even without the use of modifier additives. This leads to a significant painstaking nature of experimental research and often the possibility of implementation only in specialized laboratories. However, even in this case, it is difficult to take into account the effective properties of individual components. Therefore, it can be noted that there is no effective way to design compositions of DCMS, taking into account the important properties of raw materials.

Due to the lack of generally accepted design benchmarks and the complexity of the approach to creating DCMS compositions, it is forcing developers to advance and apply their own narrow principles in the selection of blend compositions.

V.V.Kozlov offers to treat his DCMS as an enforcer. The joint work of the elements involved in the construction depends on the cohesive strength that provides the integrity of the bonding agents and the compound, which has a set of defined properties [19].

In other studies, when calculating the composition and parameters of compositions, DCMS are treated as granular systems [20-22]. The basic principle of this method is based on the dense deposition of particles in the mixture. At the same time, the authors note that it is almost impossible to theoretically calculate a composition consisting of up to 8 components. But,

determining the number of key components is a problem that can be solved. In this, the calculation is based on the theory of compact arrangement of spherical grains [23]. Also, this technique does not allow you to take into account the peculiarities of raw materials.

To create a universal system of test methods, taking into account the specifics and variety of modern dry mixtures, it is necessary to consider the existing domestic and foreign methods, as well as take into account all the methods presented in the technical conditions for products of a particular type. It is possible to develop an advanced regulatory document only on the basis of the analysis of the world methodological apparatus.

Unfortunately, when choosing the types of dry mixtures, the developers rely on the technical characteristics reflected in the regulatory documents. Unfortunately, the local regulatory framework in the field of production and use of dry mixtures does not take into account the requirements reflected in modern construction mixtures, for example, in European standards. The only document applied to all types of enclosures is GOST 30108 [24], which regulates the radiation safety of objects.

Regulatory documents GOST 28013-98, GOST 7473-94 and GOST 5802-86, which are in force in the CIS area, regulate some requirements for such parameters and methods of their determination as the ability to hold water in the mixtures, the strength of the mixture in layering, compression and bending, frost resistance, density and mobility of the mixture. In addition to the main indicators of building mixtures, in the descriptions in the technical regulations prepared by manufacturers for certain types of mixtures [24-25], it will be necessary to take into account the specifics of mixtures.

Thus, the analysis of the scientific and technical literature shows that there is no integrated approach to the design of DCMS of different brands. The lack of a modern method of determining the quality of DCMS and the imbalance of methods reflected in the technical conditions (TSHS) for individual mixtures makes it difficult to determine the quality indicators of manufacturers' products.

Currently, more than a third of DCM in production is made up of algae and freckles. Therefore, in the dissertation work, it is envisaged to study the technology and properties of plastering and finishing dry construction mixtures (DCM), which meet the requirement of GOST 31189-2015 on the basis of domestic industrial waste.

Conclusions

- Scientific research on the creation and use of DCMS in the world is actively carried out, however, the absence of a modern regulatory framework and a complex approach to the design of dry building mixtures compositions for various purposes leads to the development of products that do not meet the requirements of construction and excessive consumption of valuable components.
- Analysis of the scientific and technical literature shows that there is no integrated approach to the design of DCMS of different brands. The lack of a modern method of determining the quality of DCMS and the imbalance of methods reflected in the technical conditions (TSHS) for individual mixtures makes it difficult to determine the quality indicators of manufacturers' products.



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