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STUDY AND ANALYSIS OF THEORETICAL AND PRACTICAL FOUNDATIONS OF MOSAIC FLOOR POLISHING TECHNOLOGY

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ABOUT ARTICLE

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Abstract: In this article a study and analysis of the theoretical and practical foundations of modern mosaic floor polishing technology and mechanization means are presented. The improvement of the construction has shown that grinding machines have enabled a reduction in labor costs and an increase in labor productivity.

INTRODUCTION

Mosaic flooring is a type of flooring that combines its high-quality features with an attractive exterior. They have a good resistance to erosion, do not require large costs when used, and have sufficient waterproofing properties. Because of this, mosaic-covered floors are used in residential and public buildings and structures, mainly in vestibules, cloakrooms, washrooms, bedrooms, hotels, hospital corridors, warehouses and common dining rooms, trade halls of enterprises, as well as production facilities of machine-building, textile, radio engineering and other industrial enterprises. used in the output buildings[1,2]

METHODS OF RESEARCH

In recent years, a number of scientific research and construction organizations have created work process maps and technological maps for the construction of integrated mosaic flooring in order to increase labor productivity and reduce the cost of work. These maps take into account the most advanced technology for doing things. But despite this, the work on the construction of mosaic floors is still labor intensive [3]. The process of building them , as you know, includes three main operations:

- building a cement-sand base (subgrade);
- the upper mosaic layer from a terrazzo concrete mixture with a large aggregate of marble;

- is the finishing of the hardened coating, which includes rough grinding (etching), fine grinding, and in some cases polishing.

The labor requirements of each operation are shown in Table 1.

The data in the table shows that the most labor intensive operation is the finishing of the floor covering, which accounts for about 39% of the total labor required for the installation of the mosaic floor. Therefore, it is of practical interest to study the actual technology and means of mechanization of mosaic floor polishing and to search for ways to reduce its labor demand.

Processes related to the finishing of buildings and structures occupy an important place in construction and assembly works. Up to 30% of the total volume of works, including 10-15% of the floor construction 3 .

"Terratso" finishing concrete mixture is used for covering the floors of industrial and civil buildings, as well as in a large part of landscaping areas. The area of facilities that need such mosaic floors is hundreds of thousands of square meters per year.

Building a mosaic floor requires a lot of labor . At the same time, the process of smoothing its surface is considered serme h 40% of all labor costs required to build a mosaic floor go to grinding.

Table 1. Labor costs for the construction of a 10 m 2 mosaic floor

Process	Operations	Labor costs, per person-minute
1. Building a cement-sand foundation.	-preparation of the base for the laying layer	14
	-installation of target symbols from the mixture	26
	- transfer of the mixture to the pouring place	20
	-laying cement-sand screed	20
	-technological break	16
	Total:	96
Laying the mosaic (terrazzo) mixture	- preparation of the surface of the substrate	14
	- marking the position of the floor painting	28
	- placement of wires and their installation	44
	- preparing and delivering the terrazzo mixture to the place of laying	58
	- wetting the surface of the underlay with cement milk	15
	-unloading and laying of terrazzo mixture	15
	- leveling and compacting the terrazzo mixture	47
	-technological break	31
	Total:	252

3. Finishing the mosaic coating	- workplace preparation - rough surface scraping by washing and wiping -puttying the floor and smoothing the joints with the wall -smoothing , washing and wiping the floor while cleaning small debris - technological a break	16 94 40 64 26
	Total:	240
	All:	588 minutes

40% of all labor costs required to build a mosaic floor go to grinding.

RESULTS

The analysis of the actual grinding technology of the mosaic coating and the mechanization tools used showed that the grinding technology has not changed much in the last ten years. Reduction of labor costs was made due to the improvement of constructions of grinding machines. The process of smoothing the surface of the mosaic coating has not been studied in practice.

Achievements in the creation of new special working bodies or new machines to replace manual labor , which are difficult and less productive in construction , are significant . depends on determining the sequence [4].

The implementation of the basic rules, that is, the creation of special working bodies and machines for the implementation of the technological processes of the construction of unified constructions of buildings , requires an enlarged assessment in accordance with the purpose at a specialized level. This, in turn, led to the need to develop new methodological requirements.

As a result of the research of some scientists, the theory of grinding homogeneous materials (metal, glass, marble, etc.) has been sufficiently developed. In addition, the state of erosion during the use of concrete coating was also studied. But it is very different from the grinding process, because the erosion during the use of concrete is under a set of effects other than the abrasive effect. These effects include impact, solid crushing, crushing, etc. The mosaic floor has a conglomerate structure and is composed of various materials, namely marble filler and cement stone. Therefore, the study of the grinding process of the two-component system is of significant scientific and practical interest.

But the effectiveness of their use in polishing two-component systems has not been sufficiently studied. The lack of such information is to a certain extent stopping the development of the technology of polishing the mosaic floor covering, which is primarily related to the increase in labor productivity.

The problem of scientific research on smoothing mosaic covered floors used in different conditions and the issues to be solved to achieve it and preliminary results were previously partially studied and analyzed in the department of "Construction technology and its organization". The continuation of this research is the analysis of the results of experimental work .

Building mosaic floors requires a lot of labor . At the same time, the process of smoothing its surface is considered serme h nat h . 40% of all labor costs required to build a mosaic floor goes to the tile.

Analysis of the actual polishing technology of the mosaic coating and the mechanization tools used showed that the polishing technology has not changed much in the last ten years . Reduction of labor costs was made due to the improvement of constructions of grinding machines . The process of smoothing the surface of the mosaic coating has not been studied in practice.

Some scientists, including I. V. Grebenshchikov, N. N. Kachalov, V. N. Kashcheev, I. V. Kragelsky, E. N. Maslov, M. M. Tenenbaum, E. G. Shmavanyan, M. As a result of the research of M. Khrushchev and others, the theory of grinding homogeneous materials (metal, glass, marble, etc.) has been sufficiently developed. In addition , in the researches of A.I.Denisov, A.G.Domokeev, O.M.Ivanov, V.M.Kulkova and others, the state of erosion during the use of concrete coating was also studied. But it is very different from grinding process is used , because the erosion during the use of concrete is under a set of effects other than the abrasive effect. these effects include impact, solid crushing, crushing, and others . Mosaic coating has a conglomerate structure and is composed of various materials, namely marble aggregate and cement stone . From this , the study of the process of smoothing the two-component system becomes an important scientific and practical task .

Shneyner and others have shown that surfactants added to water used as a wetting fluid to accelerate mechanical destruction of rocks can be [6]. It is necessary to understand the effect of Rebinder.

Rebinder effect - self-adsorption of surfactants on the solid surface, reducing the free energy on the surface and at the same time reducing the strength of the solid body. The adsorptive reduction of the strength of a solid body was discovered by the Russian physicist-chemist P.A. Rebinder in 1928. This effect is not related to corrosion, dissolution of solid matter and other phenomena, but only due to adsorption of YuFM. Initially, it was observed that the strength of some inorganic crystalline substances such as gypsum, graphite, barium carbonate, calcium monocrystals decreases in the solution of oleic and fatty acids, propyl and other alcohols. The decrease in the surface tension at the phase boundary lies behind the adsorptive decrease in the strength of the solid. In this case, it is observed that YuFM is adsorbed in the micropores and cracks on the inner surface of the solid body, and the YuFM solution enters (migrates) into the cracks and continues the process. As a result of the Rebinder effect, the deformation and deformation of the solid is facilitated. The Rebinder effect is used in the cement industry, in the preparation of flour, in all processes related to grinding and cutting of solids, i.e. in controlling the structural and mechanical properties of dispersed systems. [7].

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Based on the preliminary evidence needed to evaluate the speed of the grinding process of marbles bonded with abrasives, the increase in labor productivity when using surface-active substances (UFM) was investigated.

The results of the study of the speed of the grinding process showed a specific difference in the grinding of the mosaic coating from the grinding process of homogeneous materials, and a new hypothesis was introduced into the theory of grinding of the mosaic coating as a two-component system. The relationship between the grinding of single-sex (marble) and two-sex mosaic covering (marble and cement stone) materials was analyzed. Cement stone is polished using a ground product of marble and cement stone, which acts as a free abrasive. According to the basic principles of the theory of abrasive wear, it is reasonable to use surfactants to increase the efficiency of the grinding process.

The goal of the scientific project is to research the process of polishing mosaic floor coverings according to the above hypothesis and to develop an efficient technology of polishing based on it.

Conclusion. In order to solve this problem, it is necessary to solve the following issues:

- researching the characteristics and speed of the smoothing process of cement stone and marble depending on the physical and mechanical characteristics of individual and mosaic coating integrity;

- to study the influence of surface-active substances on the speed of the mosaic coating polishing process and to develop a technology that increases the efficiency of the process.

On the basis of the initial scientific and research work, it was possible to develop an improved method and rational technology of polishing mosaic floor covering with surface-active substances.

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