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THE USE OF FILLER MIXTURES ASSESSMENT OF THE CURRENT STATUS

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ANNOTATION

The world's largest research on the widespread use of industrial waste and secondary products in the production of building materials, the development of effective fillers, improving their physical and technical properties and increasing their long-term durability

Keywords, filler, deposits, waste, cement, consumables, mixtures, filler, granulated, crushed stone,

INTRODUCTION

Much research has been done around the world to optimize the composition of alloys using on-site industrial wastes, chemical and mineral additives, and to control the formation of structures in alloys. In this regard, it is important to study the physical and technical properties of aggregates, to increase the durability, long-term and long-term durability of aggregates deposited in mountain cavities.

INTRODUCTION

Widespread use of industrial wastes and secondary building materials in the production of building materials, development of effective filler compounds, improvement of physical and technical properties and long-term durability. .D., Aldambergenov UA, Baikonurov OA, Krupnik LA and others have made a significant contribution to the solution of these problems. Our scientists have conducted several studies on the development of the composition of building materials based on industrial waste, improving their structure and properties and increasing their efficiency. Kosimov EU, Gaziev UA, Tokhirov MK, Samigov NA, Tulaganov AA, Botvina LM, Turopov MT, Komilov HH and others have achieved significant results in this area over the years based on their research.

The filler was first used in Russia at the Norilsk Mining and Metallurgical Plant, where all the components were saturated in ball mills until they became a homogeneous mixture with a density of 1800-1900 kg / m ^{3}. The plant used cement and granular blast furnace as a complex binder, natural coarse-grained sand and flotation waste as filler. As a filler in 1 m, ^{3} of the mixture is used granular stone of nickel and nickel production, the consumption of cement is 50-160 kg and the consumption of anhydrite is 300-400 kg, the strength of the aggregate is 2-10 MPa [1].

In the fields of Falconbridge, Inco (Canada), Gekla, Kennecott Copper, Tennessee Copper (USA), ore processing plant waste was used as a filler, cement as a binder in a ratio of 1: 20-1: 40. For the top layer of 150-300 mm thickness, this is increased by a ratio of 1: 6 - 1:15. The increase in cement consumption in the upper layer of the deposit has allowed for increased strength and the extraction of ore without bedding. This resulted in the efficient use of mining

wastes and the filling of 6-8 m of vertical gaps. Falun ore from a concentrator containing pyrrhotite is used as a filler in the Falun (Sweden) ore deposit. Cement consumption was 30 kg per 1m $^{2\ of\ the}$ surface area [2].

Zaporozhets (Russia) iron ore deposit uses a chamber system of processing with filler alloy. The composition of ^{1} m ^{3} of the filling mixture is as follows: saturated granular blast furnace stone - 400 kg, Portland cement - 50 kg, and 1270 kg, water 350-400 l. the degree of saturation of the rock is 50-60% fraction less than 0.074 mm. It was determined that the design strength of the aggregate is 10.0-12.0 MPa. After three months, the true strength of the filling mass was 4.0-7.0 MPa [3].

The use of fillers in the mines "Sevuralboksitruda" (Russia) began in 1973. The aggregate mixture consists of a complex binder consisting of cement and granulated blast furnace stones, crushed limestone as a filler, with a flow rate of 300 kg / m ^{3}, limestone-based crushed stone 1420-1540 kg / m ^{3}, M400 Portland cement 50 to 200 kg / m ^{3} and water was 400 l / m ^{3}, and the strength of the solid mixture was 0.75-4.5 MPa in the case of cement consumption.

The Kosako (Japan) ore deposit uses an artificial volume of reinforced concrete for top-down excavation. Reinforcement and 50x50 mm grid wire is laid on top of the entrance layer, followed by enrichment waste, blast furnace stone and cement in a ratio of 1: 1: 0.6. The thickness of the concrete layer is 0.5 m. The remaining rock void is filled with blast furnace rock and enrichment waste (1: 1 ratio). The use of such complex technology increases the lightness and stability of the artificial mass, resulting in the full extraction of ore with a high metal content [4].

Lead-copper ore in the Fankou deposit (PRC) is mined by filling the horizontal layers with a filler alloy [10]. Excavations are carried out from the bedrock to the suspension. The height of the floor is 4 meters. After complete excavation of the excavated rock, it is fed with a filler mixture consisting of cement and enrichment waste. Consumption of cement in 1m $^{3\ of\ the}$ aggregate mixture is 100-300 kg. The mass of cement and enrichment waste is from 1: 5 to 1: 8. Using the above system, the loss in the ore deposit does not exceed 1%.

To improve the quality of ore mined at the Bal Grunt (Germany) deposit, a horizontal layer system with a filler was used, which allows to fully mechanize the filling process and make efficient use of existing filler materials. A flotation waste mixture is used as inert material in the preparation of the filling mixture. By adding up to 15% of water to it, a solid mixture is formed, which is pumped to the place of filling. Cement (up to 3% of the total mass) is prepared and delivered to the viscous mixture in the form of cement milk with the help of pipelines at a distance of 20-30 m from the unloading site. This involves adding a small amount of compressed air to the mixture at the same time, which allows it to mix with the cement and transport the filler mixture over long distances using pipelines. The strength of the artificial filling array is 2 MPa. The advantage of such filling is that drainage water is not required for filling, and a mixture of coarse and fine inert materials prevents the pipes from failing, as small materials, in turn, lubricate the pipe [5].

Keretti (Finland) copper ore deposit is processed using a chamber-column system. The aggregate consists of gravel with a size not exceeding 20 mm, classified enrichment waste and

Portland cement. The mass fraction of gravel relative to the enrichment waste is 2: 1. 110 kg of Portland cement and 600 litres of water are added for 1 m $^{3 \text{ of the}}$ mixture. The use of a mixer allows for full extraction of ore and an increase in labour productivity [6].

RESEARCH METHODS

For the first time in Uzbekistan in the 90s of the last century at the Almalyk Mining and Metallurgical Plant began to use fillers. These alloys were used to fill voids in the mountains during the mining of copper, gold and other non-ferrous metals, to increase labour productivity in ore mining and to strengthen mountain massifs. Portland cement and slag-Portland cement are used as binders, natural sand and gravel as fillers. Consumption of binders was 150-200 kg per ^{1} m $^{3 \text{ of the}}$ mixture, fillers - 1000-1200 kg. The strength of the solidified aggregate was 2-4.8 MPa [7,8].

Analyzing the experience of using the above fillers, it should be noted that the main disadvantage of the system of monolithic fillers is the high cost of cement and filler, which are components of the hardening mixture. Thus, an important area for increasing the efficiency of the use of fillers and the construction of artificial solidification systems is the development of new types of binders, as well as the development of local raw materials, mining, energy and metallurgical industries.

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