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SPECIAL COMPOUNDS FROM INDUSTRIAL WASTE

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ABSTRACT
The article presents the results of the experimental research on the development of the optimal composition of the fiber mixtures obtained from industrial waste.

Keywords: industrial waste, admixture, optimal composition, research, durability, sand, cement.

At present, in the mining industry of our Republic, there is increased interest in the issue of filling heads formed in reduced ore deposits. The increase in the extraction of minerals from the earth, the preservation of the rock layer above the water-flowing horizons, as well as the safe performance of mining operations led to the development of the filling system in existing ore deposits in our country and abroad [1].

Mines in the territory of the Republic of Uzbekistan have certain mining and geological conditions, it is economically effective to use the equipment and technologies in their processing. Retention of industrial waste and secondary products is more economical compared to retention of natural raw materials, saves expenses for geological exploration, mine operation and construction, significantly reduces fuel, energy and transport costs, lowers the cost of mined ore, reduces the level of land under heaps. , environmental cleanliness is achieved.

One of the most promising ways of using industrial waste is to use it as a building material in production. It meets 40% of the demand for raw materials. When industrial waste is used in the production of construction materials, compared to the production based on natural raw materials, a 10-30% reduction in costs is achieved, while capital investments are saved by 30-50%.

The development and renewal of production of building materials, the increase in economic efficiency at the modern stage is achieved directly through the integrated use of local raw materials and various industrial wastes [2].

In Russia, Ukraine, Uzbekistan, Azerbaijan and other countries, the waste generated during the mining of marble and granite slabs is used in the production of crushed stone, marble powder and flour, artificial mosaic tiles, various wall materials, concrete and aggregates.

In order to solve the problem of using existing local materials and new industrial waste in the production of binders, the following were selected: sand obtained from the crushing of bedrock from the opening of Kauldi ore mine, dusty waste obtained from marble processing, and portland cement produced at the Okhangaron cement plant.

The following issues were resolved: the ability to obtain energizing compounds that meet regulatory requirements; development of the optimal composition of reinforcing mixtures using portland cement from 100 to 300 kg/m3 at intervals of 50 kg/m3; determination of the technological parameters of placement, preparation and transfer of the energizing mixtures to the heads formed during the processing of ore deposits; to study the rheological, physical-mechanical, deformational, reliability and long-term durability properties of elastic mixtures; on the basis of the received energizing mixtures, to issue production approvals in the Kauldi ore mine, to justify economic efficiency, to prepare normative documents regulating consumables, technology and quality control of energizing mixtures preparation [3].

Bedrock used in the extraction of sand for filling mixtures consists of the following minerals: dolomite mineral, SaMg (SO3)2 Mg, limestone, calcite, andesite, quartz, syenite. In addition, small amounts of hydromicas, metosamotites, pyrite, etc. are found. The minerals of the mentioned rocks have approximately the same bulk mass and density of 2.65 2.85 g/cm3.

The porosity of the rock is from 0.55 to 2.22%, the water absorption is 0.21 to 0.86%, the average compressive strength is 523,638 kgs/cm³, the crushing zone at the place of technical failure, the strength of the rock decreases and is 162,202 kgs/cm³

A 250 kg sample of bedrock-based sand from the Kauldi ore mine was taken and the optimum content was determined by passing through a set of standard sieves with a mesh size of 5 mm and smaller. Suitability of sand for filling mixtures UzRST 730-96. Sand for construction work. It was determined based on research methods. Analysis of the granulometric composition of sand is presented in Table 1.

Granulometric composition of sand

1-table

№	Size of sieve meshes, mm	Some leftovers, %	A complete remnant, %
1	10	0	0
2	5	7-8	7-8
3	2,5	41-42	48-50
4	1,25	28-30	76-80
5	0,63	2-3	78-83
6	0,315	10-11	88-94
7	0,14	3-4	91-98
8	tag	1,5-2	92,5-100

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The chemical composition of the marble processing waste used for fillers, the amount of oxides by mass, in % was as follows: SiO2 0.50; AL2 O3 0.44; CaO -55.10; Fe2O3 - 0.36; MgO 0.25; CO2-45.03; K2O +Na2O3-0.12; P.P.P. - 0.10; water-insoluble residue - 0.32%.

The chemical composition and physical-mechanical properties of the 400 brand Portland cement produced at the Okhangaron cement plant are presented in Table 2 and Table 3. Chemical composition of Portland cement

2-table

Naming	Amount of oxides, % by mass								
	SiO2	AL2 O3	Fe2O3	CaO	MgO	MpO	CO3	K2O +Na2O3	P.P.P.
Portland cement 400 brand	21-24	4-7	2-4	60-63	1-2	1,1-1,5	0,2-0,3	0,3-0,7	0,6-0,7

Description of Portland cement

3-table

Naming	Grinding degree, sm²/g	Duration of bite		Activity, MPa, in the test	
		Beginning	The end	Bending over	In compression
Portland cement 400 brand	2900	1s.30 min.	5s.15 min.	6,2	32,7

When determining the optimal composition of the filling mixture, two options were chosen depending on the mixture of consumable components:

1. 400 grade portland cement, sand and water based on bedrock rock;
2. 400 grade portland cement, rock based sand, one part marble processing waste as sand and water.

The mathematical method of experimental planning was used to develop the optimal composition of the energizing mixtures, it was checked by the experimental calculation method, samples of the energizing mixtures were prepared in laboratory conditions, and the rheological and physico-mechanical properties of the mixtures and hardened samples were determined [4, 5].

As mentioned above, two components were used in the development of the technology for the preparation of filling mixtures. Initially, Portland cement consumption of -150, 180 and 210 kg per 1 m3 of the filling mix and bedrock sand of 2.5 mm and smaller size were selected and tested. Table 4 shows the consumption of components and their quality indicators for the filling mixture.

"Optimum composition of bedrock-based sand binders for Kauldi mine

4-table

Samples	The amount of materials is 1 m3 mixture for, kg			The mobility of the mixture, cm	Average compressive strength, MPa
	Portland cement 400 marks	Sand based on rock rock, 2.5mm and smaller	Water, l		
I	150	1300	250	12-14	8,8
II	180	1300	250	12-14	9,7
III	210	1300	250	12-14	13,5

The mathematical method of experimental planning was used to develop the optimal composition of filler mixtures, it was checked by experimental-calculation method, samples of filler mixtures were prepared in laboratory conditions, rheological and physical-mechanical properties of mixtures and hardened samples were determined. The production of cheap and standard building materials and mixtures based on existing industrial waste in the territory of our republic allows to improve the ecological situation of the environment, expand the used land areas, and meet the demand for building materials.

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