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IMPROVING THE ELASTICITY OF CEMENT-CONCRETE ROADS

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***Annotation.** The article discusses microsilica, bitumen, Portland cement, cement, sand, gravel, concrete, cement concrete, limestone, cement concrete preparation technology, cement grade, cement concrete elasticity, coating temperature, improvement and use of the joint and cement concrete, as well as the advantages and technology application of cement concrete coatings.*

***Keywords:** import, export, cone, crushed stone, concrete, cement concrete, paving stones, asphalt concrete, limestone, brand, powder, sand, bitumen, local.*

INTRODUCTION

Today, due to the lack of road bitumen in the country, bitumen is imported from neighboring Russia, Kazakhstan and Turkmenistan, which affects the situation on the roads. Our country is a world leader in the production of construction cement. Given the fact that in our country there are local resources of gravel, sand, gravel, our cement-concrete roads are economical and we use our own cement. President Sh.M.Mirziyoyev also stressed the need for a phased transition to cement-concrete roads in the construction of roads in the selector of the meeting on October 2, 2019, dedicated to the development of road infrastructure and attracting investment in this area. , the task of construction, reconstruction and overhaul of roads with the introduction of innovative technologies on the basis of international standards.[1]

Materials and methodsThe article uses comparative analysis, study and nationalization of foreign experience, study and field orientation of technologies, methods of logic and generalization.

The main part

It is known that the main problem in the construction of cement-concrete roads is their high construction costs: although the cost of construction of cement-concrete

roads is 15-20% more expensive, the service life is 2-3 times longer and maintenance costs are 3 times higher.[2] This is due to the complexity of the technology of preparation of cement concrete, the cost of portland cement. (PHD) According to D. Mahkamoav's research, in about 5 years, the operating costs of cement concrete and asphalt roads will be balanced. Cement concrete will increase its strength in 100 years, so our cement concrete roads can serve in good condition for 50 years. [3]



Figure 1. Cement concrete coating

At a time when the transition to cement concrete pavements in road construction in Uzbekistan has begun, the demand for Portland cement for the production of road construction materials, especially high-efficiency products that meet modern requirements, is growing. The reasons for the poor condition of our cement roads today are: imports of Portland cement, difficulties in construction technology, lack of specialists, weathering, poor elasticity of cement concrete, and the fact that our roads are cracked and crumbling.[4]

Results

I used microcirculation to fix the existing problem on our cement roads. In particular, it is worth noting the use of microcirculation in the construction of high-grade cement concrete coatings that meet environmental, elastic and temperature requirements, technological requirements. The main sources of raw materials for the production of this mixture (95%) are gravel, sand, gravel and limestone in our country. However, the component that binds them is Portland cement imported from abroad (Russia, Germany and China). To solve this problem, the addition of microcirculation powder to the cement produced in our country gives a cost-effective concrete mix. As a result of the addition of microcirculation, the elasticity of cement-

paved roads increases, temperature tolerance increases, water resistance increases. It should be noted that the coating made of microcirculation gives the same result as the coating made of portland cement. (table 1)

table 1

Naming	Sunset of the cone, cm	3 days.			7 days.			28 days.		
		kgf/s m ²	Mpa	clas s	kgf/sm ²	Mpa	clas s	kgf/sm ²	Mpa	class
Control (cement-425 kg)	3,5	273,3	26,8	21,4	350,5	34,4	27,5	356,1	34,9	27,9
Base (cement - 360 kg, microcrystallin e - 10%) Frost resistance	3,5	184,1	18	14,4	266	26,1	20,8	381,6	37,4	29,9
Base (cement - 360 kg, microcrystallin e - 10%)	1,5	195,5	19,2	15,3	286,7	28,1	22,5	425,5	41,7	33,4
Base (cement - 320 kg, microcrystallin e - 10%)	2,0	180,0	17,7	14,1	253,9	24,9	19,9	372,2	36,5	29,2

Base (cement - 425 kg, microcrystalline - 10%)	3,6	166,2	16,3	13,0	255,5	25,1	20,0	358,8	35,2	28,1
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Adding microcirculation to the production of cement-concrete mix from local cement will lead to significant currency savings for our economy and a reduction in imports for the road construction industry. It opens up opportunities to carry out the work being done in the road sector today and to reduce costs.

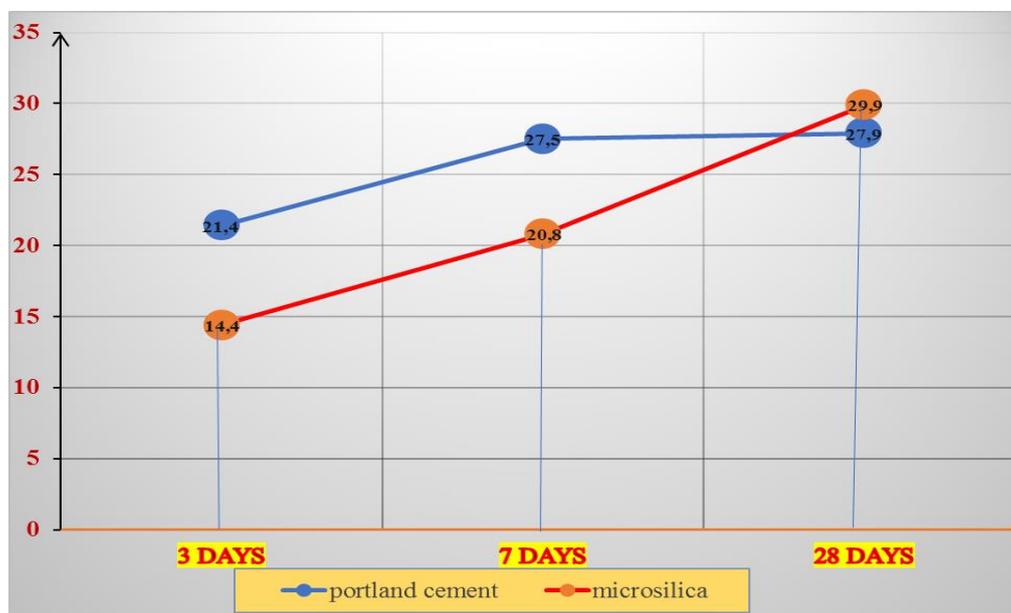


Figure 2. Diagram

The diagram shows that the rate of hardening of Portland cement is high, but we can see that our cement concrete made of local cement with the addition of microcirculation has a high strength within 28 days.

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Conclusion

This means reducing the import of Portland cement by adding a microcirculation to the cement produced in the country and preparing a quality mix

for the highway. The availability of the main sources of raw materials (95%) for the production of this mixture in our country - gravel, sand, gravel, limestone - is a guarantee of economic efficiency. The use of microcirculation powder not only brings significant benefits to the economy of our country, but also opens up opportunities for export and the construction of cement-concrete roads in foreign countries. In particular, if we build cement concrete coatings using microcirculation, we achieve the following efficiencies:

- Increased elasticity of cement concrete coating;
- Increased frost resistance;
- Water permeability increases by 50%, sulfate resistance increases by 100%;
- Save up to 40% of cement;
- Increase the service life of cement paved roads;

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