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INFLUENCE OF VARIOUS TYPES OF ROCK AGGREGATES ON SELECTION OF THE WORKING PARTS MATERIAL IN CIVIL ENGINEERING

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Abstract: In this paper are presented results of theoretical and experimental investigations and mutual comparison of various types of rock aggregates from the aspect of working parts wear of different machines for preparation and deposition of the rock materials on roads. Here are considered only the most important types of building stones: limestone, dolomite marble, calcite-dolomite marble and andesite, which are exploited at four sites in Republic of Serbia. Those aggregates are convenient for manufacturing of certain layers of the driveway constructions on roads, streets, airports, as the base layer on railways and for preparation of various types of asphalt and concrete. In selection of rocks for depositing on roads, it is necessary to know both their general and specific properties. It is necessary to conduct the mineralogical-petrographic and physical-mechanical investigations and, if needed, certain special ones, as well.

The civil engineering machines for manufacturing and building-in materials in various structural objects are exposed to different types of high loads, what is especially true for some of their working parts, which come into direct contact with the rock materials. The working life of those machines is directly dependent on the type of the building material as well as on maintenance. In exploitation, the construction mechanization is subjected to various types of corrosion and wear, and some of its parts are occasionally subjected to impact loads, as well. Certain parts are also frequently in contact with various types of stones, sands, soil, asphalt, concrete and occasionally with water.

Key words: rock materials, aggregates, minerals, working parts, civil engineering mechanization.

1. INTRODUCTION

Civil engineering machines for manufacturing and building in materials during construction of various building objects are subjected to different types of loads, especially some of their working elements, which are in direct contact with rock materials. Working life of construction machines' parts is directly dependent on the kind of the rock materials, properties of construction mechanization working parts and exploitation and maintenance conditions. Those machines are, during operation, exposed to different types of wear and corrosion, some working part are even exposed to occasional impact loads. Some parts of construction machines are frequently in contact with various kinds of rocks, sands, soil, asphalt, concrete, sometimes are even exposed to influence of water.

Knowing physical-mechanical properties of the rock minerals are of a special importance, both

for their exploitation and for their processing and building in. Since the matter of speaking are the complex tribo-mechanical processes, in which take part different elements of construction mechanization, rocks and third objects, it is especially important to properly select material of the construction machines' working parts, as well as the technology for reparation of the damaged and worn parts of those machines.

Based on investigations of the construction rocks from four available sites, the useful data were obtained both for design and reparation of the working parts of machines for minerals' exploitation, their processing and building into roads.

2. THE MOST IMPORTANT TYPES AND PROPERTIES OF ROCK MATERIALS

Rocks mainly consist of seven groups of minerals: silicates, carbonates, oxides, sulphates,

