

Experimental determination of mechanical characteristics of four types of stones and their influence on the construction machinery parts wear

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Abstract. In this paper were experimentally determined properties of four different types of stones and stone aggregates and they were compared to each other with respect to their influence on wear of working parts of machines for preparation and deposition of stones on roads. Rocks, the building stones are obtained from, consist of various types of minerals, namely of physically and chemically homogeneous rocks created within the Earth's crust. Here are considered four, most important types of building stones: limestone, dolomite marble, calcite-dolomite marble and andesite. They are being exploited from four sites in Serbia, and they are convenient for deposition of certain layers of the carriageway on roads, streets, airports and foundations on railways, as well as for making different kinds of concrete and asphalt. In the paper are presented results of mineralogical-petrographic, physical-mechanical and special investigations. Wear resistance was also checked on certain samples.

Introduction

Construction machinery for manufacturing and building-in materials, during the construction of various civil engineering objects, are subjected to different types of high loads, especially their working elements that come into direct contact with stone materials [1-3]. In papers by some authors it was emphasized that the stone materials should possess the best possible shear strength [4, 5], as well as the tensile strength [6], in order to be exploited in the best possible way. That is the reason why knowing the physical-mechanical properties of stone is of a special importance, as emphasized by several authors [7-9], not only for their exploitation, but also for their processing and building-in. Since, during that, very complex tribo-mechanical processing are taking place, where participate working part of construction machinery, stones and third solids, it is especially important to properly select the material for manufacturing those working parts, as well as technology of reparation of the damaged or worn parts of the construction machinery [10, 11]. The objective of those investigations is to reveal the characteristics of the tested materials and their influence on the life span of machines that are used in their excavation and building-in, for the purpose of increasing the durability of the working parts.

Based on conducted investigations of the building stones from four sites, which were at authors' disposal, the useful data were obtained for both design and reparation of the working parts of machinery for minerals excavation and for their processing and building-in into the rods.

Experimental determination of mechanical properties of rocks

Rocks mainly consist of seven groups of minerals: silicates, carbonates, oxides, sulphates, sulphides, chlorides and hydro-oxides. To give the proper picture about the number of minerals that constitute rocks, it should be pointed out that only the silicates group includes about 800 kinds of

