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Energy-absorbing by rock bolt support with increased tensile strength

Abstract

The paper presents the dynamic load diagram of the rock bolt support caused by rock mass tremors. In the article the results of laboratory tensile tests of rock bolt supports with increased tensile strength parameters (over 300 kN) were presented. The aim of the researches was to obtain load-displacement characteristics for different configurations of installed rock bolts. In the first stage, rock bolts support without encapsulation (resin) in several configurations: rod and two bearing plates and four nuts or two nuts were tested. In addition, the characteristic for the independent bolt rod, which was installed with four nuts was determined. In the second stage, a resin point rock bolt support, which consisted of SAS 650/800 bolt rod, profiled square bearing plate and nut was used. The bolt rod was pasted to the rock core by means of resin cartridge with a length 0.6m. On the basis of the obtained load-displacement characteristics, the amount of energy absorbed by the rock bolt supports with a specific division into the elastic and plastic range was determined.