DRILLABILITY PREDICTION IN HARD ROCK TUNNELLING

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Usually the main subject in preliminary site investigations prior to tunnelling projects is the prediction of tunnel stability. During the last years in conventional drill- and blast tunnelling, problems have occured also connected with to the accurate prediction of drillability in hard rock.

The drillability is not only decisive for the wear of tools and equipment but is - along with the drilling velocity - a standard factor for the progress of excavation works. The estimation of drillability in predicted rock conditions might bear an extensive risk of costs. Therefore an improved prediction of drilling velocity and bit wear would be desireable.

The drillability of a rock mass is determined by various geological and mechanical parameters. In this report some major correlations of specific rock properties as well as geological factors with measured bit wear and drilling velocity are shown.

Apart from conventional mechanical rock properties (compressive and tensile strength, Young's modulus) a new property for toughness/brittleness referring to drillability has been introduced: the specific destruction work $W_Z$. This new method makes it possible to understand better the connection between drilling velocity and the main mechanical rock character.

An investigation program is submitted, which helps to improve the estimation of rock drillability in planning future tunnel projects. Finally some hints are given for carrying out investigations in poor drilling and blasting conditions during running excavation works.