

Evaluation and analysis of laboratory tests of bolt-anchored, steel-fibre-reinforced shotcrete linings.

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ABSTRACT: Results from laboratory tests on statically loaded bolt-anchored, steel-fibre-reinforced shotcrete linings in interaction with rock are here evaluated using a 2D finite element model. Calculations are made to determine the state of stress in the rock-shotcrete interface near the rock joints. Plane-stress elements are used with a non-linear material model, capable of describing cracking and de-bonding during loading. The simulated crack position and force-displacement curves are compared with laboratory test results. Since most construction work in underground hard rock involves the use of explosives for excavation work, dynamic load cases are also analysed and compared to results from previous research on vibration resistance of shotcrete.