

Stable Solutions For Mining

Rock mechanics and support technology



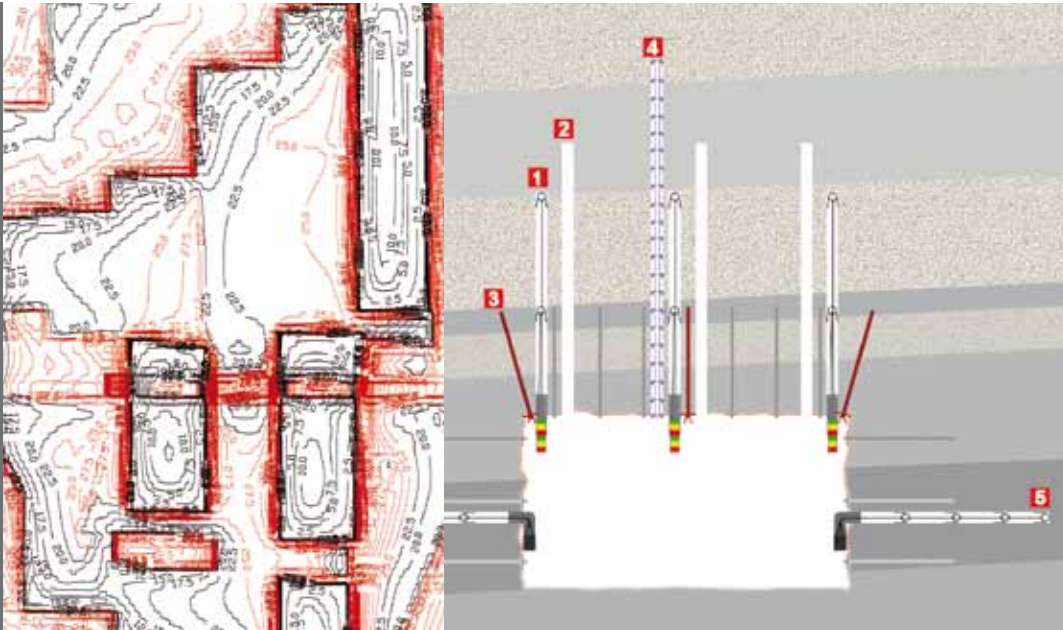
Cost-effective and safe

Coverpage left:
pit bottom with
shotcrete-rockbolt
support in 1.200 m
depth

Coverpage right:
rockbolted rectan-
gular roadway in
1000 m depth

Figure left:
rock pressure
calculation

Figure right:
Measurement ap-
plications for rock-
bolted roadways



The Rock Mechanics department provides solutions in all questions relating to the operation of underground openings. Our services include all geomechanical and support-related aspects required for the cost-effective operation of mine shafts, roadways and underground workings. This includes the planning, testing, monitoring and development of underground structures for the mining and tunnelling industries.

Cooperating closely with our clients we take care of solutions that will guarantee a high degree of safety and cost efficiency throughout the lifetime of the underground workings.

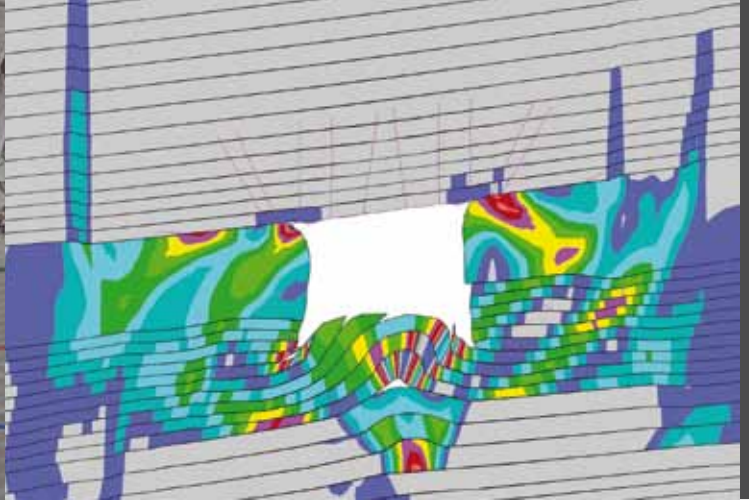
Planning

Changing underground conditions call for fault-tolerant solutions when constructing geotechnical buildings underground. Acquired over many years of serving the mining and tunnelling industries our planning skills are a vital component for the economic success of your project:

- project studies and mine planning based on geomechanical factors (choice of extraction technique, layout planning, etc.)
- expert reports and stability surveys for underground workings
- geotechnical simulations

Left: physical modelling

Right: numerical modelling



Testing

Before underground support and reinforcement systems can be used to best practise it is essential to understand exactly how they work in interaction with the strata. As a service to manufacturers and users we are able to determine the user-relevant operating characteristics of these support elements in order to ensure reliability and cost effectiveness in each specific project:

- testing the in-service properties of installed rockbolts
- testing of lagging systems
- testing the technical properties of injection agents
- testing concrete at our notified Concrete Testing Laboratory

Monitoring

Quality management in underground structures often calls for comprehensive monitoring measures, especially when combined with the need to react to changing underground conditions. We are able to draw up measurement routines designed to assess the stability and integrity of the structure during the construction phase and throughout its lifetime, arrange for the measurements and carry out further tests:

- deformation measurements in strata, in cavities and of support elements
- pull tests on in-situ rockbolts
- strata injection surveys
- testing and assessment of mineral-based building materials

Development work

The demand for ever greater cost efficiency and the need to adapt to the local underground boundary conditions in mines and tunnels requires a programme of ongoing research and development. In assistance with our customer we develop sustainable solutions:

- analytical and empirical assessment of rock mechanical processes
- laboratory and in-situ testing
- physical and numerical modelling
- geotechnical simulation



shear testing rig for installed rock bolts

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