



## Mines Safety Bulletin No. 112

**Subject:** Quality control issues when installing friction rock stabilisers with airleg drills

**Date:** 30 July 2014

### Summary of hazard

Ground reinforcement is applied to an excavation's perimeter to limit movement of the rock mass. Controlling the potential for hazardous ground movements is essential to prevent harm to anyone who enters an underground mining area and to prevent damage to plant and other infrastructure.

A friction rock stabiliser is a form of rock bolt that has a slotted high-strength steel tube and matching face plate. Once properly installed, friction stabilisers exert radial pressure against the surrounding rock over the length of the tube, reducing the potential for blocks of rock to detach and fall into the underground excavation.

Recent site inspections of airleg-installed friction stabilisers have highlighted issues with the quality of components supplied and installation practices, including quality control testing. As for any ground control measure, unplanned rockfalls can result if it is not supplied and installed to suppliers' recommendations and mine design requirements.

### Contributory factors

The following issues have been identified.

#### *Quality of components*

- The diameter of some friction stabilisers exceeds the specified size by up to 2 mm.
- Drill bit gauges are not used consistently to ensure drill bits are the correct size to achieve the required hole diameters — some bit diameters are up to 2 mm larger than the specified size.

#### *Installation issues*

- The diameters of some holes are up to 3 mm larger than the tolerance limit set by the supplier — this could reflect variations in the bit size, rock properties, or drill's operating capacity (e.g. speed, pressure and flushing capacity).
- In some instances, although the size of the friction stabiliser and drill hole met the supplier's specifications, installation was unsuccessful — airleg drills may not have sufficient power.

#### *Testing practices*

- Quality control testing (e.g. pull tests) of airleg-installed friction stabilisers is not always conducted to industry standards — possibly because it is a difficult task without appropriate resources. Without proper testing, however, mine operators have limited knowledge of the standard of work and potential for unplanned rockfalls.

## Actions required

### *Suppliers*

The suppliers of friction stabilisers and drill bits have a responsibility to provide:

- confirmation that the product, as supplied, has undergone quality control against manufacturing specifications
- correct information for each product.

Those supplying friction stabilisers also have a responsibility to indicate, with tolerance limits:

- how each product should be installed
- the methods that should be used to establish whether the supplied product has been properly installed.

### *Mine operators*

The mine operator has primary responsibility for ensuring that the mine design and suppliers' requirements are met, and associated tasks are factored into safe systems of work.

Examples of actions to satisfy these requirements include:

- undertaking quality control checks of supplies (e.g. friction stabilisers, drill bits)
- issuing drill bit gauges to airleg drill operators with clear instructions on when and how to use them
- undertaking quality control checks of the final hole diameters
- undertaking quality control checks of operating airleg drills (e.g. supply of air and water, hardware function)
- undertaking appropriate pull testing of the installed friction stabilisers to determine that they meet the prescribed ground reinforcement design requirements
- ensuring that those conducting quality testing understand the hazards and have the capacity to follow associated safe systems of work.

## Further information

Please refer to the Department's *Geotechnical considerations for underground mines – guideline* available at

[www.dmp.wa.gov.au/documents/Factsheets/MSH\\_G\\_GeotechnicalConsiderationsUGMines.pdf](http://www.dmp.wa.gov.au/documents/Factsheets/MSH_G_GeotechnicalConsiderationsUGMines.pdf)

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