

# DSI Australia: Newly developed Mesh Express Plate prevents Sparking in Mines



## he problem

During a DSI visit to an underground mine site in Australia, a rare event of sparking was observed during mesh installation operations as a steel mesh plate was installed on a rock bolt at a high degree of rotation velocity and spun up against non galvanized mesh.

As ignition sources such as sparks in an underground mine can have catastrophic consequences (such as coal dust explosions), DSI quickly began a series of subjective tests in collaboration with Solid Energy to determine the root causes and prevent sparking from happening again.

## Background

The Mesh Express plate is used to secure and retain mining mesh against the roof and ribs of a roadway on preinstalled rockbolts instead of installing an additional bolt.

The design of the circular plate provides a soft continuous edge to prevent breaking the steel mesh as it contacts and drives up against the mesh during installation.

## Method

A test setup to simulate the rotation speed of the plate and possible contact velocities as well as durations of contact was done in a safe environment. A thermal diffusion galvanizing process called Armorgalv was used as a surface coating because of its ability to coat without binding up the thread paths. This galvanized coating and a combination of **Armorgalv** and powder coated paint was tested on the Mesh Express Plates in order to determine their influence on spark formation.

The testing conducted gave a clear indication of how much each coating reduced sparking under medium load with high speed contact.



Test Mock-Up



Sparking at high Rotation

Sparking was virtually eliminated when at least one surface of the anchor plate had a galvanized coating. The powder coated paint further reduced the amount of sparking generated, but did lead to the paint smoking from the friction heat.

#### Outcome

Solid Energy introduced the **Armorgalv** coated Mesh Express Plates within a week of the lab testing with no further incidents of sparking noted by production personnel. The old uncoated plates were eliminated from the work site as a further precaution during the changeover.

The DSI engineering department is glad to have been able to support its client with a safe and efficient solution thanks to the excellent co operation with Solid Energy's geotechnical team.