



Cannon Fire over TestSafe!

David Pearson, Fire & Explosion Specialist, TestSafe Australia

TestSafe recently completed a series of commercial tests on the safety of special “Permitted” explosives used coalmines.

Recently a critical shortage of approved “Permitted” explosives had developed in NSW. This was causing tremendous difficulty for the NSW Coal Mining Industry and hindering its expansion. TestSafe’s Fire & Explosions Unit was contracted to conduct a series of tests in order to re-approve a commercial permitted explosive for use in NSW coalmines.

If conventional explosives are used inside coalmines, the presence of methane and coal dust risks the initiation of a massive secondary explosion. Only “Permitted” explosives can be used. These explosives are specially formulated

in order to reduce the likelihood of secondary explosions - when used in the recommended fashion.



Daniel Massey checking the temperature & humidity of the air

The Test, which had its origins in the late 19th century, and is designed to test the explosive under more severe conditions than are likely to occur in coalmines. The test method was

empirically developed and similar tests are used worldwide in order to test these special explosives.

Tests were conducted inside the “Type 1 Cannon” at our Londonderry site. The testing process was undertaken with the assistance of Professor Duncan Chalmers and colleagues from the Department of Mining Engineering at the University of NSW.



Daniel Massey sealing the cannon prior to testing

The Cannon consists of two parts. The first section is similar to an antique

military cannon in that it is a massive steel cylinder with a 55mm diameter bore down its centre. The borehole does not go to the end of the cylinder. The second part of the Cannon is a chamber where a flammable gas or coal dust can be dispersed. The testing method requires the explosive under test be placed inside the Cannon's bore, and detonated into the flammable gas mixture or dust. A large number of tests are conducted to achieve a statistical result.

If the explosive does not ignite either the gas or coal dust, no flame is observed even though a loud noise is produced. The explosive is assessed as having passed the test. If it ignites the gas or dust then a very loud noise and flame is produced, and the explosive is deemed to have failed.



The cannon while undertaking the testing process

TestSafe is also involved in a Coal Industry funded research project via ACARP with the Department of Mining Engineering at the University of NSW. The aim of this project is to add to the scientific understanding of what factors cause “Permitted” explosives to pass or fail this test. There is the objective that newer safer and more economical permitted explosives can be developed, and that the current exhaustive testing process may be modernised.

TestSafe continues its ongoing role in enhancing safety in our coalmining industry.