

KLOPPERSBOS FACTSHEET

Test, training and R&D facility for mining-related fires and explosions

The CSIR-managed fires and explosion test, training and research and development (R&D) facility at Kloppersbos is one of five CSIR testing laboratories. It is located approximately 40 km north of Pretoria.

The site was established in 1987 to conduct research into the explosibility of South African coals. Subsequently these facilities have been used to provide a full-scale surface test facility for the evaluation of underground explosion suppression systems; the flammability of conveyor belts; dust suppression systems for continuous miners; and similar investigations.

The unique location and size of the facility allows demonstration of large-scale coal dust/methane explosions, making it an ideal venue for basic and refresher training sessions for underground workers. Currently Kloppersbos offers awareness training seminars, designed to reinforce the levels of awareness among underground workers of the dangers associated with methane and methane/coal dust mixtures in an underground environment. Certificates of attendance are issued to each worker who completes the course. Plans are underway to expand the training service offering to incorporate other modules of relevance.

The facility is also utilised for research and development by local and international clients. Test facilities at this site include:

- A 200 m x 2,5 m diameter cylindrical test gallery for testing coal dust and coal dust/methane explosions. The tunnel is equipped with flame, dynamic and static pressure sensors, together with associated data logging equipment
- A 10 m test gallery, which is used for smaller demonstrations and as a result is not as comprehensively instrumented as the 200 m tunnel
- A 20 m test gallery. This is a rectangular structure 20 m x 7 m long and used to simulate roadway face explosions and to test active explosion suppression systems. The roof of this gallery is adjustable up to a maximum of 6 m. The gallery is also equipped with optical, gas monitoring and pressure sensors as well as a video camera
- A ventilation tunnel, which represents a full-scale underground coal mine section arranged in a last through road, heading and pillar split configuration. This 6 m wide x 3,5 m high x 140 m long tunnel is used in full-scale simulations of underground ventilation systems
- A conveyor belt fire test gallery forms part of the ventilation tunnel upstream of the extraction fan system. It is used primarily for conducting fire tests on conveyor belts
- Dust explosibility characterisation spheres (40 kg and 20 kg). The 40 kg sphere is used to determine the K_{ex} values for coal samples and the 20 kg vessel to determine the dust explosion parameters for any combustible dust or powder.

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