MINING TESTING AND TRAINING

Self-contained Self-rescuer Testing Facility

Self-contained Self-rescuers (SCSRs) are a source of oxygen for mineworkers during underground fires and explosions or toxic gas leakages. In case of emergency, mineworkers initiate the process of wearing (donning) and breathing through devices to escape from the irrespirable atmosphere to the nearest place of safety or a refuge chamber.

Offerings

The CSIR is the only approved testing authority mandated by the Department Mineral Resources and Energy to monitor the functional performance of these devices in South Africa. The tests are conducted at the CSIR SCSR Testing Facility in Johannesburg. The tragedies at Kinross, Ermelo and Middleburg underground coal mines in 1986, 1987 and 1993, respectively, during which 264 employees lost their lives due to underground fires, necessitated the compulsory deployment of belt-worn SCSRs in South African coal mines. The deployment of the devices was further extended to mines other coal mines to mitigate against the recurrence of fatalities resulting from inhaling toxic gases. More than 200 000 of these devices are deployed in the South African mining industry.

Mines must ensure that the SCSRs deployed underground are in good condition. In response to this need, the CSIR established a monitoring programme to detect any unacceptable deterioration in functional performance of SCSRs used by mines. The CSIR ensures that at least 1% of the deployed respiratory protective devices is tested annually in accordance with SANS 1737. Body-worn escape-type breathing apparatus and the requirements of the Mine Health and Safety Act, 1996 (Act 29 of 1996) Regulations 16.4 ensure that safety is not compromised.

Main objective of the monitoring programme

- Detecting adverse performance and premature deterioration trends in SCSRs in daily underground deployment, which could ultimately jeopardise a successful escape in the event of an emergency;
- Assisting mine management to achieve legal compliance with Regulation 16.4 of the Mine Health and Safety Act, which states that the employer must ensure that no defective SCSR is issued;
- Identifying units that remain functional within established norms subsequent to the expiry of negotiated periods guarantee, which means that mines do not prematurely replace or refurbish functional units;
- Providing sound technical advice onsite at mines; and
- Providing feedback through formal reports on all makes of SCSRs, thereby enabling comparative evaluations on an ongoing basis.

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Involvement in research and development (R&D) and standardisation

The CSIR SCSR Testing Facility is a key stakeholder in the SABS Technical Committee (TC94/SC15, Personal protective equipment – Respiratory equipment) and immensely contributed to the development of SANS 1737. The testing facility further provides expert advice on the application of SANS 1737 to local and international SCSR manufacturers during R&D testing before final products are submitted for the SANS 1737 approval process. The testing facility has tested more than 45 000 SCSRs since its establishment in 1996. In doing so, it has contributed significantly to the reduction of the industrywide failure rate of the devices from nine units per 100 units to less than one unit per 100 units. Inventions Through the years, the CSIR SCSR Testing Facility has invented and patented some critical components of SCSRs. The inventions Include:

- Nose clips;
- Mouthpiece;
- Canister gas seal;
- Protective housing chemical canister
- SCSR Flexi System
- SCSR training device (experimental trainer); and

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