

*WORLD CLASS MINERALS AND ENERGY SECTORS THROUGH SUSTAINABLE DEVELOPMENT*

## DEPARTMENT OF MINERALS AND ENERGY



**the dme**

Department:  
Minerals and Energy  
**REPUBLIC OF SOUTH AFRICA**

# Hazardous location

## Definitions

“**hazardous location**” means any location, where there may be a significant risk of igniting gas, dust, mist or vapour, including the following:

### *1.1 For underground coal mines*

Any location where, under normal operating conditions, there is a continuous presence of flammable gas, measured at a concentration of 0,5 % or more by volume in the general body of the air, including:

- (a) A return airway, and
- (b) Any location determined by risk assessment but not less than 180m from any working face.



### *1.2 For underground Mines Other Than Coal Mines*

(a) Any location where, under normal operating conditions, there is a continuous presence of flammable gas measured at a concentration of 0,5% or more by volume in the air.

### *1.3 For surface mines and surface locations at all mines including offshore installations*

(a) Any location as identified in accordance with South African National Standard SANS 10108: 2004 (Edition 5), “The classification of hazardous locations and the selection of apparatus for use in such locations”.

“ **Light-metal**” means-

- i). Aluminium;
- ii). Magnesium;
- iii). Titanium; and
- iv). Any alloy containing more than –
  - a). 15 per cent aluminium by mass of the alloy;
  - b). 15 per cent aluminium, magnesium and /or titanium, taken together, by mass of the alloy; or
  - c). 6 per cent magnesium and /or titanium, taken together or separately, by mass of the alloy.



“**double protected**” means a combination of any two independent types of explosion protection in such a way that in the event of failure of one of them, the other independent second means provides the required level of protection.

“**explosion protected apparatus**” means any apparatus used in a *hazardous location* and selected in accordance with the guidelines as defined in the South African National Standard SANS 10108-2005, “The classification of *hazardous locations* and the selection of apparatus for use in such locations” and the Aanbevole / Recommended Praktyk/ Practice ARP 0108, “Regulatory requirements for explosion protected apparatus”

“**certified**” means type tested, and either batch tested or produced under an approved product certification scheme, as described in South African National Standard ARP 0108 “Regulatory requirements for explosion protected apparatus”



## Regulations

- 1 The employer must take reasonable measures to ensure that all electrical reticulation systems used in hazardous locations are designed and selected by a competent person or under the direct supervision of such a competent person.
2. The employer must take reasonably practicable measures to prevent persons from being injured in any hazardous location as a result of fire, explosion or the ignition of gas, dust, mist or vapour.
3. Such measures must ensure that –
  - (a) all hazardous locations are identified, clearly marked and recorded on a plan or register, which must be kept updated and readily available at the mine;
  - (b) only explosion protected apparatus and systems certified for use in a hazardous location in accordance with the South African National Standard ARP 0108: 2005, “Regulatory requirements for explosion protected apparatus”, are used in any hazardous location;



c) the selection of explosion protected apparatus used in any hazardous location is done in accordance with SANS 10108:2005 “The classification of hazardous locations and the selection of apparatus for use in such locations”. The normative references as listed in SANS 10108 are not applicable to the employer;

(d) the installation, inspection and maintenance of explosion protected apparatus used in a hazardous location is carried out in accordance with SANS 10086-1 2005 “The installation, inspection and maintenance of equipment used in explosive atmospheres Part 1: Installations including surface installations on mines” and SANS 10086-2 2004 “The installation, inspection and maintenance of equipment used in explosive atmospheres Part 2: Electrical equipment installed underground in mines” as appropriate;

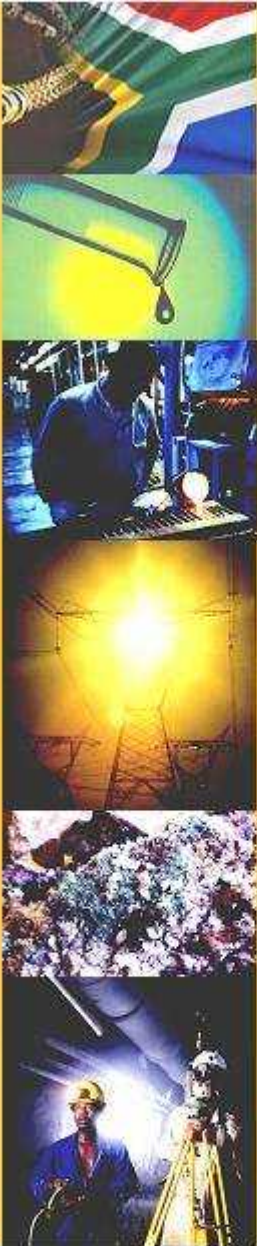


( e) any repair, overhaul or modification to any explosion protected apparatus used in any hazardous location does not alter its design characteristics and is carried out in accordance with SANS 10086-3 2005“.The installation, inspection and maintenance of equipment used in explosive atmospheres Part 3: Repair and overhaul of apparatus used in explosive atmospheres”;

( f) explosion protected apparatus used in any hazardous location is installed, maintained, repaired, overhauled, inspected and tested by a competent person ;

( g) only double protected or intrinsically safe type Ex ia explosion protected apparatus remains energised where flammable gas is present in concentrations in excess of 1.4% by volume in the air. All other explosion protected apparatus must be de-energised at flammable gas concentrations in excess of 1.4% by volume in air;

( h) every battery operated self propelled mobile machine used in any hazardous location complies with SANS 1654: 2005“DC powered machines for use in hazardous areas in mines”; The normative references as listed in SANS 1654 are not applicable to the employer



- ( i ) any trailing cable used in any hazardous location is –
- (i) provided with a pilot circuit of intrinsically safe voltage and current which will prevent power being supplied to the cable unless the earth conductor is continuous;
  - (ii) provided with a means (system) to prevent arcing of power contacts of any plug used in conjunction with the cable while such plug is being inserted or withdrawn;
  - (iii) provided with a supply of electricity of which the earth fault current is limited to a value so that there is no significant risk of electrocution;
  - (iv) individually screened on poly phase and collectively screened on single phase power conductors; and designed for being dragged across the ground;
- ( j ) measures are in place to verify, as far as reasonably practicable, that electrical circuits and components of such circuits used for explosion protected apparatus have been correctly designed, selected, installed and repaired;
- Explosion protected diesel engines



(k) only internal compression ignition engine system and machines that comply with the South African National Standard . SANS 868-1-1 2005: “Compression-ignition engine systems and machines powered by such engine systems, for use in mines and plants with explosive gas atmospheres or explosive dust atmospheres or both”, Parts 1-1 or 1-2, whichever is applicable, are used in a hazardous location. ( Part 1-1 deals with hazardous locations in underground mines - Basic explosion protected engines and part 1-2 deals with explosion protected engine systems ) The normative references as listed in SANS 868 are not applicable to the employer.

SANS 868-1-3 2005: “Compression-ignition engine systems and machines powered by such engine systems, for use in mines and plants with explosive gas atmospheres or explosive dust atmospheres or both”.

Part 1-3: Non-Hazardous locations in underground mines- machines. Move to General Machinery Diesels

Note: The normative references referred to in regulation 2 (k) are not applicable to the employer




( l) all compression ignition engines used in a *hazardous location* have a valid Inspection (IA) certificate for the components and the complete machine and test reports issued by an accredited testing laboratory (ATL) that must be available at the mine

( m) when a compression ignition engine system has any defect which may contaminate the air and cause a significant risk to the safety or health of persons, the use of such engine system is discontinued immediately;

( n) all maintenance and repairs to diesel-powered equipment is performed by a competent person;

### Light Metals

(v) no apparatus, component or machinery made of a light metal is used in a hazardous location unless such apparatus, component or machinery is:-

- 
- (i) covered by a housing, sheath, cover or coating (excluding paint) that will prevent such ignition; or
  - (ii) contained, situated or used in such a manner that does not create a significant risk of such ignition; or
  - (iii) complies with South African National Standard SANS 10012: 2004 "The use of light metals in hazardous locations at mines". The normative references listed in SANS 10012 are not applicable to the employer



the dme

Department  
Minerals and Energy  
REPUBLIC OF SOUTH AFRICA