ICS 29.260.20

ISBN 0-626-17140-7

ARP 0108: 2005

Edition 1

STANDARDS SOUTH AFRICA

Recommended practice

Regulatory requirements for explosion-protected apparatus

WARNING
Should be read in conjunction with SANS 10108.

Published by Standards South Africa
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standards SouthAfrica (a division of SABS)

ARP 0108:2005
Edition 1

Table of changes

Change No.	Date	Scope

Abstract

Covers product conformity requirements and regulatory requirements for explosion-protected apparatus used in South Africa. To be read in conjunction with SANS 10108.

Keywords

certificates of compliance, certificates of conformance, classification of hazardous locations, explosion-protected apparatus (EPA), explosion protected, explosive atmospheres, fiery mines, hazardous locations, selection of equipment.

Foreword

This recommended practice is a sectoral technical agreement developed in accordance with SANS 1-1, and agreed to by the following parties:

Aluminium Federation of South Africa
CCG Cable Terminations
CSIR
Department of Labour
Department of Minerals and Energy
Diesel Flameproof Equipment
Electrical Contractors Association of South Africa
Electrical Engineering and Allied Industries Association
Eskom
EXB Electric (Pty) Ltd
Explolabs (Pty) Ltd
Kwazulu-Natal Department of Health
Mine Regulatory Advisory Committee
Petroleum Industry Engineering Committee
Petronet
Pratley Manufacturing Co (Pty) Ltd
SA Explosion Prevention CC
Sasol
Sasol Technology (Pty) Ltd
South African Bureau of Standards
South African Colliery Engineers Association
South African Emergency Services Institute
South African Flameproof Association
Spoornet (Infrastructures)

Reference is made in 3.1.3, 3.1.5 and 3.1.8, to national regulations and statutory requirements on the control of hazardous locations. In South Africa, this means the applicable of the following:

a) Mine Health and Safety Act, 1996 (Act No. 29 of 1996) (as amended from time to time), regulated by the Chief Inspector of Mines of the Department of Minerals and Energy (Regulator); or

Foreword *(concluded)*

b) Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (as amended from time to time), regulated by the Chief Inspector of Occupational Health and Safety of the Department of Labour (Regulator); or

c) Explosives Act, 2003 (Act No. 15 of 2003) (as amended from time to time), regulated by the Chief Inspector of Explosives of the Department of Labour (Regulator).

The authorities in (a), (b) and (c) require that any testing or certification in terms of this recommended practice, be done by an approved test laboratory (ATL).

This recommended practice should be read in conjunction with SANS 10108.

Annexes A and C form an integral part of this recommended practice. Annex B is for information only.

Introduction

The approving authorities and the Explosion Prevention Industry, represented by the South African Flameproof Association, agreed that information pertaining to statutory product conformity requirements, including approved standards, approved inspection authorities, approved testing bodies, and approved certification bodies, will be made publicly available by means of this recommended practice, and that any changes to the lists will be made known through amendments to this recommended practice.

The Chief Inspector of Mines of the Department of Minerals and Energy has undertaken to accept responsibility for the accuracy and the updating of this recommended practice and Standards South Africa will promptly publish any changes received from the Department of Minerals and Energy.

Contents

Regulatory requirements for explosion-protected apparatus

1 Scope

This recommended practice deals with product conformity requirements for explosion-protected apparatus used in South Africa. It should be read in conjunction with SANS 10108.

NOTE SANS 10108 covers the classification of hazardous locations in terms of the possibility of fire or explosion owing to the presence of flammable gases, vapours, dusts or fibres in the air, and also gives the selection criteria for apparatus suitable for safe use in such locations, called explosion-protected apparatus.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this recommended practice. All normative documents are subject to revision and, since any reference to a normative document is deemed to be a reference to the latest edition of that document, parties to agreements based on this recommended practice are encouraged to take steps to ensure the use of the most recent editions of the normative documents indicated below. Information on currently valid national and international standards can be obtained from Standards South Africa.

2.1 Standards

AS 1299, *Electrical equipment for coal mines – Flameproof restrained plugs and receptacles.*

AS 2380.1, *Electrical equipment for explosive atmospheres – Explosion-protection techniques – Part 1: General requirements.*

AS 2380.2[1)], *Electrical equipment for explosive atmospheres – Explosion-protection techniques – Part 2: Flameproof enclosure d*.

AS 3584[1)], *Diesel engine systems for underground coal mines*.

BS 5501-1/EN 50014[1)], *Electrical apparatus for potentially explosive atmospheres – Part 1: General requirements*.

BS 5501-4/EN 50017[1)], *Electrical apparatus for potentially explosive atmospheres – Part 4: Powder filling 'q'*.

BS 5501-5/EN 50018[1)], *Electrical apparatus for potentially explosive atmospheres – Part 5: Flameproof enclosure 'd'*.

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1) This standard might have been withdrawn, but it has been included because equipment may still be manufactured to this standard during the validity period of the equipment certification.

BS 5501-6/EN 50019[1)], *Electrical apparatus for potentially explosive atmospheres – Part 6: Increased safety 'e'*.

BS 5501-7/EN 50020[1)], *Electrical apparatus for potentially explosive atmospheres – Part 7: Intrinsic safety 'i'*.

BS 5501-8/EN 50028[1)], *Electrical apparatus for potentially explosive atmospheres – Part 8: Encapsulation 'm'*.

BS 5501-9/EN 50039[1)], *Electrical apparatus for potentially explosive atmospheres – Part 9: Specification for intrinsically safe electrical systems 'i'*.

BS 5620, *Specification for 200 A 1 100 V flameproof restrained and bolted plugs and sockets for use in coal mines*.

CSA C22.2 No. 25, *Enclosures for use in class II, groups E, F, and G hazardous locations*.

CSA C22.2 No. 30, *Explosion-proof enclosures for use in class I hazardous locations*.

CSA C22.2 No. 157, *Intrinsically safe and non-incendive equipment for use in hazardous locations*.

EN 50016[1)], *Electrical apparatus for potentially explosive atmospheres – Pressurized apparatus "p"*.

EN 50021[1)], *Electrical apparatus for potentially explosive atmospheres – Type of protection "n"*.

EN 50281-1-1, *Electrical apparatus for use in the presence of combustible dust – Part 1-1: Electrical apparatus protected by enclosures – Construction and testing.*

EN 50303, *Group I, category M1 equipment intended to remain functional in atmospheres endangered by firedamp and/or coal dust.*

IEC 60079-27, *Electrical apparatus for explosive gas atmospheres – Part 27: Fieldbus intrinsically safe concept (FISCO) and Fieldbus non-incendive concept (FNICO).*

NFPA 496, *Purged and pressurized enclosures for electrical equipment*.

SABS 314-1[1)], *Flameproof enclosures for electrical apparatus – Part 1: International requirements.*

SABS 314-2[1)], *Flameproof enclosures for electrical apparatus – Part 2: National requirements.*

SABS 549[1)], *Intrinsically safe electrical apparatus.*

SABS 868-1[1)], *Flameproof compression ignition engines for use in hazardous areas in mines – Part 1: Engine subassembly.*

SABS 868-2[1)], *Flameproof compression ignition engines for use in hazardous areas in mines – Part 2: Adapted engine and ancillary equipment.*

SABS 969[1)], *Enclosures for electrical apparatus for use in Class II, Divisions 1 and 2 locations (dust-ignition-proof or hose-proof or both).*

SABS 970[1)], *Ex N (non-sparking) electrical equipment for use in potentially flammable atmospheres (Class 1, Division 2 locations).*

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1) This standard might have been withdrawn, but it has been included because equipment may still be manufactured to this standard during the validity period of the equipment certification.

SABS 1031[1)], Apparatus with increased safety (Ex e) for use in explosive gas atmospheres.

SANS 808 (SABS 808), *Cable glands for use on flameproof enclosures*.

SANS 868-1-1, *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 1-1: Hazardous locations in underground mines – Basic explosion protected engines.*

SANS 868-1-2, *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 1-2: Hazardous locations in underground mines – Explosion protected engine systems.*

SANS 868-1-3, *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: Hazardous locations in underground mines – Machines.*

SANS 868-4, *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 4: Non-hazardous locations in underground coal mines.*

SANS 1020, *Power-operated dispensing devices for flammable liquid fuels*.

SANS 1142 (SABS 1142)[1)], *Diesel engines modified for use in hazardous locations (other than in mines).*

SANS 1213 (SABS 1213), *Mechanical cable glands*.

SANS 1489 (SABS 1489), *Flameproof restrained and bolted type plugs and sockets*.

SANS 1654, *D.c.-powered (battery-operated) machines for use in hazardous locations in mines*.

SANS 10108, *The classification of hazardous locations and the selection of apparatus for use in such locations.*

SANS 60079-0/IEC 60079-0, *Electrical apparatus for explosive gas atmospheres – Part 0: General requirements*.

SANS 60079-1/IEC 60079-1, *Electrical apparatus for explosive gas atmospheres – Part 1: Flameproof enclosures "d".*

SANS 60079-2/IEC 60079-2 (SABS IEC 60079-2), *Electrical apparatus for explosive gas atmospheres – Part 2: Pressurized enclosures "p"*.

SANS 60079-5/IEC 60079-5, *Electrical apparatus for explosive gas atmospheres – Part 5: Powder filling "q"*.

SANS 60079-7/IEC 60079-7, *Electrical apparatus for explosive gas atmospheres – Part 7: Increased safety "e"*.

SANS 60079-11/IEC 60079-11 (SABS IEC 60079-11), *Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety "i"*.

SANS 60079-13/IEC 60079-13 (SABS IEC 60079-13), *Electrical apparatus for explosive gas atmospheres – Part 13: Construction and use of rooms or buildings protected by pressurization.*

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1) This standard might have been withdrawn, but it has been included because equipment may still be manufactured to this standard during the validity period of the equipment certification.

SANS 60079-15/IEC 60079-15 (SABS IEC 60079-15), *Electrical apparatus for explosive gas atmospheres – Part 15: Type of protection "n"*.

SANS 60079-16/IEC 60079-16 (SABS IEC 60079-16), *Electrical apparatus for explosive gas atmospheres – Part 16: Artificial ventilation for the protection of analyser(s) houses*.

SANS 60079-18/IEC 60079-18, *Electrical apparatus for explosive gas atmospheres – Part 18: Construction, test and marking of type of protection encapsulation "m" electrical apparatus*.

SANS 60079-25/IEC 60079-25, *Electrical apparatus for explosive gas atmospheres – Part 25: Intrinsically safe systems.*

SANS 60529/IEC 60529 (SABS IEC 60529), *Degrees of protection provided by enclosures (IP Code).*

SANS 61241-1/IEC 61241-1, *Electrical apparatus for use in the presence of combustible dust – Part 1: Protection by enclosures "tD"*.

SANS 61241-1-1/IEC 61241-1-1 (SABS IEC 61241-1-1)[1)], *Electrical apparatus for use in the presence of combustible dust – Part 1-1: Electrical apparatus protected by enclosures and surface temperature limitation – Specification for apparatus.*

UL 87, *Power-operated dispensing devices for petroleum products*.

UL 913, *Intrinsically safe apparatus and associated apparatus for use in class I, II, and III, division 1, hazardous (classified) locations*.

UL 1203, *Explosion-proof and dust-ignition-proof electrical equipment for use in hazardous (classified) locations*.

2.2 Other publications

ATEX Directive (Directive 94/9/EC), *The approximation of the laws of Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres.*

FM 3610, Factory Mutual Research Corporation. *Intrinsically safe apparatus and associated apparatus for use in class I, II and III, division 1 hazardous (classified) locations*. Norwood (Mass.): Factory Mutual Research Corporation, 1988. Approval standard; class No. 3610.

FM 3611, Factory Mutual Research Corporation. *Electrical equipment for use in class I division 2, class II division 2, and class III divisions 1 and 2 hazardous locations*. Norwood (Mass.): Factory Mutual Research Corporation, 1986. Approval standard; class No. 3611.

3 Definitions and abbreviations

For the purposes of this recommended practice, the following definitions and abbreviations apply.

3.1 Definitions

3.1.1
acceptable
acceptable to the approving authority

1) This standard might have been withdrawn, but it has been included because equipment may still be manufactured to this standard during the validity period of the equipment certification.

3.1.2
approved
approved by the relevant approving authority (see 3.1.5)

3.1.3
approved standard
standard approved by the approving authority (see 3.1.5) in terms of the relevant national statutory regulations (see foreword)

3.1.4
approved test laboratory
ATL
test laboratory that is accredited by the government-endorsed national accreditation body and appointed by the approving authority to carry out tests specified in the appropriate standards and to issue certificates (known as IA certificates) for explosion-protected apparatus indicating that such apparatus complies with safety requirements and any other requirements of the approving authority

3.1.5
approving authority
body legally responsible for the relevant national statutory legislation (see foreword)

3.1.6
batch
production units of type tested and certified apparatus, of the same type and size, provided by one supplier or repairer and submitted at any one time for assessment and testing

3.1.7
batch test
test conducted on a batch of type tested and certified apparatus to verify compliance with the applicable standard(s)

3.1.8
hazardous location
location determined by national regulations (see foreword) or by the risk assessment of the plant or mine, where there might be a significant risk of the ignition of gas, dust or vapour

NOTE For hazardous locations in mines, see SANS 10108.

3.1.9
Notified Body
body that carries out the tasks pertaining to the conformity assessment procedures referred to in the applicable New Approach Directives (ATEX Directive) when third party certification is required

NOTE In European countries where the ATEX Directive applies, member countries are responsible for identifying the Notified Bodies.

3.1.10
product certification scheme
scheme that aims to ensure that a product covered under the scheme and that bears the certification mark of the scheme complies with the defined standard or standards, by using control elements such as surveillance audits and production sample assessments

3.1.11
specially protected electrical apparatus
Ex s electrical apparatus
electrical apparatus that, by its nature, cannot easily comply with, or be tested to, other established standards, but that can be shown, by test or otherwise, to be unlikely to cause ignition of an explosive atmosphere

3.1.12
type test
test conducted on prototype apparatus to verify compliance of the apparatus design and performance with the applicable standard(s)

3.2 Abbreviations

ATL – Approved test laboratory

ARP – Aanbevole/Recommended Practice

ANSI – American National Standards Institute

ANZEx – Australian and New Zealand explosion protection scheme

ATEX – Atmosphere Explosive

BASEEFA – British Approvals Service for Electrical Equipment in Flammable Atmospheres

BVS – Bergbau-Versuchsstrecke

CE – Communauté Européenne

CENELEC – Comité Européen de Normalisation Électrotechnique

CESI – Centro Elettrotecnico Sperimentale Italiano

CSA – Canadian Standards Association

DEMKO – Danmarks Elektriske Materielkontrol

DIP – Dust-Ignition-Proof or Dust-Ignition-Protected

DME – Department of Minerals and Energy

DMT – Deutsche Montan Technologie

DoL – Department of Labour

EC – European Community

EPA – Explosion-protected apparatus

FM – Factory Mutual Research Corporation

GME – Government Mining Engineer

IAF	– International Accreditation Forum
IEC	– International Electrotechnical Commission
IECEx	– International Electrotechnical Commission explosion protection scheme
ILAC	– International Laboratory Accreditation Cooperation
ISA	– Instrument Society of America
ISO	– International Organization for Standardization
INERIS	– Institut National de l'Environnement Industriel et des Risques
ISSEP	– Institut Scientifique de Service Public
LCIE	– Laboratoire Central des Industries Electriques
LOM	– Laboratório Oficial José Maria de Madariaga
MECS	– Mining Equipment Certification Service
NEMKO	– Norges Elektriske Materiellkontroll
NFPA	– National Fire Protection Association
PTB	– Physikalisch-Technische Bundesanstalt
SABS	– South African Bureau of Standards
SAEx	– South African Explosion Prevention
SANAS	– South African National Accreditation System
SANS	– South African National Standard
SCS (previously Sira)	– Sira Certification Service
SIMTARS	– Safety in Mines Testing and Research Station
SP	– Sveriges Provnings
TCS	– Testing and Conformity Services
TÜV	– Technischer Überwachungsverein
UL	– Underwriters' Laboratories

4 Regulatory requirements for explosion-protected apparatus

4.1 Product conformity for explosion-protected apparatus is established through testing and certification by means of

a) type testing in accordance with 4.2, and either

b) batch testing the production units in accordance with 4.2, or

c) producing production units under an approved product certification scheme.

NOTE The following terms are also used to describe aspects of certification:

a) unit verification, for batch testing; and

b) quality assurance, for control of the production process under a product certification scheme.

4.2 The minimum requirements for type testing or batch testing are:

a) the use of an approved standard;

b) testing carried out by an ATL (accreditation recognized by ILAC, for example, accreditation by SANAS to SANS 17025 will normally be approved);

c) a type test certificate, issued for type-tested apparatus; and

d) a batch test report that identifies the units covered by serial number or batch number, issued for batch-tested apparatus.

4.3 A product certification scheme shall be operated by an approved certification body

NOTE Normally, a certification body with accreditation recognized by the IAF, for example, accreditation by SANAS to ISO Guide 65 will be approved.

4.4 In the case of explosion-protected apparatus regulated by the Department of Minerals and Energy, a national (IA) certificate shall be issued by an ATL approved by the Chief Inspector of Mines. The IA certificate will be based on the requirements in 4.1 to 4.3, but additional requirements, such as for mine-worthiness, may apply as determined by the Chief Inspector of Mines from time to time.

All new, re-designed or repaired apparatus for use in hazardous locations in mines shall have an IA certificate number displayed on such apparatus before being entered into service.

4.5 All types of explosion-protected apparatus shall be independently tested and certified by a third-party. Self-certification shall not be allowed.

NOTE In certain countries and regions, a degree of self-certification is allowed. For example, the ATEX Directive (Directive 94/9/EC) on explosion-protected apparatus traded in the European Union allows self-certification of equipment for use in zone 2 and zone 22 hazardous locations (called Category 3 equipment).

4.6 All types of explosion-protected apparatus shall be fully compliant with one or more of the standards listed in annex A.

NOTE In certain countries and regions, certification based on other requirements is allowed. For example, the ATEX Directive (Directive 94/9/EC) on explosion-protected apparatus traded in the European Union allows certification in accordance with the so-called Essential Health and Safety Requirements.

4.7 Intrinsically safe circuits shall comply with the requirements of system certification.

NOTE More information on system certification is detailed in SANS 10086-1 and SANS 10086-2.

5 Approved standards, test laboratories and certification bodies

NOTE An organization (for example, company or group of companies) may often offer testing as well as certification services. The independence of these services is ensured by the accreditation process.

5.1 General

5.1.1 Annex A lists the standards and test laboratories relevant to the testing and certification of explosion-protected apparatus, and annex B lists approved certification bodies and their certification markings.

5.1.2 In all cases, the accreditation of the test laboratory shall incorporate the standard or standards to which assessment and testing have been done. An authenticated copy of a test report issued by the test laboratory that indicates such accreditation can normally be considered as sufficient proof of accreditation.

5.1.3 In all cases, the supplied units of explosion-protected apparatus shall have been produced under an approved product certification scheme or shall have been batch tested. The application of the certification mark associated with such a product certification scheme to a unit can normally be considered as sufficient proof of production of the unit under the scheme. An authenticated copy of the scheme certificate covering the apparatus shall also be provided. In the case of batch testing, the batch test report shall be provided (see 4.2(d)).

5.2 Validity of standards

5.2.1 Standards are subject to change (amendments and revisions) on a regular basis and might be withdrawn or replaced (superseded). For practical reasons, products certified to such standards shall be produced or repaired to the original standard for a period of time after such changes have been introduced.

5.2.2 The rules established by the DME and DoL with regards to the validity of changed standards shall be as specified in annex C.

6 Other certification schemes — Operation and acceptability of certificates

6.1 ATEX Directive (European Union)

6.1.1 The European Union's product certification scheme for explosion-protected apparatus under the New Approach Directives is defined in the ATEX Directive (Directive 94/9/EC). The ATEX Directive requires compliance with the so-called Essential Health and Safety Requirements that may be partly demonstrated by compliance with the harmonized EN 50000 series of standards. Only apparatus certified to the ATEX Directive may be sold in the European Union as from 1 July 2003.

Due to the potential disastrous consequences if the wrong equipment is used, it is of vital importance that all equipment be clearly labelled with the type of protection applied to the equipment, and with a certificate number and sometimes also a certification mark to indicate compliance with the requirements for that type of protection.

ATEX certificates issued by European Notified Bodies shall be acceptable under the following conditions:

a) Category 3 apparatus shall be third-party certified; self-certified apparatus shall not be accepted. Category 3 apparatus includes zone 2 (for example, Ex n apparatus) and zone 22 (for example, DIP apparatus).

b) All apparatus shall comply fully with the relevant EN 50000 series of standards, i.e. apparatus certified only in accordance with the Essential Health and Safety Requirements of the ATEX Directive will have to be locally assessed and certified (as Ex s).

c) End users shall ensure that they obtain full copies of the documentation required under ATEX, i.e.

– EC-type Examination Certificate;

– valid Quality Assurance Notification (or similar); and

– instructions for installation, use and maintenance of the apparatus.

NOTE Category 3 (Zone 2 and Zone 22)(ATEX Directives) explosion-protected apparatus may be self-certified under the ATEX Directive, but self-certified apparatus is not acceptable in South Africa (see 4.5).

In order for apparatus (other than dust-ignition-protected apparatus listed in SANS 10108) to be used in zone 20 and zone 21 locations, its certification generally needs to include such intended use.

Some increased safety (Ex e), non-sparking (Ex n), specially protected (Ex s) and IP 65 (see SANS 60529) electrical apparatus could also be suitable for use in zone 21 locations, but will require separate certification to that effect.

Explosion-protected apparatus for zone 20 or 21 locations is called Category 1 or Category 2 apparatus respectively in the ATEX Directive (Directive 94/9/EC) of the European Union.

6.1.2 In cases where the equipment protection is not fully covered by a standard or standards (as in annex A) from the EN 50000 series due to, for example, technological advancement, certification in accordance with the Essential Health and Safety Requirements is allowed under the ATEX Directive, but only apparatus that is fully compliant with an EN 50000 series standard or standards and marked as indicated in B.3.2 is acceptable in South Africa (see 4.6).

NOTE The ATEX Directive was preceded by Directive 76/117/EEC (equipment for surface plants) and Directive 82/130/EEC (equipment for gaseous mines).

6.1.3 The international category of equipment is different from the ATEX category of equipment (see table F.1 in SANS 10108:2005). For more information on the ATEX category of equipment, see table 1.

Table 1 — Category of equipment (ATEX Directive)

1	2	3	4	5
Level of protection	**Category**		**Performance of protection**	**Conditions of operation**
	Group I	**Group II**		
Very high	M1	–	Two independent means of protection or safety even when two faults occur independently of each other	Equipment remains energized and functioning when explosive atmosphere present
Very high	–	1	Two independent means of protection or safety even when two faults occur independently of each other	Equipment remains energized and functioning in zones 0, 1, 2 (G) or zones 20, 21, 22 (D) (or a combination of these)
High	M2	–	Suitable for normal operation and severe operating conditions	Equipment de-energized when explosive atmosphere present
High	–	2	Suitable for normal operation and frequently occurring disturbances or equipment where faults are normally taken into account	Equipment remains energized and functioning in zones 1 and 2 (G) or zones 21 and 22 (D) (or a combination of these)
Normal	–	3	Suitable for normal operation	Equipment remains energized and functioning in zone 2 (G) or zone 22 (D) (or both)

6.1.4 In addition to the marking shown in B.2(i), the ATEX Directive requires conforming apparatus to be marked as follows:

CE	Ex	II	1	G
CE mark	EU explosive atmosphere symbol	Gas group	Equipment category (M1, M2, 1, 2, or 3)	G = gas D = dust

6.1.5 The marking in 6.1.4 is a duplication of the marking in table B.3, but it includes the equipment category that identifies the zones in which the apparatus can be safely used.

6.1.6 The manufacturer shall be represented within the European Union. The manufacturing process shall meet one of four possible product/production control factors as detailed in the Atex Directive (Directive 94/9/EC).

6.1.7 According to the ATEX Directive, apparatus certified to older standards, such as the BS 5501 series or previous, non-harmonized editions of the EN 50000 series standards, shall not be sold after 1 July 2003.

6.1.8 Test laboratories and certification bodies are appointed as Notified Bodies in each member country of the European Union. The Notified Bodies in the European Union (appointed under the ATEX Directive) include, but are not restricted to, BASEEFA 2001, CESI, DEMKO, DMT, INERIS, ISSEP, LCIE, LOM, NEMKO, PTB, SCS, SP and certain branches of TÜV. The website of the European Union shall be consulted for the latest list of Notified Bodies and their accreditations.

6.1.9 In South Africa, only certificates from the Notified Bodies that were issued under the ATEX Directive are generally acceptable (certain conditions apply as described in table A.1). Older certificates might require assessment by a national ATL.

6.2 UL, FM and CSA listing (North America)

Once the apparatus has been type tested to a UL, FM or CSA standard, a manufacturer can apply for the listing mark. Only selected UL, FM and CSA standards are approved for certification for the South African market.

NOTE 1 Some IEC standards have been adopted in the United States of America.

NOTE 2 Historically, selected North-American certificates have been accepted in South Africa.

6.3 IECEx Scheme (international)

6.3.1 Participating countries may nominate national test laboratories or certification bodies for assessment and accreditation under the scheme. The IEC 60079 series of standards (gases and vapours) and IEC 61241 series of standards (dusts) are used for assessment and testing.

6.3.2 South Africa participates in the scheme and therefore every effort shall be made to accept IECEx reports and certificates without further testing.

6.4 Australia and New Zealand

6.4.1 Standards Australia (AS) is an independent body and is the officially recognized National Standards Body in Australia. Standards are developed and written using procedures similar to those used in South Africa. Standards are often jointly adopted by Standards Australia and Standards New Zealand.

6.4.2 In Australia, Ex equipment has to be authorized by the relevant government department regulating each state. This authorization is issued by a test house authorized to do so by the state department. Examples are Test Safe for New South Wales and SIMTARS for Queensland.

6.4.3 Some years ago, Australia and New Zealand started, through the joint committee EL-14, (Electrical equipment in hazardous areas), the process of adoption of IEC standards, and many of their standards are already fully aligned with these. The AS or NZS standards, however, are the ones in force in terms of regulations.

6.4.4 From the end of 2003, all Ex equipment for use in Australia or New Zealand shall be certified in terms of the IECEx scheme, or the new ANZEx scheme (very similar to the IECEx and ATEX schemes). In terms of equipment certified under the IECEx scheme, there is still a requirement for imported equipment to obtain a local certificate.

NOTE Historically, selected Australian certificates have been accepted in South Africa.

7 Apparatus marking

Annex B gives specific examples of apparatus marking.

Annex A
(normative)

Approved standards, test laboratories and certification bodies for EPA

Table A.1 — Approved standards, test laboratories and certification bodies for EPA

1	2	3
Type of apparatus	**Standard**	**Test laboratories and certification bodies**
Intrinsically safe electrical (Ex i)	SANS 60079-11, SANS 60079-25 (system)	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	SABS 549[b]	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	IEC 60079-27	ATL
	BS 5501-7/EN 50020 (system)[b]	Notified Body
	BS 5501-9/EN 50039 (system)[b]	Notified Body
	UL 913	UL
	FM 3610	FM
	CSA C22.2 No. 157	CSA
Double-protected electrical	EN 50303	Notified Body
Flameproof electrical (Ex d)	SANS 60079-1, SANS 60079-0	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	SABS 314-1[b], SABS 314-2[b]	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	BS 5501-5/EN 50018[b]	Notified Body
	UL 1203	UL
	CSA C22.2 No. 30	CSA
	AS 2380.1, AS 2380.2	SIMTARS
Pressurized electrical (Ex p)	SANS 60079-2, SANS 60079-13, SANS 60079-16	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	EN 50016 [b]	Notified Body
	NFPA 496	NFPA
Encapsulated electrical (Ex m)	SANS 60079-18	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	BS 5501-8/EN 50028[b]	Notified Body
Sand-filled electrical or powder-filled electrical (Ex q)	SANS 60079-5	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	BS 5501-4/EN 50017[b]	Notified Body
Specially protected electrical (Ex s)	Any approved standard (see 3.1.3)	ATL
Increased safety electrical (Ex e)	SANS 60079-7	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	SABS 1031[b]	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	BS 5501-6/EN 50019[b]	Notified Body
Non-sparking electrical (Ex n)/(Type n)	SANS 60079-15	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	SANS 970 [b]	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	EN 50021[b]	Notified Body
	FM 3611	FM

[a] The SANAS website may be consulted for scope of accreditation information for ATLs. Some ATLs also have SANAS accreditation for testing to EN 50000 series standards.

[b] This standard might have been withdrawn, but it has been included because equipment may still be manufactured to this standard during the validity period of the equipment certification (see annex C).

[c] More information is given for specialized compression-ignition engines in the following standards that are in course of preparation: SANS 868-3-1, SANS 868-3-2 and SANS 868-3-3.

Table A.1 (*concluded*)

1	2	3
Type of apparatus	**Standard**	**Test laboratories and certification bodies**
Dust-ignition-proof (DIP)	SANS 61241-1-1[b], SANS 61241-1	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	SABS 969[b]	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	EN 50281-1-1	Notified Body
	UL 1203	UL
	CSA C22.2 No. 25	CSA
Specialized: Compression-ignition engines[c]	SANS 868-1-1, SANS 868-1-2, SANS 868-1-3, SANS 868-4	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	AS 3584	SIMTARS
	SABS 868-1[b], SABS 868-2[b], SANS 1142[b]	Explolabs[a], TCS[a], SAEx[a] (ATLs)
D.C. mining machines	SANS 1654	Explolabs[a], TCS[a], SAEx[a] (ATLs)
Cable glands	SANS 60079-0	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	BS 5501-1/EN 50014[b]	Notified Body
	SANS 60079-1	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	BS 5501-5/EN 50018[b]	Notified Body
	SANS 61241-1-1,[b] SANS 61241-1	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	SANS 808	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	SANS 1213 (only Ex glands section)	Explolabs[a], TCS[a], SAEx[a] (ATLs)
Plugs and sockets, couplers and adaptors	SANS 1489 (group I plugs and sockets, couplers and adaptors)	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	BS 5620 (group I, 200 A)	MECS
	AS 1299 (group I, 200 A, 300 A)	SIMTARS
Fuel dispensers and metering pumps	SANS 1020	Explolabs[a], TCS[a], SAEx[a] (ATLs)
	UL 87	UL
IP enclosures	SANS 6052	Explolabs[a], TCS[a], SAEx[a] (ATLs) ATL Notified Body

NOTE 1 More information with regards to Group II double-protected explosion-protected apparatus is given in IEC 60079-26, and IEC TC 31 is preparing work on a standard for Group I double-protected explosion-protected apparatus, which will be considered for approval and inclusion in this annex once available.

NOTE 2 Owing to rapid developments in the field of explosion-protected apparatus, the information in this table is subject to change. The reader should be in possession of the latest edition of this recommended practice. The relevant test laboratories should be approached for approval of apparatus not covered by this table.

NOTE 3 Although this table is applicable to all explosion-protected apparatus, it is often acceptable to repair apparatus already in service to its original standard, even if such a standard is no longer valid, as long as safety is not jeopardized. In cases of doubt, the relevant approving authority should be consulted.

[a] The SANAS website may be consulted for scope of accreditation information for ATLs. Some ATLs also have SANAS accreditation for testing to EN 50000 series standards.

[b] This standard might have been withdrawn, but it has been included because equipment may still be manufactured to this standard during the validity period of the equipment certification (see annex C).

[c] More information is given for specialized compression-ignition engines in the following standards that are in course of preparation: SANS 868-3-1, SANS 868-3-2 and SANS 868-3-3.

Annex B
(informative)

Marking of electrical apparatus for use in hazardous locations

B.1 General

The compulsory marking of explosion-protected apparatus generally covers make, model, and electrical input and output data, as well as explosion-protection ratings, conditions associated with certification, ATL and certificate number. In this annex, information and examples are given of the marking pertaining specifically to explosion protection.

B.2 Approved certification bodies

Most approved certification bodies use a certification mark that indicates unambiguously, or in conjunction with other symbols, that the apparatus is certified as explosion protected. The following marks are commonly found on apparatus used in South Africa:

a) **CERTEX**

Drg.14473a

b) **SABS Certification (Pty) Ltd**

Drg.14473

c) **SAEx**

Drg.14473b

d) **British Approvals Service for Electrical Equipment in Flammable Atmospheres (BASEEFA)**, or Ministry of Power, or Ministry of Technology, or Department of Trade and Industry, United Kingdom

Drg.14474

or plain Ex

Drg.14475

(previously)

e) **Physikalisch-Technische Bundesanstalt (PTB) or Bergbau Versuchsstrecke (BVS), Germany**:

Drg.14476

f) **Underwriters' Laboratories (UL), USA**

Drg.14478

or

Drg.14477

g) **Factory Mutual Research Corporation (FM), USA**

Drg.14479

h) **Canadian Standards Association (CSA)**

Drg.14480

i) **Certification mark under the ATEX Directive (European Council Directive 94/9/EC) for equipment certified by a Notified Body**

Drg.14481

B.3 Explosion-protection ratings and certification conditions

B.3.1 General

Internationally accepted standards for explosion protection can be grouped according to their approach to marking of explosion-protection ratings, as indicated in B.3.2.2.

B.3.2 IEC, CENELEC and related national standards

NOTE Several countries have adopted or are adopting the IEC 60079 series of standards (flammable gases and vapours) and the IEC 61241 series of standards (combustible dusts and fibres) for explosion protection. South Africa is one of them, as are some of the European countries, Australia, the USA, and Canada. The degree to which IEC standards are adopted varies greatly, but the ultimate goal is for them to replace national standards as a way of removing trade barriers. In South Africa, the above IEC series of standards are adopted technically unchanged as far as is practicable, but their legal status is determined by the relevant legislators in conjunction with technical institutions.

The EN 50000 series of standards for explosion protection (flammable gases, vapours and dusts) is produced by CENELEC, the standards-writing organization of the European Union.

B.3.2.1 As part of the drive towards global standardization, cooperation between IEC and CENELEC requires the corresponding technical committees to consider each other's standards for mutual acceptance. As a result, several of these standards are identical or closely related.

B.3.2.2 The IEC and CENELEC standards for apparatus used in flammable gases and vapours call for the following marking:

(E)Ex mark	d	IIB	T3
Symbol for apparatus built in accordance with (CENELEC) standards	Flameproof apparatus (type of protection)	Apparatus or Gas group	Temperature Class

A summary of the marking requirements for IEC and CENELEC standards is shown in table B.1.

B.3.2.3 The ATL (Notified Body according to the ATEX Directive) and certificate number should also be shown. The certificate number could be followed by one of the following identification letters:

X: The applicable special conditions at the letter-symbol X should be ascertained from the contents of the certificate. "Associated electrical apparatus" in type of protection "intrinsically safe" will be identified with rectangular brackets, for example [Ex "ib"] IIC.

U: An incomplete piece of explosion-protected apparatus or component (for example, unequipped enclosures, lampholders, contact blocks, terminals, plugs, reducers, and impregnation materials).

B.3.2.4 Some of the older national standards use different practices, for example, in accordance with the German standard DIN VDE 0170/0171, the following letters are used:

B: The test certificate contains special conditions; the approving authority requires an additional marking plate on the apparatus: "Comply with the test certificate".

S: Apparatus with intrinsically safe circuits; the intrinsically safe parts of circuits may pass into hazardous locations but the apparatus shall not enter into a hazardous area.

Table B.1 — Marking requirements for IEC and CENELEC standards

1	2
Apparatus grouping	**Identification to the IEC 60079 or EN 50000 series**
Explosion-protected apparatus for mines Explosion-protected apparatus for surface industries	Ex .. I Ex .. II
Type of protection	**Label**
Oil immersion Pressurized apparatus Powder filling Flameproof enclosure Increased safety Intrinsic safety Encapsulation (moulding) Special protection	o p q d e i ("ib" or "ia") m s
Gas group	I, IIA, IIB, IIC
Maximum surface temperature of apparatus	
Temperature class	**Maximum surface temperature** °C
T1 T2 T3 T4 T5 T6	450 300 200 135 100 85
NOTE 1 At present, clause 8 of SANS 10108:2005 does not list oil-immersed electrical apparatus (Ex o apparatus) as suitable for use in hazardous locations, and expert advice should be sought before such apparatus is commissioned. NOTE 2 In addition, multiple concepts of explosion protection are possible, for example, Ex de IIC T6 or Ex d "ib" IIC T6.	

B.3.3 North American standards

B.3.3.1 General

Historically, explosion-protected apparatus certified to FM and UL standards (USA) and CSA standards has been accepted in South Africa.

More information about approved standards and certificates can be found in annex A.

In the USA, FM, UL and ISA standards have also been accepted as national (ANSI) standards. Although the North American standards for explosion protection differ from the IEC and CENELEC standards, concepts used in the IEC and CENELEC standards for explosion protection are increasingly being incorporated in North American standards.

B.3.3.2 Underwriters' Laboratories and Canadian Standards Association

In the immediate vicinity of the certification mark, a statement appears that the specified equipment is for use in hazardous locations. The groups of hazardous materials are given by the statement: "class I, group A, B, C or D" (or a combination of these), and "class II, group E, F or G" (or a combination of these). The gases and vapours appropriate to class I, groups A, B, C and D and the dusts appropriate to class II, groups E, F and G are given in NFPA 70.

A separate statement as to whether the equipment is intrinsically safe or explosion-proof (flameproof) might appear, but dust-ignition-proofing (dust-ignition-protection) is always indicated by coded reference to the types of material for which the equipment has been certified.

B.3.3.3 Factory Mutual Research Cooperation

Equipment is marked, in the immediate vicinity of the FM mark, indicating whether it is intrinsically safe or explosion-proof (flameproof) for class I, divisions 1 and 2 (zone 1 and zone 2) locations or non-incendive (non-sparking) for zone 2 locations only. The gases and vapours for which the electrical apparatus is suitable are given by the statement, "class I, groups A, B, C or D" (or a combination of these), as for the UL and CSA.

B.4 Additional marking for specific purposes

Additional marking usually includes a warning, for example, "Circuits have to be isolated before covers are removed".

B.5 Apparatus group and temperature class conventions

Table B.2 gives a brief and simplified comparison of terminologies used to describe the different apparatus groupings applicable to gases, vapours and dusts, in respect of explosion-protected apparatus.

B.6 Examples of markings

Table B.3 gives alternative markings that indicate that the electrical apparatus is suitable for a given location classification. Examples are given only for pentane, hydrogen and aluminium dust, but the marking also applies to other flammable substances, provided that the appropriate apparatus group and temperature class are used.

NOTE In table B.3, where more than one symbol is given after the ATL's mark for the protection methods, apparatus group or temperature class, this means that any of these symbols will indicate that the apparatus is suitable.

Table B.2 — Terminologies used to describe apparatus groupings for explosion-protected apparatus

1	2	3	4	5	6
Representative substance (see SANS 10108)	**Marking in accordance with IEC 60079 and EN 50000 series of standards, also the latest South African and British standards**	**Marking in accordance with old South African and British standards[a]**	**Marking in accordance with old German standards[a]**	**American-Canadian group marking in accordance with UL, FM or CSA standards**	
Acetylene	IIC	2C (or 2f)	3n (or 3c)	Group A	Class I
Hydrogen, manufactured gas	IIC	2C (or 2e)	3a	Group B	
Ethylene, diethyl ether	IIB	2B (or 2d)	2	Group C	
Pentane, petrol vapours, alcohols, ammonia	IIA	2A (or 2c, 2b and 2a)	1	Group D	
Metal dust, such as aluminium, magnesium	Not applicable	Metallic dusts (SABS 969[a])	Not applicable	Group E	Class II
Carbon black, charcoal, coke dusts	Not applicable	Non-metallic dusts (SABS 969[a])	Not applicable	Group F	
Flour, starch or grain dusts	Not applicable	Non-metallic dusts (SABS 969[a])	Not applicable	Group G	

a These standards might have been withdrawn, but they have been included because equipment may still be manufactured to these standards during the validity period of the equipment certification.

Table B.3 — Alternative markings that indicate that the apparatus so marked is suitable for the given flammable substance

1	2	3
Certification body	**Alternative suitable markings if the flammable substance is:**	
	Pentane	**Hydrogen**
Location classification: Zone 0		
SABS Certification (Pty) Ltd	Ex i Drg.14473 IIA IIC Ex "ia" IIB T3 T4 T5 T6 SANS 60079-11 previously Intrinsic safety 2A "ia" 2B 2C T3 T4 T5 T6	Ex i Drg.14473 Ex "ia" IIC T1 T2 T3 T4 T5 T6 SANS 60079-11 previously Intrinsic safety "ia" 2C T1 T2 T3 T4 T5 T6
BASEEFA (United Kingdom) (also according to CENELEC standards (see below))	Drg.14474 IIA "ia" IIB IIC T3 T4 T5 T6	Drg.14474 "ia" IIC and applicable temperature class (optional) T1 T2 T3 T4 T5 T6
PTB (Germany) (also according to CENELEC standards (see below))	Drg.14476 "ia" T3 T4 T5 T6 Previously Drg.14476 "ia" G3 G4 G5	Drg.14476 "ia" T1 T2 T3 T4 T5 T6 Previously Drg.14476 "ia" G1 G2 G3 G4 G5
European Union according to CENELEC standards	Drg.14481 IIA EEx "ia" IIB IIC T3 T4 T5 T6	Drg.14481 IIA EEx "ia" IIB IIC T1 T2 T3 T4 T5 T6

Table B.3 (*continued*)

1	2	3
Certification body	**Alternative suitable markings if the flammable substance is:**	
	Pentane	**Hydrogen**
Location classification: Zone 1		
SABS Certification (Pty) Ltd	As for zone 0, but also including "ib". In addition: Ex d SABS Drg.14473 IIA Ex d IIB IIC T3 T4 T5 T6 SANS 60079-1 previously Flameproof SABS 2A 2B 2C	As for zone 0, but also including "ib". In addition: Ex d SABS Drg.14473 Ex d IIC T1 T2 T3 T4 T5 T6 SANS 60079-1 previously Flameproof SABS 2C
	Ex e SABS Drg.14473 Ex e II T3 T4 T5 T6 SANS 60079-7 previously Type e/Ex e SABS T3 T4 T5 T6	Ex e SABS Drg.14473 Ex e T1 T2 T3 T4 T5 T6 SANS 60079-7 previously Type e/Ex e SABS T1 T2 T3 T4 T5 T6
	SABS Drg.14473 Ex p^m II T3 T4 T5	SABS Drg.14473 Ex p^m II T1 T2 T3 T4 T5 T6

Table B.3 (*continued*)

1	2	3
Certification body	**Alternative suitable markings if the flammable substance is:**	
	Pentane	**Hydrogen**
Location classification: Zone 1 (continued)		
BASEEFA (United Kingdom) (also according to CENELEC standards (see below))	Drg.14474 d IIA T3 T4 IIB T5 IIC T6 Drg.14474 e_s II T3 T4 T5 T6	Drg.14474 d IIC T1 T2 T3 T4 T5 T6 Drg.14474 e_s II T1 T2 T3 T4 T5 T6
PTB (Germany) (also according to CENELEC standards (see below))	Drg.14476 d 1 2 3a 3b 3n T3 T4 T5 T6 or G3 G4 G5 Drg.14476 e s p T3 T4 T5 T6 or G3 G4 G5	Drg.14476 d 3a 3b 3n T1 T2 T3 T4 T5 T6 or G2 G3 G4 G5 Drg.14476 e s p T1 T2 T3 T4 T5 T6 or G2 G3 G4 G5
European Union according to CENELEC standards	Drg.14481 EEx d IIA IIB IIC T3 T4 T5 T6 Drg.14481 EEx e IIA IIB IIC T3 T4 T5 T6 Drg.14481 EEx p^m II T3 T4 T5	Drg.14481 EEx d IIC T1 T2 T3 T4 T5 T6 Drg.14481 EEx e IIC T1 T2 T3 T4 T5 T6 Drg.14481 EEx p^m II T1 T2 T3 T4 T5 T6

Table B.3 (*continued*)

1	2	3
Certification Body	**Alternative suitable markings if the flammable substance is:**	
	Pentane	**Hydrogen**
Location classification: Zone 1 (concluded)		
UL and FM (USA) and CSA (Canada)	UL LISTED Equipment for hazardous locations CSA Drg.14480 Equipment for hazardous locations Class I Group D FM APPROVED Ex i electrical apparatus Class I Group D	UL LISTED Equipment for hazardous locations CSA Drg.14480 Equipment for hazardous locations Class I Group B FM APPROVED Ex i electrical apparatus Class I Group B
Location classification: Zone 2		
SABS Certification (Pty) Ltd	As for zone 1, but also Non-sparking / Ex n SABS Drg.14473 T3 T4 T5 T6	As for zone 1, but also Non-sparking / Ex n SABS Drg.14473 T1 T2 T3 T4 T5 T6
BASEEFA (United Kingdom)	Ex Drg.14474 T3 T4 ^{n}N II T5 T6	Ex Drg.14474 T1 T2 T3 Ex ^{n}N T4 T5 T6

Table B.3 *(concluded)*

1	2	3
Certification Body	**Alternative suitable markings if the flammable substance is:**	
	Pentane	**Hydrogen**
Location classification: Zone 2 (concluded)		
FM (USA)	FM APPROVED Non-incendive apparatus Class I Group D	FM APPROVED Non-incendive apparatus Class I Group B
Aluminium dust		
Location classification: Zone 20 and zone 21		
SABS Certification (Pty) Ltd	Those with suitable certification in accordance with 8.3.2 of SANS 10108:2005 and also Dust-ignition-proof SABS Drg.14473 Metallic and non-metallic dust	
UL (USA)	UL LISTED Equipment for hazardous location Class II Group E	
CSA (Canada)	CSA Drg.14480	

B.7 Unmarked electrical apparatus

In the case of electrical apparatus that is unmarked, or where the marking is incomplete or there is doubtful applicability to the particular hazard, it shall not be used and it shall either be submitted for testing and certification or its use shall be immediately discontinued.

Annex C
(normative)

Upgrading and maintenance of EPA certificates for mines and factories

C.1 In South Africa, all EPA (Group I, Explosion-protected apparatus) used in mines shall be covered by an IA certificate. The requirements in C.2 to C.15 cover the validity of IA certificates.

C.2 All IA certificates issued shall have a validity period of 10 years. Where a product is in service and its certificate has expired it will not be affected. IA certificates based on overseas certification will be valid for a period of one year.

C.3 If, during a validity period or if the product is in service after its certificate has expired, the product is modified or changed to an extent that it requires re-evaluation, this shall be done by an ATL and re-certified. This re-evaluation or re-certification (or both) shall take into account the current edition of the national standard used for certification and the complete product shall meet the requirements of that standard.

C.4 During the validity period of IA certificates the product can be manufactured or supplied either under the batch test method or under an approved product certification scheme irrespective of changes to the national standard, provided that the product does not change from the original certified design and that no unsafe condition that affects the products is identified in the original edition of the standard used for certification (see also B.7).

C.5 Repairs and overhauls carried out by the certificate holder shall not invalidate the IA certificate. Repairs and overhauls carried out by a party other than the certificate holder, where the repairer or overhauler is not in possession of the certification documents, shall be carried out in such a manner that the product meets the requirements of the applicable national standards to which the product was originally certified, or any more recent edition.

C.6 Should a product be modified or changed in such a way that it no longer complies with the certified design, it shall be re-submitted to an ATL for re-evaluation. This re-evaluation shall take into account the current national standard and the product shall comply with that standard. This applies to newly manufactured as well as in-service products.

C.7 Current IA certificates and GME certificates (previously known as V or VM numbers) issued before 1998 shall have a validity of 5 years and those after 1998 a validity of 10 years. All new products shall have a validity of 10 years from the date of certification. The date of issue and the date of expiry shall be stated on newly issued IA certificates.

C.8 A product still in production shall be submitted for re-certification to an ATL before the IA certificate expires so as to achieve re-certification before the expiry date. The product will be re-assessed or tested (or both) and will be re-certified to the current edition of the national standard. Where the current edition of the national standard dictates that a product shall be upgraded or changed, the onus is on the manufacturer or supplier of the product to institute such upgrades or changes as to ensure that the product is compliant to the current national standard, as required for re-certification.

C.9 Where a product with a valid IA certificate is found to be unsafe for use, the manufacturer or supplier shall take appropriate steps to rectify the design of such a product and re-certify such rectified products. Unsafe products already supplied shall be recalled and both the regulatory body and the ATL (and approved certification body for mark holders) that issued the certificate shall be notified.

C.10 In cases where any system safety parameter of an intrinsically safe apparatus is changed, consideration shall be given to the safety of the loops in which the apparatus is used, and such loops shall be re-certified.

C.11 Where a standard is superseded during the validity period of a certificate, then such standard shall still be deemed to apply to the product for the validity period of the certificate. In terms of batch-tested products, ATLs shall still be able to test to such standards while the certificates remain valid.

C.12 Certification that covers variations in product design, or covers a range of similar products, shall show, in the test report or IA certificate, that each variation or design has been considered and tested where deemed necessary, and each variation or design shall be clearly stated in the test report and IA certificate.

C.13 Any repairer or overhauler operating in terms of an approved product certification mark scheme for Ex certified equipment, shall attach to the product a durable, legible and noticeable label that gives at least the following information:

a) the repairer's certificate number under the mark scheme,

b) the IA certificate number,

c) the name of mark scheme holder, and

d) the month and year of repair or overhaul.

C.14 The label fitted by the original equipment manufacturer shall not be removed, but labels fitted by previous repairers shall be removed, except in cases where the repairer or overhauler submits the finished product to an ATL and has the product fully tested to the national standards and a new IA certificate is issued in his name. In this case, only the repairer or overhauler plate shall to be fitted.

C.15 All records related to manufacture or repair of Ex certified apparatus shall be kept for a minimum period of 10 years by the product certificate holder or manufacturer.

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SANS 60079-12/IEC 60079-12 (SABS IEC 60079-12), *Electrical apparatus for explosive gas atmospheres – Part 12: Classification of mixtures of gases or vapours with air according to their maximum experimental safe gaps and minimum igniting currents*.

1) This standard might have been withdrawn, but it has been included because equipment may still be manufactured to this standard during the validity period of the equipment certification.

SANS 60079-20/IEC 60079-20 (SABS IEC 60079-20), *Electrical apparatus for explosive gas atmospheres – Part 20: Data for flammable gases and vapours, relating to the use of electrical apparatus*.

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