

Australian/New Zealand Standard™

Electrical apparatus for explosive gas atmospheres

Part 0: General requirements

AS/NZS 60079.0:2005

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-014, Electrical Equipment in Hazardous Areas. It was approved on behalf of the Council of Standards Australia on 8 April 2005 and on behalf of the Council of Standards New Zealand on 15 April 2005.
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Australian/New Zealand Standard™

Electrical apparatus for explosive gas atmospheres

Part 0: General requirements

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-014, Electrical Equipment in Hazardous Areas, to supersede AS/NZS 60079.0:2000.

This Standard incorporates Amendment No. 1 (June 2005). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

This Standard is identical with, and has been reproduced from, IEC 60079-0, Ed.4.0(2004), *Electrical apparatus for explosive gas atmospheres - Part 0: General requirements*.

The objective of this Standard is to provide general requirements for the manufacturers, testing authorities and certification bodies concerned with electrical apparatus for explosive gas atmospheres.

This Standard will run concurrently with AS 2380.1 *Electrical equipment for explosive atmospheres—Explosion-protection techniques, Part 1: General requirements*, until the AS/NZS 60079 series is complete at which time the AS 2380 series will be withdrawn.

The significant changes with respect to the previous edition are listed below:

- (a) Standard atmospheric conditions re-introduced.
- (b) All requirements for third-party certification removed.
- (c) New type of protection ‘n’ introduced.
- (d) New apparatus standards for caplights, intrinsically safe systems, Zone 0 apparatus, and trace heating introduced.
- (e) Clarification of the status of symbol ‘s’.
- (f) Definitions for symbols ‘U’ and ‘X’ revised to align with current usage.
- (g) Definition for Ex component transferred from IEC 60079-18.
- (h) New definitions drafted for ‘energy limited’ parameters to allow common usage by types of protection ‘i’ and ‘n’.
- (i) New definitions for batteries transferred from IEC 60079-7.
- (j) Definition added for ambient temperature.
- (k) Definition added for continuous operating temperature (COT).
- (l) Definition for certificate transferred from IEC 60079-15 and revised based on ISO /IEC 17000.
- (m) Definition added for cable gland.
- (n) Clause 5 for temperature re-written to address the influences of ambient temperature, internal sources of heat, and external sources of heating or cooling.
- (o) Small component ignition test transferred from IEC 60079-11 and IEC 60079-15.
- (p) Requirements for bonding transferred from IEC 60079-7 and IEC 60079-15.
- (q) Requirements for gasket retention transferred from IEC 60079-15 for wider applicability.
- (r) Relative thermal index (RTI) added as an alternative to thermal index (TI).
- (s) Electrostatic requirements transferred and rationalized from IEC 60079-15 and IEC 60079-26 to apply to all of Group I and Group II.
- (t) Introduction of two additional test methods to evaluate the use of non-metallic materials with respect to the storage of electrostatic charges.

- (u) Light metal requirements transferred and rationalized from IEC 60079-15 and IEC 60079-26 to apply to all of Group I and Group II.
- (v) Introduction of a test to evaluate the use of a non-metallic enclosure wall in an earth bonding connection.
- (w) Clause 16 rewritten to align with industry usage of the terms *cable gland* and *conduit entry*.
- (x) Equipotential bonding requirements for machines transferred from IEC 60079-7 and IEC 60079-15.
- (y) Requirement for disconnectors in switchgear and luminaires revised to provide IP20 protection for live parts and include additional marking.
- (z) General requirements for cells and batteries transferred from IEC 60079-7 and IEC 60079-15.
- (aa) Impact test revised to specify drop height in lieu of energy.
- (bb) Clarification of application of 5°C and 10°C temperature margins to type-tested samples.
- (cc) Clarification of order of tests for metallic materials.
- (dd) Clarification of number of samples and order of tests for non-metallic materials.
- (ee) Clarification of order of marking.
- (ff) Clarification of marking details for associated apparatus.
- (gg) Clarification of marking of specific gases.
- (hh) Clarification of marking of temperature class.
- (ii) Clarification of usage of compulsory certificate number.
- (jj) Clarification of marking of small apparatus.
- (kk) Compilation of all warning markings into a table.
- (ll) Clarification of marking examples.
- (mm) Addition of a Clause on instructions.
- (nn) Deletion of Annex A as information is available in more appropriate standards (IEC 60079-20).
- (oo) Revision and clarification of Annex A (previously Annex B) to accommodate term *cable gland*.

As this Standard is reproduced from an International Standard, the following applies:

- (i) Its number appears on the cover and title page while the international standard number appears only on the cover
- (ii) In the source text ‘this International Standard’ should read ‘this Australia/New Zealand Standard’.
- (iii) A full point substitutes for a comma when referring to a decimal marker.

The terms ‘normative’ and ‘informative’ are used to define the application of the annex to which they apply. A normative annex is an integral part of a Standard, whereas an informative annex is only for information and guidance.

CONTENTS

	<i>Page</i>
INTRODUCTION	vii
1 Scope	1
2 Normative references	2
3 Terms and definitions	5
4 Apparatus grouping and temperature classification	11
4.1 Apparatus grouping	11
4.2 Group II	11
5 Temperatures	12
5.1 Environmental influences	12
5.2 Service temperature	12
5.3 Maximum surface temperature	13
5.4 Surface temperature and ignition temperature	13
5.5 Small components	13
6 Requirements for all electrical apparatus	14
6.1 General	14
6.2 Mechanical strength of apparatus	15
6.3 Opening times	15
6.4 Circulating currents	15
6.5 Gasket retention	15
7 Non-metallic enclosures and non-metallic parts of enclosures	16
7.1 General	16
7.2 Thermal endurance	16
7.3 Electrostatic charges on external non-metallic materials of enclosures	16
7.4 Threaded holes	17
8 Enclosures containing light metals	17
8.1 Material composition	17
8.2 Threaded holes	18
Fasteners	18
9.1 General	18
9.2 Special fasteners	18
9.3 Holes for special fasteners	19
10 Interlocking devices	20
11 Bushings	20
12 Materials used for cementing	20
13 Ex components	21
13.1 General	21
13.2 Mounting internal to apparatus	21
13.3 Mounting external to apparatus	21
14 Connection facilities and terminal compartments	21
14.1 General	21
14.2 Connection space	21
14.3 Type of protection	21
14.4 Creepage and clearance	22

	<i>Page</i>
15 Connection facilities for earthing or bonding conductors.....	22
15.1 Internal	22
15.2 External	22
15.3 Apparatus not requiring earthing	22
15.4 Size of conductor connection	22
15.5 Protection against corrosion.....	23
15.6 Secureness.....	23
16 Entries into enclosures.....	23
16.1 General.....	23
16.2 Identification of entries.....	23
16.3 Cable glands.....	23
16.4 Blanking elements.....	23
16.5 Conductor temperature	24
17 Supplementary requirements for rotating electrical machines.....	24
17.1 Fans and fan hoods	24
17.2 Ventilation openings for external fans	25
17.3 Construction and mounting of the ventilating systems	25
17.4 Clearances for the ventilating system.....	25
17.5 Materials for external fans and fan hoods.....	25
17.6 Equipotential bonding conductors	25
18 Supplementary requirements for switchgear.....	25
18.1 Flammable dielectric	25
18.2 Disconnectors.....	26
18.3 Group I – Provisions for locking	26
18.4 Doors and covers.....	26
19 Supplementary requirements for fuses	26
20 Supplementary requirements for plugs and sockets.....	27
20.1 Interlocking	27
20.2 Energized plugs	27
21 Supplementary requirements for luminaires.....	27
21.1 General.....	27
21.2 Covers	27
21.3 Special lamps	28
22 Supplementary requirements for caplights and handlights	28
22.1 Group I caplights and handlights.....	28
22.2 Group II caplights and handlights	28
23 Apparatus incorporating cells and batteries.....	28
23.1 Batteries	28
23.2 Cell types.....	28
23.3 Cells in a battery	29
23.4 Ratings of batteries.....	30
23.5 Mixture of cells	30
23.6 Interchangeability	30
23.7 Charging of primary batteries	30
23.8 Leakage.....	30
23.9 Connections	30

	<i>Page</i>
23.10 Orientation	30
23.11 Replacement of cells or batteries	30
24 Documentation	30
25 Compliance of prototype or sample with documents	30
26 Type tests	31
26.1 General	31
26.2 Test configuration	31
26.3 Tests in explosive test mixtures	31
26.4 Tests of enclosures	31
26.5 Thermal tests	34
26.6 Torque test for bushings	36
26.7 Non-metallic enclosures or non-metallic parts of enclosures	37
26.8 Thermal endurance to heat	37
26.9 Thermal endurance to cold	38
26.10 Resistance to light	38
26.11 Resistance to chemical agents for Group I electrical apparatus	38
26.12 Earth continuity	39
26.13 Surface resistance test of parts of enclosures of non-metallic materials	40
26.14 Charging tests	41
26.15 Measurement of capacitance	45
27 Routine verifications and tests	45
28 Manufacturer's responsibility	45
28.1 Certificate	45
28.2 Responsibility for marking	45
29 Marking	45
29.1 Location	46
29.2 General	46
29.3 Different types of protection	47
29.4 Order of marking	47
29.5 Ex components	47
29.6 Small apparatus and Ex components	48
29.7 Extremely small apparatus and Ex components	48
29.8 Warning markings	48
29.9 Cells and batteries	49
29.10 Examples of marking	49
30 Instructions	50
30.1 General	50
30.2 Cells and batteries	51
Annex A (normative) Ex cable glands	52
Annex B (normative) Requirements for Ex components	59
Annex C (informative) Example of rig for resistance to impact test	61
Bibliography	62

INTRODUCTION

It is acknowledged that, with developments in technology, it will be possible to achieve the objectives of the IEC 60079 series of standards in respect of explosion prevention by methods that are not yet fully defined. Where a manufacturer wishes to take advantage of such developments, this International Standard, as well as other standards in the IEC 60079 series, may be applied in part. It is intended that the manufacturer prepare documentation that clearly defines how the IEC 60079 series of standards has been applied, together with a full explanation of the additional techniques employed. In this case, the letter “s” has been reserved to indicate a method of protection that is not fully defined in the standards. Compliance with this standard cannot be claimed in these circumstances.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australia/New Zealand Standard**Electrical apparatus for explosive gas atmospheres
Part 0: General requirements**

1 Scope

This part of IEC 60079 specifies the general requirements for construction, testing and marking of electrical apparatus and Ex components intended for use in explosive gas atmospheres.

Unless modified by one of the parts in the IEC 60079 series, electrical apparatus complying with this standard is intended for use in hazardous areas in which explosive gas atmospheres, caused by mixtures of air and gases, vapours or mists, exist under normal atmospheric conditions of

- temperature -20 °C to $+60\text{ °C}$;
- pressure 80 kPa (0,8 bar) to 110 kPa (1,1 bar); and
- air with normal oxygen content, typically 21 % v/v.

The application of electrical apparatus in atmospheric conditions outside this range may need special consideration.

NOTE 1 The determination of the maximum surface temperature is based on an operational ambient temperature of -20 °C to $+40\text{ °C}$, if not otherwise specified by the manufacturer. See also 5.1.1.

NOTE 2 In designing apparatus for operation in explosive gas atmospheres under conditions other than the atmospheric conditions given above, this standard may be used as a guide. However, additional testing related specifically to the intended conditions of use is recommended. This is particularly important when the types of protection 'flameproof enclosures "d"' (IEC 60079-1) and 'intrinsic safety "i"' (IEC 60079-11) are applied.

NOTE 3 Requirements given in this standard result from an ignition hazard assessment made on electrical equipment. The ignition sources taken into account are those found associated with this type of equipment, such as hot surfaces, mechanically generated sparks, thermite reactions, electrical arcing and static electric discharge in normal industrial environments. For other ignition sources like adiabatic compression, shock waves, exothermic chemical reaction, self ignition of dust, naked flames, hot gases/liquids the apparatus are subjected to a hazard analysis that identifies and lists all of the potential sources of ignition by the electrical apparatus and the measures to be applied to prevent them becoming effective.

This standard does not specify requirements for safety, other than those directly related to the explosion risk.

This standard is supplemented or modified by the following parts of IEC 60079 concerning specific types of protection:

- IEC 60079-1: Flameproof enclosures "d";
- IEC 60079-2: Pressurized enclosures "p";
- IEC 60079-5: Powder filling "q";
- IEC 60079-6: Oil immersion "o";
- IEC 60079-7: Increased safety "e";
- IEC 60079-11: Intrinsic safety "i";
- IEC 60079-15: Type of protection "n";
- IEC 60079-18: Encapsulation "m".