

Australian/New Zealand Standard™

Explosive atmospheres

**Part 11: Equipment protection by
intrinsic safety 'i'**



AS/NZS 60079.11:2006

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-014, Equipment for Explosive Atmospheres. It was approved on behalf of the Council of Standards Australia on 10 November 2006 and on behalf of the Council of Standards New Zealand on 8 December 2006.
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Australian/New Zealand Standard™

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Part 11: Equipment protection by intrinsic safety 'i'

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-014, Equipment for Explosive Atmospheres, to supersede AS/NZS 60079.11:2000.

The objective of this Standard is to specify the construction and testing of intrinsically safe apparatus intended for use in an explosive gas atmosphere and for associated apparatus, which is intended for connection to intrinsically safe circuits which enter such atmospheres.

This Standard is identical to and has been reproduced from IEC 60079-11, Ed. 5.0 (2006), *Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”*.

Footnotes have been added to clarify typographical errors in the original IEC Standard.

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

- (a) introduction of level of protection “ic” (this level of protection has been introduced to allow removal of the ‘energy limitation’ concept from IEC 60079-15);
- (b) introduction of Annex F that allows reduction in segregation distance requirements when the pollution degree has been reduced by installation or enclosure;
- (c) introduction of alternative spark test apparatus construction when used with high current circuits;
- (d) introduction of Annex E that provides a method for transient energy test;
- (e) changes in the table of ‘Temperature classification of tracks on PCBs’ to allow correlation with IPC-2152;
- (f) allowing alternative methods of rating resistors when used to limit the discharge from capacitance;
- (g) introduction of methods to deal with the spark ignition energy consideration when high current low voltage cells and batteries are used;
- (h) introduction of tests to measure the maximum pressure in sealed battery containers;
- (i) introduction of methods to deal with fault application on voltage enhancement ICs;
- (j) introduction of infallible connection methods for SMDs (surface mount devices);
- (k) introduction of alternative methods to deal with the spark ignition energy in circuits with both inductance and capacitance;
- (l) introduction of alternative high voltage test for transformers;
- (m) introduction of methods to assess the reduction of effective capacitance when protected by series resistances;
- (n) introduction of Group I data for permitted short circuit current and permitted capacitance in the tables of Annex A.

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

- (i) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (ii) In the source text ‘IEC 60079-11’ should read ‘AS/NZS 60079.11’.
- (iii) A full point should be substituted 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.

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Australian/New Zealand Standard**Explosive atmospheres****Part 11: Equipment protection by intrinsic safety 'i'****1 Scope**

This part of IEC 60079 specifies the construction and testing of intrinsically safe apparatus intended for use in an explosive gas atmosphere and for associated apparatus, which is intended for connection to intrinsically safe circuits which enter such atmospheres.

This type of protection is applicable to electrical apparatus in which the electrical circuits themselves are incapable of causing an explosion in the surrounding explosive atmospheres.

This standard is also applicable to electrical apparatus or parts of electrical apparatus located outside the explosive gas atmosphere or protected by another type of protection listed in IEC 60079-0, where the intrinsic safety of the electrical circuits in the explosive gas atmosphere may depend upon the design and construction of such electrical apparatus or parts of such electrical apparatus. The electrical circuits exposed to the explosive gas atmosphere are evaluated for use in such an atmosphere by applying this standard.

The requirements for intrinsically safe systems are provided in IEC 60079-25. The requirements for intrinsically safe concepts for fieldbus are provided in IEC 60079-27.

This standard supplements and modifies the general requirements of IEC 60079-0, except as indicated in Table 1. Where a requirement of this standard conflicts with a requirement of IEC 60079-0, the requirements of this standard shall take precedence.

If associated apparatus is placed in the explosive gas atmosphere, it must be protected by an appropriate type of protection listed in IEC 60079-0, and then the requirements of that method of protection together with the relevant parts of IEC 60079-0 also apply to the associated apparatus.

Table 1 – Exclusion of specific clauses of IEC 60079-0

Clause or subclause of IEC 60079-0		Intrinsically safe apparatus	Associated apparatus
4.2.2	Group II – Surface temperature marking	Applies	Excluded
5.3	Maximum surface temperature	Applies	Excluded
5.4	Surface temperature and ignition temperature	Applies	Excluded
5.5	Small components	Applies	Excluded
6.3	Opening times	Excluded	Excluded
7.1.1	Applicability	Applies	Excluded
7.1.2	Specification of materials	Applies	Excluded
7.1.3*	Plastic materials	Excluded	Excluded
7.2*	Thermal endurance	Excluded	Excluded
7.3	Electrostatic charges on external non-metallic materials of enclosures	Applies	Excluded
7.3.2	Avoidance of a build-up electrostatic charge	Applies	Excluded
7.4	Threaded holes	Excluded	Excluded