

Australian/New Zealand Standard™

**Electrical equipment for explosive gas
atmospheres—Selection, installation
and maintenance**

Part 1: General requirements



AS/NZS 2381.1:2005

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 5 April 2005 and on behalf of the Council of Standards New Zealand on 11 February 2005.
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The following are represented on Committee EL-014:

Auckland Regional Chamber of Commerce
Australian Association of Certification Bodies
Australian Chamber of Commerce and Industry
Australian Gas Association
Australian Industry Group
Australian Liquefied Petroleum Gas Association
Australian Paint Manufacturers Federation
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Australian/New Zealand Standard™

Electrical equipment for explosive gas atmospheres—Selection, installation and maintenance

Part 1: 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 2381.1:1999 and Amendment 1:2004.

This Standard incorporates Amendment No. 1 (September 2005), Amendment No. 2 (December 2006) and Amendment No. 3 (October 2007). 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.

The Joint Committee EL-014 has endorsed the adoption of the IEC 60079 Gases and vapours and IEC 61241 Dusts series of Standards as Joint Australian/New Zealand Standards. The different Zones are identified as Zone 0, 1, 2 for explosive gases atmospheres and Zones 20, 21, 22 for explosive dust atmospheres.

The significant changes in this edition are as follows:

- (a) The removal of all references to combustible dusts other than references in the Clauses 1.2 and 2.5 stating that the requirements for dusts are given in AS/NZS 61241.14.
- (b) Clauses 1.6, 2.4.6, 2.6, 3.8.4, 3.8.15.1.2, 3.11.2, 4.2, 4.3.1 and 5.10 were reworded.
- (c) Clauses 3.2.6 and 4.3.2 were added.
- (d) Appendices B and F were deleted.
- (e) Appendix G has changed title and content.
- (f) Appendix I has been added.

All permitted explosion-protection techniques for electrical equipment for Zones 0, 1 and 2 and the respective applicable Standards are summarized in Table 2.1.

This Standard necessarily deals with existing conditions, but it is not intended to discourage invention or to exclude materials, equipment and methods which may be developed in the future.

This revision which is to accommodate the introduction of AS/NZS 61241.14 for dusts, will have a relatively short currency, since it is planned to replace it with modified versions of IEC 60079-14 and IEC 60079-17 as AS/NZS 60079.14 and AS/NZS 60079.17, as part of a strategy for alignment with IEC Standards. Publication of AS/NZS 60079.14 and AS/NZS 60079.17, is expected for early 2007.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

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FOREWORD

Many gases, vapours and mists that are generated, processed, handled and stored, are combustible. When ignited they can burn rapidly and with considerable explosive force if mixed with air in the appropriate proportions. It is often necessary to use electrical equipment in locations where such combustible materials are present, and suitable precautions must therefore be taken to ensure that all such equipment is adequately protected so as to reduce the likelihood of ignition of the external explosive atmosphere. In electrical equipment, potential ignition sources include electrical arcs and sparks, hot surfaces, and frictional sparks.

Areas where gases, vapours and mists occur in dangerous quantities are classified as hazardous.

Generally, electrical safety is ensured by the implementation of one of two considerations, i.e. that electrical equipment be located where reasonably practicable outside hazardous areas and that electrical equipment be designed, installed and maintained in accordance with measures recommended for the area in which the equipment is located.

Several techniques are available for the explosion-protection of electrical equipment in explosive gas hazardous areas. This Standard describes the safety features of these types of explosion-protection techniques and specifies the installation and maintenance procedures to be adopted. It is most important that the correct selection, installation and maintenance procedures be followed to ensure the safe use of electrical equipment in hazardous areas.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Electrical equipment for explosive gas atmospheres—Selection,
installation and maintenance**

Part 1: General requirements

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies general requirements, additional to those required for basic electrical safety, for the selection of electrical equipment and instruments, and associated equipment, and for the electrical equipment's installation and maintenance to ensure safe use in hazardous areas where flammable materials are generated, prepared, processed, handled, stored or otherwise used.

This Standard does not apply to those materials which are specifically manufactured as explosives, or to materials which are inherently explosive or pyrophoric. Explosive materials may require special considerations which are beyond the scope of this Standard.

The requirements of this Standard apply only to the use of electrical equipment under normal or near normal atmospheric conditions. For other conditions, additional precautions may be necessary. For example, most flammable materials and many materials which are normally regarded as non-flammable might burn vigorously under conditions of oxygen enrichment. Other precautions might also be necessary in the use of electrical equipment under conditions of extreme temperature and pressure. Such precautions are beyond the scope of this Standard.

Precautions which may be necessary against the effects of static electricity and against lightning are also outside the scope of this Standard, except for the general recommendations indicated in Clause 1.9.

1.2 APPLICATION

The requirements specified in this Standard are supplementary to and not alternative to any requirements given in AS/NZS 3000. Any alterations or modifications to AS/NZS 3000 in this document are specifically stated.

Installation of electrical equipment for explosive gas atmospheres shall comply with the requirements of this Standard and any additional requirements contained in other relevant parts of the AS 2381 series. Requirements for combustible dusts are given in the AS/NZS 61241 series and AS/NZS 60079 series. However, the requirements of this Standard may be varied by other relevant parts of the AS 2381 series for the types of protection concerned, in which case the requirements of other parts shall take precedence over this Standard.

Notwithstanding application of the installation requirements of this Standard to new installations, the requirements for inspection shall be applied to all electrical equipment and installations irrespective of age and date of installation.

1.3 REFERENCED DOCUMENTS

A list of documents referred to in this Standard is given in Appendix A.

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