AS/NZS 2290.3:2018

Australian/New Zealand Standard™

Electrical equipment for coal mines—Introduction, inspection and maintenance

Part 3: Gas detecting and monitoring equipment

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Australian/New Zealand Standard™

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Part 3: Gas detecting and monitoring equipment

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-023, Electrical Equipment in Mines and Quarries, to supersede AS 2290.3—1990, *Electrical equipment for coal mines—Maintenance and overhaul*, Part 3: *Maintenance of gas detecting and monitoring equipment*.

This Standard is Part 3 in a series of Standards on the maintenance and overhaul of electrical equipment used in association with coal mining. The series is as follows:

(a) AS/NZS 2290.1, *Electrical equipment for coal mines—Introduction, inspection and maintenance*, Part 1: *For hazardous areas*.

(b) AS/NZS 2290.3, *Electrical equipment for coal mines—Introduction, inspection and maintenance*, Part 3: *Gas detecting and monitoring equipment* (this Standard).

The objective of this Standard is to facilitate the safe, efficient and productive use of gas detection and monitoring equipment in coal mines, by specifying requirements and recommendations for the inspection and maintenance of such equipment.

The principal differences between this edition and the 1990 edition are as follows:

(i) Equipment classifications have been revised to match common industry terminology.

(ii) Accuracy requirements for gas detectors have been aligned with 'as new' design and performance requirements. (In the previous edition, accuracy requirements for maintenance were more onerous than for 'new' detectors.)

(iii) Requirements for measuring the response time of detection systems have been introduced.

(iv) Requirements for checking telemetry systems from gas detectors to alarm/tripping points have been added.

(v) Requirements for maintenance of gas chromatographs have been added.

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.

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FOREWORD

Gas detection and monitoring equipment form a critical safety system in coal mines. It is essential that—

(a) the equipment is periodically inspected and maintained; and

(b) the performance of the safety system (and individual sub-systems) are tested at regular intervals to verify performance.

The underlying principle of this Standard is that gas detection and monitoring equipment is maintained in 'as new' condition.

The 'as new' performance of portable and fixed detectors is described by:

(i) AS/NZS 60079.29.1, *Explosive atmospheres*, Part 29.1: *Gas detectors—Performance requirements of detectors for flammable gases*, specifies general requirements for construction, testing and performance, and describes the test methods that apply to the detection and measurement of flammable gas or vapour concentrations with air.

(ii) AS/NZS 4641, *Electrical apparatus for detection of oxygen and other gases and vapours at toxic levels—General requirements and test methods*, provides general requirements and test methods for manufacturers, testing authorities and certifying bodies concerned with electrical apparatus for the measurement of the concentration of oxygen and toxic levels of gases and vapours.

Tube bundle analysers and gas chromatograph systems do not have equivalent performance standards, and so greater reliance is made on manufacturers' information for maintaining those systems. AS ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*, provides general guidance on the competence to carry out tests and/or calibrations, including sampling, that are applicable to tube bundle analysers and gas chromatograph systems.

This Standard sets out a prescriptive approach to the inspection and maintenance requirements for gas detection and monitoring equipment used in mine safety systems. Minimum requirements are prescribed that are intended to be complemented by additional site-specific practices determined from risk analyses to ensure key safety system performance is reliably maintained.

This Standard is not intended to address equipment used to monitor, report or manage environmental emissions; however, the principles and practices described in this Standard may be used for guidance in such applications.

AS/NZS 60079.29.2, *Explosive atmospheres*, Part 29.2: *Gas detectors—Selection, installation, use and maintenance of detectors for flammable gases and oxygen*, provides guidance on, and recommended practice for, the selection, installation, safe use and maintenance of apparatus intended for the detection and measurement of flammable gases conforming to the requirements of AS/NZS 60079.29.1, and so complements this Standard.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out requirements for the inspection, maintenance and performance verification of gas detection and monitoring equipment that forms, or is a part of, a coal mine's safety system.

This Standard is applicable to the following:

(a) Equipment that includes sensors to measure or monitor—

  (i) Group I flammable gases at concentrations below, within, or above the explosive range;

  (ii) toxic gases; and

  (iii) oxygen.

(b) Equipment that is—

  (i) portable—handheld;

  (ii) machine mounted;

  (iii) fixed and transportable.

(c) Equipment included in—

  (i) tube bundle systems; and

  (ii) gas chromatographic systems.

This Standard is not applicable to equipment used for monitoring or reporting of environmental emissions.

While this Standard addresses coal mine applications, the principles are also applicable to other mining applications where toxic gases may present operational hazards.

Section 2 describes the general requirements for inspection, maintenance and user servicing of gas detection and monitoring apparatus.

Section 3 sets out the schedule of inspections and tests applicable to various classifications of gas detection apparatus.

Section 4 describes the individual inspections and tests, the acceptance criteria, and the corrective actions applicable to portable handheld, machine mounted, fixed and transportable gas detectors.

Section 5 describes the individual inspections and tests, the acceptance criteria, and the corrective actions applicable to tube bundle and gas chromatograph systems.

Appendix A sets out the prescribed accuracies for various classes of gas detectors.

NOTE: Appendices B, C, D, E and F provide guidance on good practice for aspects of the installation, inspection and maintenance of gas detection and monitoring equipment.