Australian Standard®

Electrical equipment for coal mines—Maintenance and overhaul

Part 3: Maintenance of gas detecting and monitoring equipment

This Australian Standard was prepared by Committee EL/23, Electrical Equipment in Coal Mines. It was approved on behalf of the Council of Standards Australia on 13 November 1989 and published on 2 April 1990.

The following interests are represented on Committee EL/23:

Australian Chamber of Commerce
Australian Coal Association
Australian Electrical and Electronic Manufacturers Association
Confederation of Australian Industry
Department of Industrial Relations and Employment, N.S.W.
Department of Minerals and Energy, N.S.W.
Department of Mines, Qld
Institution of Mining Electrical and Mining Mechanical Engineers
Joint Coal Board
Regulatory authorities (electrical)

Additional interests participating in preparation of Standard:

Australian Coal Industrial Research Laboratories
Southern Mines Rescue Station

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PREFACE

This Standard was prepared by the Standards Australia Committee on Electrical Equipment in Coal Mines. It is intended for the guidance of users and relevant regulatory authorities concerned with the maintenance of electrical equipment in coal mines and is part of a series of Standards on the maintenance and overhaul of electrical equipment used in association with underground mining machines.

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FOREWORD

Various Australian Standards and statutory requirements lay down criteria for the manufacture and regulations for the installation and use of electrical equipment.

This Standard recognizes the need to maintain equipment properly while it is in service, and lays down guidelines in the form of checklists and examination procedures.

Where maintenance and testing of gas detecting and monitoring equipment is required, the Standard specifies that the work be carried out by organizations approved for the purpose. Only persons authorized by the relevant Regulatory Authority are to supervise or carry out such work.

Guidelines setting out the manner in which the work is to be performed and recorded are included.

STANDARDS AUSTRALIA

Australian Standard

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SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard sets out requirements for the examination and calibration of gas detecting and monitoring equipment for use in and around underground coal mines. It details methods of examination, maintenance and testing required to ensure safety, compliance with relevant Standards and trouble-free operation while the equipment is in service.

Organizations and personnel engaged in the examination, repair and testing of gas detecting equipment may be required to be approved for the purpose by the relevant Regulatory Authority. Minimum requirements for authorized persons and accredited test authorities are given in Appendix D.

NOTES:

1. Gas detector tubes, of either sample draw or diffusion types, which rely on a visually detectable chemical change in the presence of a gas, are not subject to the requirements of this Standard.
2. Attention is drawn to the various Mines Acts, the Regulations under these Acts, and also any other appropriate statutory requirements or by-laws. These place the prime responsibility for complying with specific safety requirements on the manufacturer or user of the equipment.

1.2 REFERENCED DOCUMENTS. The following documents are referred to in this Standard:

AS

2706 Numerical values — Rounding and interpretation of limiting values

3573 Electrical equipment for coal mines — Glossary of terms

1.3 DEFINITIONS. For the purpose of this Standard, the definitions given in AS 3573 and those below apply.

1.3.1 Accredited test authority — authority approved, or otherwise recognized, by the relevant Regulatory Authority, for the purpose of examination and calibration of gas detecting equipment as required by this Standard, and approved to issue a Certificate of Compliance.

1.3.2 Accredited workshop — workshop approved, or otherwise recognized, by the relevant Regulatory Authority, for the purpose of repair of gas detecting equipment as required by this Standard.

1.3.3 Authorized person — person authorized by the relevant Regulatory Authority as being competent to carry out or supervise the examinations as required by this Standard.

1.3.4 Certified test gas — mixture of a test gas and diluent in which the true content of the test gas, with a confidence level, is accepted by the relevant Regulatory Authority.

1.3.5 Certificate of Compliance — certificate issued by an accredited test authority verifying that the equipment complies with the relevant requirements of this Standard.

1.3.6 Verification check — check on the response of gas detecting equipment when exposed to zero gas and certified test gas(es) or, where alarm levels are the subject of the test, the accuracy of alarm settings.

NOTE: Verification checks should not be confused with full calibration of equipment which is, in general, more rigorous.

1.3.7 Full scale concentration — that gas concentration equivalent to the maximum variation in gas concentration which may be read from the equipment scale and range being used.

1.3.8 Gas sensing element — that part of gas detecting equipment which is in direct contact with sampled gas and at which a physical or chemical change, dependent on gas concentration, occurs.

1.3.9 Gas detector head — discrete assembly within gas detecting or monitoring equipment which contains the gas sensing element.

1.3.10 Examination — inspection to determine the condition of gas detecting equipment. This may involve visual inspection, the application of zero or span tests or the verification of equipment functions.

1.3.11 Electrical zero — the reading produced by gas detecting equipment under zero gas conditions, with the equipment electrically activated.

1.3.12 Mechanical zero — the reading produced by gas detecting equipment in the absence of electrical activation of the equipment. This reading corresponds to the reading produced by an error in the mechanical adjustment of moving coil meters.

1.3.13 Zero gas — for equipment other than oxygen sensing, a gas mixture free from the component which the item of gas detecting equipment under test is designed to detect. For oxygen sensing equipment, clean air is used as a zero gas.

NOTE: The convention has been adopted that the normal null point for oxygen detecting equipment is that corresponding to fresh air. Normal instrument response from this point is in a negative direction with decreasing oxygen concentration.

1.3.14 Zero gas conditions — application of zero gas to the gas sensing element of equipment under test.

1.3.15 Zero test — test of response to zero gas conditions. The 'zero' reading for oxygen detecting equipment is that corresponding to clean air.

1.3.16 Span test — test of response to certified test gas(es). The 'span' reading for oxygen detecting equipment is that corresponding to certified test gas(es) containing less oxygen than clean air.