AS 5487 (Int):2025
Interim
Australian Standard®
**Expiration 26 September 2027**

# Battery powered electric machines for use in underground mines



# AS 5487 (Int):2025

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Australian Cablemakers Association
Australian Industry Group
Aviation and Marine Engineers Association
Construction Forestry Miners and Energy Union
Department of Local Government, Industry Regulation and Safety – Western Australia
Engineers Australia
Engineers Australia/Mining Electrical and Mining Mechanical Engineering Society
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# How to read this Standard

This page explains the meaning of the language and structure of this Standard.

Refer to Standards Australia's Standardisation Guide 006 for more details about drafting rules.

Australian and Australian/New Zealand Standards are voluntary unless they are referenced in legislation or called up in contracts.

**Requirements**

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

**Recommendations, permissions and possibilities**

The following words are commonly used in Standards, but statements using them do not have to be followed to conform to the Standard:

(a) "should" means that something is recommended.

(b) "may" means that something is permitted.

(c) "can" means that something is possible.

**Structure of Standards**

A Standard always has the following parts:

(i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.

(ii) The Scope states what the Standard is about, what it covers and what it does not cover.

(iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.

(iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

(1) A normative appendix sets additional requirements that need to be conformed to.

(2) An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Standard will explain when those requirements apply.

(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

# Preface

This Interim Standard was prepared by the Australian members of the Joint Standards Australia/ Standards New Zealand Committee EL-023, Electrical Equipment in Mines and Quarries.

This Interim Standard will have a currency of two years from its date of publication. At the conclusion of that period it will be superseded by another document, confirmed as an interim Standard in its present form for a further two year period or withdrawn.

The objective of this document is to specify the requirements for the safe design, manufacture, installation, operation and maintenance of battery powered electric machines in underground mines.

The terms “normative” and “informative” are used in Standards to define the application of appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

Standards Australia welcomes comments on this Interim Standard. Please contact Standards Australia at success@standards.org.au for a copy of the commenting template and return the completed form to the same email address. Standards Australia Committee EL-023 will review comments received.

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# Introduction

EL-023 drafted this document due to the increasing number of battery powered electric machines being introduced into the Australian underground mining industry and a lack of Standards detailing any industry expectations for the safety of these machines during their life cycle.

With the progressively tightening emission controls in underground mines, the electrification of diesel powered machines has attracted increasing attention, as electric machines (EMs) provide the significant advantages of low noise and zero emissions over diesel engine vehicles.

This document has been drafted to be technology agnostic and allow any future innovation to be encompassed in its requirements.

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# Battery powered electric machines for use in underground mines

## Section 1 Scope and general

### 1.1 Scope

This document specifies requirements for the safe design, manufacture, installation, operation and maintenance of battery powered electric machines in underground mines. It covers the technical requirements necessary to eliminate or minimize the significant hazards which could occur during normal operation or expected malfunctions of battery powered electrically operated machines for use in underground mines. Fire-protected and explosion-protected machines are included.

### 1.2 Application

This document has been drafted in sections. Section 1 details the scope and general aspects of this document. Section 2 details performance/objectives-based requirements. Section 3 details prescriptive requirements that, when followed, means the machine is "deemed to conform" with the requirements of this document. The intent is that either Section 2 or Section 3 of this document is applied, not both.

NOTE Due to the infancy of this type of technology in underground mines, Section 3 has been left blank at this time with the intent that it will be populated at a future date when the prescriptive requirements will be better understood.

This document is not intended to be a machine safety standard and, as such, should be read in conjunction with the AS/NZS 4024 series of standards, AS 20474 series of Standards, AS 5368, and AS/NZS 3000.

Earth moving equipment standards, for example, ISO 13649, while not directly applicable, are also a good source of information on safety of mobile machinery used for mining activities.

### 1.3 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

NOTE Documents for informative purposes are listed in the Bibliography.

AS 5062, *Fire prevention and protection for mobile and transportable equipment*

AS 60529, *Degrees of protection provided by enclosures (IP Code)*

AS/NZS 1020, *The control of static electricity in non-hazardous areas*

AS/NZS 3000, *Electrical installations (known as the Australian/New Zealand Wiring Rules)*

AS/NZS 5368, *Electrical equipment in mines and quarries*

AS/NZS 60079 (series), *Explosive atmospheres*

AS ISO 19014 (series), *Earth-moving machinery — Functional safety*

ISO 4589-2, *Plastics — Determination of burning behaviour by oxygen index — Part 2: Ambient-temperature test*

IEC 61851 (series), *Electric vehicle conductive charging system*

IEC 60068-2-6:2007, *Environmental testing — Part 2-6: Tests — Test Fc: Vibration (sinusoidal)*

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