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ELECTRICAL EQUIPMENT FOR EXPLOSIVE GAS ATMOSPHERES
BATTERY OPERATED VEHICLES

STANDARDS ASSOCIATION OF AUSTRALIA
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Australian Coal Association

Australian Electrical and Electronic Manufacturers Association

Australian Institute of Petroleum

Confederation of Australian Industry

Department of Industrial Relations, N.S.W.

Department of Defence Support

Department of Minerals and Energy, Vic.

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Electrical Contractors Associations of Australia

Electricity Supply Association of Australia

Independent testing interests

Insurance Council of Australia

State electricity regulatory authorities

1915—1992 Electrical equipment for explosive atmospheres—Battery-operated vehicles
(In Professional Package 40) 4pp C

Specifies requirements for battery-operated vehicles (truck and tractors) which incorporate a storage battery of the lead-acid type as the source of power, which may be all-electric or electro-hydraulic in operation, and which may be used where flammable gases or vapours may be present.

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AUSTRALIAN STANDARD

ELECTRICAL EQUIPMENT FOR EXPLOSIVE GAS ATMOSPHERES

BATTERY OPERATED VEHICLES

AS 1915—1983

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PREFACE

This edition of this standard was prepared by the Association's Committee on Electrical Equipment in Hazardous Locations, to supersede AS 1915—1976. It is intended for the guidance of manufacturers, users and statutory authorities, and for use with relevant statutory regulations. It prescribes requirements in respect of design, construction and marking of the equipment specified, and includes a section on testing.

This standard is based on corresponding requirements issued by the British Approvals Service for Electrical Equipment in Flammable Atmospheres (BASEEFA Publication SFA 3006). Acknowledgement is made of the assistance received from this source.

The following are the major changes in this edition:

(a) Reference is made to AS 2380, Part 1, for grouping of apparatus, temperature classification, materials used in construction, and marking.

(b) Deletion of the requirement that interconnecting cables have to be screened.

(c) Addition of a requirement that batteries must comply with AS 2402, and an amendment to the Scope limiting the standard to vehicles using lead-acid batteries only.

(d) Addition of a requirement that cells with a capacity in excess of 600 A.h must be provided with two terminals for each pole.

(e) Introduction of new requirements for electrical protection.

(f) Simplification of the test procedures for the temperature rise and brake tests.

(g) Amendment of the requirements for antistatic tyres—only one tyre has to comply now and the criteria for compliance are given.

(h) Addition of a marking requirement warning against charging the vehicle's battery in a hazardous area.

(j) Deletion of the test to determine the effectiveness of battery container ventilation.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

ELECTRICAL EQUIPMENT FOR EXPLOSIVE GAS ATMOSPHERES—BATTERY OPERATED VEHICLES

FOREWORD

The purpose of this standard is to establish criteria for battery operated vehicles which include items of electrical equipment which may act as a source of ignition.

The classification of hazardous areas is dealt with in AS 2430, Parts 1 and 2. Part 1 applies to explosive gas atmospheres and recognizes the following zones:

Zone 0—an area in which an explosive gas atmosphere is present continuously, or is expected to be present for long periods or for short periods which occur with high frequency.

Zone 1—an area in which an explosive gas atmosphere can be expected to occur periodically or occasionally during normal operation.

Zone 2—an area in which an explosive gas atmosphere is not expected to occur in normal operation and if it occurs is likely to be present only infrequently and for short duration.

Apparatus complying with this standard will be suitable for use in Zone 1 and Zone 2 areas.

SPECIFICATION

1 SCOPE. This standard applies to battery operated vehicles (i.e. trucks and tractors) which incorporate a storage battery of the lead-acid type as the source of power, which may be all-electric or electrohydraulic in operation, and which may be used where flammable gases or vapours may be present in the atmosphere, but it does not apply to battery operated vehicles within the scope of AS 2595, Part 1.

The standard prescribes requirements for the electrical components and those mechanical or hydraulic components which may be capable of producing arcs, sparks, or hot surfaces that will present a fire or explosion hazard in the presence of flammable gases or vapours. It also prescribes the tests to which certain components will be subjected to establish their compliance with this standard.

Hazards other than the ignition of gases or vapours are excluded from this standard.

NOTE: Some statutory authorities require that battery operated vehicles, in addition to complying with this standard, also comply with AS 2359, Part 1.

2 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1593	Electrical Equipment for Explosive Atmospheres—Increased Safety Apparatus—Type of Protection e
AS 1825	Electrical Equipment for Explosive Atmospheres—Pressurized Apparatus—Type of Protection p
AS 1826	Electrical Equipment for Explosive Atmospheres—Special Protection—Type of Protection s
AS 1828	Electrical Equipment for Explosive Atmospheres—Cable Glands
AS 1829	Electrical Equipment for Explosive Atmospheres—Intrinsically Safe Apparatus—Type of Protection i
AS 1939	Classification of Degrees of Protection Provided by Enclosures for Electrical Equipment
AS 2034	Electrical Equipment for Explosive Atmospheres—Flameproof Electric Lighting Fittings
AS 2359	SAA Industrial Truck Code Part 1—Design and Manufacture
AS 2380	Electrical Equipment for Explosive Gas Atmospheres—Explosion Protection Techniques Part 1—General Requirements
AS 2402	Lead-acid Traction Batteries
AS 2431	Electrical Equipment for Explosive Atmospheres—Encapsulated Apparatus—Type of Protection m
AS 2480	Electrical Equipment for Explosive Atmospheres—Flameproof Enclosure—Type of Protection d
AS 2595	Electrical Equipment for Coal Mines —Electrical Requirements for Underground Coal Mining Machines Part 1—Equipment for Use in Explosive Atmospheres

3 DEFINITIONS. For the purpose of this standard, the following definitions apply:

3.1 Battery container—a single unit containing a number of cells.

3.2 Rated capacity (rating)—the capacity in ampere hours of a cell assigned to it by the maker under specified conditions of discharge.

3.3 Terminal post—a lead post projecting through the lid of a cell from which connection is made to the external circuit or to a terminal post of another cell.

3.4 Vent plug—a removable plug fitted to the cell cover over the hole used for filling or topping-up, and designed to provide for the escape of gases from the cell while obstructing the passage of acid spray.

4 GROUPING. Battery operated vehicles shall be grouped in accordance with Section 1 of AS 2380, Part 1.

5 TEMPERATURE CLASSIFICATION. Battery operated vehicles shall be classified in accordance with Section 1 of AS 2380, Part 1.

6 GENERAL REQUIREMENTS.

6.1 Electrical Equipment. Individual units of electrical equipment for battery operated vehicles shall comply with the relevant Australian standard for an appropriate type of protection; e.g. AS 1593, AS 1825, AS 1826, AS 1828, AS 1829, AS 2034, AS 2431, AS 2480.

NOTE: Components for which current SAA certificates of compliance have been issued for use in a Zone 1 area and which are marked accordingly, need not be subjected to further testing.

6.2 Construction Materials. Materials used in the construction of a battery operated vehicle or part thereof shall comply with AS 2380, Part 1.

Paints based on light alloy powders shall not be used unless the parts concerned are protected against possible impact or rubbing that could produce incendive sparking.

6.3 Additional Precautions. Notwithstanding the foregoing requirements, such additional precautions as are necessary shall be taken against any hazards that may be introduced by particular circumstances such as recognized overloads, environmental conditions such as dust deposits, catalytic or pyrophoric effects, impurities in the gas or vapour or large volumes of gas or vapour.

7 BATTERY AND BATTERY CONTAINERS.

7.1 General. The battery and its containers shall comply with the following requirements:

(a) Batteries shall comply with AS 2402.

NOTE: A declaration from the manufacturer, or statement of performance criteria or test results from a recognized laboratory, may be accepted as proof of compliance with this requirement.

(b) The battery and its containers shall comply with AS 1593, except that a creepage distance of 100 mm shall apply.