AS 2402—1980
UDC 621.355.2

Australian Standard 2402—1980

LEAD-ACID TRACTION BATTERIES

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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THE FOLLOWING SCIENTIFIC, INDUSTRIAL, CONSUMER AND GOVERNMENTAL organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Automobile Association

Australian Federation of Consumer Organizations

Australian Lead Development Association

Confederation of Australian Industry

Department of Housing and Construction

Department of Defence

Electricity Supply Association of Australia

Federal Chamber of Automotive Industries

Railways of Australia Committee

Society of Automotive Engineers—Australasia

Telecom Australia

This standard, prepared by Committee EL, 5, Accumulators, was approved on behalf of the Council of the Standards Association of Australia on 25 August 1980, and was published on 1 December 1980.

This standard was issued in draft form for public review as DR 78002.

AUSTRALIAN STANDARD

LEAD-ACID TRACTION BATTERIES

AS 2402--1980

First published 1980

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR STREET, NORTH SYDNEY, N.S.W.

ISBN 0 7262 2054 X

PREFACE

This standard was prepared by the Association's Committee on Accumulators at the request of manufacturers and users of lead-acid traction batteries.

In this standard the dimensions of traction battery cells, requirements for measuring instruments, rated capacity, and the battery life test are based on IEC 254-1 and IEC 254-2. Additional requirements not covered by these IEC publications have been included to cover Australian conditions. Acknowledgement is made of the assistance received from BS 2550, Lead-acid Traction Batteries for Battery Electric Vehicles and Trucks, for additional requirements.

The usable life obtained from a battery is very much dependent on the quality of the charger and performance requirements for lead-acid traction battery chargers are laid down in AS .....*

This standard requires reference to the following Australian standards:

AS 1042	Direct-acting Indicating Electrical Measuring Instruments and Their Accessories
AS 1349	Bourdon Tube Pressure and Vacuum Gauges
AS 1852(50)	International Electrotechnical Vocabulary—Electrochemistry and Electrometallurgy
AS 1915	Battery Operated Vehicles for Explosive Atmospheres
AS	Battery Chargers for Lead-acid Traction Batteries*
AS C59	Water for Use in Secondary Batteries of the Enclosed Cell Type
AS C60	Sulphuric Acid for Use in Secondary Batteries

*In course of preparation.

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Australian Standard
for
LEAD-ACID TRACTION BATTERIES

SECTION 1. SCOPE AND DEFINITIONS

1.1 SCOPE. This standard specifies requirements for lead-acid traction batteries intended for installation in electrical traction vehicles or mechanical handling equipment and having a prescribed minimum life of 1000 charge/discharge cycles.

NOTES:

1. Attention is drawn to the existence of traction batteries intended for use in mainly non-industrial applications such as golf buggies, which have a life shorter than 1000 charge/discharge cycles.
2. This standard does not cover engine-starting batteries; however, some guidance is given on the use of traction batteries for this application in Paragraph F4 of Appendix F.

Because of the wide variety of assemblies of individual cells, sizes and dimensions of assembled batteries are not included in this standard; however, a rationalized series of standard dimensions for cells is included.

1.2 DEFINITIONS. For the purpose of this standard, the following definitions, in addition to those listed in AS 1852(50), apply.

1.2.1 Capacity—the quantity of electricity, expressed in ampere hours, which a cell is capable of delivering at a given rate of discharge (normally the 5-hour rate) under specified conditions of voltage and temperature.

1.2.2 Cell jar—a container made from acid-resisting, insulating material, in which the plates and other internal components are fitted.

1.2.3 Cell lid—a component of acid-resisting, insulating material which is sealed to the walls of the container near the top and is provided with holes for terminals and vent plug or plugs.

1.2.4 Charge/discharge cycle—a cycle which commences with the flow of a discharge current from a cell or battery of cells, and which is concluded when a charging current has returned the cell or battery of cells to a fully charged condition.

1.2.5 Charging—the passage of a current of electricity through the cell so as to bring it to a chemical condition in which it is capable of supplying electricity to an external circuit. The quantity of electricity thus put in is known as the 'charge' and is measured in ampere hours.

1.2.6 Cover—a removable covering of suitable material, enclosing the top of the battery or battery unit.

1.2.7 Discharging—the connection of a cell to an external circuit in such a way that a current flows through the cell in the reverse direction to that of the charging current. The quantity of electricity thus taken out is known as the 'discharge' and is measured in ampere hours.

1.2.8 Electrolyte—a solution which will react with the electrodes and carry an electric current between them when the cell terminals are connected to a closed circuit.

1.2.9 End terminal post—a lead post projecting through the lid of the end cell of a battery unit from which connection is made to the external circuit or to an end terminal post of another unit.

1.2.10 Fully charged battery—a battery in the condition such that the density of its electrolyte, and the voltage measured across its terminals, do not vary appreciably between three consecutive hourly readings taken at the end of the charging period, account being taken of temperature variations and the charging current having been that specified by the manufacturer.

1.2.11 Head space—the vertical distance between the maximum electrolyte level recommended by the manufacturer and the level at which the vent holes will become blocked.

1.2.12 Lead-acid cell—a cell fitted with plates in which the active materials are as follows:

(a) Positive electrodes ..... lead dioxide.
(b) Negative electrodes .....spongy lead.
(c) Electrolyte ..... dilute sulphuric acid.

1.2.13 Life—the number of charge/discharge cycles before the capacity of a battery falls to 80 percent of the rated capacity.

1.2.14 Lifting irons—U-shaped or L-shaped strips or iron or steel attached to the base and two opposite sides of a wooden tray, fitted with eyelet holes for lifting, and treated to resist corrosion by sulphuric acid.

1.2.15 Lug-type terminal—a terminal having a vertical flat surface with one or more bolt holes for connection to the external circuit or to another unit.

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

1.2.17 Secondary cell—a voltaic cell, which after discharge, can be brought back to its initial (charged) chemical condition by passing a current through it in the reverse direction to that of discharge.

NOTE: A secondary cell is also referred to as a 'cell'.

1.2.18 Separator—a sheet of porous, non-conducting acid-resisting material fitted between adjacent plates.

1.2.19 Tapered cable thimble—a device fitted to the end of a flexible cable to form the connection between the cable and the battery or battery unit.