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STATIONARY BATTERIES
OF THE LEAD-ACID PASTED PLATE TYPE

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

THE FOLLOWING INDUSTRIAL, SCIENTIFIC 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

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STATIONARY BATTERIES
OF THE LEAD-ACID PASTED PLATE TYPE

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PREFACE

This edition of this standard was prepared by the Association's Committee on Accumulators.

This edition of the standard is technically identical with the 1977 edition except that it incorporates Amendment No 1 of June 1978, and allows for an increase in the bismuth content of the positive plate grid to meet the characteristics of ore currently being mined. Some editorial updating has also been carried out.

Batteries covered by Section 2 (10-hour rate batteries) were originally developed by the Australian Post Office (now Telecom Australia) in conjunction with local battery manufacturers. These batteries have proved to be most successful in the field having service lives in excess of 15 years.

Batteries covered by Section 3 (1-hour rate batteries) are currently being developed both locally and overseas for various high-discharge-rate applications. Although these batteries are still in the relatively early stages of development and no practical experience has been gained as to minimum service life, it is considered that adherence to the basic parameters described herein will assist in the correct development and usage of such batteries and promote adequate levels of performance and service lives.

In the preparation of this standard, reference was made to Australian Post Office Specification 662, Indian Standard 6304, and Japanese Industrial Standards C8704 and C2313, and acknowledgement is made of the assistance received therefrom.

This standard makes reference to the following standards:

AS 1042	Direct-acting Indicating Electrical Measuring Instruments and Their Accessories
AS 1320	Separators for Lead-acid Starter Batteries
AS 1671	Methods for the Analysis of Lead Alloys Part 3—Higher Concentration Antimony in Lead and White Metal Alloys Containing not more than 2.5 percent Arsenic and 1.0 percent Copper (Volumetric Method)
AS 1852(50)	International Electrotechnical Vocabulary: Electrochemistry and Electrometallurgy
AS C59	Water for use in Secondary Batteries of the Enclosed Cell Type
AS C60	Sulphuric Acid for Use in Secondary Batteries
AS D23	Containers and Cell Covers for Lead-acid Batteries of the Automobile Type
AS K185	Colours for Specific Purposes
ASTM E57	Chemical Analysis of White Metal Bearing Alloys
ASTM E87	Photometric Methods for Chemical Analysis of Lead, Tin, Antimony and Their Alloys.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
STATIONARY BATTERIES OF THE LEAD-ACID PASTED PLATE TYPE

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard sets out requirements for lead-acid batteries of the enclosed, pure lead positive, pasted plate type, designed specifically for floating service in a stationary mode. These batteries are designed to yield service lives as follows:

(a) For 10-hour rate batteries—approximately 15 years.

(b) For 1-hour rate batteries—not yet verified by experience in the field. However, it is anticipated that adherence to the relevant parameters listed herein should ensure service lives equivalent to the 10-hour rate design.

The standard includes requirements for batteries of the above types incorporating cells of either the 10-hour rate or 1-hour rate design and their accessories, but does not apply to Planté, tubular-positive plate or lead-calcium type batteries, or to those batteries designed for planned routine cycling.

1.2 APPLICATION. A stationary battery of the lead-acid pasted plate type shall be deemed to comply with this standard only if it complies with all the relevant requirements of this Section and with the appropriate requirements and tests of the following relevant Section:

Section 2—Specific requirements for 10-hour rate batteries

Section 3—Specific requirements for 1-hour rate batteries.

NOTE: The performance of batteries at rates other than those nominated above is subject to negotiation between purchaser and supplier.

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

Accessories—items supplied with a battery to facilitate the continued operation, service and adjustment of the battery. Such accessories include distilled water in containers, cable lugs, lead-plated connecting bolts and nuts, hydrometers and other such items as agreed to by the supplier and purchaser.

Battery—a unit consisting of one or more cells connected in a series, parallel, or series-parallel arrangement to supply the voltage and current requirements of the connected load.

Cell—the basic single unit consisting of case, electrolyte, positive and negative plates, and connecting terminals, used for storing electric energy by electrolytic processes.

Nominal capacity—the quantity of electricity expressed in ampere houres which a cell or battery is capable of delivering under specified conditions of rate of discharge, end voltage, temperature, and initital density of electrolyte.

10-hour capacity—the ampere hours expected from a battery during a continuous uniform discharge from the fully charged state to an end-voltage of 1.85 V per cell, over aperiod of 10 h, at a current in amperes equal to 10 percent of the nominal rated capacity of the battery, and corrected for an average electrolyte temperature of 25° C.

1-hour capacity—the ampere hours expected from a battery during a continuous uniform discharge from the fully charged state to an end-voltage of 1.70 V per cell, over a period of 1 h, at a current in amperes equal to the nominal rated capacity of the battery, and corrected for a average delectrolyte temperature of 25° C.

Rate—the current in amperes at which a storage battery will be discharged in a specified time under specified conditions of temperature and final voltage.

10-hour rate cell—an enclosed type cell of the pasted plate type designed to facilitate a nominal current output without excessive voltage drop and nominally rated at the 10-hour rate.

1-hour rate cell—an enclose type cell of the pasted plate type designed to facilitate a high current output without excessive voltage drop and nominally rated at the 1-hour rate.

Safety vent—a removable stopper fitted in a hole in the cell cover and provided with vents of the anti-splash type to permit the venting of gases.

1.4 MATERIALS. Materials used in the construction of a battery shall be such that the battery will comply with the performance requirements of this standard, In addition, materials shall release no impurities which may be harmful to the performance or life of the battery.

1.5 WORKMANSHIP. All fabrication and construction shall be carried out in a thoroughly workmanlike manner and in accordance with the best prevailing trade practice.

1.6 OPERATING CONDITIONS. The battery shall be suitable for continuous operation in ambient temperatures of 0° C to 50° C under constant voltage float conditions, with the voltage held between 2.10 V and 2.30 V per cell according to the conditions of service. However, during periods of normal supply failure, the battery may be called upon to discharge at various rates depending on the load demand.

1.7 DESIGN AND CONSTRUCTION.

1.7.1 Shape and Dimensions. The shape and dimensions of the battery container shall comply with any requirements specified in the relevant Section of this standard.

1.7.2 Cell Assembly. The method of assembly of the cells shall be designed to guard against plates or separators becoming displaced in service.