Australian Standard®

Stationary batteries — Lead-acid

Part 3: Pure lead positive pasted plate type

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The following interests are represented on Committee EL/5:

Australian Automobile Association
Australian Automotive Aftermarket Association
Australian Chamber of Commerce and Industry
Australian Electrical and Electronic Manufacturers Association
Australian Federation of Consumer Organizations
Australian Lead Development Association
Department of Defence
Electricity Supply Association of Australia
Federal Chamber of Automotive Industries
Institution of Engineers Australia
Telecom Australia

Additional interests participating in preparation of Standard:

Civil Aviation Authority
Department of Administrative Services — Australian Construction Services

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PREFACE

This Standard was prepared by the Standards Australia Committee on Secondary Batteries to supersede AS 1981-1981, *Stationary batteries of the lead-acid pasted plate type*.

The major alteration to the previous edition is the classification of batteries as low, medium or high discharge rate in accordance with a specified cycle test.

Batteries of the pure lead positive plate type are usually used in applications where very high reliability and long lifespans are the major considerations of the user.

Batteries classified as low, medium or high rate were originally developed by Telecom Australia in conjunction with Australian battery manufacturers and have given service lives of from 7 to 15 years in the field.

This Standard is one of a 3-part series to cover stationary lead-acid batteries. The three parts are as follows:

(a) A proposed Part 1 to cover vented cells.

(b) AS 4029 *Stationary batteries - Lead-acid*
4029.2 Part 2: *Valve-regulated sealed type*.

(c) This Standard, i.e. AS 4029.3.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard sets out requirements for vented lead-acid batteries of the pure lead positive pasted plate type, primarily intended for use in floating service in a stationary mode.

NOTE: Appendix A gives recommendations on information to be supplied in purchasing specifications.

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

AS	
1006	Solid-stem general purpose thermometers
1042	Direct-acting indicating electrical measuring instruments and their accessories
1671	Lead and lead alloys
1671.3	Part 3: Determination of high concentrations of antimony in lead alloys containing not more than 2.5 percent arsenic and 1.0 percent copper—Titrimetric method
2400	Packaging
2400.21	Part 21: Packaging of dangerous goods
2562	Hydrometers—Portable syringe-type for lead-acid batteries
2668	Water for use in secondary batteries
2669	Sulphuric acid for use in lead-acid batteries
2700	Colour standards for general purposes
ASTM	
E37	Method for chemical analysis of pig lead
E46	Test methods for chemical analysis of lead- and tin-base solder

1.3 DEFINITIONS For the purpose of this Standard, the definitions below apply.

1.3.1 Accessories — items supplied with a battery to facilitate the continued operation of the battery, including distilled water, connectors and connecting nuts and bolts.

1.3.2 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 a connected load.

1.3.3 Cell — an assembly of electrodes and electrolyte which constitute the basic unit of a battery.

1.3.4 Capacity — the quantity of electricity (electric charge) usually expressed in ampere hours (A.h) which a fully charged battery can deliver under specified conditions (see Clause 1.3.5).

1.3.5 Rated capacity (rating) — the quantity of electricity in ampere hours, declared by the manufacturer which a new battery can deliver after a full charge under specified conditions of discharge rate and final voltage.

The capacity of a cell or battery is denoted by the symbol *C*. As the capacity varies with rate of discharge, the symbol *C* is followed by a numerical suffix giving the rate of discharge. Thus C_3 is the capacity in ampere hours (A.h) at the 3 h rate of discharge. The specified temperature is usually 25°C. The final voltage depends on battery type and conditions of service.

1.3.6 Available capacity — the total number of ampere hours that can be withdrawn from a cell or battery for a specific set of operating conditions including: initial state of charge, age, discharge rate, temperature and final voltage.

1.3.7 Discharge rate — the current at which a battery is discharged. This may be expressed in amperes, but more commonly it is normalized to rated capacity *C* and expressed as C_x.

1.3.8 Hour rate — the discharge rate of a cell or battery expressed in terms of the length of time a fully charged new cell or battery can be discharged at a specific current, before reaching a specific final voltage.

For example, if a fully charged new cell rated at 100 A.h can be discharged at 20 A for a period of 5 h before reaching its specified final voltage, then the discharge of this battery at 20 A is referred to as the 5 h rate.