

Australian Standard[®]

**Secondary batteries for use with
stand-alone power systems**

Part 2: Installation and maintenance

This Australian Standard was prepared by Committee EL/5, Secondary Batteries. It was approved on behalf of the Council of Standards Australia on 21 April 1997 and published on 5 October 1997.

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 Lead Development Association
Electrical Development Association of New Zealand
Electricity Supply Association of Australia
Federal Chamber of Automotive Industries
Telstra Corporation

Additional interests participating in preparation of Standard:

Solar Energy Industries Association of Australia

Review of Australian Standards. To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

Australian Standard[®]

**Secondary batteries for use with
stand-alone power systems**

Part 2: Installation and maintenance

First published as AS 4086.2—1997.

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL/5, Secondary Batteries. This Standard is the result of a consensus among Australian and New Zealand representatives on the Joint Committee to produce it as an Australian Standard.

It is the second part of a two-part Standard on stand-alone batteries. The two parts are as follows:

- (a) AS 4086.1, *Secondary batteries for use with stand-alone power systems, Part 1: General requirements.*
- (b) This Standard.

This Standard was prepared in response to requests from battery manufacturers and installers for a standard which specifically covers the installation requirements of stand-alone batteries.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

© Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	5
1.2 REFERENCED DOCUMENTS	5
1.3 DEFINITIONS	6
SECTION 2 BATTERY ACCOMMODATION AND ARRANGEMENT	
2.1 GENERAL	9
2.2 CONNECTION BETWEEN BATTERY AND DIRECT CURRENT SWITCHBOARD	9
2.3 OVERCURRENT PROTECTION	9
2.4 THERMAL RUNAWAY	10
2.5 ALARMS	10
2.6 BATTERY ENCLOSURE	10
2.7 VENTILATION	11
2.8 SAFETY SIGNS	13
SECTION 3 INSPECTION AND MAINTENANCE	
3.1 INSPECTION	14
3.2 MAINTENANCE	14
3.3 EARTH FAULT LOCATION	15
SECTION 4 INSTALLATION AND COMMISSIONING	
4.1 UNPACKING	16
4.2 STORAGE	16
4.3 MOUNTING AND CONNECTION	16
4.4 COMMISSIONING	17
SECTION 5 SAFETY	
5.1 GENERAL	18
5.2 HANDLING, MIXING AND STORING OF ELECTROLYTE	18
5.3 PROTECTIVE EQUIPMENT	18
5.4 ELECTROLYTE BURNS	18
5.5 WATER SUPPLY	19
5.6 PRECAUTIONS	19
5.7 FIREFIGHTING EQUIPMENT	20
A. APPENDICES	
A DESIGN CONSIDERATIONS FOR BATTERY INSTALLATIONS	21
B SAFETY SIGNS	24
C INITIAL CHARGING AND COMMISSIONING OF VENTED LEAD-ACID BATTERIES	26
D INITIAL CHARGING AND COMMISSIONING OF VENTED NICKEL-CADMIUM ALKALINE BATTERIES	28

	<i>Page</i>
E INITIAL CHARGING AND COMMISSIONING OF VALVE-REGULATED NICKEL-CADMIUM BATTERIES	30
F INITIAL CHARGING AND COMMISSIONING OF VALVE-REGULATED LEAD-ACID BATTERIES	31
G TYPICAL DIRECT CURRENT SYSTEM EARTHING	32
H SHORT-CIRCUIT PERFORMANCE OF CABLES	33
I PERFORMANCE TEST	38

Currently in preview, click buy full version

STANDARDS AUSTRALIA

Australian Standard

Secondary batteries for use with stand-alone power systems

Part 2: Installation and maintenance

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard sets out recommended practices for the installation, maintenance, testing and replacement of secondary batteries, having nominal voltages not exceeding 115 V d.c., for use with stand-alone systems.

Stand-alone systems are systems that are not connected to the power distribution systems of an electricity supply authority. Stand-alone systems are supplied with power from one of a number of sources: a photovoltaic array, a wind generator, a water generator, or a diesel generator.

This Standard applies to the installation of all types of batteries, including lead-acid and nickel-cadmium and covers both vented and valve-regulated cells.

NOTE: AS 3011.1 and AS 3011.2 cover requirements for batteries having nominal voltages exceeding 115 V d.c.

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

AS

- | | |
|--------|---|
| 1006 | Solid-stem general purpose thermometers |
| 1319 | Safety signs for the occupational environment |
| 2184 | Low voltage switchgear and controlgear—Moulded-case circuit-breakers for rated voltages up to and including 600 V a.c. and 250 V d.c. |
| 2444 | Portable fire extinguishers and fire blankets—Selection and location |
| 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 |
| 2676 | Guide to the installation, maintenance, testing and replacement of secondary batteries in buildings |
| 2676.1 | Part 1: Vented cells |
| 2676.2 | Part 2: Sealed cells |
| 3000 | Electrical installations—Buildings structures and premises (known as the SAA Wiring Rules) |
| 3011 | Electrical installations—Secondary batteries installed in buildings |
| 3011.1 | Part 1: Vented cells |
| 3011.2 | Part 2: Sealed cells |
| 3111 | Approval and test specification—Miniature overcurrent circuit-breakers |
| 3439 | Low-voltage switchgear and controlgear assemblies |
| 3439.1 | Part 1: Type-tested and partially type-tested assemblies |