

Australian Standard<sup>®</sup>

---

**Battery chargers for lead-acid  
traction batteries**

**Part 1: Battery chargers for vented  
cells**

---

This Australian Standard was prepared by Committee EL/5, Secondary Batteries. It was approved on behalf of the Council of Standards Australia on 29 October 1997 and published on 5 January 1998.

---

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  
Electricity Supply Association of Australia  
Federal Chamber of Automotive Industries, Australia  
Telstra Corporation

---

**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which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.*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.*

---

*This Standard was issued in draft form for comment as DR 95307.*

Australian Standard<sup>®</sup>

---

**Battery chargers for lead-acid  
traction batteries**

**Part 1: Battery chargers for vented  
cells**

---

Originated as AS 2548—1982.  
Revised and redesignated AS 2548.1—1998.

## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL/5, Secondary Batteries to supersede AS 2548—1982, *Battery chargers for lead-acid traction batteries—Performance requirements*. It applies to a.c. mains-operated charging equipment for charging vented lead-acid batteries specifically designed for traction applications.

This Standard is the result of a consensus among representatives on the Joint Committee to produce it as an Australian Standard.

The electrical safety requirements for traction battery chargers are not covered by this Standard but are specified in AS/NZS 3100, *Approval and test specification—General requirements for electrical equipment*.

The objective of this Standard is to provide users and manufacturers of battery chargers for vented lead-acid traction batteries with definitions of terms, minimum performance requirements, and test methods to simplify their specification.

This Standard was revised with the objective of including requirements for regulated chargers that will maintain the charging profile despite variations in the input voltage. Regulated chargers are better able to charge batteries with the required capacity under varying conditions of electrolyte temperature, a.c. input voltage and battery state of charge.

In this Standard, charger performance requirements have been included because the eventual life of a traction battery is dependent on the characteristics of the charger. Output characteristics of single taper, two-stage taper, and regulated chargers are covered.

Consideration has been given to the charging conditions that influence battery service life. The requirements stipulated are intended to ensure optimum battery life. Because the ripple content of the d.c. output of a battery charger is an important factor in battery service life, a ripple requirement has been stipulated.

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.

This Standard is Part one of a two-part series arranged as follows:

- (a) AS 2548, *Battery chargers for lead-acid traction batteries*, Part 1: *Battery chargers for vented cells*. (this Standard).
- (b) A proposed Part 2 to cover battery chargers for valve-regulated cells.

## © 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>
1 SCOPE .....	4
2 REFERENCED DOCUMENTS .....	4
3 DEFINITIONS .....	4
4 COMPLIANCE WITH OTHER STANDARDS .....	5
5 CLASSIFICATION .....	6
6 DESIGN AND CONSTRUCTION .....	6
7 PERFORMANCE REQUIREMENTS .....	6
8 MARKING .....	8
APPENDICES	
A CHARGING RATES .....	9
B DETERMINATION OF CHARGER CURRENT RATING, RIPPLE CURRENT PERCENTAGE AND CHARGE PROFILE REGULATION	12
C INFORMATION TO BE SUPPLIED BY THE PURCHASER .....	15

## STANDARDS AUSTRALIA

## Australian Standard

## Battery chargers for lead-acid traction batteries

## Part 1: Battery chargers for vented cells

**1 SCOPE** This Standard specifies the requirements for both regulated and unregulated battery chargers designed for charging vented lead-acid traction batteries.

## NOTES:

- 1 Throughout this Standard battery charger(s) are referred to as ‘charger(s)’.
- 2 It is recommended that a purchaser of a battery charger furnish the information given in Appendix C when placing an order.

**2 REFERENCED DOCUMENTS** The following Standards are referred to in this Standard:

## AS

- 1104 Informative symbols for use on electrical and electronic equipment  
2402 Traction batteries—Lead-acid

## AS/NZS

- 3100 Approval and test specification—General requirements for electrical equipment

## IEC

- 51 Direct acting indicating analogue electrical measuring instruments and their accessories  
51-2 Part 2: Special requirements for ammeters and voltmeters

**3 DEFINITIONS** For this Standard, the definitions below apply.

**3.1 Capacity (C)**—the quantity of electricity that a fully charged battery can deliver under specified conditions.

## NOTES:

- 1 Capacity is measured in ampere hours (A.h).
- 2 The specified conditions are rate of discharge, final voltage and temperature. AS 2402 requires batteries to be rated at  $C_5$  and 30°C to a final voltage of 1.7 V per cell.

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  $C_5$  is the capacity in ampere hours (A.h) at the 5 h rate of discharge. The specified temperature is usually 30°C. The final voltage depends on battery type and conditions of service.

Capacity may be specified as follows:

- (a) *Actual capacity*—the quantity of electricity in ampere hours (A.h) that can be withdrawn from a cell or battery for a specific set of operating conditions including discharge rate, temperature, initial state of charge, age, and final voltage.
- (b) *Rated capacity*—the quantity of electricity in ampere hours (A.h), declared by the manufacturer, which a battery can deliver after a full charge under specified conditions.