AS 2668—1983

Australian Standard®

WATER FOR USE IN SECONDARY BATTERIES

This Australian standard was prepared by Committee EL/5, Accumulators. It was approved on behalf of the Council of the Standards Association of Australia on 29 September 1983 and published on 4 November 1983.

The following interests are represented on Committee EL/5:

Australian Automobile Association
Australian Federation of Consumer Organizations Inc.
Australian Lead Development Association
Confederation of Australian Industry
Department of Defence
Department of Health, N.S.W.
Department of Science and Technology
Department of Housing and Construction
Electricity Supply Association of Australia
Federal Chamber of Automotive Industries
Railways of Australia Committee
Society of Automotive Engineers Australasia
Telecom Australia

This standard was issued in draft form for comment as DR 82082.

Australian Standard®

WATER FOR USE IN SECONDARY BATTERIES

First published (as AS C59) 1931
Revised 1961
Revised and issued as AS 2668 1983

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140
ISBN 0 7262 3214 9

PREFACE

This standard was prepared by the Association's Committee on Accumulators. It supersedes AS C59 — 1961, Water for Use in Secondary Batteries of the Enclosed Cell Type.

During the preparation of this standard, close consideration was given to the adoption of International (ISO) standards (in particular methods of analysis) wherever possible. The emphasis, however, was to adopt the simplest method suitable for the task in hand. Again, where possible, methods of analysis using the atomic absorption spectrometric techniques have been adopted.

Major differences between the ISO standards and this standard are as follows:

(a) The allowable limits for impurities in water have been changed and are similar with those appearing in BS 4974:1975, Water for Lead-acid Batteries.

(b) All methods of analysis have been altered to improve and modernize the techniques used, bearing in mind the comments made above relating to the standards.

It should be noted that reference is made to water for use in batteries and not the electrolytes already used in batteries. This is of particular importance when chloride determinations are required on used electrolytes. In these instances reduction of oxidized species of chlorine are required prior to total chloride determination.

In the preparation of this standard, reference was made to BS 4974 and acknowledgment is made of the assistance received therefrom.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
WATER FOR USE IN SECONDARY BATTERIES

1 SCOPE. This standard specifies requirements for water intended for use in secondary batteries.

2 APPLICATION. As a constituent of the electrolyte or for subsequent volumetric adjustment to make good the water lost in operation, this standard provides for two levels of quality of the water.

One quality level is an all-purpose quality distilled or demineralized water, the use of which is mandatory in long-life standby batteries and is preferable in all other secondary battery applications.

The second quality level is the minimum standard of water which may be used in automotive starting, lighting and ignition (SLI) type lead acid batteries. In other types of batteries this second quality level should only be used by agreement with the battery manufacturer.

Compliance with the conductivity specification for battery electrolyte water ensures that mineralization is low, i.e. it is free of a wide range of soluble salts even in very small concentrations. For minimum quality water the major contaminants are individually specified together with their limits (see Table 1).

3 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 2134 Code of Practice for the Chemical Analysis of Materials by Flame Atomic Absorption Spectroscopy

AS 2164 One-mark Volumetric Flasks

AS CK19 Code of Recommended Practice for the Chemical Analysis of Materials by Ultraviolet Visible Spectrophotometry

Standard Method for the Examination of Water and Wastewater. (Current edition.) Produced jointly by American Public Health Association, American Water Works Association, and Water Pollution Control Federation.

4 DEFINITION. For the purpose of this standard the following definition applies:

Conductivity—a numerical expression of the ability of an aqueous solution to carry an electric current. This ability depends on the presence of the total minerals dissolved in the water.

5 SAMPLING.

5.1 Preparation of containers for water sampling. Samples of water for testing shall be collected in polyethylene plastics containers, the interiors of which have been thoroughly cleansed prior to use by the following method:

(a) Washed with an acid-dichromate mixture except where the water is to be analysed for chromium.

NOTE: A suitable acid-dichromate cleaning mixture is 1 L of concentrated sulphuric acid added slowly with stirring (TAKE CARE) to 35 mL of saturated sodium or potassium dichromate solution.

(b) Rinsed with potable water to a pH of not less than 6.

(c) Rinsed with distilled water till the rinsings indicate a conductivity of not more than 1 mS/m.

5.2 Sampling procedure. For testing in accordance with this standard, a representative bulk sample of not less than 10 L of the processed water shall be taken from a suitable number of finished product containers.

For bottled or plastics packaged product, not less than 250 mL per container shall be taken. Where the water is supplied to the point of use in a bulk tank, not less than 500 mL shall be run off before the portion intended for test samples is collected.

The bulked sample of water shall be thoroughly mixed by shaking and shall be divided into two equal portions and transferred to previously prepared sample containers. The test sample containers shall then be sealed and labelled with suitable identification. One such sample shall be retained by the supplier or distiller for reference in case of dispute. Samples shall be tested and analysed as soon as possible after collection.

NOTE: Adequate care must be taken throughout the sampling procedure to ensure that the sample is not contaminated in any way, particularly during transfer to test sample containers.

6 APPEARANCE. The water shall be free of suspended matter, odour and taste, and shall be colourless when viewed through a depth of 300 mm.

7 IMPURITIES.

7.1 Long-life standby batteries.

7.1.1 *General.* The water for use in long-life standby batteries shall comply with Clauses 7.1.2 and 7.1.3.

7.1.2 *Conductivity.* The conductivity of the water, determined in accordance with the method described in Appendix F, shall be not greater than 1 mS/m measured at 25°C.

NOTE: 1 S (siemens) = Ω^{-1} (mho)
1 mS/m = 10 μmho/cm

7.1.3 *Manganese content.* The manganese content, determined and calculated in accordance with the method described in Appendix E, shall be not more than 0.1 mg of manganese (Mn) per kilogram of water.

NOTE: The manganese limits need only be complied with when wood or wood based separators are used.

7.2 Starting lighting and ignition (SLI) batteries. In the water for use in SLI batteries, the amount of each impurity listed in Table 1, determined in accordance with the method described in the relevant appendix, shall conform to the limits specified therein.