AS 2669—1983

Australian Standard®

SULPHURIC ACID FOR USE IN LEAD–ACID 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

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Australian Standard®

SULPHURIC ACID FOR USE IN LEAD–ACID BATTERIES

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PREFACE

This standard was prepared by the Association's Committee on Accumulators. It supersedes AS C60–1961, Sulphuric Acid for Use in Secondary Batteries.

During the preparation of this standard, close consideration was given to the adoption of 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:

1. The allowable limits for impurities in acid remain unaltered, however platinum has been deleted from the list.
2. 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 acid 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 the ISO standards listed below and acknowledgement is made of the assistance received therefrom.

ISO 910 Sulphuric Acid and Oleum for Industrial Use – Determination of Total Acidity and Calculation of Free Sulphur Dioxide Content of Oleum – Titrimetric Method

ISO 911 Sulphuric Acid for Industrial Use – Evaluation of Sulphuric Acid Concentration by Measurement of Density

ISO 914 Sulphuric Acid and Oleum for Industrial Use – Determination of Total Nitrogen Content – Titrimetric Method after Distillation

ISO 915 Sulphuric Acid and Oleum for Industrial Use – Determination of Iron Content – 2.2' Bipyridyl Spectrophotometric Method

ISO 2363 Sulphuric Acid and Oleum for Industrial Use – Determination of Oxides of Nitrogen – 2,4–Xylenol Spectrophotometric Method

ISO 2590 General Method for the Determination of Arsenic – Silver Diethyldithiocarbamate Photometric Method

ISO 2877 Sulphuric Acid for Industrial Use – Determination of Chlorides Content – Potentiometric Method

ISO 2899 Sulphuric Acid and Oleum for Industrial Use – Determination of Ammoniacal Nitrogen Content – Spectrophotometric Method

ISO 5792 Sulphuric Acid for Industrial Use – Determination of Arsenic Content – Silver Diethyldithiocarbamate Photometric Method

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
SULPHURIC ACID FOR USE IN LEAD-ACID BATTERIES

1 SCOPE. This standard specifies requirements for sulphuric acid (H_2SO_4) used in electrolyte solutions for lead-acid batteries.

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

AS 2026 Density Hydrometers

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

AS 2165 Burettes and Bulb Burettes

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

BS 612 Nessler Cylinders

BS 753 Density-composition Tables for Aqueous Solutions of Sulphuric Acid

BS 2058 Lunge-Rey Weighing Pipette

3 SAMPLING. Sufficient acid shall be withdrawn from the bulk container(s) to form a representative sample of 3 L of dilute acid or 500 mL of concentrated acid. The operation should be carried out as expeditiously as possible when sampling concentrated acid. The sample shall be placed in a clean dry container of glass or other acid-resisting material.

Where the sample is required for transit, the container shall be securely sealed, care being taken to prevent contamination.

4 CONCENTRATION. Acids shall be supplied in one of the following concentrations and shall be tested in accordance with Appendix A:

(a) *Concentrated acid*. Concentrated sulphuric acid shall have a concentration of not less than 90 percent nor more than 99 percent of H_2SO_4.

(b) *Dilute acid*. Dilute acids shall have a concentration specified by the purchaser and shall be in terms of concentration or density (see Appendix A, Table A1).

5 COLOUR. The colour of the acid, determined in accordance with the method described in Appendix B, shall not be darker than that of the reference colour solution.

6 DERIVATION. The acid shall be derived from a platinum-free process.

7 IMPURITIES.

7.1 Organic matter. The acid, tested in accordance with the method described in Appendix C, shall absorb not more than 20 mL of 0.002 mol/L potassium permanganate per 100 g of H_2SO_4.

7.2 Other impurities (calculated to 100 percent H_2SO_4). 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.

TABLE 1
IMPURITY LIMITS

Impurity	Limit		Test Method
	percent m/m	mg/kg	
Residue on ignition (other than lead sulphate)	0.05	5[illegible]	Appendix D
Chlorides expressed as C1	0.003	30	Appendix E
Nitrogen oxides expressed as N	0.003	30	Appendix F
Ammoniacal nitrogen expressed as N	0.003	30	Appendix G
Arsenic	0.001	10	Appendix H
Antimony	0.0001	1	Appendix J
Iron	0.003	30	Appendix K
Manganese	0.0001	1	Appendix K
Copper	0.001	10	Appendix K

8 MARKING. The following information shall be marked on the container or on a label securely attached thereto:

(a) The name or registered trade name or mark of the manufacturer.

(b) The concentration or density of the acid.

NOTE: Manufacturers who place the number of this Australian standard on containers or on literature associated with sulphuric acid for use in lead-acid batteries should ensure that the product complies with the standard.

Attention is particularly drawn to the scheme for independent assurance provided by the AS Mark which is a registered certification trade mark owned by the Standards Association of Australia and which is available for use with suitable Australian standards.

The presence of the AS Mark on or in relation to a product is an assurance that the goods have been produced under a system of supervision, control and testing applied during manufacture and including periodical inspections at the manufacturer's works in accordance with the certification mark scheme of the SAA.

The AS Mark can be used only by manufacturers licensed under the certification mark scheme operated by the SAA, and only when accompanied by the number of the relevant Australian standard. It will usually be a requirement that the words 'Manufactured to Australian Standard' accompany the number of the standard and enclose the Mark as shown below; however, this is a matter for negotiation with the Association.

Further particulars of the terms of licence and suitability of this standard for certification purposes may be obtained from the Quality Assurance and Certification Department, Standards Association of Australia, 1, The Crescent, Homebush NSW 2140.