

Australian Standard<sup>®</sup>

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**HYDROMETERS—PORTABLE  
SYRINGE-TYPE FOR  
LEAD-ACID BATTERIES**

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This Australian standard was prepared by Committee CH/1, Laboratory Glassware and Related Apparatus. It was approved on behalf of the Council of the Standards Association of Australia on 22 June 1982 and published on 11 October 1982.

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The following interests were represented on the committee responsible for the preparation of this standard:

Australian Medical Association  
Chambers of Commerce (N.S.W., Vic.)  
Chief Secretary's Department, Victoria  
Commonwealth Serum Laboratories  
Confederation of Australian Industry  
CSIRO, Division of Applied Physics  
Department of Agriculture, N.S.W.  
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## PREFACE

This standard was prepared by the subcommittee on battery hydrometers of the Association's Committee on Laboratory Glassware and Related Apparatus under the direction of the Chemical Standards Board. It was prepared at the request of manufacturers and users of battery hydrometers in order to formalize the specifications for such instruments.

The standard is based on a draft submitted by Telecom Australia.

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## STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

for

## HYDROMETERS—PORTABLE SYRINGE—TYPE FOR LEAD-ACID BATTERIES

## SECTION 1. SCOPE AND GENERAL

**1.1 SCOPE.** This standard specifies requirements for the design, construction and testing of portable syringe-type hydrometers for use in the determination of the density of the electrolyte\* in lead-acid storage batteries within the normal range of ambient temperature experienced in Australia. A separate standard will be published to specify thermometers for use in conjunction with battery hydrometers.

Notes on safety precautions to be observed when using hydrometers and notes for the care of hydrometers are given in Appendices A and C respectively.

**1.2 APPLICATION.** This standard was drawn up to apply to accurate hydrometers used to evaluate batteries where high reliability and long life are essential; for example, those used with computers and in telephone exchanges. However, this may include emergency lighting use and marine and automotive applications.

**1.3 REFERENCED DOCUMENTS.** The following documents are referred to in this standard:

AS 1199	Sampling Procedures and Tables for Inspection by Attributes
AS 1336	Code of Practice for Industrial Eye Protection
AS 1337	Eye Protectors for Industrial Applications
AS 1338	Filters for Eye Protectors
AS 1399	Guide to AS 1199, Sampling Procedures and Tables for Inspection by Attributes
AS 1520	Fibreboard Containers for General Purposes
AS 1821 to 1823	Suppliers Quality Control Systems—Levels 1, 2 and 3
AS 2000	Guide to AS 1821—1823, Suppliers Quality Control Systems
AS 2026	Density Hydrometers
AS 2210	Safety Footwear
AS 2225	Rubber Gloves for Electrical Purposes
AS 2433	Plastics—Method for Exposure to Ultraviolet Lamps
AS C60	Sulphuric Acid for Use in Secondary Batteries
AS K185	Colours for Specific Purposes

AS CK15 Code of Recommended Practice for the Storage of Vulcanized Elastomers

ASTM D 543 Test for Resistance of Plastics to Chemical Reagents

**1.4 CLASSIFICATION.** Hydrometers shall be classified as follows:

*Class 1: General purpose*—range 1140 kg/m<sup>3</sup> to 1300 kg/m<sup>3</sup>, scale graduations each 5 kg/m<sup>3</sup>. May be fitted with an integral thermometer.

*Class 2: General purpose*—range 1140 kg/m<sup>3</sup> to 1300 kg/m<sup>3</sup>, scale graduations each 10 kg/m<sup>3</sup> (with colour bands, if required, as specified in Clause 2.6.4).

*Class 3: Special purpose hydrometer of small dimensions*—range 1140 kg/m<sup>3</sup> to 1300 kg/m<sup>3</sup>, scale graduations each 20 kg/m<sup>3</sup> (with colour bands, if required, as specified in Clause 2.6.4).

**1.5 DEFINITIONS.** For the purpose of this standard, the following definitions apply:

**1.5.1 Hydrometer float**—a sealed glass or plastics float, consisting of a weighted bulb and calibrated stem, which floats vertically in a fluid to an immersion depth dependent on the density of the fluid. The calibration on the stem coincident with the immersion level indicates the density of the fluid. A typical float is shown in Fig. 1.1.

**1.5.2 Battery hydrometer**—a portable apparatus for measuring the density of the electrolyte solution contained in a 'lead-acid' battery or accumulator. It consists of—

- a clear, transparent glass or plastics *barrel* containing the hydrometer float;
- a hydrometer float as described in Clause 1.5.1;
- a rubber or plastics, flexible *nozzle* fitted snugly onto the lower end of the barrel;
- a compressible, elastic *bulb* which makes an airtight fit over the upper end of the barrel;
- a perforated plug or equivalent device, which allows free passage of air but prevents the float from entering the bulb.

A typical battery hydrometer is shown in Fig. 1.2, in which the terms printed above, in italics, are indicated.

\*As prepared from the ingredients specified in AS C60 (under revision).