



ANSI C18.1M, Part 1-2015

American National
Standard for Portable
Primary Cells and
Batteries with Aqueous
Electrolyte-General
and Specifications





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*American National Standard for
Portable Primary Cells and Batteries with Aqueous Electrolyte—
General and Specifications*

Secretariat:

National Electrical Manufacturers Association

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American National Standards Institute, Inc.

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Foreword (This Foreword Is Not Part Of American National Standard C18.1m, Part 1-2015.)

This edition of *American National Standard for Portable Primary Cells and Batteries with Aqueous Electrolyte* is based in part on the previous *American National Standard for Dry Cells and Batteries—Specifications*, ANSI C18.1M, Part 1-2009, and recognizes the work of the International Electrotechnical Commission (refer to IEC Publications 60086-1 and 60086-2) in establishing worldwide standard requirements for portable primary batteries. As with the previous edition, this edition includes the following chemistries:

- a) Carbon zinc (Leclanché and zinc chloride types)
- b) Alkaline manganese dioxide
- c) Silver oxide
- d) Zinc air
- e) Nickel oxyhydroxide

Previous editions of ANSI C18.1M, Part 1, have included the terms HIF and LIF, which describe specific time periods, i.e., on/off cycles, for load application in portable lighting tests. HIF was an acronym for “Heavy Industrial Flashlight” and LIF was an acronym for “Light Industrial Flashlight.” Starting with the 2005 edition of C18.1M, Part 1, the HIF and LIF terms were removed and replaced with the actual duty cycle for each test. The term “four minutes per 15 minutes, eight hours per day” replaces HIF, and the term “four minutes per hour, eight hours per day” replaces LIF.

Modified specifications for this edition include the ANSI 13 (D), 14 (C), 15 (AA), 24 (AAA), 25 (AAAA), 1604 (9-volt), 1412 (J), 1811 (21 or 23), 7000, 7002-7005 (hearing aid), and 903, 904, 908, 915, 918, 926, and 936 (lantern) battery types.

In April 1996, then-ANSI Accredited Standards Committee C18 on Specifications for Dry Cells and Batteries established a new general format for publication of its standards, dividing this standard into two parts. Part 1 of this American National Standard for Portable Primary Cells and Batteries with Aqueous Electrolyte contains two basic sections. The first has general requirements and information, such as the scope, applicable definitions, general descriptions of battery dimensions, terminal requirements, marking requirements, general design conditions, and test conditions. Section 2 of Part 1 is composed of specification sheets for various types of cells and batteries. **Part 2 of the standard, a separate document, contains safety requirements.**

Suggestions for improvement of this standard are welcome. They should be sent to:

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This standard was processed and approved for submittal to ANSI by the American National Standards Committee C18 on Portable Cells and Batteries. Committee approval of this standard does not necessarily imply that all committee members voted for its approval. At the time Committee C18 approved this standard, it had the following members:

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Marcus Boolish, Vice Chairperson
Andrei Moldoveanu, Secretary

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Section 1 GENERAL

Part 1 does not include safety requirements. Safety requirements can be found in Part 2.

1.1 SCOPE AND PURPOSE

1.1.1 Scope

This standard applies to portable primary cells and batteries with aqueous electrolyte and a zinc anode (non-lithium). This edition includes the following electrochemical systems:

- a) Carbon zinc (Leclanché and zinc chloride types)
- b) Alkaline manganese dioxide
- c) Silver oxide
- d) Zinc air
- e) Nickel oxyhydroxide

1.1.2 Purpose

The purpose of this publication is to:

- a) Ensure the electrical and physical interchangeability of products from different manufacturers;
- b) Minimize proliferation of cell and battery types;
- c) Define a standard of performance and provide guidance for its assessment; and
- d) Provide guidance to consumers, manufacturers, and designers.

This is achieved by specifying items such as nomenclature, dimensions, polarity, terminals, marking, test conditions, and procedures.

1.2 NORMATIVE REFERENCES

The following standards contain provisions that, through reference in this text, constitute provisions of this American National Standard. Parties to agreements based on this American National Standard are encouraged to investigate the most recent editions of the standards indicated below.

ANSI/ASME Y14.5, *Dimensioning and tolerancing*

ANSI C18.1M Part 2, *Portable primary cells and batteries with aqueous electrolyte—safety standard*

1.3 DEFINITIONS

1.3.1 anode: electrode at which an electrochemical oxidation reaction occurs

1.3.2 application test: a test that simulates the actual use of a battery in a specific application

1.3.3 battery: one or more cells, including case, terminals, and markings

1.3.4 battery, button: small, round non-lithium battery, in which the overall height is less than the diameter

Note—the term “battery, coin” is defined in ANSI C18.3 as a small, round lithium battery, in which the overall height is less than the diameter.

1.3.5 battery, portable: a battery that is easily carried