ANSI C18.5M, Part 1-2023

American National Standard for Portable Lithium Rechargeable Cells and Batteries—General and Specifications

Secretariat:

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, VA 22209

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American National Standards Institute, Inc.

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Foreword

In 1912, a committee of the American Electrochemical Society recommended standard methods to be used in testing dry cells. Their recommendations were followed five years later when the National Bureau of Standards prepared specifications that included cell sizes, arrangement of cells within batteries, service tests, and required performance.

The need for continued revision to the specification led to the authorization by the American Engineering Standards committee of a permanent sectional committee on dry cells, now portable cells. This committee, C18, representing battery users, manufacturers, and government agencies, has remained active since that time.

The first edition of ANSI C18.5M, Part 1-2020 *American National Standard for Portable Lithium Rechargeable Cells and Batteries—General and Specifications* was based on a revision of ANSI C18.2M, Part 1-2007 *American National Standard for Portable Rechargeable Cells and Batteries—General and Specifications*. The first edition was to separate out the rechargeable lithium cells and batteries and improve upon performance and other requirements that are unique to rechargeable lithium with harmonization to the IEC 61960 standards for rechargeable lithium where applicable. Harmonization with the other ANSI C18 standards was implemented where applicable.

This revision includes the following changes and additions:

- Further progressed the harmonization of ANSI C18.5M, Part 1 to the IEC 61960 series of standards for lithium ion batteries.
- Addition of physical test methods and criteria for flexible and wearable prismatic lithium ion batteries, including resistance to washing conditions.
- Clarification of the methods to measure external dimensions of prismatic batteries contained in a laminar film case (Annex C).

The basic philosophical approach used in developing this standard was that of setting forth uniform test procedures that permit manufacturers' self-declaration with regard to the performance levels of their products, or, in some cases, establishing minimum acceptable performance levels.

In April 1996, the then ANSI Accredited Standards Committee C18 on Specifications for Dry Cells and Batteries established a new general format for the publication of its standards, dividing this standard into two parts. Part 1 of this American National Standard for Portable Rechargeable Cells and Batteries contains two basic sections. The first section has general requirements and information, such as the scope, applicable definitions, general descriptions of battery dimensions, terminal requirements, marking requirements, general design conditions, test requirements, etc. 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 the improvement of this standard will be welcome. They should be sent to:

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, VA 22209
Attention: Secretary ANSI ASC C18

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. When Committee C18 approved this standard, it had the following members:

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Steven Wicelinski, Chairperson
Khaled Masri, Secretary

First Name	Last Name	Organization	Voting Status	Interest Category
Heather	Peterson	Batteries Plus, LLC	Voting	GEN INTEREST
Jason	Fladhammer	Batteries Plus, LLC	Alt. Voting	GEN INTEREST
Robert	Coughlin	Consumer Product Integrity Consulting, LLC	Voting	GEN INTEREST
Jody	Leber	CSA Group	Voting	GEN INTEREST
Steven	Wicelinski	Duracell, Inc.	Voting	PRODUCER
Arthur	Adams	Duracell, Inc.	Alt. Voting	PRODUCER
Christopher	Brown	Duracell, Inc.	Alt. Voting	PRODUCER
David	Pappas	Duracell, Inc.	Alt. Voting	PRODUCER
Paul	Geanacopoulos	Energizer Brands, LLC	Alt. Voting	PRODUCER
John	Hadley	Energizer Holdings	Voting	PRODUCER
Douglas	Golde	Fisher-Price	Voting	USER
Thomas	O'Hara	Intertek	Voting	TESTING LABORATORY
Rich	Byczek	Intertek	Alt. Voting	TESTING LABORATORY
Melissa	Fensterstock	Landsdowne Labs	Voting	GEN INTEREST
Ravi	Vasudevan	Landsdowne Labs	Alt. Voting	GEN INTEREST
Elliott	Alexander	Micropower Battery Co.	Voting	USER
Earnie	Davis	Panasonic Energy Corporation of America	Voting	USER
Jeff	Ortega	Riot Energy, Inc.	Voting	PRODUCER
Henry	Kessler	Sy Kessler Sales Inc.	Voting	USER
Laurie	Florence	UL Solutions	Voting	TESTING LABORATORY
Jessica	Rowland	UL Solutions	Alt. Voting	TESTING LABORATORY

The Task Group members of Subcommittee C18-5 on Portable Rechargeable Lithium Batteries who contributed to the development of this standard are:

Laurie Florence, Chairman
Heather Peterson, Vice Chairman
Khaled Masri, Secretary

John Hadley
Jody Leber
Steven Wicelinski

Others who contributed to the development of this document are:

Akinori Awano	Battery Association of Japan
Hirotaka Shima	Hitachi Maxell, Ltd.

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1 General

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

1.1 Scope and Purpose

1.1.1 Scope

This publication applies to portable secondary (rechargeable), lithium cells and batteries.[1]

This document covers secondary lithium cells and batteries with a range of chemistries. Each electrochemical couple has a characteristic voltage range over which it releases its electrical capacity, a characteristic nominal voltage, and a characteristic final voltage during discharge. See Tables 1A and 1B for further details of the electrochemical systems included in the scope of this standard.

This document defines a minimum required level of performance and a standardized methodology by which testing is performed, and the results of this testing reported to the user.

Users will be able to establish the viability of commercially available cells and batteries via the declared specification and thus be able to select the cell or battery best suited for their intended application.

Part 2 of this standard describes all safety tests and requirements for secondary lithium cells and batteries.

1.1.2 Purpose

The purpose of this publication is:

a. To define standard performance tests and provide guidance for their assessment;
b. To provide guidance to consumers, manufacturers, designers, and other end users;
c. To ensure the electrical and physical interchangeability of coin cell and battery products from different manufacturers; and
d. To minimize the proliferation of coin cell and battery types.

This is achieved by specifying designations, dimensions, polarity, terminals, markings, 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. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below.

IEC 61000-4-2	*Electromagnetic compatibility (EMC)—Part 4-2: Testing and measurement techniques—Electrostatic discharge immunity test*
ISO 6330	*Textiles—Domestic washing and drying procedures for textile testing*

[1] Unless otherwise noted, the word “battery” is used to refer to either cell or battery or both in the remainder of this document.

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