



ANSI C18.1M, Part 2-2019

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

Secretariat:

National Electrical Manufacturers Association

Approved: May 10, 2019

American National Standards Institute

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Foreword (This foreword is not part of American National Standard ANSI C18.1M, Part 2-2019)

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 (currently the National Institute of Standards and Testing) prepared specifications that included cell sizes, the 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. This committee, C18, representing battery users, manufacturers, and government agencies, has remained active since that time. Committee C18 prepared ANSI Standard C18.1M, Part 2, upon which this document is originally based under the sponsorship of the National Electrical Manufacturers Association (NEMA).

ANSI Standard C18.1M, Part 2, was created in parallel with the International Electrotechnical Commission (IEC) project to develop a product safety Standard for primary batteries with aqueous electrolyte (IEC Publication 60086-5). This revision was undertaken to provide a new over-discharge test for the 13-25 batteries and revise the criteria in select tests.

Suggestions for the improvement of this Standard are welcome. They should be sent to the National Electrical Manufacturers Association, 1300 N. 17th Street, Suite 900, Rosslyn, VA 22209, Attention: Secretary ANSI ASC C18.

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

Steven Wicelinski, Chairperson
 Marcus Boolish, Vice Chairperson
 Khaled Masri, Secretary

<u>Organization Represented:</u>	<u>Name of Representative(s):</u>		<u>Voting Status:</u>
Batteries Plus Bulbs	Heather	Peterson	Voting
	Jason	Fladhammer	Alt. Voting
Bureau Veritas Consumer Product Services	David	Grandin	Voting
Consumer Product Integrity Consulting, LLC	Robert	Coughlin	Voting
Duracell, Inc.	Steven	Wicelinski	Voting
	Christopher	Brown	Alt. Voting
Energizer Brands, LLC	Marcus	Boolish	Voting
	Carin	Stuart	Alt. Voting
Fisher-Price	Douglas	Golde	Voting
Intertek	Thomas	O'Hara	Voting
	Rich	Byczek	Alt. Voting
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Micropower Battery Co.	Jeff	Becker	Voting
Panasonic Corporation of North America	Charles	Monahan	Voting
SGS	Rodney	Grimes	Voting
Spectrum Brands, Inc.	John	Hadley	Voting

	Andy	Roszkowski	Alt. Voting
UL LLC	Laurie	Florence	Voting
ZPower, LLC	Jeff	Ortega	Voting
	Tim	Powers	Alt. Voting

The Members of Subcommittee C18-6 on Safety Standards who contributed to the development of this Standard are:

Carin Stuart, Chairperson
Tom O'Hara, Vice-Chairperson
Khaled Masri, Secretary

Name		Organization
Yasuo	Akai	FDK CORPORATION
Larry	Albert	Stanley Black & Decker
Akinrori	Awano	Battery Association of Japan
Jeff	Becker	Micropower Battery Co.
Zekarias	Bekele	CSA Group
Marcus	Boolith	Energizer Brands, LLC
Christopher	Brown	Duracell, Inc.
Rich	Byczek	Intertek
Denis	Carpenter	Spectrum Brands, Inc.
Cary	Costello	Kimberly-Clark Corporation
Robert	Coughlin	Consumer Product Integrity Consulting, LLC
Raju	Desai	Apple Inc.
Sharon	Ensminger	Sy Kessler Sales, Inc.
Melissa	Fensterstock	Landsdowne Labs
Jacqueline	Ferrante	U. S. Consumer Product Safety Commission
Jeff	Fischer	Spectrum Brands, Inc.
Jason	Fladhammer	Batteries Plus Bulbs
Laurie	Florence	UL LLC
Akio	Furukawa	Panasonic Automotive & Industrial Systems Company
Douglas	Golde	Fisher-Price
David	Grandin	Bureau Veritas Consumer Product Services
Rodney	Grimes	SGS North America
John	Hadley	Energizer Brands, LLC
Ray	Iveson	Duracell, Inc.
Judith	Jeevarajan	Underwriters Laboratories Inc.
Henry	Kessler	Sy Kessler Sales, Inc.
Roland	Klinger	RENATA
Jody	Leber	CSA Group
Douglas	Lee	U. S. Consumer Product Safety Commission
Khaled	Masri	NEMA
Charles	Monahan	Panasonic Corporation of North America

Thomas	O'Hara	Intertek
Jeff	Ortega	ZPower, LLC
Heather	Peterson	Batteries Plus Bulbs
Tim	Powers	ZPower, LLC
Andy	Roszkowski	Spectrum Brands, Inc.
John	Rotondo	Duracell, Inc.
Hiroataka	Shima	Hitachi Maxell, Ltd.
Carin	Stuart	Energizer Brands, LLC
Yoshiki	Terao	Panasonic
Hirohito	Teraoka	FDK CORPORATION
Kelly	Tsudama	Google
Steven	Wicelinski	Duracell, Inc.

1 Introduction

The concept of safety is closely related to safeguarding the integrity of people and property. This Standard defines performance requirements for primary batteries with aqueous electrolyte to ensure their safe operation under normal use and reasonably foreseeable misuse.

Safety is a balance between freedom from risk of harm and other demands to be met by the product. There can be no absolute safety. Even at the highest level of safety, the product can only be relatively safe. In this respect, decision-making is based on risk evaluation and safety judgment.

As safety will pose different problems, it is impossible to provide a set of precise provisions and recommendations that will apply in every case. This may be particularly true for button-type batteries. However, when following a judicious “use when applicable” basis this Standards publication will provide reasonably consistent standards for safety.

2 Scope

This American National Standard specifies tests and requirements for portable primary batteries with aqueous electrolyte and zinc anode (non-lithium) to ensure their safe operation under normal use and reasonably foreseeable misuse. For reference, the chemical systems standardized in ANSI C18.1M, Part 1 are:

- a. Carbon Zinc (Leclanché and Zinc Chloride types);
- b. Alkaline Manganese Dioxide;
- c. Silver Oxide;
- d. Zinc air;
- e. Nickel Oxy-Hydroxide.