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ANSI C18.2M, Part 2-2021

# American National Standard for Portable Nickel Rechargeable Cells and Batteries—Safety Standard

National Electrical Manufacturers Association

National Electrical Manufacturers Association
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**ANSI C18.2M, Part 2-2021**
Revision of ANSI C18.2M, Part 2-2014

# *American National Standard for Portable Nickel Rechargeable Cells and Batteries— Safety Standard*

Secretariat:

**National Electrical Manufacturers Association**

Approved: November 20, 2020

**American National Standards Institute**

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# Foreword

(This foreword is not part of American National Standard C18.2M, Part 2-2014.)

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, 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, now portable cells. This committee, C18, representing battery users, manufacturers, and government agencies, has remained active since that time.

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 the 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 conditions, etc. Section 2 of Part 1 is comprised of specification sheets for various types of cells and batteries. This Part 2 of the Standard, a separate document, contains safety requirements.

The ANSI Committee C18 on Portable Cells and Batteries completed what is in effect the first edition of this specification on safety requirements in 1999 under the sponsorship of the National Electrical Manufacturers Association (NEMA). This latest edition was issued to separate rechargeable nickel systems and lithium systems into two Standards. This Standard now covers rechargeable nickel systems, while ANSI C18.5, Part 1, will cover rechargeable lithium systems. Additionally, this Standard was revised to more closely harmonize with IEC 61951-1 Secondary cells and batteries containing alkaline or other non-acid electrolytes—Secondary sealed cells and batteries for portable applications—Part 1: Nickel-Cadmium and 61951-2 Secondary cells and batteries containing alkaline or other non-acid electrolytes—Secondary sealed cells and batteries for portable applications—Part 2: Nickel-metal hydride.

Suggestions for 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 on Dry Cells and Batteries, C18. 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

| Name of Representative(s): | | Organization Represented: | Voting Status |
|---|---|---|---|
| Heather | Peterson | Batteries Plus Bulbs | Voting |
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| David | Grandin | Bureau Veritas Consumer Product Services | Voting |
| Robert | Coughlin | Consumer Product Integrity Consulting, LLC | Voting |
| Jody | Leber | CSA Group | Voting |

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| Rich | Byczek | Intertek | Alt. Voting |
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| Rodney | Grimes | SGS | Voting |
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| Jeff | Ortega | ZPower, LLC | Voting |
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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

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| Kelly | Tsudama | Google |
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# *American National Standard for Portable Nickel Rechargeable Cells and Batteries—Safety Standard*

## 1 Introduction

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

Safety is a balance between freedom from the 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 requirements will pose different challenges, it is impossible to provide a set of precise provisions and recommendations that will apply in every case. However, this Standard, when followed on a judicious "use when applicable" basis, will provide reasonably consistent Standards for safety.

## 2 Scope

This American National Standard specifies performance requirements for standardized portable nickel cadmium and nickel metal hydride rechargeable cells and batteries to ensure their safe operation under normal use and reasonably foreseeable misuse. It also includes information relevant to hazard avoidance.

It is understood that consideration of this American National Standard might also be given to measuring and/or ensuring the safety of non-standardized secondary batteries. In either case, no claim or warranty is made that compliance or non-compliance with this American National Standard will fulfill or not fulfill any of the user's particular purposes or needs.

## 3 Normative References

The following Standards contain provisions which, 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 editions of the Standards indicated below.

ANSI C18.2M, Part 1- *Portable Nickel Rechargeable Cells and Batteries-General and Specifications*

## 4 Definitions

For the purposes of this American National Standard, the following definitions apply.

**4.1 battery:** One or more cells electrically connected by permanent means; may be fitted in a case with terminals, markings and protective devices, etc., as necessary for use.

**4.2 cell, button:** A cell of circular cross-section in which the overall height is less than the overall diameter.

Note: button cells are non-lithium, and coin cells are lithium chemistries.

**4.3 battery, portable:** A battery that is easily hand-carried by one person (less than 12 kg).

**4.4 battery, prismatic:** A battery having the shape of a parallelepiped whose faces are rectangular.