NEMA Standards Publication

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American National Standard for Portable Rechargeable Cells and Batteries-Safety Standard

National Electrical Manufacturers Association

National Electrical Manufacturers Association
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ANSI C18.2M, Part 2-2007

American National Standard

for Portable Rechargeable
Cells and Batteries—

Safety Standard

ANSI C18.2M, Part 2-2007
Revision of
ANSI C18.2M, Part 2-1999

American National Standard

For Portable Rechargeable Cells and Batteries— Safety Standard

Secretariat:

National Electrical Manufacturers Association

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American National Standard

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Foreword (This foreword is not part of American National Standard C18.2M, Part 2-2005.)

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, government agencies, and other interested parties have 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 update the safety tests and keep them current with the best possible practices. In particular, this latest edition considers and takes into account the *United Nations Recommendations on the Transport of Dangerous Goods*. These *Model Regulations*, adopted in December 2000, include lithium battery test recommendations in the *Manual of Tests and Criteria*. Additional consideration was also given to *IEC 62281, Ed.1: Safety of primary and secondary lithium cells and batteries during transport*. The purpose of these considerations was to harmonize test procedures, where appropriate, and prevent the proliferation of unnecessary or redundant tests. The latest edition also separates lithium batteries from nickel-based batteries and eliminates lead acid batteries to better reflect the realities of the current market. In doing so, the Committee recognized that there are some different and unique requirements for rechargeable lithium batteries.

Suggestions for improvement of this standard are welcome. They should be sent to the National Electrical Manufacturers Association, 1300 N. 17th Street, Suite 1752, 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:

Michael H. Babiak, Chairperson
James C. DeJager, ViceChairperson
Paul Orr, Secretary

Organization Represented:	*Name of Representative:*
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Panasonic Battery Corporation	Charles P. Monahan
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Paul Krehl
David Linden
Andrew Markow
Charlie Monahan
Terence O'Beirne
Steven Wicelinski
C. Richard Walk

American National Standard For Portable 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 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 lithium-ion, nickel cadmium, and nickel metal hydride rechargeable cells and batteries to ensure their safe operation under normal use and reasonably foreseeable misuse, and 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 editions indicated were 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 1-2003, *Portable Rechargeable Cells and Batteries-General and Specifications*

IEC 60068-2-32, *Environmental Testing, Part 2: Free fall*

4 Definitions

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

4.1 battery: One or more cells, including case, terminals, and markings.

4.2 battery, button (coin): Small round battery, in which the overall height is less than the diameter.