



**ANSI C18.3M, Part 1-2008**

Revision of  
ANSI C18.3M, Part 1-2005

American National Standard

**For Portable Lithium Primary  
Cells and Batteries—  
General and Specifications**

Secretariat:

**National Electrical Manufacturers Association**

Approved July 3, 2008

**American National Standards Institute**

## NOTICE AND DISCLAIMER

The information in this publication was considered technically sound by the consensus of persons engaged in the development and approval of the document at the time it was developed. Consensus does not necessarily mean that there is unanimous agreement among every person participating in the development of this document.

NEMA standards and guideline publications, of which the document contained herein is one, are developed through a voluntary consensus standards development process. This process brings together volunteers and/or seeks out the views of persons who have an interest in the topic covered by this publication. While NEMA administers the process and establishes rules to promote fairness in the development of consensus, it does not write the document and it does not independently test, evaluate, or verify the accuracy or completeness of any information or the soundness of any judgments contained in its standards and guideline publications.

NEMA disclaims liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, application, or reliance on this document. NEMA disclaims and makes no guaranty or warranty, express or implied, as to the accuracy or completeness of any information published herein, and disclaims and makes no warranty that the information in this document will fulfill any of your particular purposes or needs. NEMA does not undertake to guarantee the performance of any individual manufacturer or seller's products or services by virtue of this standard or guide.

In publishing and making this document available, NEMA is not undertaking to render professional or other services for or on behalf of any person or entity, nor is NEMA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. Information and other standards on the topic covered by this publication may be available from other sources, which the user may wish to consult for additional views or information not covered by this publication.

NEMA has no power, nor does it undertake to police or enforce compliance with the contents of this document. NEMA does not certify, test, or inspect products, designs, or installations for safety or health purposes. Any certification or other statement of compliance with any health or safety-related information in this document shall not be attributable to NEMA and is solely the responsibility of the certifier or maker of the statement.

# **AMERICAN NATIONAL STANDARD**

Approval of an American National Standard requires verification by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made toward their resolution.

The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he has approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

Caution Notice: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this standard. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute, 11 West 42nd Street, New York, NY, 10036, phone (212) 642-4900.

Published by

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

© Copyright 2008 by the National Electrical Manufacturers Association  
All rights including translation into other languages, reserved under the Universal Copyright Convention, the Berne Convention or the Protection of Literary and Artistic Works, and the International and Pan American Copyright Conventions.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Printed in the United States of America

**This page intentionally left blank.**

## Contents

|                       |   | Page |
|-----------------------|---|------|
| <b>Foreword</b> ..... |   | v    |
| <b>1</b>              | <b>General</b> .....  | 1    |
|                       | <b>1.1</b> Scope and purpose .....                              | 1    |
|                       | <b>1.1.1</b> Scope .....  | 1    |
|                       | <b>1.1.2</b> Purpose .....                                      | 1    |
|                       | <b>1.2</b> Normative references .....                           | 1    |
|                       | <b>1.3</b> Definitions .....                                    | 1    |
|                       | <b>1.4</b> Requirements .....                                   | 3    |
|                       | <b>1.4.1</b> Designations, chemical systems, and voltages ..... | 3    |
|                       | <b>1.4.2</b> Battery dimensions .....                           | 4    |
|                       | <b>1.4.3</b> Terminals .....                                    | 7    |
|                       | <b>1.4.4</b> General design considerations .....                | 8    |
|                       | <b>1.4.5</b> Test conditions .....                              | 8    |
|                       | <b>1.4.6</b> Test requirements .....                            | 8    |
|                       | <b>1.4.7</b> Marking .....                                      | 10   |
| <b>2</b>              | <b>Specifications</b> .....                                     | 11   |
|                       | <b>2.1</b> Specification sheet reference .....                  | 11   |
|                       | <b>2.2</b> Battery specification sheets .....                   | 12   |
| <br><b>Table</b>      |   |      |
| <b>1</b>              | <b>Chemical systems and voltages</b> .....                      | 4    |

**Figures**

|           |   |   |
|-----------|---|---|
| <b>1</b>  | Small cell or battery gauge (inner dimensions)..... | 3 |
| <b>2A</b> | Round battery (protruding negative).....            | 6 |
| <b>2B</b> | Round battery (recessed negative).....              | 6 |
| <b>3</b>  | Coin battery .....                                  | 7 |

**Annexes**

|          |   |    |
|----------|---|----|
| <b>A</b> | Methods of determining load and test conditions.....                | 25 |
| <b>B</b> | Guidance for packaging, handling, storage, and transportation ..... | 27 |
| <b>C</b> | Reliability guidelines .....  | 29 |
| <b>D</b> | Bibliography .....  | 31 |

**Foreword** (This Foreword is not part of American National Standard C18.3M, Part 1-2008.)

This edition of an American National Standard for Portable Lithium Primary Cells and Batteries is based in part on the previous American National Standard for Lithium Primary Cells and Batteries—General and Specifications, ANSI C18.3M, Part 1-2005, and recognizes the work of the International Electrotechnical Commission (refer to IEC Publications 60086-1 and 60086-2) in establishing world-wide standard requirements for portable lithium primary batteries. As with the previous edition, this edition includes the following chemistries:

Lithium/carbon monofluoride;  
Lithium/manganese dioxide;  
Lithium/iron disulfide.

After review, certain selected performance tests and dimensions were revised or added.

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 Lithium Primary 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. **Part 2 of the standard, a separate document, contains safety requirements.**

Suggestions for the improvement of this standard are welcome. They should be sent to the National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1752, 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. At the time Committee C18 approved this standard, it had the following members:

**Michael H. Babiak, Chairperson**

Steven Wicelinski, Vice Chairperson

Eric Schweitzer, Secretary

*Organization Represented:**Name of Representative:*

BAE Systems

Andrew J. Markow  
Dan Radzykewycz (Alternate)

Bureau Veritas, Consumer Product Services

Thomas M. Heckmann

Consultant

Albert Himy

Defense Supply Center Richmond

John M. Thompson

Duracell

Steven Wicelinski  
S. Keel Kelly (Alternate)

Eastman Kodak Company

James C. DeJager

|  |  |
|--|--|
| Energizer Battery Manufacturing, Inc.            | Michael H. Babiak<br>Marc K. Boolish (Alternate) |
| Fisher Price / Mattel                            | Robert J. Coughlin                               |
| International Imaging Industry Association (i3a) | James Peyton                                     |
| Intertek ETL SEMKO                               | Terence J. O'Beirne                              |
| Moltech Power Systems                            | Ramesh V. Shah                                   |
| Panasonic Battery Corporation of America         | Charles P. Monahan                               |
| Spectrum Brands, Inc.                            | John Hadley<br>Denis Carpenter (Alternate)       |
| Tiburon Associates                               | James A. Gucinski                                |

The members of Subcommittee C18-3 for Portable Lithium Primary Cells and Batteries who contributed to the development of this standard are:

**Marc K. Boolish, Chairperson**

Steven Wicelinski, Vice Chairperson

Eric Schweitzer, Secretary

Michael Babiak  
Robert Coughlin  
James DeJager  
James Gucinski  
John Hadley  
Thomas Heckmann  
Albert Himy

S. Keel Kelly  
Andrew Markow  
Charles Monahan  
Terence O'Beirne  
Dan Radzykewycz  
Ramesh Shah

## **For Portable Lithium Primary Cells and Batteries— General and Specifications**

### **1 General**

**NOTE—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 lithium primary cells and batteries. This edition includes the following electrochemical systems:

- a) Lithium/carbon monofluoride;
- b) Lithium/manganese dioxide;
- c) Lithium/iron disulfide.

##### **1.1.2 Purpose**

The purpose of this publication is:

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

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

### **1.2 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 most recent editions of the standards indicated below.

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

ANSI C18.3, Part 2, *For Portable Lithium Primary Cells and Batteries--Safety Standard*

### **1.3 Definitions**

**1.3.1 application test:** A test which simulates the actual use of a battery in a specific application.