



ANSI C78.81-2016

---

American National  
Standard for Electric  
Lamps—Double-  
Capped Fluorescent  
Lamps—  
Dimensional and  
Electrical  
Characteristics





**ANSI C78.81-2016**

*American National Standard  
for Electric Lamps—  
Double-Capped Fluorescent Lamps—  
Dimensional and Electrical Characteristics*

Secretariat:

**National Electrical Manufacturers Association**

Approved: June 29, 2016

**American National Standards Institute, Inc.**

## 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.

American National Standards Institute, Inc. (ANSI) 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 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, expressed 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 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 The American National Standards Institute, Inc. (ANSI) that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer. An American National Standard implies a consensus of those substantially concerned with its scope and provisions. 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 existence of an American National Standard does not in any respect preclude anyone, whether s/he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards. It is intended as a guide to aid the manufacturer, the consumer, and the general public.

The American National Standards Institute, Inc., 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, Inc. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on this title page.

**CAUTION NOTICE:** This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute, Inc., 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, Inc.

Published by

**National Electrical Manufacturers Association**  
**1300 North 17<sup>th</sup> Street, Suite 900**  
**Rosslyn, Virginia 22209**

© 2016 National Electrical Manufacturers Association

All rights, including translation into other languages, reserved under the Universal Copyright Convention, the Berne Convention for 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 prior written permission of the publisher.

Printed in the United States of America

**FOREWORD (This foreword is not part of ANSI C78.81-2016)**

Suggestions for improvement of this standard should be submitted to the Secretariat, C78 Committee, National Electrical Manufacturers Association, 1300 North 17<sup>th</sup> Street, Suite 900, Rosslyn, VA 22209.

This standard was processed and approved by Accredited Standards Committee on Electric Lamps, C78, and its work group, C78WG02. Approval of the standard does not necessarily imply that all work group members voted for its approval.

This revision supersedes ANSI C78.81-2014.

**This standard features revisions to:**

**1. The following datasheets**

1. 17 Watt, 24-Inch T8, Fluorescent Lamp [7881-ANSI-1001-2] -3
2. 25 Watt 36 inch T8, Fluorescent Lamp [7881-ANSI-1002-2] -3
3. 25 Watt, 48-inch T8, Fluorescent Lamp [7881-ANSI-1028-2] -3
4. 32 Watt, 48-inch T8, Fluorescent Lamp [7881-ANSI-1005-3] -4
5. 28 Watt, 48-inch T8, Fluorescent Lamp [7881-ANSI-1029-2] -3
6. 30 Watt, 48-inch T8, Fluorescent Lamp [7881-ANSI-1030-2] -3
7. 40 Watt, 60-inch T8, Fluorescent Lamp [7881-ANSI-1007-2] -3
8. 15 Watt, 18-inch T8, Fluorescent Lamp [7881-ANSI-1031-1] -2
9. 15 Watt, 24-inch T8, Fluorescent Lamp [7881-ANSI-1032-1] -2
10. 21 Watt, 36-inch T8, Fluorescent Lamp [7881-ANSI-1033-1] -2

**2. Annex D**

**3. Datasheet 7881-ANSI-1501-2**

86- Watt, 96-inch T8, 0.4 A HF Rapid Start Fluorescent Lamp, pg. 115, revision and reformat

## CONTENTS

Foreword .....	iv
Table of Contents .....	v
<b>PART 1—General Information and Requirements .....</b>	<b>1</b>
1 Scope .....	1
2 General .....	1
3 Definitions .....	2
4 Lamp abbreviations .....	2
5 Methods of measurement .....	2
6 Reference ballasts .....	2
7 Product drawings .....	2
8 Application of lamps on more than one type of circuit .....	3
9 Lamp physical and dimensional requirements .....	3
10 Lamp electrical characteristics .....	5
11 Requirements for ballast design .....	6
12 Requirements for luminaire design .....	8
<b>PART II—Lamp Drawings and Dimensioning Principles .....</b>	<b>10</b>
<b>PART III—Annexes .....</b>	<b>11</b>
Annex A (Informative) Guide for Establishing Fluorescent Lamp Abbreviations .....	11
Annex B (Informative) Guidelines for the Establishment of Wattage Ratings on Lamp Data Sheets .....	14
Annex C (Informative) Bibliography .....	16
Annex D (Normative) USA Deviations to adopted IEC sheets .....	17
<b>PART IV—Lamp Specification Data Sheets .....</b>	<b>18</b>
1 General Principles for Numbering of Data Sheets .....	18
2 Data Sheet List and Sequence .....	18
3 Deviations to Adopted IEC Data Sheets .....	18
Lamp Data Sheets .....	19-186

**<This page intentionally left blank.>**

## PART I General Information and Requirements

### 1 Scope

This standard sets forth the physical and electrical characteristics of the principal types of fluorescent lamps intended for application on conventional line frequency circuits and electronic high frequency circuits. Some data sheets may specify more than one circuit application. Specifications for the lamp itself and the interactive features of the lamp and ballast are given. Only double-based lamps of the regular linear shape are included. Single-based lamps, including compact, circular, square, and U-shaped, are found in ANSI C78.901.

Lamps for conventional systems relying on auxiliary support from external ballasts are described. These lamps are those designed for 60 Hz and/or high frequency operation.

Lamp color is not specified herein.

Certain lamp types covered in this standard may be similar to those in IEC 60081. However, additional types are included that are used only in North America and are not specified in the IEC standard.

#### 1.1 Important Patent Disclaimer

At the time of publication, it is possible that some of the elements of this document may be the subject of patent rights. When this standard was approved for publication, the National Electrical Manufacturers Association (NEMA) did not know of any patent applications, patents pending, or existing patents. NEMA shall not be held responsible for identifying any or all such patent rights.

### 2 General

There are four parts to this standard:

- |                 |  |
|-----------------|--|
| <b>Part I</b>   | Contains requirements and general information. Detailed descriptions, references, and explanations of the terms used in the lamp data sheets are given. Defines the principles of dimensioning lamps, both as finished lamps and for maximum outline purposes. |
| <b>Part II</b>  | Contains dimensioning principles and lamp outline drawings.  |
| <b>Part III</b> | Contains the annexes.  |
| <b>Part IV</b>  | Contains the lamp data sheets for the lamp classes covered in this standard. Sheets adopted from IEC are not included, but a source reference is listed.   |

#### 2.1 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 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 C78.79  | <i>American National Standard for Electric Lamps—Nomenclature for Envelope Shapes Intended for Use with Electric Lamps</i> |
| ANSI C78.180 | <i>American National Standard for Electric Lamps—Specifications for Fluorescent Lamp Starters</i>                          |