



**ANSI C136.38-2015**

*American National Standard for  
Roadway and Area Lighting Equipment—  
Induction Lighting*

Secretariat:

**National Electrical Manufacturers Association**

Approved: April 29, 2015

**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 (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 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. ANSI states 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 significantly more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and 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 they have 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 under 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.

Published by

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

© 2015 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

At the time this standard was approved, the ANSI C136 committee was composed of the following members:

Alabama Power Company	LITES
American Electric Lighting	Los Angeles City Bureau of Street Lighting
Caltrans	LUXIM Corp.
Ceravision	Mississippi Power
City of Kansas City, Missouri	National Grid
Cooper Lighting by Eaton	OSRAM SYLVANIA, Inc.
Duke Energy	Philips HADCO
Duke Energy – Florida	Philips Lumec
Edison Electric Institute	PNNL
EPRI	ROAM/DTL
EYE Lighting International	SELC Lighting
Florida Power and Light	Sensus Metering
FRE Composites (2005) Inc.	Shakespeare Composite Structures
GE Lighting	Silver Spring Networks
Georgia Power Company	South Carolina Electric & Gas
Gulf Power Company	SouthConn Technologies, Inc.
Hapco Aluminum Pole Products	StressCrete/King Luminaire
Holophane, An Acuity Brands Company	Sunrise Technologies, Inc., FP OLC
Hubbell Lighting, Inc.	TE Connectivity
Inovus Solar	Utility Metals Division of Fabricated Metals, LLC
Intertek USA	Valmont Industries, Inc.
JEA	Vamas Engineering and Consultants
Kauffman Consulting, LLC	Xcel Energy
LED Roadway Lighting	

## TABLE OF CONTENTS

1	Scope .....	1
2	Normative References.....	1
3	Informative References .....	1
4	General.....	2
4.1	INDUCTION LIGHTING SYSTEMS.....	2
4.1.1	Toroidal (Ring) Induction Lamps.....	2
4.1.2	Re-Entrant Cavity Lamps.....	3
4.2	OPERATION IN HIGH HUMIDITY ENVIRONMENTS.....	3
4.3	EXTREME LOW TEMPERATURES.....	3
5	RF Generator Requirements .....	3
5.1	OPERATING VOLTAGES.....	3
5.2	AMBIENT TEMPERATURE .....	3
5.3	CASE TEMPERATURE .....	3
5.4	MOUNTING PROVISIONS .....	3
5.5	HEAT SINK .....	4
5.6	LAMP OPERATION .....	4
5.7.1	Toroidal Lamps 4	
5.7.2	Re-Entrant Cavity Lamps.....	4
6	Lamp Requirements .....	4
6.1	APPLICABLE STANDARDS.....	4
6.2	MOUNTING.....	4
6.3	ORIENTATION.....	4
6.3.1	Toroidal Lamps 4	
6.3.2	Re-Entrant Cavity Lamps.....	4
6.4	SHOCK AND VIBRATION .....	5
6.5	COLOR TEMPERATURE .....	5
7	Electrical Immunity .....	5
7.1	DIELECTRIC VOLTAGE-WITHSTAND .....	5
7.2	CONDUCTED AND RADIATED EMISSIONS .....	6
7.3	SURGE: 1.2/50 $\mu$ S–8/20 $\mu$ S COMBINATION WAVE .....	6
7.4	SURGE: 0.5 $\mu$ s – 100 kHz RING WAVE.....	6
7.5	ELECTRICAL FAST TRANSIENTS (EFT).....	6
7.6	ELECTROSTATIC DISCHARGE (ESD) .....	7
7.7	TOTAL HARMONIC DISTORTION (THD).....	7
7.8	INRUSH CURRENT.....	7
8	Power Coupler (Antenna).....	7
8.1	POWER COUPLER TEMPERATURE .....	7
8.2	HEAT SINK .....	7
9	Terminals.....	7
9.1	RF GENERATOR INPUT.....	7

9.2	RF GENERATOR OUTPUT—LAMP INPUT .....	7
10	Wiring and Grounding .....	8
11	Ratings .....	8
12	Labeling .....	8

## FIGURES

Figure 1	SCHEMATIC OF A TOROIDAL (RING) ELECTRODELESS FLUORESCENT LAMP .....	2
Figure 2	SCHEMATIC OF A RE-ENTRANT CAVITY LAMP .....	3

## TABLES

Table 1	ALLOWABLE CCT AND DUV (ADAPTED FROM ANSI C78.377) .....	5
Table 2	DIELECTRIC WITHSTAND TEST SPECIFICATION .....	5
Table 3	TEST LEVEL.....	6

## 1 Scope

This standard defines the electrical and mechanical requirements of induction-type light sources for use in roadway and area lighting luminaires.

## 3 Informative References

This standard is intended to be used in conjunction with the following publications. The latest edition of the publication applies (including amendments).

ANSI C136.14-2004 (R2009), *American National Standard for Roadway and Area Lighting Equipment—Elliptically Shaped, Enclosed Side-mounted Luminaires for Horizontal-burning High-intensity Discharge (HID) Lamps*

ANSI C136.15-2011, *American National Standard for Roadway and Area Lighting Equipment—Luminaire Field Identification*

ANSI C136.16-2009, *American National Standard for Roadway and Area Lighting Equipment—Enclosed, Post Top-mounted Luminaires*

ANSI C136.22-2004, *American National Standard for Roadway and Area Lighting Equipment—Internal Labeling of Luminaires*