# ANSI/NEMA FL 1

# FLASHLIGHT BASIC PERFORMANCE STANDARD



Approved as an American National Standard ANSI Approval Date: August 18, 2009

## ANSI/NEMA FL 1-2009

Flashlight Basic Performance Standard

Published by

National Electrical Manufacturers Association 1300 North 17th Street, Suite 1752 Rosslyn, Virginia 22209

www.nema.org

© Copyright 2009 by the 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.

#### 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.

The National Electrical Manufacturers Association (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, 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 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.

# Contents

Sc	ope	1
1	GENERAL	2
	1.1 Reference Standards	2
	1.2 Definitions	
	1.2.1 Beam Distance	
	1.2.2 Peak Beam Intensity	
	1.2.3 Run Time	
	1.2.4 Light Output	
	1.2.5 Impact Resistance	
	1.2.6 Enclosure Protection Against Water Penetration Ratings	
	1.2.7 Hand-Held/Portable	
	1.2.8 Spectroradiometer	
	1.2.9 Light Measuring Device	
	1.2.10 Surface Light Intensity	
	1.2.11 Integrating Sphere	
	1.3 Sample Size and Order of Testing	
	1.3.1 Performance Testing	
	1.3.2 Reliability Testing	
	1.4 Units of Measure	4
2	TEST METHODS	4
	2.1 General	
	2.1.1 Lab Conditions	
	2.1.2 Sampling Selection	
	2.2 Beam Distance	
	2.2.1 Purpose	
	2.2.2 Power Source	
	2.2.3 Conditions	
	2.2.4 Apparatus	
	2.2.5 Procedures	
	2.2.6 Final calculations	
	2.3 Peak Beam Intensity	
	2.3.1 Purpose	
	2.3.2 Power Source	
	2.3.3 Conditions	
	2.3.4 Apparatus	
	2.3.5 Procedures	
	2.3.6 Final calculations	
	2.4 Run Time	
	2.4.1 Purpose	
	2.4.2 Power Source	
	2.4.3 Conditions	
	2.4.4 Apparatus	
	2.4.5 Initial and End Point	
	2.4.6 Final Calculation	
	2.5 Light Output	
	2.5.1 Purpose	
	2.5.2 Power Supply	8
	· · ·	

	2.5.3	Conditions	9
		Apparatus	
		Test Equipment Sampling Calibration	
		Procedures	
	2.5.7		
	2.6 lmp	pact Resistance	9
		Purpose	
		Conditions	
	2.6.3	Apparatus	9
	2.6.4	Drop Test	9
	2.6.5	Passing Criteria	10
		Impact Resistance Rating	
	2.7 En	closure Protection Against Water Penetration Rating	10
	2.7.1	Purpose	
	2.7.2	Conditions	10
	2.7.3	Apparatus	10
	2.7.4	Test Procedure	11
	2.7.5	Passing Criteria	11
	2.7.6	Enclosure Protection Against Water Penetration Rating	11
3	MARKING		12
	3.1 Pro	per Use of Icons and Styling Guidelines	12
		im Consistency	
		n Appearance	
		Beam Distance	
	3.3.2	Peak Beam Intensity	13
	3.3.3	Run Time	13
	3.3.4	Light Output	13
	3.3.5	Impact Resistant	
	3.3.6	Water Resistant	13
	3.3.7	Waterproof AND Submersible	14
		e of Multiple Icons	

#### **Foreword**

In the preparation of this Standards Publication, input of users and other interested parties has been sought and evaluated. Inquiries, comments, and proposed or recommended revisions should be submitted by contacting the:

FSC Secretary National Electrical Manufacturers Association 1300 North 17th Street, Suite 1752 Rosslyn, Virginia 22209

This Standards Publication was developed by the Flashlight Standards Committee. At the time it was approved, the Committee was composed of the following members:

Dorcy International	Columbus, OH	43217
Princeton Tec	Bordentown, NJ	08505
Coast	Portland, OR	97218
Surefire, LLC	Fountain Valley, CA	92708
Golight	Culbertson, NÉ	69024
Petzl	Clearfield, UT	84016
The Brinkman Corporation	Dallas, TX	75244
Energizer Holdings	Westlake, OH	44145
ASP Inc.	Appleton. WI	54912
Streamlight, Inc.	Eagleville, PA	19403
Cat Eye Co., Inc.	Boulder, CO	80302
Black Diamond	Salt Lake City, UT	84124
The Coleman Company Inc.	Wichita, KS	67219
Duracell, Inc.	Bethel, CT	06801

< This page is intentionally left blank. >

## SCOPE

This Standards Publication covers basic performance of hand-held/portable flashlights, spotlights, and headlamps providing directional lighting.