### NEMA RV 4-2012

## Application and Installation Guidelines for Service-Entrance Cable



# **NEMA Standard RV 4-2012** Application and Installation Guidelines for Service-Entrance Cable Published by: **National Electrical Manufacturers Association** 1300 North 17<sup>th</sup> Street, Suite 900 Rosslyn, Virginia 22209 www.nema.org © 2013 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 a consensus among persons engaged in its development at the time it was approved. Consensus does not necessarily mean there was unanimous agreement among every person participating in the development process.

The National Electrical Manufacturers Association (NEMA) standards and guideline publications, of which the document herein is one, are developed through a voluntary 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. Although NEMA administers the process and establishes rules to promote fairness in the development of consensus, it does not write the documents, nor does it 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, 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 particular purpose(s) or need(s). NEMA does not undertake to guarantee the performance of any individual manufacturer's 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 circumstance. 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**

		Page
FOREWO	RD	IV
SECTION	1 APPLICATION GUIDELINES FOR SERVICE-ENTRANCE CABLE	1
1.1	CONSTRUCTION	
	1.1.1 General	
	1.1.2 Insulated Conductors	
	1.1.3 Grounding Conductors	
	1.1.4 Separators	
	1.1.5 Fillers	
	1.1.6 Coverings	
1.2	GROUNDING	
	1.2.1 Grounding Conductor	
	1.2.2 Polarity	
1.3	MARKING	
	1.3.1 General	
	1.3.2 Cable, Tag, or Package	
	1.3.3 Circuit Conductors	
	1.3.4 Grounding Conductors	
1.4	CODES AND STANDARDS	
	1.4.1 National Electrical Code® (NEC)	
	1.4.2 Underwriters Laboratories (UL) Standards and Directory	
OFOTION	2 INSTALLATION GUIDELINES FOR TYPE SE CABLE	
	NEC REQUIREMENTS FOR INSTALLATION OF SERVICE-ENTRANCE CONDUC	
2.1	PRACTICES FOR INSTALLING SERVICE-ENTRANCE CABLES AS BRANCH	
2.2		
	OR FEEDERS	
	2.2.1 Cable Preparation	
	2.2.2 Inserting the Cable	
	2.2.3 Cable Preparation	
	2.2.4 Seating a Securement Clamp	
	2.2.5 Screw-Tightening Torque	
	2.2.6 Supports	
	0 11 0	
	2.2.8 Special Installation Considerations—Exposed Work	
	2.2.9 Unfinished Basements and Crawl Spaces 2.2.10 Accessible Attics	
	2.2.12 Ampacity     2.2.13 Damage	
	-	
SECTION	3 INSTALLATION TECHNIQUES	
3.1	CABLE PREPARATION AND FITTING ASSEMBLY TECHNIQUE	13
	3.1.1 Inserting SE Cable	13
	3.1.2 Cable Preparation	13
	3.1.3 Seating a Securement Clamp	13
	3.1.4 Screw-Tightening Torque	14
3.2	ATTACHMENT TO BOXES AND SUPPORT	
	3.2.1 Attachment to Unthreaded Entries	14
	3.2.2 Attachment to Threaded Entries	
	3.2.3 Supports	14
3.3	VERIFICATION OF INSTALLATION	
3.4	MAINTENANCE	16

#### **FOREWORD**

These application and installation guidelines offer practical information on correct usage and industry-recommended practices for service-entrance cable installation in accordance with the *National Electrical Code®* (*NEC*). They address service masts, sunlight resistance, submerged cables, conduit markings, aerial installation, suitability for branch and feeder circuits, termination requirements in wet locations, and important changes to the 2011 *NEC*.

These guidelines were developed by the National Electrical Manufacturers Association's (NEMA) Building Wire and Cable Section, which has committed to periodically reviewing them for any revisions necessary to address changing conditions, product listing and installation requirements, and technical progress.

Comments and suggestions for improving this document are encouraged. They should be sent to:

Senior Technical Director, Operations National Electrical Manufacturers Association 1300 North 17th Street, Suite 900 Rosslyn, Virginia 22209 www.nema.org

At the time of approval, the Building Wire and Cable Section was composed of the following members:

- AFC Cable Systems, Inc., a part of Atkore International—New Bedford, MA
- Alan Wire Company—Sikeston, MO
- Alcan Cable—Atlanta, GA
- AmerCable—El Dorado, AR
- Anamet Electrical, Inc.—Mattoon, IL
- Cerro Wire LLC—Hartselle, AL
- Colonial Wire & Cable Co., Inc.— Hauppauge, NY
- Conductores Monterrey S.A. de C.V.—
- San Nicolás de los Garza, MEX
- Electri-Flex Co.—Roselle, IL

- Encore Wire Corp.—McKinney, TX
- General Cable—Highland Heights, KY
- International Metal Hose Co.—Bellevue, OH
- Nexans North America—Chester, NY
- Prysmian Power Cables & Systems USA, LLC—Lexington, SC
- Rubidue Wire Co., Inc.—Greeley, CO
- Service Wire Co.—Culloden, WV
- Southwire Co.—Carrollton, GA
- The Okonite Co.—Ramsey, NJ
- United Copper Industries—Denton, TX