

NEMA PRP 1-2014 (R2019)

Guidelines for Conduit-in-Casing Construction



NEMA Publication PRP 1-2014 (R2019)

Guidelines for Conduit-in-Casing Construction

Published by

National Electrical Manufacturers Association

1300 North 17th Street, Suite 900

Rosslyn, Virginia 22209

www.nema.org

© 2020 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 warranty 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.

Foreword

The purpose of these guidelines is to describe the benefits, types and sizes, requirements, procedures, and recommended practices for installing conduit-in-casing construction.

These guidelines are in no way intended to assume or replace any responsibilities of engineers, customer representatives, owners, or other persons in establishing engineering design practices and procedures best suited to individual job conditions.

User needs have been considered during the development of this Standard.

The NEMA Polymer Raceway Products Section, through its members, works closely with the American Society for Testing and Materials, appropriate government agencies, and other organizations in the periodic review and revision of its Standards for any changes necessary to keep them up to date with advancing technology. Proposed or recommended revisions should be submitted to:

Technical Operations Department
National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, Virginia 22209

These guidelines were developed and approved by the NEMA Polymer Raceway Section. Approval does not necessarily imply that all members of the Section voted for its approval. At the time of approval, the Polymer Raceway Section consisted of the following members:

ABB, Inc.—www.abb.com—Memphis, TN
Anamet Electrical, Inc.—www.anacondasealtite.com—Matttoon, IL
Atkore International—www.atkore.com—Harvey, IL
Champion Fiberglass, Inc.—www.championfiberglass.com—Spring, TX
Electric-Flex Company—www.electriflex.com—Roselle, IL
FRE Composites—www.frecomposites.com—St. Andre-d'Argenteuil, PQ, Canada
Hubbell Incorporated—www.hubbell.com—Shelton, CT
IPEX USA, LLC.—www.ipexinc.com—Mississauga, ON, Canada
Legrand North America—www.legrand.us—West Hartford, CT
Panduit Corporation—www.panduit.com—Tinley Park, IL
Phoenix Contact—www.phoenixcontact.com—Middletown, PA
Southern Pipe, Inc.—www.southern-pipe.com—New London, NC
Southwire Company—www.southwire.com—Carrollton, GA
Underground Devices, Inc.—www.udevices.com—Northbrook, IL
United Fiberglass of America—www.unitedfiberglass.com—Springfield, OH

< This page left blank intentionally >

Currently in preview, click buy full version

CONTENTS

Foreword.....	i
Introduction.....	1
What Is Conduit-in-Casing Construction?	2
Why Use Conduit-in-Casing Construction?.....	2
Casing Types and Sizes.....	2
Conduit Normally Used.....	3
What Supports the Conduits?.....	3
Typical Bore Spacer Examples	4
Grout and Reasons to Grout	6
“No Grout” and “Blown Sand” Applications	7
Typical Bore Spacer Cross-Sections.....	8
Grout Injection Techniques.....	9
Other Methods and Practices	10
Tables	
Table 1 Common Steel Casings Used for Conduit-in-Casing Installations.....	3
Table 2 Common Conduit Separation Requirements.....	4
Figures	
Figure 1 Hybrid-type Bore Spacer	4
Figure 2 Spider-type Bore Spacer	4
Figure 3 Double Wall, Full-complement Bore Spacer	5
Figure 4 Double Wall, Hybrid-type Bore Spacer for Directional Bore.....	5
Figure 5 Double Wall, Spider-type Bore Spacer for Directional Bore.....	5
Figure 6 Double Wall, Full-complement Bore Spacer	5
Figure 7 Double Wall, Full-complement Bore Spacer	6
Figure 8 Deformed and Collapsed Conduits.....	7
Figure 9 Duct Bank Being Installed in a Steel Casing with a Pull Plate and Winch Line	8
Figure 10 Cross-section of a Typical Conduit-in-Casing Installation.....	8
Figure 11 Single End Grout Injection with Bulk Heads.....	9
Figure 12 Single End Extractable Grout Injection Pipe Technique.....	9
Figure 13 Stationary Sacrificial Grout Injection Pipe Technique	10