NEMA Standards Publication RV 2-2021

Application and Installation Guidelines for Nonmetallic-Sheathed Cable and Underground Feeder and Branch Circuit Cable

Published by:

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

www.nema.org

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Foreword

These application and installation guidelines offer practical information on correct usage and industry-recommended practices for installation of Type NM-B nonmetallic-sheathed cable and Type UF-B underground feeder and branch circuit cable in accordance with the *National Electrical Code® (NEC).*

These guidelines have been developed by the NEMA Building Wire and Cable Group and Dues Center, which has committed to periodically reviewing them for any revisions necessary to address changing conditions, product listing and installation requirements, and technical progress. Comments for proposed revisions are welcome and should be submitted to:

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At the time this document was approved, the Building Wire and Cable Group and Dues Center of the National Electrical Manufacturers Association (NEMA) had the following Members:

At the time of approval, the NEMA Building Wire and Cable Group had the following Members:

AFC Cable Systems, Inc., a part of Atkore	New Bedford	MA
Electri-Flex Company	Roselle	IL
Copperweld Bi-Metallics, LLC	Brentwood	TN
Cerrowire	Las Vegas	NV
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Service Wire Company	Culloden	WV
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The Okonite Company	Ramsey	NJ
Colonial Wire & Cable Co., Inc.	Hauppauge	NY
Southwire Company	Carrollton	GA
International Metal Hose Company	Bellevue	OH

The following Member companies participated in a special working group to develop these guidelines:

AFC Cable Systems, Inc., a part of Atkore	New Bedford, MA
Anamet Electrical, Inc.	Mattoon, IL
Cerro Wire LLC	Hartselle, AL
Southwire Company	Carrollton, GA

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Section 1
Application Guidelines for Nonmetallic-Sheathed Cable

1.1 Construction

1.1.1 General

Nonmetallic-Sheathed Cable (NM cable, to be referred to throughout these guidelines as Type NM-B) constructed in accordance with NFPA 70®, *National Electrical Code®* (*NEC*) employs copper, copper-clad, or recognized AA-8000 aluminum alloy conductors. Type NM-B can be found in flat or round constructions.

Copper conductors are of sizes 14–2 AWG. Copper-clad or aluminum conductors are of sizes 12–2 AWG. The 2020 *NEC* recognizes two cable types—Types NM-B and NMC. Currently, Type NMC is not commercially available. However, Type UF-B can be substituted for NMC.

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1.1.2 Circuit Conductors

All circuit conductors 8 AWG and larger are stranded. Circuit conductors of Type NM-B typically have dry-location polyvinyl chloride (PVC)/nylon insulation. These comply with Underwriters Laboratories (UL) 83 requirements for Type THHN but are not marked as such and cannot be used as THHN conductors.

1.1.3 Grounding Conductor

The grounding conductor will always be in one location in the cable. In flat Type NM-B, it is located either in the valley between the circuit conductors or directly between them. In a twisted construction, the grounding conductor may be wound along with the circuit conductors or in the center of the assembly. Bare grounding conductors are wrapped in paper to prevent contact with the nylon jacketing or circuit conductor insulation.

The permitted sizes of grounding conductors for Type NM-B are summarized in Table 1.

Table 1
Grounding Conductors in NM-B Cables with 2, 3, or 4 Circuit Conductors

Size of Circuit Conductors	Smallest Acceptable Grounding Conductor
14 AWG	14 AWG
12	12
10, 8, 6	10
4	8
3, 2	8

1.1.4 Cable Sheath

The sheath of the listed NM-B is made to provide flexibility and resistance to abrasion. Physical properties tests in UL 719 are conducted to evaluate these properties. Typically, PVC is the material used.