NEMA Standards Publication

NEMA OS 4

Requirements for Air-Sealed Boxes for Electrical and Communication Applications

National Electrical Manufacturers Association

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Published by:

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

www.nema.org

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Foreword

Building and energy codes for energy-efficient construction place a high priority on preserving the building thermal envelope. Installation of doors; windows; and mechanical, electrical, and other systems within exterior walls and ceilings and other separations between conditioned and unconditioned spaces results in penetrations in the air barrier. When these penetrations are not effectively sealed, the air barrier is compromised, resulting in air leakage, both in and out, which increases the energy usage necessary to maintain the desired condition of the air inside the structure.

Besides external walls and ceilings in a building, uninsulated interior walls and interior floor/ceiling cavities not designed specifically for air exchange, present pathways for air leakage. Even though air barriers are not commonly installed here, consideration should be given to using effective sealing techniques at wall, ceiling, and floor penetrations in these areas.

Sealing air-barrier penetrations is not always as simple as applying more insulation, caulk, or expanding foam. Products such as electrical outlet boxes, having design features that address effective sealing of the air-barrier penetrations, also reduce potentially undesirable effects that can result from the use of unspecified sealing techniques.

Annex B of this standard provides pertinent references to the applicable building and energy codes and to other helpful references.

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:

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This standards publication was developed by the Outlet and Switch Box Section. Section approval does not necessarily imply that all section members voted for its approval or participated in its development. At the time it was approved, the section was composed of the following members:

2D2C, Inc.—http://www.2d2c.com—Lincolnshire, IL
Allied Moulded Products, Inc.—http://www.alliedmoulded.com—Bryan, OH
Arlington Industries, Inc.—http://www.aifittings.com—Scranton, PA
Eaton's B-Line Business—http://www.cooperbline.com—Highland, IL
Crouse-Hinds by Eaton—http://www.crouse-hinds.com—Syracuse, NY
Emerson Automation Solutions—http://www.emersonindustrial.com/en-US/businesses/Pages/appletongroup.aspx—Rosemont, IL
Pentair Engineered Electrical & Fastening Solutions—http://www.erico.com—Solon, OH
Hubbell Incorporated—http://www.hubbell.com—Shelton, CT
Legrand/Pass & Seymour—http://www.passandseymour.com—Syracuse, NY
RACO—http://www.hubbell.com/Electrical/Raco.aspx—South Bend, IN
Sigma Electric Manufacturing Corporation—http://www.sigmaelectric.com—Garner, NC
Southwire Company—http://www.southwire.com/—Carrollton, GA
Thomas & Betts, A Member of the ABB Group—http://www.tnb.com—Memphis, TN
Wiremold/Legrand—http://www.wiremold.com—West Hartford, CT

Section 1
General

1.1 Scope

This standard establishes a performance test and classification scheme for outlet boxes: wall boxes, ceiling boxes, and floor boxes used for electrical and communication applications having design provisions for reducing the flow of air (air leakage) through the box and at its installed interface with the building structure, when installed as intended for normal use as instructed by the manufacturer.

The classification scheme in this standard meets the intent of the International Energy Conservation Code (IECC) and covers boxes installed in walls, ceilings, and floors where an air barrier is required.

This standard does not cover design or performance of electrical outlet boxes that are addressed in ANSI/UL 514A, CSA C22.2 No.18.1, NMX-J-023-ANCE, ANSI/UL 514C, CSA C22.2 No.18.2, ANSI/NEMA OS1, ANSI/NEMA OS2, IEC 60670-1, IEC 60670-21, or IEC 60670-23.

This standard does not cover environmental classifications for boxes or enclosures addressed in ANSI/UL 50E, CSA C22.2 No. 94.2, or NMX-J-235/2-ANCE.

1.2 References

The following normative documents contain provisions that through reference in this text constitute provisions of this standards publication. By reference herein, these publications are adopted, in whole or in part as indicated, in this standards publication. Unless otherwise stated, references are to the latest edition of the standard.

ASTM International (ASTM)
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

ASTM E283-04 (2012), *Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen*

Association of Standards and Certification (ANCE)
Av. Lázaro Cárdenas
No. 869
Nueva Industrial Vallejo
Ciudad de México
C.P. 07700 México

NMX-J-023-ANCE, *Metallic Outlet Boxes*
NMX-J-235/2-ANCE, *Enclosures for Electrical Equipment, Environmental Considerations*

Canadian Standards Association (CSA)
5060 Spectrum Way
Mississauga, ON L4W 5N6 Canada

CSA C22.2 No.18.1-13, *Metallic outlet boxes*
CSA C22.2 No.18.2-06 (R2016), *Nonmetallic outlet boxes*
CSA C22.2 No. 94.2-15, Enclosures for electrical equipment, environmental considerations