CSA Group

C22.2 No. 126.1-17

Metal cable tray systems

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CSA Group

Standards Update Service

C22.2 No. 126.1-17
July 2017

Title: *Metal cable tray systems*
Pagination: 24 pages (iv preliminary and 20 text)

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CSA Group
CSA C22.2 No. 126.1-17
Fourth Edition

National Electrical Manufacturers Association
NEMA VE 1-2017
Sixth Edition

Metal cable tray systems

July 2017

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ISBN 978-1-4883-0488-0

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Preface

This is the harmonized CSA Group and NEMA standard for Metal Cable Tray Systems. It is the fourth edition of CSA C22.2 No. 126.1, superseding the previous editions published in 2009, 2002, and 1998, and the sixth edition of NEMA VE 1, superseding the previous edition published in 2009.

This harmonized standard was prepared by the CANENA Technical Harmonization Committee for Metal Cable Tray Systems, comprising members from CSA Group, the National Electrical Manufacturers Association, and the cable tray manufacturing industry. The efforts and support of the CANENA Technical Harmonization Committee are gratefully acknowledged.

This standard is considered suitable for use for conformity assessment within the stated scope of the standard.

This standard was reviewed by the CSA Integrated Committee on Cable Tray Systems, under the jurisdiction of the CSA Technical Committee on Wiring Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee.

This standard was also approved at NEMA by the Codes and Standards Committee.

Where reference is made to a specific number of samples to be tested, the specified number is considered to be a minimum quantity.

Note: Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

Level of Harmonization
This standard uses an IEC format, but is not based on, nor is it to be considered equivalent to, an IEC standard. This standard is published as an identical standard for NEMA and CSA Group.

An identical standard is a standard that is exactly the same in technical content except for national differences resulting from conflicts in codes and governmental regulations. Presentation is word for word except for editorial changes.

Reasons for Differences from IEC
The Technical Harmonization Committee (THC) identified one IEC standard that addresses electrical cable tray systems included in the scope of this standard. The THC determined the safe use of electrical cable tray is dependent on the design, performance, and installation of the cable tray system. The IEC standard does not mention the bonding/equipment grounding function of cable tray, and there are no requirements for corrosion protection at this time. Significant investigation is required to assess safety and system issues that may lead to harmonization of traditional North American electrical cable tray standards with those presently addressed in the known IEC standard. The THC agreed such future investigation might be facilitated by completion of harmonization of the North American standards for electrical cable tray.

Interpretations
The interpretation by the Standards Development Organization (SDO) of an identical or equivalent standard is to be based on the literal text to determine compliance with the standard in accordance with the procedural rules of the SDO. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the SDOs to reflect more accurately the intent.

Foreword (NEMA)

This standards publication provides technical requirements concerning the construction, testing, and performance of metal cable tray systems. The development of this publication is the result of many years of research, investigation, and experience by the members of the Cable Tray Section of NEMA. Throughout the development of this publication, test methods and performance values have been related as closely as possible to end-use applications. It has been developed through consultation among manufacturers, with users and engineering societies, to result in improved serviceability and safety of metal cable tray systems.

This publication reflects the study of applicable building codes and the *Canadian Electrical Code, Part I (CE Code)* and the *National Electrical Code*® (NEC), and adheres to applicable national material and manufacturing standards, such as those of the American Society for Testing and Materials, the American Iron and Steel Institute, the Aluminum Association, and Underwriters Laboratories, Inc. The NEMA Cable Tray Section periodically reviews this publication for any revisions necessary, to keep it up to date with advancing technology.

Comments and suggestions for the improvement of this document are encouraged.

They should be sent to:

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The primary purpose of this standards publication is to encourage the manufacture and utilization of standardized metal cable tray systems and to eliminate misunderstandings between manufacturers and users. It has been promulgated with a view toward promoting safety of persons and property by the proper selection and use of metal cable tray systems.

The cable tray system manufacturer has limited or no control over the following factors, which are vital to a safe installation:

a. environmental conditions;
b. system design;
c. product selection and application;
d. installation practices; and
e. system maintenance.

NEMA VE 1 was developed by the NEMA Cable Tray Section. Section approval does not necessarily imply that all section members voted for approval or participated in development. At the time NEMA VE 1-2017 was approved, the NEMA Cable Tray Section consisted of the following members:

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Section 1
Scope

This standard specifies the requirements for metal cable trays and associated fittings designed for use in accordance with the Canadian Electrical Code (CE Code), Part I, and the *National Electrical Code*® (NEC).

Section 2
Definitions

The following definitions apply in this standard:

bonding/equipment-grounding conductor: A conductor that is defined in the *National Electrical Code* and the *Standard for Electrical Installations* as "Grounding Conductor, Equipment," and defined in the *Canadian Electrical Code*, Part I, as "Bonding conductor."

cable tray system: A section or assembly of sections, and associated fittings, forming a mechanical system used to support cables and raceways.

channel cable tray: A fabricated structure consisting of a one-piece ventilated- or solid-bottom channel section.

connector: A component that joins any combination of cable tray straight sections and fittings.

Note: The basic types of connectors include rigid, expansion, adjustable, and reducer. The term "splice" is also used in the industry to describe a connector.

fasteners: Screws, nuts, bolts, washers, rivets, spacers, pins, and other items used to connect and assemble cable tray systems.

fill depth: The vertical interior dimension of a cable tray that is used to calculate the allowable interior cross-sectional area.

fitting: A component that is used to change the size or direction of a cable tray system.

horizontal cross: A fitting that joins cable trays in four directions at 90° intervals in the same plane.

horizontal elbow: A fitting that changes the direction of cable tray in the same plane.

horizontal tee: A fitting that joins cable trays in three directions at 90° intervals in the same plane.

ladder cable tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).

reducer: A fitting that joins cable trays of different widths in the same plane.

single-rail cable tray: A fabricated structure consisting of a longitudinal rail with transversely connected members (rungs) that project from one side (side-supported) or both sides (center-supported), which can be single- or multi-tier.

solid-bottom or non-ventilated cable tray: A fabricated structure consisting of a bottom without ventilation openings within integral or separate longitudinal side rails.

straight section: A length of cable tray that has no change in direction or size.

trough or ventilated cable tray: A fabricated structure consisting of integral or separate longitudinal rails and a bottom having openings sufficient for the passage of air, fumes, and vapors, and heat dissipation, utilizing 75% or less of the plan area of the surface to support cables where the maximum open spacings

between cable support surfaces of transverse elements do not exceed 100 millimeters (mm) (4 inch (in.)) in the direction parallel to the tray side rails.

Notes:

a. On horizontal bends only, the maximum distance between transverse elements is measured at the centerline of the bend.
b. A ladder cable tray having rung spacing such that the cable tray meets the definition described above is considered to be a ventilated cable tray.

vertical elbow: A fitting that changes the direction of cable tray to a different plane.

vertical tee: A fitting that joins cable trays in three directions at 90° intervals in different planes.

wire mesh cable tray: A fabricated structure consisting of steel wires welded at all intersections.

wire mesh cable tray fitting: A fitting for wire mesh cable tray systems, fabricated from wire mesh cable tray straight sections.

Note: Most fittings are field-constructed, and are attached to the adjacent sections using splice connectors in accordance with the manufacturer's instructions.