

NATIONAL ELECTRICAL CODE, NEC (2011)

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Article 355 - Reinforced Thermosetting Resin Conduit Type (RTRC)

I. General

355.1 Scope.

This article covers the use, installation, and construction specification for reinforced thermosetting resin conduit (RTRC) and associated fittings.

Informational Note: Refer to Article 352 for Rigid Polyvinyl Chloride Conduit: Type PVC, and Article 353 for High Density Polyethylene Conduit: Type HDPE.

355.2 Definition.

Reinforced Thermosetting Resin Conduit (RTRC). A rigid nonmetallic conduit of circular cross section, with integral or associated couplings, connectors, and fittings for the installation of electrical conductors and cables.

355.6 Listing Requirements.

RTRC, factory elbows, and associated fittings shall be listed.

II. Installation

355.10 Uses Permitted.

The use of RTRC shall be permitted in accordance with 355.10 (A) through (I).

- (A) Concealed. RTRC shall be permitted in walls, floors, and ceilings
- (B) Corrosive Influences. RTRC shall be permitted in locations subject to severe corrosive influences as covered in 300.6 and where subject to chemicals for which the materials are specifically approved.
- (C) Cinders. RTRC shall be permitted in cinder fill.
- (D) Wet Locations. RTRC shall be permitted in portions of dairies, laundries, canneries, or other wet locations and in locations where walls are frequently washed, the entire conduit system, including boxes and fittings used therewith, shall be installed and equipped so as to prevent water from entering the conduit. All supports, bolts, straps, screws, and so forth, shall be of corrosion-resistant materials or be protected against corrosion by approved corrosion-resistant materials.
- (E) Dry and Damp Locations. RTRC shall be permitted for use in dry and damp locations not prohibited by 355.12.
- (F) Exposed. RTRC shall be permitted for exposed work if identified for such use.

Informational Note: RTRC, Type XW, is identified for areas of physical damage.

- (G) Underground Installations. For underground installations, see 300.5 and 300.50.
- (H) Support of Conduit Bodies. RTRC shall be permitted to support nonmetallic conduit bodies not larger than the largest trade size of an entering raceway. These conduit bodies shall not support luminaires or other equipment and shall not contain devices other than splicing devices as permitted by 110.14(B) and 314.16(C)(2).
- (I) Insulated temperature Limitations: Conductors or cables rated at temperature higher than the listed temperature rating of RTRC conduit shall be permitted to be installed in RTRC conduit, if the conductors or cables are not operated at a temperature higher than the listed temperature rating of the RTRC conduit.**

355.12 Uses Not Permitted.

RTRC shall not be used in the following conditions.

- (A) Hazardous (Classified) Locations.
 - 1. In hazardous (classified) locations, except as permitted by other articles in this Code
 - 2. In Class I, Division 2 locations, except as permitted in 501.10(B)(3)
- (B) Support of Luminaries. For the support of luminaries or other equipment not described in 355.10(H).
- (C) Physical Damage. Where subject to physical damage unless identified for such use.*
- (D) Ambient Temperatures. Where subject to ambient temperatures in excess of 50°C (122°F) unless listed otherwise.**
- (E) Insulation Temperature Limitations. For conductors or cables operating at temperature higher than the RTRC listed operating temperature rating.
- (F) Theaters and Similar Locations. In theaters and similar locations, except as provided in Articles 518.4 and 520.5.
 - (*) Champion Haz Duct[®] is identified for such use, i.e. can be used where Physical Damage is of concern.
 - (**) Champion Duct[®] and Haz Duct[®] are listed for 110°C (230°F).

CANADIAN ELECTRICAL CODE, CEC (2009)

Rigid RTRC Conduit

12-1200 Scope

Rules 12-1202 to 12-1220 apply only to the installation of rigid RTRC conduit Type AG and Type BG.

12-1202 Use

- (1) Rigid RTRC conduit Type AG and Type BG shall be permitted to be installed
 - (a) underground in accordance with Rule 12-012; and
 - (b) in walls, floors, and ceilings where encased or embedded in at least 50 mm of masonry or poured concrete.
- (2) Rigid RTRC conduit Type AG shall, in addition to the locations permitted in Subrule (1), be permitted for exposed and concealed locations.

12-1204 Restrictions on use (see Appendix B)

Rigid RTRC conduit shall not be used in buildings required to be of non-combustible construction, unless it has a flame spread rating and smoke developed classification as specified in the National Building Code of Canada.

12-1206 Mechanical protection

Rigid RTRC conduit shall be provided with mechanical protection where exposed to damage either during installation or afterwards.

12-1208 Field bends

Rigid RTRC conduit shall not be bent in the field.

12-1210 Temperature limitations

Rigid RTRC conduit shall not be used where normal conditions are such that any part of the conduit is subjected to a temperature in excess of 110°C.

12-1212 Fittings

Rigid RTRC conduit shall not be threaded but shall be used with adapters and couplings specifically designed for the purpose.

12-1214 Expansion joints (see Appendix B)

Except where encased in concrete, at least one expansion joint shall be installed in any conduit run where the expansion of the conduit due to the maximum probable temperature change during and after installation will exceed 45 mm.

12-1216 Conduit supports

Where rigid RTRC conduit Type AG is run in accordance with Rule 12-1202(2), it shall be supported with hangers or clamps

- (a) in such a manner as to permit adequate linear movement to allow for expansion and contraction due to temperature change; and
- (b) with the spacings of the supports not greater than permitted by Rule 12-1010.

12-1218 Maximum number of conductors

The maximum number of conductors in rigid RTRC conduit shall be determined in accordance with Rule 12-1014.

12-1220 Provision for bonding

A separate bonding conductor shall be installed in rigid RTRC conduit in compliance with Rule 10-404.

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