

- (10) Direct buried, where identified for such use.
- (11) In hazardous (classified) locations where specifically permitted by other articles in this *Code*.
- (12) For service-entrance conductors where identified for such use and marked Type TC-ER.

Informational Note No. 2: See 310.14(A)(3) for temperature limitation of conductors.

336.12 Uses Not Permitted. Type TC tray cable shall not be installed or used as follows:

- (1) Installed where it will be exposed to physical damage
- (2) Installed outside a raceway or cable tray system, except as permitted in 336.10(4), 336.10(7), 336.10(9), and 336.10(10)
- (3) Used where exposed to direct rays of the sun, unless identified as sunlight resistant

336.24 Bending Radius. Bends in Type TC cable shall be made so as not to damage the cable. For Type TC cable without metal shielding, the minimum bending radius shall be as follows:

- (1) Four times the overall diameter for cables 25 mm (1 in.) or less in diameter
- (2) Five times the overall diameter for cables larger than 25 mm (1 in.) but not more than 50 mm (2 in.) in diameter
- (3) Six times the overall diameter for cables larger than 50 mm (2 in.) in diameter

Type TC cables with metallic shielding shall have a minimum bending radius of not less than 12 times the cable overall diameter.

336.80 Ampacity. The ampacity of Type TC tray cable shall be determined in accordance with 392.80(A) for 14 AWG and larger conductors, in accordance with 402.5 for 18 AWG through 16 AWG conductors where installed in cable trays, and in accordance with 310.14 where installed outside of cable trays, where permitted.

Part III. Construction Specifications

336.100 Construction. A metallic sheath or armor as defined in 330.116 shall not be permitted either under or over the nonmetallic jacket. Metallic shield(s) shall be permitted over groups of conductors, under the outer jacket, or both.

336.104 Conductors. For ungrounded, grounded, and equipment grounding conductors, the conductor sizes shall be 14 AWG through 1000 kcmil copper, nickel, or nickel-coated copper and 12 AWG through 1000 kcmil aluminum or copper-clad aluminum. Insulation types shall be one of the types listed in Table 310.4(1) or Table 310.4(2) that is suitable for branch circuit and feeder circuits or one that is identified for such use.

For control and signal conductors, the minimum conductor sizes shall be 18 AWG copper, nickel, or nickel-coated copper, 14 AWG copper-clad aluminum, and 12 AWG aluminum.

(A) Fire Alarm Systems. Where used for fire alarm systems, conductors shall also be in accordance with 760.49.

(B) Thermocouple Circuits. Conductors in Type TC cable used for thermocouple circuits in accordance with Part III of Article 724 shall also be permitted to be any of the materials used for thermocouple extension wire.

(C) Class 1 Circuit Conductors. Insulated conductors of 18 AWG and 16 AWG copper shall also be in accordance with 724.49.

336.116 Jacket. The outer jacket shall be a flame-retardant, nonmetallic material.

336.120 Marking. There shall be no voltage marking on a Type TC cable employing thermocouple extension wire.

336.130 Hazardous (Classified) Location Cable. Cable listed and marked Type TC-ER-HL shall comply with the following:

- (1) The overall nonmetallic jacket shall be suitable for the environment.
- (2) The overall cable construction shall be essentially circular in cross-section.
- (3) The overall nonmetallic jacket shall be continuous and gas/vapor tight.
- (4) For construction greater than 25.4 mm (1 in.) in diameter, the following shall apply:
 - a. The equipment grounding conductor shall be bare.
 - b. A metallic shield shall be included over all conductors under the outer jacket.

ARTICLE

337

Type P Cable

Part I. General

337.1 Scope. This article covers the use, installation, and construction specifications for up through 2000 volt Type P cable. (armored and unarmored).

337.6 Listing Requirements. Type P cables and associated fittings shall be listed.

Part II. Installation

337.10 Uses Permitted. Type P cable shall be permitted to be used: