TABLE 315.60(D)(4) *Ambient Temperature Correction Factors*

For ambient temperatures other than 40°C (104°F), multiply the allowable ampacities specified in the ampacity tables by the appropriate factor shown below.

Ambient Temperature (°C)	Temperature Rating of Conductor		Ambient Temperature (°F)
	90°C	105°C	
10 or less	1.26	1.21	50 or less
11–15	1.22	1.18	51–59
16–20	1.18	1.14	60–68
21–25	1.14	1.11	69–77
26–30	1.10	1.07	78–86
31–35	1.05	1.04	87–95
36–40	1.00	1.00	96–104
41–45	0.95	0.96	105–113
46–50	0.89	0.92	114–122
51–55	0.84	0.88	123–131
56–60	0.77	0.83	132–140
61–65	0.71	0.78	141–149
66–70	0.63	0.73	150–158
71–75	0.55	0.68	159–167
76–80	0.45	0.62	168–176
81–85	0.32	0.55	177–185
86–90	—	0.48	186–194
91–95	—	0.39	195–203
96–100	—	0.28	204–212

(F) Ampacity in Underground Electrical Ducts and Direct Buried in Earth. Ampacities for conductors and cables in underground electrical ducts and direct buried in earth shall be as specified in Table 315.60(C)(11) through Table 315.60(C)(20). Ampacities shall be based on the following:

(1) Ambient earth temperature of 20°C (68°F)
(2) Arrangement in accordance with Figure 315.60(D)(3)
(3) 100 percent load factor
(4) Thermal resistance (Rho) of 90
(5) Conductor temperatures 90°C (194°F) and 105°C (221°F)
(6) Minimum burial depths to the top electrical ducts or cables shall be in accordance with 305.15.
(7) Maximum depth to the top of electrical duct banks shall be 750 mm (30 in.), and maximum depth to the top of direct-buried cables shall be 900 mm (36 in.).

ARTICLE 320

Armored Cable: Type AC

Part I. General

320.1 Scope. This article covers the use, installation, and construction specifications for armored cable, Type AC.

Type AC cable is listed in sizes 14 AWG through 1 AWG copper and 12 AWG through 1 AWG aluminum or copper-clad aluminum and is rated at 600 volts or less. Exhibit 320.1 provides two examples of type AC cable. Note the paper wrap on the individual insulated conductors and the 16 AWG aluminum bonding strip that is in contact with the metal cable armor for its entire length. The bonding strip is not required to be brought into any box or enclosure with the circuit conductors and can be terminated at the cable fitting. The paper wrap and bonding strip are two features that distinguish Type AC cable from other metal jacketed cables.

At a glance, Type AC cable and interlocked armor Type MC cable look very similar, particularly in the sizes used for general lighting and receptacle branch circuits. However, there are construction differences between the two based on the respective product standards (UL 4, *Standard for Armored Cable*, for Type AC and UL1569, *Standard for Metal-Clad Cables*, for Type MC). More important, though, are the *NEC*® applications of the two cables in which the requirement calls for certain construction features depending on which of the cables is being used. Examples of such requirements include 517.13(A) and (B), 518.4(A), and 530.11.

Notwithstanding requirements that call for construction features available only in Type MC cable (such as an impervious nonmetallic outer covering), there are also requirements such as 516.7, 516.38, and 690.31(D)(1) that specifically call for the use of Type MC cable. Although many electricians generically refer to cables with an outer metal jacket as "BX," it must be understood that the cable is either a Type AC or a Type MC cable and recognizing the difference between them is important to getting the installation correct. See 310.8(B) for information on how Types AC and MC cables are required to be marked.

320.6 Listing Requirements. Type AC cable and associated fittings shall be listed.

Part II. Installation

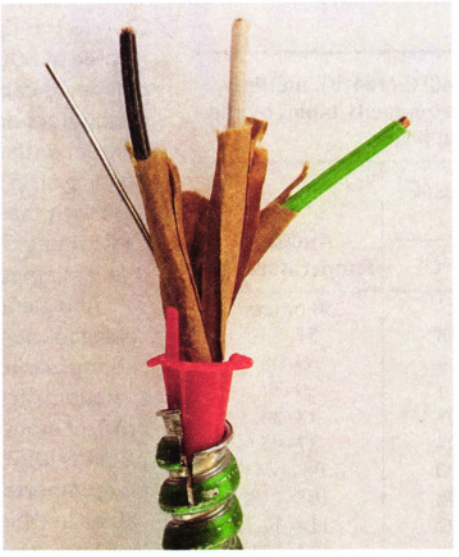
320.10 Uses Permitted. Type AC cable shall be permitted as follows:

(1) For feeders and branch circuits in both exposed and concealed installations
(2) In cable trays
(3) In dry locations
(4) Embedded in plaster finish on brick or other masonry, except in damp or wet locations
(5) To be run or fished in the air voids of masonry block or tile walls where such walls are not exposed or subject to excessive moisture or dampness

Informational Note: The "Uses Permitted" is not an all-inclusive list.

320.12 Uses Not Permitted. Type AC cable shall not be used as follows:

Type AC cable with insulated circuit conductors in a metal armor that also serves as the EGC



Type AC cable with insulated circuit conductors in a metal armor that also serves as one EGC, plus a second insulated wire-type EGC

EXHIBIT 320.1 Two examples of Type AC cable. *(Courtesy of AFC Cable Systems, a Part of Atkore International)*

(1) Where subject to physical damage
(2) In damp or wet locations
(3) In air voids of masonry block or tile walls where such walls are exposed or subject to excessive moisture or dampness
(4) Where exposed to corrosive conditions
(5) Embedded in plaster finish on brick or other masonry in damp or wet locations

320.15 Exposed Work. Exposed runs of cable, except as provided in 300.11(B), shall closely follow the surface of the building finish or of running boards. Exposed runs shall also be permitted to be installed on the underside of joists where supported at each joist and located so as not to be subject to physical damage.

320.17 Through or Parallel to Framing Members. Type AC cable shall be protected in accordance with 300.4(A), (C), and (D) where installed through or parallel to framing members.

320.23 In Accessible Attics. Type AC cables in accessible attics or roof spaces shall be installed as specified in 320.23(A) and (B).

(A) Cables Run Across the Top of Framing Members. Where run across the top of framing members, or across the face of rafters or studding within 2.1 m (7 ft) of the floor or horizontal surface, the cable shall be protected by guard strips that are at least as high as the cable. Where this space is not accessible by permanently installed stairs or ladders, protection shall only be required within 1.8 m (6 ft) of the nearest edge of the scuttle hole or attic entrance.

A permanently installed stairway is typically one that is built in place and if constructed new is built in compliance with the applicable building code. A permanently installed ladder is simply a ladder that is installed so that access to the attic can be accomplished without having to bring a portable ladder to the attic access location. Permanently installed stairs and ladders promote use of the attic space for storage, which can lead to damaged cables if not protected as specified in this section.

(B) Cable Installed Parallel to Framing Members. Where the cable is installed parallel to the sides of rafters, studs, or ceiling or floor joists, neither guard strips nor running boards shall be required, and the installation shall also comply with 300.4(D).

320.24 Bending Radius. Bends in Type AC cable shall be made such that the cable is not damaged. The radius of the curve of the inner edge of any bend shall not be less than five times the diameter of the Type AC cable.

320.30 Securing and Supporting.

(A) General. Type AC cable shall be supported and secured by staples; cable ties listed and identified for securement and support; straps, hangers, or similar fittings; or other approved means designed and installed so as not to damage the cable.

Type AC cable fittings shall be permitted as a means of cable support.

(B) Securing. Unless otherwise permitted, Type AC cable shall be secured within 300 mm (12 in.) of every outlet box, junction box, cabinet, or fitting and at intervals not exceeding 1.4 m (4½ ft).

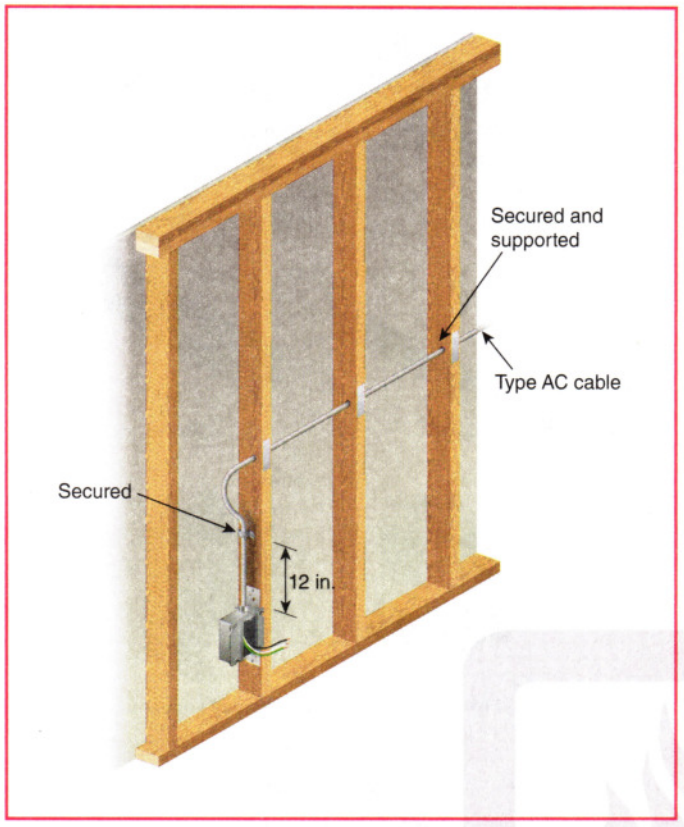


EXHIBIT 320.2 Type AC cable supported by framing members and secured within 12 inches of the outlet box.

(C) Supporting. Unless otherwise permitted, Type AC cable shall be supported at intervals not exceeding 1.4 m (4½ ft).

Horizontal runs of Type AC cable installed in wooden or metal framing members or similar supporting means shall be considered supported and secured where such support does not exceed 1.4 m (4½ ft) intervals.

Bored or punched holes in framing members support and secure horizontal runs of Type AC cable. Additional securing and supporting are not needed, provided the cable is secured within 12 inches of the outlet and the framing members are less than 4½ feet apart. Exhibit 320.2 illustrates the difference between securing and supporting.

Δ **(D) Unsupported Cables.** Type AC cable shall be permitted to be unsupported and unsecured where the cable complies with any of the following:

(1) Is fished between access points through concealed spaces in finished buildings or structures and supporting is impracticable
(2) Is not more than 600 mm (2 ft) in length at terminals where flexibility is necessary
(3) Is not more than 1.8 m (6 ft) in length from the last point of cable support to the point of connection to a luminaire(s) or other electrical equipment and the cable and point of connection are within an accessible ceiling

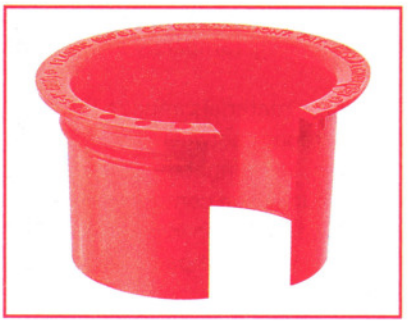


EXHIBIT 320.3 An anti-short bushing designed to protect insulated conductors from abrasion. *(Courtesy of Eaton, Crouse-Hinds Division)*

320.40 Boxes and Fittings. At all points where the armor of AC cable terminates, a fitting shall be provided to protect wires from abrasion, unless the design of the outlet boxes or fittings is such as to afford equivalent protection, and, in addition, an insulating bushing or its equivalent protection shall be provided between the conductors and the armor. The connector or clamp by which the Type AC cable is fastened to boxes or cabinets shall be of such design that the insulating bushing or its equivalent will be visible for inspection. Where change is made from Type AC cable to other cable or raceway wiring methods, a box, fitting, or conduit body shall be installed at junction points as required in 300.15.

An anti-short bushing (sometimes referred to as a "red head") is shown in Exhibit 320.3. It is a plastic insert placed between the metal jacket of a Type AC cable and the insulated conductors at the point where the conductors emerge from the metal jacket of the Type AC cable. The anti-short bushing provides the insulated conductors with an additional level of short-circuit and ground-fault protection where they are most vulnerable.

Armored cable connectors are considered suitable for equipment grounding if installed in accordance with 300.10.

320.80 Ampacity. The ampacity shall be determined in accordance with 310.14.

(A) Thermal Insulation. Armored cable installed in thermal insulation shall have conductors rated at 90°C (194°F). The ampacity of cable installed in these applications shall not exceed that of a 60°C (140°F) rated conductor. The 90°C (194°F) rating shall be permitted to be used for ampacity adjustment and correction calculations; however, the ampacity shall not exceed that of a 60°C (140°F) rated conductor.

Where more than two Type AC cables containing two or more current-carrying conductors in each cable are installed in contact with thermal insulation, caulk, or sealing foam without maintaining spacing between cables, the ampacity of each conductor shall be adjusted in accordance with Table 310.15(C)(1).

Armored cable installed in thermal insulation has a decreased heat dissipation capacity. Cable marked "ACTH" indicates an armored cable rated 75°C and employing conductors having thermoplastic insulation. Cable marked "ACTHH" indicates an armored cable rated 90°C and employing conductors having thermoplastic insulation. Cable marked "ACHH" indicates armored cable rated 90°C and employing conductors having