

Exception: A grounded conductor shall be permitted to be uninsulated as follows:

- (1) Bare copper used in a raceway or part of a service cable assembly
- (2) Bare copper for direct burial where bare copper is approved for the soil conditions
- (3) Bare copper for direct burial without regard to soil conditions where part of a cable assembly identified for underground use
- (4) Aluminum or copper-clad aluminum without individual insulation or covering where part of a cable assembly or identified for underground use in a raceway, or for direct burial
- (5) Bare conductors used in an auxiliary gutter

230.42 Minimum Size and Ampacity.

- Δ (A) **General.** Service-entrance conductors shall have an ampacity of not less than the maximum load to be served. Conductors shall be sized not less than the largest of 230.42(A)(1) or (A)(2). Loads shall be determined in accordance with Part III, IV, or V of Article 220, as applicable. Ampacity shall be determined from 310.14 and shall comply with 110.14(C). The maximum current of busways shall be that value for which the busway has been listed or labeled.

Informational Note: See UL 857, *Standard for Safety for Busways*, for information on busways.

- N (1) **Continuous and Noncontinuous Loads.** Where the service-entrance conductors supply continuous loads or any combination of noncontinuous and continuous loads, the minimum service-entrance conductor size shall have an ampacity not less than the sum of the noncontinuous loads plus 125 percent of continuous loads.

Exception No. 1: Grounded conductors that are not connected to an overcurrent device shall be permitted to be sized at 100 percent of the sum of the continuous and noncontinuous load.

Exception No. 2: The sum of the noncontinuous load and the continuous load if the service-entrance conductors terminate in an overcurrent device where both the overcurrent device and its assembly are listed for operation at 100 percent of their rating shall be permitted.

- N (2) **Application of Adjustment or Correction Factors.** The minimum service-entrance conductor size shall have an ampacity not less than the maximum load to be served after the application of any adjustment or correction factors.

(B) **Specific Installations.** In addition to the requirements of 230.42(A), the minimum ampacity for ungrounded conductors for specific installations shall not be less than the rating of the service disconnecting means specified in 230.79(A) through (D).

(C) **Grounded Conductors.** The grounded conductor shall not be smaller than the minimum size as required by 250.24(D).

230.43 Wiring Methods for 1000 Volts, Nominal, or Less. Service-entrance conductors shall be installed in accordance with the applicable requirements of this *Code* covering the type of wiring method used and shall be limited to the following methods:

- (1) Open wiring on insulators
- (2) Type IGS cable
- (3) Rigid metal conduit (RMC)
- (4) Intermediate metal conduit (IMC)
- (5) Electrical metallic tubing (EMT)
- (6) Electrical nonmetallic tubing
- (7) Service-entrance cables
- (8) Wireways
- (9) Busways
- (10) Auxiliary gutters
- (11) Rigid polyvinyl chloride conduit (PVC)
- (12) Cablebus
- (13) Type MC cable
- (14) Mineral-insulated, metal-sheathed cable, Type MI
- (15) Flexible metal conduit (FMC) not over 1.8 m (6 ft) long or liquidtight flexible metal conduit (LFMC) not over 1.8 m (6 ft) long between a raceway, or between a raceway and service equipment, with a supply-side bonding jumper routed with the flexible metal conduit (FMC) or the liquidtight flexible metal conduit (LFMC) according to 250.102(A), (B), (C), and (E)
- (16) Liquidtight flexible nonmetallic conduit (LFNC)
- (17) High density polyethylene conduit (HDPE)
- (18) Nonmetallic underground conduit with conductors (NUCC)
- (19) Reinforced thermosetting resin conduit (RTRC)
- (20) Type TC-ER cable where identified for use as service entrance conductors
- (21) Flexible bus systems

Section 230.43(15) permits no more than 6 feet of flexible metal conduit or liquidtight flexible metal conduit to be used as a service wiring method. Because of the high levels of fault energy available on the line side of the service disconnecting means, a bonding jumper must be installed where these raceway types are used for service conductors. The bonding jumper is allowed to be installed inside or outside the raceway, but when installed outside the raceway it must follow the path of the raceway and cannot exceed 6 feet in length. To minimize the impedance of the ground-fault current return path, the bonding jumper must not be wrapped or spiraled around the flexible conduit.

230.44 Cable Trays. Cable tray systems shall be permitted to support service-entrance conductors. Cable trays used to support service-entrance conductors shall contain only service-entrance conductors and shall be limited to the following methods: