

Section 16120

Conductors and Cables

PART 1: General

- 1.1 *Summary* – This Section includes the following:
 - 1.1.1 Wires and cables rated 600 V and less
 - 1.1.2 Connectors and terminations rated 600 V and less
- 1.2 *Restrictions* – All wire/cable runs of any type must be continuous. Splices are expressly prohibited. There shall be no wire nuts in panel boards.
- 1.3 *Definitions* –
 - 1.3.1 *NBR* – Acrylonitrile-butadiene rubber
 - 1.3.2 *FVR* – Full-Voltage Starter
 - 1.3.3 *RVSS* – Reduced-Voltage Soft Starter
 - 1.3.4 *TSP* – Twisted Shielded Pair
 - 1.3.5 *VFD* – Variable Frequency Drive
- 1.4 *Submittals* – Product Data for each type of product indicated.
- 1.5 *Quality Assurance* –
 - 1.5.1 *Electrical Components, Devices, and Accessories* – Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 1.5.2 *Standards* – Comply with NFPA 70.

PART 2: Products

- 2.1 *Conductors and Cables* –
 - 2.1.1 *Manufacturers* – Subject to compliance with requirements, provide products by one of the following:
 - 2.1.1.1 Alcan Products Corporation; Alcan Cable Division
 - 2.1.1.2 American Insulated Wire Corp.; a Leviton Company
 - 2.1.1.3 General Cable Corporation

- 2.1.1.4 Senator Wire & Cable Company
- 2.1.1.5 Southwire Company
- 2.1.1.6 The Okonite Company
- 2.1.2 Requirements – All conductors shall be stranded. No solid conductors shall be allowed.
- 2.1.3 *Copper Conductors* – Comply with NEMA WC 70
- 2.1.4 *Conductor Insulation* – Comply with NEMA WC 70 for Types THHN-2/THWN-2
- 2.1.5 *Multi-conductor Cable* – Comply with NEMA WC 70 for Types SOOW
- 2.1.6 *Instrumentation Cable* – Comply with NEMA WC 70 for TSP
- 2.2 *Connectors* –
 - 2.2.1 *Manufacturers* – Subject to compliance with requirements, provide products by one of the following:
 - 2.2.1.1 AFC Cable Systems, Inc.
 - 2.2.1.2 Hubbell Power Systems, Inc.
 - 2.2.1.3 O-Z/Gedney; EGS Electrical Group LLC
 - 2.2.1.4 3M; Electrical Products Division
 - 2.2.1.5 Tyco Electronics Corp
 - 2.2.2 *Description* – Factory-fabricated connectors of size, ampacity rating, material, type, and class for application and service indicated.

PART 3: Execution

- 3.1 *Conductor Material Applications* –
 - 3.1.1 Feeders: Copper
 - 3.1.2 Branch Circuits: Copper
- 3.2 *Conductor Insulation and Multi-conductor Cable Applications and Wiring Methods* –
 - 3.2.1 *Service Entrance* – Type THHN-2/THWN-2, single conductors in raceway.
 - 3.2.2 *Feeders Concealed in Concrete, Below Slabs-on-Grade, and Underground (not into wet well)* – Type THHN-2/THWN-2, single conductors in raceway.
 - 3.2.3 *Branch Circuits, into Wet Well* – Type SOOW, multi-conductor hard service cord.

- 3.2.3.1 Shall be supported by means of a stainless steel, wire mesh, strain relief device located in an accessible location from the wet well access door.
- 3.2.3.2 Be routed with wet well to not cause damage to cord during operation or removal of serving mechanical equipment or control device for maintenance purposes.
- 3.2.3.3 Be connected to serving mechanical equipment or control device in such manner as to be rated for a Class I, Division I rated assembly.
- 3.2.4 *Class 1 & 2 Control Circuits* – Type THHN-2/THWN-2, in raceway or Type SOOW as applicable.
- 3.2.5 *Analog Instrumentation Circuits* – Type TSP (in raceway-Type TC) shield Flexible Tray Cable.
- 3.3 *Installation of Conductors and Cables* –
 - 3.3.1 Use Manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed Manufacturer's recommended maximum pulling tensions and sidewall pressure values.
 - 3.3.2 Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
 - 3.3.3 Identify and color-code conductors and cables according to Section 16075-"Electrical Identification."
- 3.4 *Connections* – Tighten electrical connectors and terminals according to Manufacturer's published torque-tightening values. If Manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.