



2017

NATIONAL ELECTRICAL CODE / GUIDE



The NEC 2017 is upon us, and the following represents a synopsis of how it has changed over the 2014 code.

NEW ARTICLES

- 425 Fixed Resistance and Electrode Industrial Process Heating Equipment
- 691 Large-Scale Photovoltaic (PV) Electric Power Production Facility
- 706 Energy Storage Systems
- 710 Stand-Alone Systems
- 712 Direct Current Microgrids

OVERVIEW OF CHANGES TO ARTICLE 90, INTRODUCTION

Some minor changes have been made to 90.2 clarifying what the NEC applies to and what it does not apply to.

The words “and removal” have been added in the first sentence of 90.2(A). This revision expands the scope of the NEC beyond just installation requirements to include requirements addressing removal of equipment. Current NEC rules require removal of equipment such as those for removal of temporary power wiring and those for removing abandoned communications cables.

The term “Energy Storage” is specifically included in 90.2(B) clarifying that energy storage installed and under the exclusive control of a utility is not covered by the NEC, but it could be covered in the NESC or other regulations.

OVERVIEW OF CHANGES TO CHAPTER 1, GENERAL

Several definitions in Article 100 Definitions have been revised for clarity including Buildings, Structures, Readily Accessible, Receptacles, and Substation e.g., Readily Accessible - now makes it clear that “keys” are not considered tools and, as such, panels requiring a key for access may still be considered readily accessible. This revision also makes it clear that having to crawl under equipment, such as a conveyor line, would render electrical equipment on the other side not readily accessible.

The definition of Receptacle was modified to accommodate electrical utilization equipment that is now installed that does not use the traditional attachment plug cap to connect directly to the corresponding contact device.

New definitions include Cord Connectors for Hazardous Locations as well as Field Evaluation Terminology.

- Cord Connector [as applied to Hazardous (Classified) Locations] – “A fitting intended to terminate a cord to a box or similar device and reduce the strain at points of termination and may include an explosionproof, a dustignitionproof, or a flameproof seal.” This new definition clears up questions in terminology between standard cord connectors and those used on Tray Cable (TC-ER and TC-ER-HL) in classified locations.
- Field Labeled - “Equipment or materials to which have been attached a symbol, a label, or other identifying mark of an FEB (Field Evaluation Body) indicating the equipment or materials were evaluated and found to comply with requirements as described in the accompanying field evaluation report.” Field Evaluations have become more prominent in electrical installation work and the Code now addresses the activity.

Definitions related to Hazardous (Classified) Locations have been relocated from Chapter 5 to Article 100.

110.14 Electrical Connections has a new subsection regarding mandatory tightening torque requirements.

- 110.14 (D) Installation. If a tightening torque is indicated as a numeric value on the equipment or the manufacturer's installation instructions, a calibrated court tool must be used to achieve the required torque value, (unless the manufacturer provides alternative instructions).

NEW LABELING REQUIREMENTS FOR:

- Arc Flash Warning Label on Service Equipment in other than Dwelling Units.
 - 110.16 (B) Service Equipment In other than dwelling units, in addition to the general labeling requirements in subsection (A), a permanent label shall be field or factory applied to the service equipment rated 1200 A or more. Additional provisions apply.
- Labeling of reconditioned equipment.
 - 110.21 (A) Equipment Marking (2) "Reconditioned equipment shall be identified as "reconditioned" and approval of the reconditioned equipment shall not be solely based on the equipment's original listing."

110.26. New working space provisions for spaces of "Limited Access" for equipment above lay-in ceilings and in crawl spaces now apply.

110.41 is a new section on Inspections and Tests.

- 110.41 Inspections and Tests (A) Pre-energization and Operating Tests "Where required elsewhere in this Code, the complete electrical system design, including settings for protective, switching and control circuits, shall be prepared in advance and made available on request to the authority having jurisdiction and shall be tested when first installed on site."

OVERVIEW OF CHANGES TO CHAPTER 2, WIRING AND PROTECTION

- There are changes to identification of conductors for Branch Circuits.
- There are changes in Ground-Fault Circuit-Interrupter Protection for Personnel.
- There is expansion of AFCI protection.
- There are several changes within 210.52 for Dwelling Unit Receptacle Outlets.
- There are new provisions for Garage Branch Circuits.

210.5 Identification of Branch Circuits (1) Branch circuits supplied from more than one nominal system are to be identified. (2) Branch circuits supplied from Dc systems are to be marked. The change is an exception permitting only the new distribution system be marked in existing installations with a voltage system already in place.

210.8 New sink distance measurement requirements for determining the "six foot" rule.

210.8 (B) Other Than Dwelling Units now applies to all single phase receptacles rated 150 V to ground or less, 50 A or less and three-phase receptacles 150 V to ground or less, 100 A or less. See 1 through 10 for location requirements.

210.12 AFCI Additional installations where children may be present.

210.52 New spacing requirements for wall units and peninsulas; at least one receptacle outlet installed in each vehicle bay in garages.

- Changes to Article 250 Grounding and Bonding:

250.22 makes it clear that the Low Voltage Suspended Ceiling Lighting is not to be grounded.

250.22 Circuits Not to Be Grounded. The following circuits shall not be grounded: (6) Class 2 load side circuits for suspended ceiling low-voltage power grid distribution systems.

The building grounding electrode system must be used as the grounding electrode for a separately derived system.

250.30 Grounding Separately Derived AC Systems. (4) The building or structure grounding electrode system shall be used as the grounding electrode for the separately derived system. If located outdoors, the grounding electrode shall be in accordance with 250.30 (C).

There are changes in terminology in 250.52 reflecting the new term "Metal In-Ground Support Structure(s)" plus other revisions to Grounding Electrodes.

250.52 (B) - This section describes systems that shall not be used as a grounding electrode, specifically the change is (3) The structures and structural reinforcing steel described in the 680.26(B)(1) and (B)(2). 680.26 addresses Equipotential Bonding in Swimming Pools, Fountains, and Similar Installations.

250.66 revision removes confusion with the term "sole connection" when sizing the Grounding Electrode Conductor.

OVERVIEW OF CHANGES TO CHAPTER 3, WIRING METHODS AND MATERIALS

- There are revisions to 300.5 allows for reduced burial depths for landscape lighting.
- There are changes to 310.15 Ampacities for Conductors Rated 0 – 2000 V.
 - (B)(3)c Rooftop Temperature Adders. (Removed for 2017)
- 314.27 (E) is a new subsection under Outlet Boxes to address the technology for Separable Attachment Fittings.
- There are new provisions in Article 336 for Uses Permitted for Type TC Cable.
- 366.20 is a new provision for conductors connected in parallel and will require grouping of parallel conductors installed in Auxiliary Gutters to minimize the effects of inductive heating.

300.5 The Table has an additional note (b) which allows for a 6 inch depth for pool, spa, and fountain lighting, installed in a nonmetallic raceway, limited to not more than 30 V where part of a listed low-voltage lighting system.

336.10 Uses Permitted. (7) Between a cable tray and the utilization equipment or devices, provided all of the following apply: (a)(b)(c)(d)(e)(f). (9) In one and two family dwelling units, TC-ER cable containing both power and control conductors that is identified for pulling through structural members shall be permitted. Type TC-ER cable used as interior wiring shall be installed per the requirements of part II of article 334. (10) Direct buried, were identified for such use.

366.20 is a new section addressing conductors connected in parallel in Auxiliary Gutters. The conductors must be grouped and consist of not more than one conductor per phase, neutral, or grounded conductor to prevent current imbalance in the paralleled conductors due to inductive reactance.

OVERVIEW OF CHANGES TO CHAPTER 4, EQUIPMENT FOR GENERAL USE

- There are more specific requirements for the markings on controlled receptacles.
- There are New Construction requirements for receptacles with integral Class 2 circuits.
- The use for "Extra Duty" Covers is clarified.
- There is expansion of the use of Tamper Resistant Receptacles.
- There are new guarding requirements for service terminals and busbars.
- There are new requirements for Short Circuit Current ratings and Available Fault Current on Industrial Control Panels, in addition to other marking requirements.
- GFCI requirements for appliances are clarified.
- 430.99 is a new section requiring MCC's be marked with the available short circuit current.
- New Article 425 - Fixed Resistance and Electrode Industrial Process Heating Equipment

406.3 (E) Controlled Receptacle Marking. Automated receptacles for the purpose of energy management or building automation shall be properly marked with a symbol and the word "controlled." This should remove the confusion as to whether the symbol appears on the cover plate or the receptacle.

406.3 (F) Receptacle with USB Charger. "A 125 V 15- or 20- amp receptacle that additionally provides Class 2 power shall be listed and constructed such that the Class 2 circuitry is integral with the receptacle."

406.9 (B) (1) Receptacles of 15 and 20 Amperes in a Wet Location. In these locations the enclosure is to be weatherproof whether or not a plug is inserted. An outlet box hood installed for this purpose shall be listed and shall be identified as "extra duty".

406.12 Tamper Proof Receptacles. Added: (4) preschools and elementary education facilities, (5) Business offices, corridors, waiting rooms and the like in clinics, medical and dental offices and outpatient facilities. (6) Places of waiting transportation, gymnasiums, skating rinks, and auditoriums. (7) Dormitories.

408.3 (A) (2) Service Panelboards, Switchboards, and Switchgear. Requires barriers now be place in panelboards. Exception: This requirement does not apply to service panels with provisions for more than one service disconnect within a single enclosure.

OVERVIEW OF CHANGES TO CHAPTER 5 SPECIAL OCCUPANCIES

- Definitions for Hazardous (Classified) Locations have been relocated.

OVERVIEW OF CHANGES TO CHAPTER 6 SPECIAL EQUIPMENT

- There are new labeling requirement for fluorescent fixtures that have been retrofitted for LED lamps.
- There are new labeling for Industrial Machinery requiring available short circuit current.
- There are new Article 691 Large-Scale Photovoltaic (PV) Supply Stations.

600.4 (B) Signs with a Retrofitted Illumination System. (3) LED powered signs retrofitted from fluorescent, need to include a label alerting service personnel the sign has been modified.

670.5 Short Circuit Current Rating. (1) Industrial machinery shall not be installed where the available short-circuit current exceeds its short current rating as marked. (2) Industrial machinery shall be legibly marked in the field with the maximum available short-circuit current. The field marked shall include the date the shortcircuit calculation was performed.

691 Large Scale Photovoltaic (PV) space Electrical Supply Stations. NEW. This article covers the installation of large-scale PV elected supply stations with a generating capacity no less than 5000 KW and not under exclusive utility control.

OVERVIEW OF CHANGES TO CHAPTER 7 SPECIAL OCCUPANCIES

- Emergency circuits, equipment and components must be marked to indicate they are part of the emergency system.
- There are new Articles in Chapter 7:
 - 706 Energy Storage Systems
 - 710 Stand-Alone Systems
 - 712 Direct Current Microgrids