# 2020 NFPA Codes & Standards - News Flash

The National Fire Protection Association has just published the 2020 National Electrical Code® (*NEC*). Several changes are important to the communications cable industry.

## Creation of a New Article 800, General Requirements for Communications Systems

The 2017 *NEC* has five Articles in Chapter 8, Communications Systems:

Article 800, *Communications Circuits*

Article 810, *Radio and Television Equipment*

Article 820, *Community Antenna Television and Radio Distribution Systems*

Article 830, *Network-Powered Broadband Communications Systems*

Article 840, *Premises-Powered Broadband Communications Systems*

The 2020 *NEC* has added a general article to Chapter 8. The six Articles are:

Article 800, *General Requirements for Communications Systems* (new Article)

Article 805, *Communications Circuits* (formerly Article 800)

Article 810, *Radio and Television Equipment*

Article 820, *Community Antenna Television and Radio Distribution Systems*

Article 830, *Network-Powered Broadband Communications Systems*

Article 840, *Premises-Powered Broadband Communications Systems*

The primary purpose of the new article is to consolidate redundant requirements by placing them into one general article. The following are examples of interest to the communications cable industry:

Cable listing requirements for communications, cable TV and network-powered broadband communications cables have been removed from Article 805 (formerly Article 800), Article 820 and Article 830 and placed in new Article 800.

Listing requirements for Cable Routing Assemblies and Communications Raceways have been moved from Article 805 to the new general article (Article 800).

Applications for listed communications wires, cables and network-powered communications cables have been removed from Article 805 (formerly Article 800), Article 820 and Article 830 and placed in new Article 800.

Definitions of terms used in multiple articles in Chapter 8 have been moved to the new general article (Article 800). Definitions used in multiple articles (other than just Chapter 8) have been moved to the definitions section in Chapter 1.

Many of the installation requirements for cables have been consolidated to new Article 800, including:

800.21 Access to electrical Equipment Behind Panels Designed to Allow Access

800.24 Mechanical Execution of Work

800.25 Abandoned Cables

800.26 Spread of Fire or Products of Combustion

800.27 Temperature Limitation of Wires and Cables - Note that the requirement in Section 800.27 is simplified. It replaces the reference in Section 800.3(H) of the 2017 *NEC* to Section 310.15(A)(3), with a requirement that "No wire or cable shall be used in such a manner that its operating temperature exceeds that of its rating."

800.49 Metal Entrance Conduit Grounding

800.53 Separation from Lightning Conductors

## Powering over Communications/Data Cables

The 2017 *NEC* added provisions for powering over communications/data cables, including, but not limited to, Power over Ethernet (PoE). In the 2017 *NEC* Section 840.160 permits communications cables to carry circuits for powering communications equipment in addition to the communications signal, provided that the power supplied doesn't exceed 60 watts. Above 60 watts, Section 840.160 defers to the requirements in Section 725.144 of Article 725, *Class 1, Class2, and Class 3 Remote-Control, Signaling, and Power-Limited Circuits*.

In the 2020 *NEC,* Section 840.160 has been modified to clarify that:

1. The communications cables must be listed communications cable listed in accordance with Section 805.179
2. The communications equipment must be listed communications equipment listed in accordance with Section 805.170
3. The power source must be listed in accordance with Section 840.170(G)
4. Listed 4-pair communications cables are permitted to substitute for Class 2 and Class 3 cables installed in accordance with the cable substitution requirements Section 725.154(A).

In the 2017 and 2020 *NEC,* Section 725.144 has two alternate provisions for assuring that the cables carrying power and signaling do not exceed their temperature rating. The first option is to comply with the ampacity table, Table 725.144. The other option is to use "Limited Power" (-LP) cables and to keep the current in each conductor below the ampere limit marked on the cable. The listing requirements for Limited Power (LP) Cables are in Section 725.179(I) in the 2017 and 2020 *NEC*.

Local Area Network (LAN) cables are now nearly universally used for PoE applications. Listed 4-pair communications cables are almost always used in place of listed 4-pair Class 2 or Class 3 cables as permitted by the Cable Substitutions Table 725.154(A). 2020 *NEC* Section 805.179(D) has new provisions that recognize the listing of communications Limited Power (LP) cables for these applications.

In the 2020 *NEC,* the ampacity table in Section 725.144, which is based on a UL Fact-Finding study, has been modified to use true rounding instead of rounding down. In some instances this results in slightly higher ampacities being permitted.

## Grounding of Green Wires

Section 250.119 of the 2017 *NEC h*as a long-standing requirement that identifies the green wires in a cable as ground wires. This was obviously written with power cables in mind. There is an exception for communications, Class 2, Class 3 and power-limited fire alarm cables operating at less than 50 volts. That exception is clearly inadequate because many communications, Class 2, Class 3 and power-limited fire alarm circuits operate above 50 volts.

In the 2020 *NEC,* the 50 volt exception in 250.119 has been changed to be 50 volts ac or 60 volts dc in order to accommodate PoE. Additional changes in Section 725.3(P) for Class 2 and Class 3 cables and in Section 760.3(O) for power-limited fire alarm cables, permit green wires to be used ungrounded without the voltage limitations in Section 250.119. Code organization, Section 90.3 exempts Chapter 8 from the requirements of Chapters 1 through 7 unless specifically referenced in Chapter 8, consequently 250.119 doesn't apply to communication's circuits because that section is not referenced in Chapter 8.

CCCA submitted Public Comments to change Section 250.119 to permit all cables of Class 2, Class 3 and power-limited fire alarm circuits to be able to use the green wires for other than grounding purposes.

## Data Center Cabling

Article 645, *Information Technology Equipment*, covers the installation of information technology equipment in an information technology equipment room, i.e.; a data center. Article 645 is written to correlate with the fire protection requirements in NFPA 75, *Standard for the Fire Protection of Information Technology Equipment*. Prior to the 2017 edition, NFPA 75 always required active fire protection, typically sprinklers or a gaseous clean agent, in the raised floor plenum under the data center. The 2017 edition of NFPA 75 permits two alternate approaches to fire protection in the raised floor plenum, either provide active fire protection or only use plenum grade materials, which include, of course, plenum cable.

In the 2020 *NEC,* Section 645.5(E) correlates with NFPA 75-2017 by requiring plenum cables where cables are exposed to the airflow (not in conduit) in the area under the raised floor and that area is not protected by active fire suppression. Where active fire suppression is present, all cable types, except limited-use (CMX & CATVX), are permitted under the raised floor.

## Cable Marking

The *NEC* has always permitted marking on communications cables to indicate additional attributes beyond those required by the *Code*, for example, a LAN cable marked CAT 6A. The 2020 *NEC* now explicitly permits optional cable markings. Sections 725.179(K) and 805.179)(G) state that "Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials." Informational notes provide examples of optional markings.

## Painting of Cables

In the construction of office buildings, cables are often installed before construction is completed. Consequently, communications cables may be inadvertently spray-painted or coated with foreign substances. Painting the cables can change the cable performance properties in unknown ways. This is especially true of plenum cables, which are designed to have excellent fire resistance properties. Painting or coating of plenum cables might compromise their fire safety properties.

In order to alert users to this issue, the 2017 *NEC* added Informational Notes to Articles 770 (optical fiber cables), 800 (communications cables) and 820 (CATV coaxial cables). In the 2020 NEC, Informational Notes were added to Sections 725.24 and 760.24.Thes notes state:

> "Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of Class 1, Class 2, Class 3 and PLTC cable properties."
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> "Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of PLFA and NPLFA cable properties."

CCCA submitted Public Inputs to establish these new informational notes.