Second Revision No. 7562-NFPA 70-2024 [Global Comment]

Renumber Article 590 as Article 140.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Oct 14 16:57:47 EDT 2024

Committee Statement

Committee Statement: Article 590 will be relocated to Chapter 1 because temporary wiring is not a special occupancy.
Response Message: SR-7562-NFPA 70-2024

Public Comment No. 1192-NFPA 70-2024 [Article 590]

Second Revision No. 7756-NFPA 70-2024 [Global Comment]

[New Article 723 created]-see attached

Article 723 – Raceways, Cable Routing Assemblies, and Cable Trays for Limited-Energy Systems

Supplemental Information

File Name	Description	Approved
723_-_Terra_Copy.docx	For editorial use only	
NEC_Global_SR-7756_Article_723-new_for_ballot.docx	For ballot	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 12:23:57 EDT 2024

Committee Statement

Committee Statement: New Article 723 has been created to house the requirements for Limited-Energy Raceways, Cable Routing Assemblies, and Cable Trays. The scope of Article 722 covers the installation of Limited-Energy Cables. As such, the requirements for other Limited-Energy wiring methods like Raceways, Cable Routing Assemblies, and Cable Trays are more appropriately housed in a separate article.

Response Message: SR-7756-NFPA 70-2024

Public Comment No. 1312-NFPA 70-2024 [New Section after 722.182]

Public Comment No. 52-NFPA 70-2024 [New Article after 722]

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Article 723 Raceways, Cable Routing Assemblies, and Cable Trays for Limited-Energy Systems

Part I. General

723.1 Scope.

This article covers the application and installation of raceways, cable routing assemblies, and cable trays for limited-energy systems.

723.2 Listing.

Raceways, cables routing assemblies, and nonmetallic cable trays for limited-energy systems shall be listed in accordance with 723.2(A) and 723.2(B) .

(A) General.

Raceways, cable routing assemblies, and cable trays installed within buildings for limited-energy systems shall comply with the following:

(1) Listed as resistant to the spread of fire

(2) Suitable for their application as specified in Article 723 Parts II through IV

(B) Wet Locations.

Raceways, cable routing assemblies, and nonmetallic cable trays for limited-energy systems installed in wet locations shall be listed for wet locations.

Part II. Application and Installation of Raceways for Limited-Energy Systems

723.20 Application of Limited-Energy Raceways in Buildings.

Permitted and nonpermitted applications of limited-energy raceways shall be in accordance with Table 723.20

Table 723.20 Applications of Limited-Energy Raceways in Buildings

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Applications		Listed Communications Raceway Type		
		Plenum	Riser	General-Purpose
In ducts specifically fabricated for environmental air as described in 720.22(B)	In fabricated ducts	N	N	N
	In metal raceway that complies with 700.22(B)	N	N	N
In other spaces used for environmental air (plenums) as described in 720.22(C)	In other spaces used for environmental air	Y	N	N
	In metal raceway that complies with 700.22(C)	Y	Y	Y
	In plenum cable routing assemblies	N	N	N
	Supported by open metal cable trays	Y	N	N
	Supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y
In risers	In vertical runs	Y	Y	N
	In metal raceways	Y	Y	Y
	In fireproof shafts	Y	Y	Y
	In plenum cable routing assemblies	N	N	N
	In riser cable routing assemblies	N	N	N
	In one- and two-family dwellings	Y	Y	Y
Within buildings in other than air-handling spaces and risers	General	Y	Y	Y
	In one- and two-family dwellings	Y	Y	Y
	In multifamily dwellings	Y	Y	Y

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Applications	Listed Communications Raceway Type		
	Plenum	Riser	General-Purpose
In nonconcealed spaces	Y	Y	Y
Supported by cable trays	Y	Y	Y
Under carpet, modular flooring, and planks	N	N	N
In distributing frames and cross-connect arrays	Y	Y	Y
In any raceway recognized in Chapter 3	Y	Y	Y
In plenum cable routing assemblies	N	N	N
In riser cable routing assemblies	N	N	N
In general-purpose cable routing assemblies	N	N	N

Note: An "N" in the table indicates that the communications raceway type shall not be installed in the application. A "Y" indicates that the communications raceway type shall be permitted to be installed in the application, subject to the limitations described in 723.22 and 722.131.

723.22 Installation of Raceways for Limited-Energy Systems.

(A) Types of Raceways.

Limited-energy wires and cables shall be permitted to use raceways that comply with 723.22(A)(1), 723.22(A)(2), or 723.22(A)(3). Medium-power network-powered broadband communications cables shall not use raceways that comply with 723.22(A)(2).

(1) Permitted Raceways.

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Limited-energy wires and cables shall be permitted to be in any raceway included in Chapter 3 using the separation requirements of 722.15. The raceways shall be installed in accordance the applicable raceway article.

(2) Communications Raceways.

Limited-energy wires and cables shall be permitted to use plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with Table 723.20, listed in accordance with 723.2, and installed in accordance with 722.131 and 362.24 through 362.48, where the requirements applicable to electrical nonmetallic tubing (ENT) apply.

(3) Innerduct for Limited-Energy Cables.

Plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with Table 723.20 shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.

(B) Permitted Substitutions.

Substitutions of communications raceways shall be permitted in accordance with Table 723.22(B).

Table 723.22(B) Permitted Substitutions of Communications Raceways

Raceway Type	Permitted Substitution
Riser communications raceway	Plenum communications raceway
General purpose communications raceway	Plenum communications raceway, riser communications raceway

Part III. Application and Installation of Cable Routing Assemblies for Limited-Energy Systems

723.30 Application of Cable Routing Assemblies.

Permitted and nonpermitted applications of cable routing assemblies shall be in accordance with Table 723.30.

Table 723.30 Applications of Cable Routing Assemblies in Buildings

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Applications		Listed Cable Routing Assembly Type		
		Plenum	Riser	General-Purpose
In ducts specifically fabricated for environmental air as described in 720.22(B)	In fabricated ducts	N	N	N
	In metal raceway that complies with 700.22(B)	N	N	N
In other spaces used for environmental air (plenums) as described in 720.22(C)	In other spaces used for environmental air	Y	N	N
	In metal raceway that complies with 700.22(C)	N	N	N
	In plenum communications raceways	N	N	N
	Supported by open metal cable trays	Y	N	N
	Supported by solid bottom metal cable trays with solid metal covers	N	N	N
In risers	In vertical runs	Y	Y	N
	In metal raceways	N	N	N
	In fireproof shafts	Y	Y	Y
	In plenum communications raceways	N	N	N
	In riser communications raceways	N	N	N
	In one- and two-family dwellings	Y	Y	Y
	General	Y	Y	Y

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Applications		Listed Cable Routing Assembly Type		
		Plenum	Riser	General-Purpose
Within buildings in other than air-handling spaces and risers	In one- and two-family dwellings	Y	Y	Y
	In multifamily dwellings	Y	Y	Y
	In nonconcealed spaces	Y	Y	Y
	Supported by cable trays	Y	Y	Y
	Under carpet, modular flooring, and planks	N	N	N
	In distributing frames and cross-connect arrays	Y	Y	Y
	In any raceway recognized in Chapter 3	N	N	N
	In plenum communications raceways	N	N	N
	In riser communications raceways	N	N	N
	In general-purpose communications raceways	N	N	N

Note: An "N" in the table indicates that the cable routing assembly type shall not be installed in the application. A "Y" indicates that the cable routing assembly type shall be permitted to be installed in the application subject to the limitations described in 722.131.

723.32 Installation of Cable Routing Assemblies.

Limited-energy cables shall be permitted to use plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with Table 723.30 and installed in accordance with 723.32(A), 723.32(B), and 723.32(C).

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(A) Horizontal Support.

Cable routing assemblies shall be supported where run horizontally at intervals not to exceed 900 mm (3 ft) and at each end or joint, unless listed for other support intervals. In no case shall the distance between supports exceed 3 m (10 ft).

(B) Vertical Support.

Vertical runs of cable routing assemblies shall be supported at intervals not exceeding 1.2 m (4 ft), unless listed for other support intervals, and shall not have more than one joint between supports.

(C) Permitted Substitutions.

Substitutions of listed cable routing assemblies shall be permitted in accordance with Table 723.32(C).
Table 723.32(C) Permitted Substitutions of Cable Routing Assemblies

Raceway Type	Permitted Substitution
Riser cable routing assembly	Plenum cable routing assembly
General purpose cable routing assembly	Plenum cable routing assembly, riser cable routing assembly

Part IV. Cable Trays for Limited-Energy Systems

723.40 Cable Trays.

(A) General.

Limited-energy cables and communications raceways shall be permitted to be installed in metal or listed nonmetallic cable tray systems.

(B) Ladder Cable Trays.

Ladder cable trays shall be permitted to support cable routing assemblies.

Second Revision No. 7861-NFPA 70-2024 [Global Comment]

Revise the following sections in Article 760 as shown:

760.41 NPLFA Circuit Power Source Requirements.

(A) Power Source.

The power source of non–power-limited fire alarm circuits shall comply with Chapters 1 through 4, and the output voltage shall be not more than 600 volts, nominal. The fire alarm circuit disconnect shall be permitted to be secured in the “on” position.

(B) Branch Circuit.

The branch circuit supplying the fire alarm equipment(s) shall supply no other loads. The location of the branch-circuit ~~overcurrent protective device~~ OCPD shall be permanently identified at the fire alarm control unit. The circuit disconnecting means shall have red identification, shall be accessible only to qualified personnel, and shall be identified as “FIRE ALARM CIRCUIT.” The red identification shall not damage the ~~overcurrent protective devices~~ OCPDs or obscure the manufacturer’s markings. This branch circuit shall not be part of a multiwire branch circuit and shall not be supplied through ground-fault circuit interrupters or arc-fault circuit-interrupters.

760.45 NPLFA Circuit Overcurrent Protective Device Location.

~~Overcurrent devices~~ OCPDs shall be located at the point where the conductor to be protected receives its supply.

Exception No. 1: Transformer secondary conductors. Non-power-limited fire alarm circuit conductors supplied by the secondary of a single-phase transformer that has only a 2-wire (single-voltage) secondary shall be permitted to be protected by overcurrent protection provided by the primary (supply) side of the transformer, provided the protection is in accordance with 450.5 and does not exceed the value determined by multiplying the secondary conductor ampacity by the secondary-to-primary transformer voltage ratio. Transformer secondary conductors other than 2-wire shall not be considered to be protected by the primary overcurrent protection.

Exception No. 2: Electronic power source output conductors. Non-power-limited circuit conductors supplied by the output of a single-phase, listed electronic power source, other than a transformer, having only a 2-wire (single-voltage) output for connection to non-power-limited circuits shall be permitted to be protected by overcurrent protection provided on the input side of the electronic power source, provided this protection does not exceed the value determined by multiplying the non-power-limited circuit conductor ampacity by the output-to-input voltage ratio. Electronic power source outputs, other than 2-wire (single voltage), connected to non-power-limited circuits shall not be considered to be protected by overcurrent protection on the input of the electronic power source.

Informational Note: A single-phase, listed electronic power supply whose output supplies a 2-wire (single-voltage) circuit is an example of a non-power-limited power source that meets the requirements of 760.41.

760.121 Power Sources for PLFA Circuits.

(A) Power Source.

The power source for a power-limited fire alarm circuit shall be as specified in the following:

Informational Note No. 1: See Chapter 9, Tables 12(A) and 12(B), for the listing requirements for power-limited fire alarm circuit sources.

(1) A listed PLFA or Class 3 transformer

(2) A listed PLFA or Class 3 power supply

(3) Listed equipment marked to identify the PLFA power source

Informational Note No. 2: Examples of listed equipment are a fire alarm control panel with integral power source; a circuit card listed for use as a PLFA source, where used as part of a listed assembly; a current-limiting impedance, listed for the purpose or part of a listed product, used in conjunction with a non-power-limited transformer or a stored energy source, for example, storage battery, to limit the output current.

(B) Branch Circuit.

The branch circuit supplying the fire alarm equipment(s) shall comply with the following requirements:

(1) The branch circuit shall supply no other loads.

(2) The branch circuit shall not be supplied through ground-fault circuit interrupters or arc-fault circuit interrupters.

(3) The location of the ~~branch-circuit overcurrent protective device~~ OCPD shall be permanently identified at the fire alarm control unit.

(4) The circuit disconnecting means shall have red identification, shall be accessible only to qualified personnel, and shall be identified with the following words: “FIRE ALARM CIRCUIT.” The red identification shall not damage the ~~overcurrent protective devices~~ OCPDs or obscure the manufacturer's markings.

(5) The fire alarm branch-circuit disconnecting means shall be permitted to be secured in the “on” position.

760.127 Overcurrent Protection of the PLFA Power Source.

Transformers or other devices supplied from power-supply conductors shall be protected by an ~~overcurrent device~~ OCPD rated not over 20 amperes.

Exception: The input leads of a transformer or other power source supplying power-limited fire alarm circuits shall be permitted to be smaller than 14 AWG, but not smaller than 18 AWG, if they are not over 300 mm (12 in.) long and if they have insulation that complies with 760.49(B).

Supplemental Information

File Name	Description	Approved
PC_1643_-_Terra_Copy.docx		

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Wed Oct 16 18:34:02 EDT 2024

Committee Statement

Committee Statement: Using consistent terms will improve usability and accuracy for NEC requirements.

Response Message: SR-7861-NFPA 70-2024 - See also SR-8106 [100, Fire Alarm Circuit], SR-8107 [300.17(I)], SR-8108 [590.6(B)], SR-8109 [590.9], SR-8110 [724.40(B)], SR-8111 [724.45 [excluding subs]], SR-8112 [724.45(A)], and SR-8113 [725.127]

Public Comment No. 1643-NFPA 70-2024 [Global Input]

Second Revision No. 7864-NFPA 70-2024 [Global Comment]

Revise the Parts in Article 722 as follows:

[Before 722.100] Part II. ~~Listing and~~ Marking Requirements

[Before 722.~~110~~ 120] **Part III. Limited-Energy Cables and Wiring Methods~~, Applications and Installations Inside Buildings~~**

[Before 722.130] Part IV . Communication Cables and Wiring Methods

[Before 722. 140] Part V . Class 2 or Class 3 Cables and Wiring Methods

[Before 722. 150] Part VI . Class 4 Cables and Wiring Methods

[Before 722. 160] Part VII . Optical Fiver Cables and Wiring Methods

[Before 722. 170] Part VIII . Power-Limited Fire Alarm (PLFA) Cables and Wiring Methods

[Before 722. 180] Part IX . Circuit Integrity Cables (Type CI), Fire-Resistive Cable Systems, and Electrical Circuit Protective Systems

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 18:59:10 EDT 2024

Committee Statement

Committee Statement: Article 722 has been strategically divided into 9 parts. This promotes usability and is consistent with other large articles in this code.

The title of Part II is changed to Marking Requirements as listing is part of the general requirement in Part I.

Response Message: SR-7864-NFPA 70-2024

Public Comment No. 1314-NFPA 70-2024 [Article 722]

Public Comment No. 1498-NFPA 70-2024 [Part II.]

Second Revision No. 8615-NFPA 70-2024 [Detail]

722.121 Installations.

(A) Industrial Establishments.

In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, Type PLTC cable shall be permitted in accordance with either of the following:

(1) Where the cable is not subject to physical damage, Type PLTC cable ~~that complies with the crush and impact requirements of Type MC cable and is identified as Type PLTC~~-ER ~~for such use~~ shall be permitted to be exposed between ~~the~~ a cable tray, raceway, or enclosure and the utilization equipment or device. The cable shall be continuously supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft). Where not subject to physical damage, Type PLTC-ER cable shall be permitted to transition between cable trays, raceways, and enclosures and between a cable tray~~s~~, raceway, and enclosure and utilization equipment or devices for a distance not to exceed 1.8 m (6 ft) without continuous support. The cable shall be mechanically supported where exiting the cable tray to ensure that the minimum bending radius is not exceeded.

(2) Type PLTC cable, with a metallic sheath or armor in accordance with 722.~~2100(A)(6)~~, shall be permitted to be installed exposed. The cable shall be continuously supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be secured at intervals not exceeding 1.8 m (6 ft).

Supplemental Information

File Name	Description	Approved
Detail_SR8615_722.121.docx		

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Dec 06 15:56:51 EST 2024

Committee Statement

Committee Statement: Transitions to raceways or enclosures are added to correlate with changes made in 336.10. Reference to MC cable is also deleted to correlate with 336.10. The reference to 794.2 is updated to 722.100(A)(6).

Response Message: SR-8615-NFPA 70-2024

Public Comment No. 1851-NFPA 70-2024 [Section No. 722.121(A)]

Second Revision No. 8616-NFPA 70-2024 [Detail]

722.121 Installations in Industrial Establishements.

~~(A) Industrial Establishments.~~

In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, Type PLTC cable shall be permitted in accordance with either of the following:

(1) Where the cable is not subject to physical damage, Type PLTC cable that complies with the crush and impact requirements of Type MC cable and is identified as Type PLTC-ER for such use shall be permitted to be exposed between the cable tray and the utilization equipment or device. The cable shall be continuously supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft). Where not subject to physical damage, Type PLTC-ER cable shall be permitted to transition between cable trays and between cable trays and utilization equipment or devices for a distance not to exceed 1.8 m (6 ft) without continuous support. The cable shall be mechanically supported where exiting the cable tray to ensure that the minimum bending radius is not exceeded.

(2) Type PLTC cable, with a metallic sheath or armor in accordance with 722.100(A)(6), shall be permitted to be installed exposed. The cable shall be continuously supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be secured at intervals not exceeding 1.8 m (6 ft).

Supplemental Information

File Name	Description	Approved
Detail_SR8616_722.121.docx		

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Dec 06 16:15:56 EST 2024

Committee Statement

Committee Statement: This editorial Second Revision is developed by NFPA staff to delete the first level subdivision arrangement of the requirement. Single requirements do not need to be subdivided.

Response Message: SR-8616-NFPA 70-2024

Second Revision No. 7574-NFPA 70-2024 [Definition: Cable Tie Integral Device.]

~~**Cable Tie Integral Device.**~~

~~A single component, as produced, incorporating a cable tie and a cable tie fixing device that are not separable.~~

~~Note:~~ ~~The following are cable tie and cable tie fixing device type designations:~~

(0) ~~Type(s) 1, 11, 2, 21, 2S, or 21S are evaluated for use in cable management applications.~~

(0) ~~Type(s) 2S or 21S are also evaluated for securing and supporting cable, flexible conduit, and flexible tubing.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 17:53:27 EDT 2024

Committee Statement

Committee Statement: This term is not used in the code. Therefore, the definition is not required and is deleted.

Response Message: SR-7574-NFPA 70-2024

Public Comment No. 483-NFPA 70-2024 [Definition: Cable Tie Integral Device.]

Second Revision No. 7558-NFPA 70-2024 [Definition: Circuit, Power-Limited. (Power-Limited Circuit)]

~~**Circuit, Power-Limited. (Power-Limited Circuit)**~~

~~An electrical circuit that is designed to provide acceptable protection from fire initiation and electrical shock by limiting the amount of power delivered into a fault by the power supply. (CMP-3)~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 16:43:34 EDT 2024

Committee Statement

Committee Statement: The definition provided no helpful information that could not be inferred from the term, itself.

Response Message: SR-7558-NFPA 70-2024

Public Comment No. 485-NFPA 70-2024 [Definition: Circuit, Power-Limited. (Power-Limited Circuit)]

Second Revision No. 8106-NFPA 70-2024 [Definition: Fire Alarm Circuit.]

Fire Alarm Circuit.

The portion of the wiring system between the load side of the overcurrent protective device (OCPD) or the power-limited supply and the connected equipment of all circuits powered and controlled by the fire alarm system. Fire alarm circuits are classified as either non-power-limited or power-limited. (CMP-3)

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 21 00:41:58 EDT 2024

Committee Statement

Committee Statement: Using consistent terms will improve usability and accuracy for NEC requirements.

Response Message: SR-8106-NFPA 70-2024

Second Revision No. 7567-NFPA 70-2024 [Definition: Limited-Energy System.]

Limited-Energy System.

The equipment and cables of an end-to-end system that are either power-restricted ~~to ensure the energy delivered into any fault provides acceptable protection for fire prevention and electric shock~~ or capable of limiting or shutting down the power source to prevent deviations above normal operating limits to mitigate hazards related to electric shock and fire . (CMP-3)

Informational Note: Examples of limited-energy systems include Class 2, Class 3, Class 4, power-limited fire alarm (PLFA), and communications systems.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 17:18:55 EDT 2024

Committee Statement

Committee Statement: The proposed comment revisions have been applied to the definition of Limited-Energy System, removing terms that could be considered subjective, like “acceptable”. Additionally, an informational note is created to provide examples of systems that could be considered “Limited-Energy Systems” to provide clarification and information to the code user.

Response Message: SR-7567-NFPA 70-2024

Public Comment No. 1370-NFPA 70-2024 [Definition: Limited-Energy System.]

Second Revision No. 7568-NFPA 70-2024 [Definition: Wire.]

Wire (as applied to limited-energy systems) .

A factory assembly of one or more insulated conductors without an overall covering. ~~(805)~~ (CMP-3)

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 17:23:10 EDT 2024

Committee Statement

Committee Statement: The elimination of Chapter 8's independence and consolidation of the Limited-Energy System requirements throughout Chapter 7 and 8 necessitate the need for this definition to apply to more than just Article 805.

Response Message: SR-7568-NFPA 70-2024

Public Comment No. 1296-NFPA 70-2024 [Definition: Wire.]

Second Revision No. 7556-NFPA 70-2024 [New Definition after Definition: Cable, Integrated Gas Spac...]

Cable, Limited-Energy. (Limited-Energy Cable)

A factory assembly of one or more conductors or optical fibers used for any of the following:

(1) Class 2 circuits
(2) Class 3 circuits
(3) Class 4 circuits
(4) Optical fiber systems
(5) Communications circuits
(6) Community antenna television circuits (CATV)
(7) Network-powered broadband low-power communications circuits
(8) Premises communications circuits
(9) Power-limited fire alarm circuits

(CMP-3)

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Oct 14 16:36:45 EDT 2024

Committee Statement

Committee Statement: A new definition has been created to provide an all-encompassing defined term to clearly establish all the cable types that qualify as limited-energy cables. This defined term will enhance usability by making it clear that cables installed for communications, power-limited fire alarm systems, optical fiber circuits, and Class 2, Class 3, and Class 4 circuits are under the limited-energy umbrella. This defined term will also aid in simplifying scopes and code language for limited-energy related articles.

Response Message: SR-7556-NFPA 70-2024

Public Comment No. 724-NFPA 70-2024 [New Definition after Definition: Cable, Integrated Gas Spac...]

Public Comment No. 838-NFPA 70-2024 [New Definition after Definition: Cable, Integrated Gas Spac...]

Public Comment No. 1371-NFPA 70-2024 [New Definition after Definition: Cable Joint.]

Second Revision No. 7503-NFPA 70-2024 [Article 206]

Article 206 Non-Power-Limited Remote-Control and Signaling Circuits

206.1 Scope.

This article provides the general requirements for non-power-limited remote-control and signaling circuits.

Informational Note No. 1: See Article 724 for Class 1 power-limited remote-control and signaling circuit requirements.

Informational Note No. 2: See Article 725 for Class 2 and Class 3 power-limited remote-control and signaling circuit requirements.

206.4 ~~Circuit Classification~~ Installation .

~~Remote~~ Non-power-limited remote -control and signaling circuits shall be ~~classified as either power-limited or non-power-limited~~ installed in accordance with 300.4 through 300.25 and shall comply with 206.4(A) through ~~206.4(C)~~ 206.4(D) .

~~**(A)** Class 1 Power-Limited Remote-Control and Signaling Circuits.~~

~~Class 1 power-limited remote-control and signaling circuits shall comply with 724.30 through 724.52 , 790.4 through 790.24 , and 794.204 .~~

~~**(B)** Class 2 and Class 3 Power-Limited Remote-Control and Signaling Circuits.~~

~~Class 2 and Class 3 power-limited remote-control and signaling circuits shall comply with 725.3 through 725.160.~~

~~**(C)** Non-Power-Limited Remote-Control and Signaling Circuits.~~

~~Non-power-limited remote-control and signaling circuits shall be installed in accordance with 300.4 through 300.25 and shall comply with 206.4(C)(1) through 206.4(C)(3) .~~

(A) Sizes and Use.

(1) Installation and Maximum Load for 18 AWG and 16 AWG Conductors.

18 AWG copper and 16 AWG copper or copper-clad aluminum conductors shall be permitted to supply loads that do not exceed the ampacities specified in 402.5. They shall be installed in a raceway, enclosure, or listed cable.

(2) Installation and Maximum Load for 14 AWG Conductors

14 AWG copper-clad aluminum conductors shall only be permitted in Type MC cable and Type TC cable. They shall only supply loads not exceeding 8 amperes.

(3) Ampacity Calculation.

Conductors larger than 16 AWG copper or copper-clad aluminum shall not supply loads greater than the ampacities specified in 310.14 without applying the ampacity adjustment and correction factors specified in 310.15 to the ampacity calculation.

(4) Flexible Cords.

Flexible cords shall comply with Article 400, Parts I and II.

(B) Insulation.

(1) Rating .

Conductor insulation shall be rated for the system voltage and not less than 600 volts.

(2) General Requirements.

Conductors larger than 16 AWG copper or 14 AWG copper-clad aluminum shall comply with the applicable general requirements for conductors rated up to and including 2000 volts for type designations, insulations, markings, ampacity ratings, and uses in accordance with 310.5, 310.4, 310.6, 310.8, 310.10, and 310.14.

(3) Type.

Conductors that are 18 AWG copper, 16 AWG copper, or 14 AWG copper-clad aluminum shall be Type FFH-2, Type KF-2, Type KFF-2, Type PAF, Type PAFF, Type PF, Type PFF, Type PGF, Type PGFF, Type PTF, Type PTFF, Type RFH-2, Type RFHH-2, Type RFHH-3, Type SF-2, SFF-2, Type TF, Type TFF, Type TFFN, Type TFN, Type ZF, or Type ZFF.

(0) ~~Conductors with other types and thicknesses of insulation shall be permitted if suitable for Class 1 circuit use.~~

(C) Non-Power-Limited Remote-Control and Signaling Circuits with Power-Supply Circuits.

Non-power-limited remote-control and signaling circuit conductors rated 1000 volts ac, 1500 volts dc, nominal, or less and power-supply circuits shall be permitted to occupy the same cable, enclosure, or raceway without a barrier if all conductors have an insulation rating equal to at least the maximum circuit voltage applied to any conductor within the enclosure, cable, or raceway, and the equipment powered is functionally associated.

(D) Overcurrent Protection.

Non-power-limited remote control and signaling circuit conductors shall be protected from overcurrent in accordance with 240.4 or 240.5 .

Supplemental Information

File Name	Description	Approved
206_-_Terra_Copy.docx	staff use (updated)	
NEC-CMP-3_SR-7503_Article_206.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 11:52:37 EDT 2024

Committee Statement

Committee Statement: Article 206 was revised and now applies only to non-power limited circuits. Power limited requirements are located in Chapter 7. References to Sections 790.4, 790.24, and 790.204 are removed because Article 790 was deleted.

CMP-3 understands that the article scope is within the purview of the Correlating Committee and recommends the identified changes.

Response Message: SR-7503-NFPA 70-2024

Public Comment No. 1179-NFPA 70-2024 [Article 206]

Public Comment No. 960-NFPA 70-2024 [Section No. 206.4(C)(1)]

Public Comment No. 532-NFPA 70-2024 [Article 206]

Public Comment No. 1235-NFPA 70-2024 [Section No. 206.4(C) [Excluding any Sub-Sections]]

Second Revision No. 7505-NFPA 70-2024 [Section No. 300.1]

300.1 Scope.

(A) ~~All Wiring Installations~~ Covered .

This article covers general requirements for wiring methods and materials for all wiring installations not over 1000 volts ac, 1500 volts dc, nominal, unless modified by other articles in Chapter 3.

(B) ~~Integral Parts of Equipment~~ Not Covered .

This article does not cover the following:

(1) ~~This article does not cover~~ Class 2 circuits, Class 3 circuits, Class 4 circuits, optical fiber systems, communications systems, antenna systems, community antenna systems, network-powered broadband communications systems, premises-powered broadband communications systems, and power-limited fire alarm systems

(2) ~~The requirements of this article are not intended to apply to the conductors~~ Conductors that form an integral part of equipment, such as motors, controllers, motor control centers, or factory-assembled control equipment or listed utilization equipment

~~(1)~~

~~This article does not cover Class 2 circuits, Class 3 circuits, Class 4 circuits, optical fiber systems, communications systems, antenna systems, community antenna systems, network-powered broadband communications systems, premises-powered broadband communications systems, and power-limited fire alarm systems.~~

~~(1)~~

~~The requirements of this article are not intended to apply to the conductors that form an integral part of equipment, such as motors, controllers, motor control centers, or factory-assembled control equipment or listed utilization equipment.~~

~~(C) Metric Designators and Trade Sizes.~~

~~Metric designators and trade sizes for conduit, tubing, and associated fittings and accessories shall be in accordance with Table 300.1(C) .~~

~~Table 300.1(C) Metric Designators and Trade Sizes~~

~~Metric Designator~~	~~Trade Size~~
~~12~~	~~3/8~~
~~16~~	~~1/2~~
~~21~~	~~3/4~~
~~27~~	~~1~~
~~35~~	~~1 1/4~~
~~41~~	~~1 1/2~~
~~53~~	~~2~~
~~63~~	~~2 1/2~~
~~78~~	~~3~~
~~91~~	~~3 1/2~~
~~103~~	4
~~129~~	~~5~~
~~155~~	~~6~~
~~205~~	~~8~~

~~Note: The metric designators and trade sizes are for identification purposes only and are not actual dimensions.~~

Supplemental Information

File Name	Description	Approved
300.1_-_Terra_Copy.docx	for staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 12:05:32 EDT 2024

Committee Statement

Committee Statement: Section 300.1(A) is unchanged from previous editions.

The addition of 300.1(B)(1) is needed to reflect the changes made in Chapters 7 and 8 for limited-energy systems. Section 300.1(B)(2) was revised to remove the statement of intent and replace it with enforceable language. Section 300.1(C) has been relocated to 300.19, as this material is not appropriate for an article's scope.

Response Message: SR-7505-NFPA 70-2024

Public Comment No. 863-NFPA 70-2024 [Section No. 300.1]

Public Comment No. 1668-NFPA 70-2024 [Section No. 300.1(A)]

Public Comment No. 1392-NFPA 70-2024 [Section No. 300.1(C)]

Public Comment No. 540-NFPA 70-2024 [Section No. 300.1]

Second Revision No. 7506-NFPA 70-2024 [Section No. 300.4(C)]

(C) Damaged Conductors and Wiring Methods .

Conductors and wiring methods that are no longer suitable for use due to damage, such as overheating, fire damage, corrosive influences, or water, shall be replaced ~~with products that comply with this code~~ .

Informational Note No. 1: See NEMA GD 1-2019, *Evaluating Water-Damaged Electrical Equipment*, for information on electrical equipment and wiring methods damaged by water.

Informational Note No. 2: See NEMA GD 2-2021, *Evaluating Fire- and Heat-Damaged Electrical Equipment*, for information on electrical equipment and wiring methods damaged by fire or heat.

Supplemental Information

File Name	Description	Approved
300.4C_-_Terra_Copy.docx	for staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 12:13:52 EDT 2024

Committee Statement

Committee Statement: The title has been revised to correlate with the language in the requirement: conductors and wiring methods. Additionally, the text is revisited to remove "with products that comply with this code," since "products" is an undefined term.

Response Message: SR-7506-NFPA 70-2024

Public Comment No. 26-NFPA 70-2024 [Section No. 300.4(C)]

Second Revision No. 7508-NFPA 70-2024 [Section No. 300.5(B)(4)]

(4) Column-Width ~~Enclosed~~ Panelboards.

Where an auxiliary gutter runs between a column-width ~~enclosed~~ panelboard and a pull box, and the pull box includes neutral terminations, the neutral conductors of circuits supplied from the panelboard shall be permitted to originate in the pull box.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 12:22:13 EDT 2024

Committee Statement

Committee Statement: An "enclosed panelboard" is not just a panelboard inside of an enclosure. By removing the term “enclosed” this section no longer applies to only enclosed panelboards. The definition for enclosed panelboard no longer exists, which is why the term was removed.

Response Message: SR-7508-NFPA 70-2024

Public Comment No. 372-NFPA 70-2024 [Section No. 300.5(B)(4)]

Public Comment No. 991-NFPA 70-2024 [Section No. 300.5(B)(4)]

Second Revision No. 7509-NFPA 70-2024 [Section No. 300.5(C)]

(C) Conductors of Different Systems.

(1) 1000 Volts ac, 1500 volts dc, Nominal, or Less.

(a) *Insulation Voltage Rating.* Conductors of ac and dc circuits rated 1000 volts ac, 1500 volts dc, nominal, or less shall be permitted to occupy the same equipment wiring enclosure, cable, or raceway. All conductors shall have an insulation rating equal to at least the maximum circuit voltage applied to any conductor within the enclosure, cable, or raceway.

(b) *Electric-Discharge Lamps.* Secondary wiring to electric-discharge lamps of 1000 volts ac, 1500 volts dc, nominal , or less, if insulated for the secondary voltage involved, shall be permitted to occupy the same luminaire, sign, or outline lighting enclosure as the branch-circuit conductors.

Informational Note No. 1: See 722.15 ~~725.136(A)~~ for Class 2 and Class 3 circuit conductors.

Informational Note No. 2: See 722.15 ~~725.136(A)~~ for Class 4 circuit conductors.

Informational Note No. 3: See 690.31(B) for photovoltaic source and output circuits.

(2) Over 1000 Volts ac, 1500 Volts dc, Nominal.

Conductors of circuits rated over 1000 volts ac~~,~~ or 1500 volts dc~~, nominal,~~ shall not occupy the same equipment wiring enclosure, cable, or raceway with conductors of circuits rated 1000 volts ac, 1500 volts dc, nominal, or less unless permitted in accordance with 305.13(B).

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 12:25:26 EDT 2024

Committee Statement

Committee Statement: Editorial revisions were made for clarity. The previous text could have been misinterpreted as not applying to circuits with voltages lower than 1,000 V ac or 1,500 V dc.

Response Message: SR-7509-NFPA 70-2024

Public Comment No. 786-NFPA 70-2024 [Section No. 300.5(C)]

Public Comment No. 788-NFPA 70-2024 [Section No. 300.5(C)(1)]

Public Comment No. 787-NFPA 70-2024 [Section No. 300.5(C)(2)]

Second Revision No. 7515-NFPA 70-2024 [Section No. 300.6(E)]

(E) Wiring Methods and Materials ~~Beneath~~ in or Under Roof Decking.

~~If subject to physical damage, wiring~~ Wiring methods and materials installed ~~in exposed or concealed locations~~ under roof decking~~,~~ shall be installed to maintain not less than 38 mm (1½ in.) separation from the lowest surface of the roof decking. Wiring methods shall not be installed in concealed locations in metal-corrugated, sheet decking–type roofs.

Informational Note: Roof decking material is often repaired or replaced after the initial raceway or cabling and roofing installation and might be penetrated by screws or other mechanical devices designed to provide “hold down” strength of the waterproof membrane or roof insulating material.

Exception No. 1: Rigid metal conduit and intermediate metal conduit, with listed steel or malleable iron fittings and boxes, shall not be required to comply with 300.6(E).

Exception No. 2: The 38 mm (1½ in.) spacing shall not be required where metal-corrugated sheet roof decking is covered with a minimum thickness 50 mm (2 in.) concrete slab, measured from the top of the corrugated roofing.

Exception No. 3: Wiring methods and materials shall be permitted in concealed locations where encased in concrete not less than 50 mm (2 in.) thick. Boxes and conduit bodies shall be installed in accordance with 314.29.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 12:33:31 EDT 2024

Committee Statement

Committee Statement: Editorial revisions were made to the title and text to increase clarity. The “if subject to physical damage” language was removed as it is superfluous. Wiring within the 1 ½” space below the deck is subject to physical damage, hence the requirement.

Response Message: SR-7515-NFPA 70-2024

Public Comment No. 1140-NFPA 70-2024 [Section No. 300.6(E)]

Second Revision No. 7526-NFPA 70-2024 [Section No. 300.6(G)]

(G) Fittings.

Where raceways contain 4 AWG or larger insulated circuit conductors, and these conductors enter a cabinet, a box, an enclosure, or a raceway, ~~prior to~~ the ~~installation of~~ conductors~~, the conductors~~ shall be protected in accordance with any of the following:

(1) An identified fitting providing a smoothly rounded insulating surface

(2) A listed metal fitting that has smoothly rounded edges

(3) Separation from the fitting or raceway using an identified insulating material that is securely fastened in place

(4) Threaded hubs or bosses that are an integral part of a cabinet, box, enclosure, or raceway providing a smoothly rounded or flared entry for conductors

Conduit bushings constructed wholly of insulating material shall not be used to secure a fitting or raceway. The insulating fitting or insulating material shall have a temperature rating not less than the insulation temperature rating of the installed conductors.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 13:25:52 EDT 2024

Committee Statement

Committee Statement: The language requiring the conductors to be protected prior to installation is deleted because it is unnecessarily restrictive and creates challenges with the use of some mechanical pulling equipment. The code text without this language adequately accomplishes the requirement for protection of conductors during and after installation.

Response Message: SR-7526-NFPA 70-2024

Public Comment No. 993-NFPA 70-2024 [Section No. 300.6(G)]

Second Revision No. 7529-NFPA 70-2024 [Section No. 300.7(D)(3)]

(3) Service Conductors and Raceways.

~~Underground~~ Direct buried service conductors and raceways containing service conductors that are not encased in concrete and that are buried 450 mm (18 in.) or more below grade shall have their location identified by a warning ribbon that is placed in the trench at least 300 mm (12 in.) above the underground installation.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 13:34:31 EDT 2024

Committee Statement

Committee Statement: Editorial revisions were made to clarify that this requirement applies only to the installation of service conductors. Changed the term underground to direct buried for consistency in terminology.

Response Message: SR-7529-NFPA 70-2024

Public Comment No. 548-NFPA 70-2024 [Section No. 300.7(D)(3)]

Second Revision No. 7531-NFPA 70-2024 [Section No. 300.8]

300.8 Protection Against Corrosion and Deterioration.

Raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures (other than surrounding fences and walls), elbows, couplings, fittings, supports, and support hardware shall be of materials suitable for the environment in which they are to be installed. For the purposes of this section, enclosures shall not include fences or walls surrounding electrical equipment.

(A) Ferrous Metal Equipment.

Ferrous metal raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, nipples, fittings, supports, and support hardware shall be suitably protected against corrosion inside and outside ~~(except threads at joints)~~ by a coating of approved corrosion-resistant material. Where corrosion protection is necessary and the conduit is threaded anywhere other than at the factory where the product is listed, the threads shall be coated with an approved electrically conductive, corrosion-resistant compound.

Exception: Stainless steel shall not be required to have protective coatings.

(1) Protected from Corrosion Solely by Enamel.

Where protected from corrosion solely by enamel, ferrous metal raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, nipples, fittings, supports, and support hardware shall not be used outdoors or in wet locations as described in 300.8(D).

(2) Organic Coatings on Boxes or Cabinets.

Where boxes, cabinets, or enclosures ~~(other than surrounding fences and walls)~~ have an approved system of organic coatings and are marked “Raintight,” “Rainproof,” or “Outdoor Type,” they shall be permitted outdoors.

(3) In Concrete or in Direct Contact with the Earth.

Ferrous metal raceways, cable armor, boxes, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, nipples, fittings, supports, and support hardware shall be permitted to be installed in concrete, in direct contact with the earth, or in areas subject to severe corrosive influences where made of material approved for the condition or where provided with corrosion protection approved for the condition.

(B) Aluminum Metal Equipment.

Aluminum raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, nipples, fittings, supports, and support hardware embedded or encased in concrete or in direct contact with the earth shall be provided with supplementary corrosion protection.

(C) Nonmetallic Equipment.

Nonmetallic raceways, cable trays, cablebus, auxiliary gutters, boxes, cables with a nonmetallic outer jacket and internal metal armor or jacket, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, nipples, fittings, supports, and support hardware shall be made of material approved for the condition and shall comply with 300.8(C)(1) and 300.8(C)(2) as applicable to the specific installation.

(1) Exposed to Sunlight.

Where exposed to sunlight, the materials shall be listed as sunlight resistant or shall be identified as sunlight resistant.

(2) Chemical Exposure.

Where subject to exposure to chemical solvents, vapors, splashing, or immersion, materials or coatings shall either be inherently resistant to chemicals based on their listing or be identified for the specific chemical reagent.

(D) Indoor Wet Locations.

In portions of dairy processing facilities, laundries, canneries, and other indoor wet locations, and in locations where walls are frequently washed or where there are surfaces of absorbent materials, such as damp paper or wood, the entire wiring system, where installed exposed, including all boxes, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , fittings, raceways, and cable used therewith, shall be mounted so that there is at least a 6 mm (¼ in.) airspace between it and the wall or supporting surface.

Exception: Nonmetallic raceways, boxes, and fittings shall be permitted to be installed without the airspace on a concrete, masonry, tile, or similar surface.

Informational Note: In general, areas where acids and alkali chemicals are handled and stored might present such corrosive conditions, particularly when wet or damp. Severe corrosive conditions might also be present in portions of meatpacking plants, tanneries, glue houses, and some stables; in installations immediately adjacent to a seashore and swimming pool areas; in areas where chemical deicers are used; and in storage cellars or rooms for hides, casings, fertilizer, salt, and bulk chemicals.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 13:39:05 EDT 2024

Committee Statement

Committee Statement: Editorial revisions were made to comply with the NEC Style Manual as it relates to the use of parenthetical language. The issue of which enclosures this section applies to is now addressed by the added sentence in the parent text. The matter of corrosion protection at threaded joints in 300.8(A) was already addressed in the section.

Response Message: SR-7531-NFPA 70-2024

Public Comment No. 530-NFPA 70-2024 [Section No. 300.8]

Public Comment No. 378-NFPA 70-2024 [Section No. 300.8]

Second Revision No. 7536-NFPA 70-2024 [Section No. 300.9(A)]

(A) Condensation.

Where portions of a raceway or sleeve are known to be subjected to different temperatures, and where condensation is known to be a problem, as in cold storage areas of buildings or where passing from the interior to the exterior of a building, the raceway or sleeve shall be comply with 300.9(A)(1) or 300.9(A)(2).

(1) *Sealants.* The raceway or sleeve shall be sealed to prevent the circulation of warm air to a colder section of the raceway or sleeve. Sealants shall be identified for use with cable insulation, conductor insulation, a bare conductor, a shield, or other components. An explosionproof seal shall not be required for this purpose.

(2) *Other Approved Means.* The use of a listed fitting or other approved means identified for the purpose of preventing condensation and the circulation of warm air shall be permitted.

Informational Note: An example of a fitting ~~identified~~ for the prevention of condensation could be a thermal break coupling.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 13:47:20 EDT 2024

Committee Statement

Committee Statement: Fittings intended for use in raceways must be listed for the purpose. The phrase “circulation of warm air” is added to clarify what the other approved means must be identified for. “Identified” is deleted in the informational note because fittings are required to be listed.

Response Message: SR-7536-NFPA 70-2024

Public Comment No. 994-NFPA 70-2024 [Section No. 300.9(A)]

Public Comment No. 1254-NFPA 70-2024 [Section No. 300.9(A)]

Second Revision No. 7537-NFPA 70-2024 [Section No. 300.11]

300.11 Raceways in Wet Locations Above Grade.

~~Where raceways are installed in wet locations above grade, the interior of these raceways shall be considered to be a wet location. Insulated conductors and cables installed in raceways in wet locations above grade shall comply with 310.10(C) .~~

(A) General.

Where raceways are installed in wet locations above grade, the interior of these raceways shall be considered to be a wet location. Insulated conductors and cables installed in raceways in wet locations above grade shall comply with 310.10(C).

(B) Drainage.

Raceways installed in wet locations above grade shall be arranged to drain.

Supplemental Information

File Name	Description	Approved
NEC_CMP-3_SR-7537_300.11.docx		

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 13:54:47 EDT 2024

Committee Statement

Committee Statement: This section was modified for consistency with 225.22. Because that language only applies to exterior locations, this section needed to be expanded. Raceways in indoor wet locations often contain liquids, and without drainage provisions those liquids can enter enclosures and create unsafe conditions.

Response Message: SR-7537-NFPA 70-2024

Public Comment No. 995-NFPA 70-2024 [Section No. 300.11]

Second Revision No. 7541-NFPA 70-2024 [Section No. 300.13(B)]

(B) Wiring Systems Installed Above Suspended Ceilings.

~~Wiring shall not be secured to or supported by the ceiling system, including the ceiling support wires. Support wires and associated fittings that provide secure support and that are installed in addition to the ceiling grid support wires shall be permitted as the sole support. If independent support wires are used, they shall be distinguishable by color, tagging, or other means from those that are part of the ceiling system.~~

(1) General.

Wiring shall not be secured to or supported by the ceiling grid system, including the ceiling support wires.

(2) Independent Support Wires.

Independent support wires and associated fittings shall be permitted to provide support for wiring systems installed above a suspended ceiling if the independent support wires comply with all the following:

(1) ~~Support~~ The independent support wires ~~and associated fittings that provide secure support and that~~ are installed in addition to the ceiling grid support wires ~~shall be permitted as the sole support~~ .

(2) ~~If~~ The independent support wires are ~~used, they shall be~~ distinguishable by color, tagging, or other means from those that are part of the ceiling system.

(3) The independent support wires are secured at both ends.

(4) The independent support wires provide secure support.

Exception No. 1: The ceiling support system shall be permitted to support wiring and equipment that have been tested as part of the fire-rated assembly.

Informational Note: See ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, for one method of testing to determine fire rating.

Exception No. 2: The ceiling system shall be permitted to support branch-circuit wiring and associated equipment if installed in accordance with the ceiling system manufacturer's instructions.

Supplemental Information

File Name	Description	Approved
300.13B_-_Terra_Copy.docx		
NEC_CMP-3_SR-7541_300.13_B_.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 14:17:55 EDT 2024

Committee Statement

Committee Statement: Editorial revisions were made to clarify that support wires for electrical wiring must be in addition to those required for supporting the ceiling system. The requirement for

securing both ends of the support wires was inadvertently left out during the consolidation of 300.11(B).

The requirement was reformatted to a numbered list to comply with the Style Manual.

Response Message: SR-7541-NFPA 70-2024

Public Comment No. 27-NFPA 70-2024 [Section No. 300.13(B)]

Public Comment No. 373-NFPA 70-2024 [Section No. 300.13(B)]

Second Revision No. 7543-NFPA 70-2024 [Section No. 300.13(C)]

(C) Raceways Used as Means of Support.

Raceways shall be used as a means of support for other raceways, cables, or nonelectrical equipment only under any of the following conditions:

(1) If the raceway or means of support is identified as a means of support

(2) If the raceway contains power supply conductors for electrically controlled equipment and is used to support Class 2 or Class 3 circuit conductors or cables that are solely for the purpose of connection to the equipment control circuits

(3) If the raceway is used to support boxes or conduit bodies in accordance with 314.23 or to support luminaires in accordance with 410.36(E)

(4) If the raceway is used to support an equipment bonding jumper that is associated with the circuit conductors within the raceway

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 14:25:52 EDT 2024

Committee Statement

Committee Statement: Clarification that this section allows, but does not require, raceways to be used as a support method was made by adding the word “only” in reference to the conditions.

Response Message: SR-7543-NFPA 70-2024

Public Comment No. 379-NFPA 70-2024 [Section No. 300.13(C)]

Second Revision No. 7544-NFPA 70-2024 [New Section after 300.13(D)]

(E) Cable Ties Used as Means of Securement and Support.

(1) Cable Ties.

Cable ties used as a means for securement and support for cable, flexible conduit, and flexible tubing shall be listed and identified for securement and support.

(2) Cable Tie Fixing Devices.

If a cable tie fixing device is installed, the cable tie fixing device shall be listed and identified for securement and support.

Informational Note: Type(s) 1, 11, 2, 21, 2S, or 21S cable tie and cable tie fixing device type designations are evaluated for use in cable management applications. Type(s) 2S or 21S are also evaluated for securing and supporting cable, flexible conduit, and flexible tubing.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 14:28:33 EDT 2024

Committee Statement

Committee Statement: The requirements and informational note in 300.13(E) are essential for the proper installation of cable ties.

Response Message: SR-7544-NFPA 70-2024 The submitter did not provide substantiation to prohibit cable ties from being fastened to framing members. Also, the proposed reference to UL 62275 is not added as an informational note because 2.1.10.5 of the NEC Style Manual prohibits it.

Public Comment No. 826-NFPA 70-2024 [New Section after 300.13(D)]

Second Revision No. 8107-NFPA 70-2024 [Section No. 300.17(l)]

(l) Enclosures.

A box or conduit body shall not be required where a splice, switch, terminal, or pull point is in a cabinet or cutout box, in an enclosure for a switch or ~~overcurrent device~~ OCPD as permitted in 312.11, in a motor controller as permitted in 430.10(A), or in a motor control center.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 21 00:45:46 EDT 2024

Committee Statement

Committee Statement: Using consistent terms will improve usability and accuracy for NEC requirements.

Response Message: SR-8107-NFPA 70-2024

Second Revision No. 7546-NFPA 70-2024 [Section No. 300.19]

300.19 Number of Conductors and Cables in Raceway.

~~The number and size of conductors and cables in a complete raceway shall not exceed the allowable percentage fill specified in Chapter 9 , Table 1.~~

(A) Raceway Fill.

The number and size of conductors and cables in a complete raceway shall not exceed the allowable percentage fill specified in Chapter 9, Table 1.

(B) Metric Designators and Trade Sizes.

Metric designators and trade sizes for conduit, tubing, and associated fittings and accessories shall be in accordance with Table 300.19(B) .

Table 300.19(B) Metric Designators and Trade Sizes

Metric Designator	Trade Size
12	3/8
16	1/2
21	3/4
27	1
35	1 1/4
41	1 1/2
53	2
63	2 1/2
78	3
91	3 1/2
103	4
129	5
155	6
205	8

Note: The metric designators and trade sizes are for identification purposes only and are not actual dimensions.

Supplemental Information

File Name	Description	Approved
300.19_-_Terra_Copy.docx		
300.19_-_SR-7546.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Oct 14 15:48:41 EDT 2024

Committee Statement

Committee Statement: This language was originally located in 300.1, but it does not belong in an article's scope. The information is moved to this section. Also see SR-7505.

Response Message: SR-7546-NFPA 70-2024

Public Comment No. 862-NFPA 70-2024 [Section No. 300.19]

Public Comment No. 1393-NFPA 70-2024 [Section No. 300.19]

Second Revision No. 7548-NFPA 70-2024 [Section No. 300.24]

300.24 Bends.

The total degree of bends in any combination of conduit or tubing wiring methods used for a single run shall not exceed 360 degrees between pull points.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 15:55:06 EDT 2024

Committee Statement

Committee Statement: The words “conduit or tubing” were added to clarify the types of wiring methods that this section applies to.

Response Message: SR-7548-NFPA 70-2024

Public Comment No. 1625-NFPA 70-2024 [Section No. 300.24]

Public Comment No. 531-NFPA 70-2024 [Section No. 300.24]

Public Comment No. 360-NFPA 70-2024 [Section No. 300.24]

Public Comment No. 306-NFPA 70-2024 [Section No. 300.24]

Second Revision No. 7554-NFPA 70-2024 [Section No. 300.25(C)(1)]

(1) Wiring Methods.

~~The wiring methods for other spaces used for environmental air shall be limited to totally enclosed, nonventilated, insulated busway having no provisions for plug-in connections, Type MI cable without an overall nonmetallic covering, Type MC cable without an overall nonmetallic covering, Type AC cable, or other factory-assembled multiconductor control or power cable that is specifically listed for use within an air-handling space, or listed prefabricated cable assemblies of metallic manufactured wiring systems without nonmetallic sheath. Other types of cables, conductors, and raceways shall be permitted to be installed in electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, rigid metal conduit without an overall nonmetallic covering, flexible metal conduit, or, where accessible, surface metal raceway or metal wireway with metal covers.~~

~~Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables shall be listed as having low smoke and heat release properties.~~

~~Informational Note: See UL 2043, *Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces*, for one method of testing low smoke and heat release properties for nonmetallic cable ties and other nonmetallic cable accessories to determine a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a peak heat release rate of 100 kW or less.~~

(a) The wiring methods for other spaces used for environmental air shall be limited to the following:

(1) Totally enclosed, nonventilated, insulated busway having no provisions for plug-in connections

(2) Rigid metal conduit without an overall nonmetallic covering

(3) Intermediate metal conduit without an overall nonmetallic covering

(4) Electrical metallic tubing without an overall nonmetallic covering

(5) Flexible metallic tubing

(6) Flexible metal conduit

(7) Type MI cable without an overall nonmetallic covering

(8) Type MC cable without an overall nonmetallic

(9) Type AC cable

(10) Flexible bus systems that are specifically listed for use within an air-handling space

(11) Other factory-assembled multiconductor control or power cable that is specifically listed for use within an air-handling space~~,~~ or listed prefabricated cable assemblies of metallic manufactured wiring systems without nonmetallic sheath

(b) Other types of cables, conductors, and raceways shall be permitted to be installed in ~~electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, rigid metal conduit without an overall nonmetallic covering, flexible metal conduit,~~ any of the wiring methods in 300.25(C)(1)(a)(1) through 300.25(C)(1)(a)(11) or, where accessible, surface metal raceway or metal wireway with metal covers.

(c) Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables shall be listed as having low smoke and heat release properties.

Informational Note: See UL 2043, *Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces*, for one method of testing low smoke and heat release properties for nonmetallic cable ties and other nonmetallic cable accessories to determine a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a peak heat release rate of 100 kW or less.

Supplemental Information

File Name	Description	Approved
300.25_C_1_-_Terra_Copy.docx	for staff use only	
300.25_C_1_-_SR-7554.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 16:22:23 EDT 2024

Committee Statement

Committee Statement: The list of items permitted in plenums was changed to a list format for readability, ease of use, and compliance with the Style Manual. Flexible bus systems have been added to the permitted wiring methods, but only if listed for such locations. Other factory assembled multiconductor cables are separated for clarification.

Response Message: SR-7554-NFPA 70-2024

Public Comment No. 1685-NFPA 70-2024 [Section No. 300.25(C)(1)]

Public Comment No. 1982-NFPA 70-2024 [Section No. 300.25(C)(1)]

Public Comment No. 1626-NFPA 70-2024 [Section No. 300.25(C)(1)]

Second Revision No. 7555-NFPA 70-2024 [Section No. 300.28]

300.28 Remote-Control and Signaling Circuits Classification.

Remote-control and signaling circuits shall be classified as either power-limited or non-power-limited and comply with 300.28(A) through 300.28(C) .

(A) Class 1 Power-Limited Remote-Control and Signaling Circuits.

Class 1 power-limited remote-control and signaling circuits shall comply with 790.4 through 790.8 and 794.4 .

(B) Class 2 and Class 3 Power-Limited Remote-Control and Signaling Circuits.

Class 2 and Class 3 power-limited remote-control and signaling circuits shall comply with 790.4 through 790.8 and 794.4 .

(C) Non-Power-Limited Remote-Control and Signaling Circuits.

Non-power-limited remote-control and signaling circuits shall be installed in accordance with 300.4 through 300.27 and comply with 300.28(C)(1) through 300.28(C)(3) .

(1) Sizes and Use.

(0) Conductors that are 18 AWG and 16 AWG copper shall be permitted to be used if they supply loads that do not exceed the ampacities specified in 402.5 and are installed in a raceway, an approved enclosure, or a listed cable.

(0) Conductors that are 14 AWG copper-clad aluminum shall be permitted to be used in Type MC cable and Type TC cable. The continuous load shall not exceed 8 amperes.

(0) Conductors larger than 16 AWG copper or 14 AWG copper-clad aluminum shall not supply loads greater than the ampacities specified in 310.14 .

(0) Flexible cords shall comply with the applicable general requirements, applications, and construction specifications for flexible cords and flexible cables in accordance with Article 400 Parts I and II.

(2) Insulation.

(0) Insulation on conductors shall be rated for the system voltage and not less than 600 volts.

(0) Conductors larger than 16 AWG copper or 14 AWG copper-clad aluminum shall comply with the applicable general requirements for conductors rated up to and including 2000 volt for type designations, insulations, markings, ampacity ratings, and uses in accordance with 310.3 , 310.4 , 310.6 , 310.8 , 310.10 , and 310.14 .

(0) Conductors that are 18 AWG copper, 16 AWG copper, or 14 AWG copper-clad aluminum shall be Type FFH-2, Type KF-2, Type KFF-2, Type PAF, Type PAFF, Type PF, Type PFF, Type PGF, Type PGFF, Type PTF, Type PTFF, Type RFH-2, Type RFHH-2, Type RFHH-3, Type SF-2, SFF-2, Type TF, Type TFF, Type TFFN, Type TFN, Type ZF, or Type ZFF.

(0) Conductors with other types and thicknesses of insulation shall be permitted if listed for Class 1 circuit use.

~~**(3)** Overcurrent Protection.~~

~~(0) Overcurrent protection for conductors 14 AWG copper and larger shall be provided in accordance with the conductor ampacity, without applying the ampacity adjustment and correction factors specified in 310.15 to the ampacity calculation.~~

~~(0) Overcurrent protection shall not exceed 7 amperes for 18 AWG copper conductors and 10 amperes for 16 AWG copper and 14 AWG copper-clad aluminum.~~

~~*Exception: The overcurrent protection specified in 300.28(C)(3)(a) and 300.28(C)(3)(b) shall not be required where this Code requires or permits other overcurrent protection ratings.*~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 16:27:12 EDT 2024

Committee Statement

Committee Statement: The contents of this section were revised and relocated to the new Article 206. This section has been deleted as a result of that move.

Response Message: SR-7555-NFPA 70-2024

Public Comment No. 1236-NFPA 70-2024 [Section No. 300.28]

Second Revision No. 8108-NFPA 70-2024 [Section No. 590.6(B)]

(B) Branch Circuits.

All branch circuits shall originate in an approved power outlet, switchgear, switchboard or enclosed panelboard, motor control center, or fused switch enclosure. Conductors shall be permitted within cable assemblies or within multiconductor cord or cable of a type identified in Table 400.4 for hard usage or extra-hard usage. Conductors shall be ~~protected from~~ provided with overcurrent protection as provided in 240.4, 240.5, and 245.26, as applicable. For the purposes of this section, the following wiring methods shall be permitted:

(1) Type NM, Type NMC, and Type SE cables shall be permitted to be used in any dwelling, building, or structure without any limitation by building construction type and without concealment within walls, floors, or ceilings.

(2) Type SE cable shall be permitted to be installed in a raceway in an underground installation.

Exception: Branch circuits installed for the purposes specified in 140.5(B) or 140.5(C) shall be permitted to be run as single insulated conductors. Where the wiring is installed in accordance with 140.5(B), the voltage to ground shall not exceed 150 volts, the wiring shall not be subject to physical damage, and the conductors shall be supported on insulators at intervals of not more than 3.0 m (10 ft); or, for festoon lighting, the conductors shall be so arranged that excessive strain is not transmitted to the lampholders.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 21 00:48:14 EDT 2024

Committee Statement

Committee Statement: Using consistent terms will improve usability and accuracy for NEC requirements.

Response Message: SR-8108-NFPA 70-2024

Second Revision No. 7564-NFPA 70-2024 [Section No. 590.7(A)(3)]

(3) Receptacles on 15-kW or less Portable Generators.

~~All 125-volt and 125/250-volt, single-phase, 15-, 20-, and 30-ampere receptacle outlets that are a part of a 15-kW or smaller portable generator shall have listed ground-fault circuit-interrupter protection for personnel. All 15- and 20-ampere, 125- and 250-volt receptacles, including those that are part of a portable generator, used in a damp or wet location shall comply with 406.9(A) and 406.9(B) .~~

~~*Exception: A listed cord set or device incorporating listed GFCI protection for personnel and identified for portable use shall be permitted for compliance with this section where the portable generator was manufactured or remanufactured prior to January 1, 2015.*~~

(a) *GFCI Protection.* All 125-volt and 125/250-volt, single-phase, 15-, 20-, and 30-ampere receptacle outlets that are a part of a 15-kW or smaller portable generator shall have listed ground-fault circuit-interrupter protection for personnel.

Exception: A listed cord set or device incorporating listed GFCI protection for personnel and identified for portable use shall be permitted for compliance with this section where the portable generator was manufactured or remanufactured prior to January 1, 2015.

(b) *Damp or Wet Locations.* All ~~15- and 20-ampere, 125- and 250-volt~~ receptacles, including those that are part of a portable generator, used in a damp or wet location shall comply with 406.9(A) and 406.9(B).

Supplemental Information

File Name	Description	Approved
590.7_A_3_-_Terra_Copy.docx	for staff use	
NEC_CMP-3_SR-7564_590.7_A_3_.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 17:12:40 EDT 2024

Committee Statement

Committee Statement: This section is not intended to modify the requirements of 406.9. Therefore, the voltage and current ratings of receptacles have been removed from this section. The section is reformatted to comply with the 3.1.5.2 of the Style Manual. In the exception, the word “where” is changed to “if,” which is more appropriate.

Response Message: SR-7564-NFPA 70-2024

Public Comment No. 382-NFPA 70-2024 [Section No. 590.7(A)(3)]

Second Revision No. 8109-NFPA 70-2024 [Section No. 590.9]

140.9 Overcurrent Protective Devices.

(A) Where Reused.

~~Overcurrent protective devices~~ OCPDs that have been previously used and are installed in a temporary installation shall be examined to ensure they have been properly installed and properly maintained and there is no evidence of impending failure.

Informational Note: See the following standards for further information for properly maintained equipment:

(1) NEMA AB 4, *Guidelines for Inspection and Preventive Maintenance of Molded-Case Circuit Breakers Used in Commercial and Industrial Applications*

(2) NFPA 70B~~-2023~~ , *Standard for Electrical Equipment Maintenance*

(3) NEMA GD 1, *Evaluating Water-Damaged Electrical Equipment*

(4) IEEE 1458, *IEEE Recommended Practice for the Selection, Field Testing, and Life Expectancy of Molded-Case Circuit Breakers for Industrial Applications*

(B) Service Overcurrent Protective Devices.

~~Overcurrent protective devices~~ OCPDs for solidly grounded wye electrical services of more than 150 volts to ground but not exceeding 1000 volts phase-to-phase, available fault current greater than 10,000 amperes, shall be current limiting.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 21 00:49:50 EDT 2024

Committee Statement

Committee Statement: Using consistent terms will improve usability and accuracy for NEC requirements.

Response Message: SR-8109-NFPA 70-2024

Second Revision No. 7605-NFPA 70-2024 [Section No. 720.1]

720.1 Scope.

(A) Limited-Energy System Installations.

This article covers the general wiring methods and materials requirements for limited energy system installations ~~Class 1 power-limited circuits, Class 2 circuits, Class 3 circuits, Class 4 circuits, optical fiber systems, communications systems, antenna systems, community antenna systems, network-powered broadband communications systems, premises-powered broadband communications systems, and power-limited fire alarm systems~~ .

Informational Note: See 800.1 for general requirements of communications installations outside of a building.

(B) Integral Parts of Equipment.

The requirements of this article ~~are~~ do not ~~intended to~~ apply to the conductors that form an integral part of equipment, such as listed utilization equipment.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 19:32:34 EDT 2024

Committee Statement

Committee Statement: The revision of the definition for Limited-Energy Systems now includes all the systems covered by these general requirements. The committee revises the scope utilizing this new definition to make it clear to the code user that all limited-energy systems are covered by Article 720. Additionally, the language in (B) has been revised for clarity as the phrase “are not in intended to” creates unnecessary ambiguity as this article does not cover integral parts of utilization equipment.

“Are not intended to” was replaced with “do not” for enforceability.

The scope now includes limited-energy systems, which includes optical fiber systems. The scope no longer includes Class 1 circuits.

CMP-3 understands that the article scope is within the purview of the Correlating Committee and recommends the identified changes.

Response Message: SR-7605-NFPA 70-2024 The titles of the sections were not changed as proposed in PC-877 because the proposed titles do not add clarity.

Public Comment No. 877-NFPA 70-2024 [Section No. 720.1]

Public Comment No. 1372-NFPA 70-2024 [Section No. 720.1]

Public Comment No. 332-NFPA 70-2024 [Section No. 720.1(A)]

Public Comment No. 923-NFPA 70-2024 [Section No. 720.1(A)]

Second Revision No. 7607-NFPA 70-2024 [Section No. 720.2]

720.2 Listing.

Communications equipment shall be listed as being suitable for electrical connection to a communications network.

Exception: This listing requirement shall not apply to test equipment that is intended for temporary connection to a telecommunications network by qualified persons during the course of installation, maintenance, or repair of telecommunications equipment or systems.

~~Informational Note No. 1: See ANSI/UL 60950-1-2014, *Standard for Safety of Information Technology Equipment, ANSI/UL 1863-2012, Standard for Safety Communications Circuit Accessories* , or ANSI/UL 62368-1-2014 or ANSI/UL 62368-1-2018, *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements* .~~

Informational Note: See ~~ANSI/ATIS 0600337-2016~~ ATIS 0600337-2019 (R2024) , *Requirements for Maximum Voltage, Current, and Power Levels Used in Communications Circuits*, for additional information regarding voltages, currents, and power allowed on communications circuits.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 19:41:49 EDT 2024

Committee Statement

Committee Statement: Informational note 1 has been deleted as the referenced standard is no longer relevant. Informational note 2 has been revised to the only informational note and the referenced standards have been updated to the correct edition.

Response Message: SR-7607-NFPA 70-2024

Public Comment No. 1504-NFPA 70-2024 [Section No. 720.2]

Public Comment No. 333-NFPA 70-2024 [Section No. 720.2]

Second Revision No. 7608-NFPA 70-2024 [Section No. 720.4]

720.4 Other ~~Articles~~ Requirements .

(A)_ General Requirements.

Only those sections of Article 300 referenced in this article shall apply.

(B) Other Limited-Energy ~~Articles~~ Requirements .

Table 720.4(A) lists the limited-energy installations covered by these general requirements.

Table 720.4(A) Other ~~Articles for~~ Limited-Energy ~~Installations~~ Requirements

Application	Code Section
Limited-energy power sources	721.1
Limited-energy cables ~~for power-limited circuits, fault-managed power circuits, optical fiber circuits, and communications circuits~~	722.1
Raceways, cable routing assemblies, and cable trays for limited-energy systems	723.1
~~Class 1 power-limited circuits and equipment~~	~~724.1~~
Class 2 and Class 3 power-limited circuits and equipment	725.1
Class 4 fault-managed power circuits and equipment	726.1
Overvoltage protection of limited-energy ~~and communications~~ systems	742.1
Limited-energy system grounding	750.1
Fire alarm systems	760.1
Fire-resistive cable systems — Type FR	772.1
General requirements for communications systems outside and entering building	800.1
Antenna systems	810.1
Community antenna and television and radio distribution systems	820.1
Network-powered broadband communications systems	830.1
Premises-powered broadband communications systems	840.1

~~**(C)** Hazardous Locations.~~

~~Limited-energy and communications cables and equipment shall be permitted to be used in hazardous (classified) locations as defined in 500.5 and 500.6 where specifically permitted elsewhere in this code.~~

Supplemental Information

File Name	Description	Approved
720.4_-_Terra_copy.docx	staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 19:49:20 EDT 2024

Committee Statement

Committee Statement: A new (A) was created to address the application of the general requirements in Article 300, making it clear that code users apply the general requirements in Article 720 to limited-energy installations unless specifically referencing another part of the code. Subpart (B) has been created for the table listing other requirements for limited-energy installations in compliance with NEC Style manual section 4.1.5. The reference to Section 724.1 and application has been removed from the table list, as Class 1 circuits are not limited energy. The applications list has been revised, removing the words “and communications” where appropriate, to accurately reflect the same changes made in the scopes referenced as limited-energy systems and limited-energy cables include communications systems and cables by definition. New section 723.1 has been added as a new Article 723 has been created to cover raceways, cable routing assemblies, and cable trays for limited-energy systems. Lastly, the redundant subpart for “Hazardous Locations” has been deleted, as the requirements in Chapter 5 apply to limited-energy installations already per section 90.3.

Response Message: SR-7608-NFPA 70-2024

Public Comment No. 1505-NFPA 70-2024 [Section No. 720.4]

Public Comment No. 1306-NFPA 70-2024 [Section No. 720.4(A)]

Public Comment No. 1695-NFPA 70-2024 [Section No. 720.6]

Public Comment No. 1700-NFPA 70-2024 [Section No. 720.8]

Public Comment No. 1689-NFPA 70-2024 [Section No. 720.5]

Public Comment No. 334-NFPA 70-2024 [Section No. 720.4(A)]

Public Comment No. 1701-NFPA 70-2024 [Section No. 720.11]

Public Comment No. 1698-NFPA 70-2024 [Section No. 720.7]

Public Comment No. 880-NFPA 70-2024 [Section No. 720.4]

Public Comment No. 1343-NFPA 70-2024 [Section No. 720.4(B)]

Second Revision No. 7623-NFPA 70-2024 [Section No. 720.5(A)]

(A) Wet Locations.

The interior of enclosures or raceways installed underground shall be considered to be a wet location. Insulated conductors and cables installed in these enclosures or raceways in underground installations shall comply with ~~722.2(A)(11)~~ 722.2(B) .

Exception: The requirements of ~~310.10(C)~~ 722.2(B) shall not apply to ~~communications Type CM cables and conductors and coaxial-type CATV cables.~~ the following limited-energy cable types:

(1) Optical fiber cables

(2) Communications cables

(3) Coaxial-Type CATV cable

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 11:49:19 EDT 2024

Committee Statement

Committee Statement: The reference in 720.5(A) has been updated to correct the reference for cable listing found in 722.2. The exception in 720.5(A) has been revised to exclude the limited-energy cable types previously excluded when Chapter 8 was independent. It was also put into list format for usability.

Response Message: SR-7623-NFPA 70-2024

Public Comment No. 1502-NFPA 70-2024 [Section No. 720.5(A)]

Public Comment No. 335-NFPA 70-2024 [Section No. 720.5(A)]

Second Revision No. 7625-NFPA 70-2024 [Section No. 720.5(B)]

(B) Pools.

Limited-energy ~~and communications~~ cables located under the pool or within the area extending 1.5 m (5 ft) horizontally from the inside wall of the pool shall meet those requirements specified in 680.11.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 11:56:34 EDT 2024

Committee Statement

Committee Statement: The words “and communications cables” have been deleted as the new definition for Limited-Energy Cables adequately covers communications cables. “Listed” is not added as Article 722 requires listed cables and stating “listed cables” would leave a loophole for unlisted cables to not have separation requirements.

Response Message: SR-7625-NFPA 70-2024

Public Comment No. 1506-NFPA 70-2024 [Section No. 720.5(B)]

Public Comment No. 336-NFPA 70-2024 [Section No. 720.5(B)]

Second Revision No. 7629-NFPA 70-2024 [Section No. 720.5(C)]

(C) Underground Cables and Conductors Under Buildings.

Underground limited-energy ~~and communications~~ cable ~~and conductors~~ installed under a building shall be in a raceway.

Exception: The following unlisted outside plant limited-energy cable types shall be permitted to be installed without a raceway:

(1) Optical fiber cables

(2) Communication cables

(3) Coaxial-Type CATV cable

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 12:02:27 EDT 2024

Committee Statement

Committee Statement: The words “and conductors” have been deleted as the new definition for Limited-Energy Cables adequately covers this. The exception in 720.5(C) has been revised to exclude the limited-energy cable types previously excluded when Chapter 8 was independent. It was also put into list format for usability.

Response Message: SR-7629-NFPA 70-2024

Public Comment No. 337-NFPA 70-2024 [Section No. 720.5(C)]

Public Comment No. 1507-NFPA 70-2024 [Section No. 720.5(C)]

Second Revision No. 7632-NFPA 70-2024 [Section No. 720.5(D)]

(D) Protection from Damage when Emerging from Grade.

Direct-buried limited-energy ~~and communications conductors and~~ cables emerging from grade shall be protected by enclosures or raceways extending from ~~the minimum cover distance below~~ grade ~~required by 720.5(A)~~ to a point at least 2.5 m (8 ft) above finished grade. ~~In no case shall the protection be required to exceed 450 mm (18 in.) below finished grade.~~

Exception: The following unlisted outside plant limited-energy cable types shall be permitted to be installed without protection:

(1) Optical fiber cable

(2) Communications cable

(3) Coaxial Type-CATV cable

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 12:07:08 EDT 2024

Committee Statement

Committee Statement: The words “and communications conductors” have been deleted as the new definition for Limited-Energy Cables adequately covers this. The language referencing section 720.5(A) has been deleted as it is incorrect, and there are no burial depth requirements for limited-energy cables. The exception in 720.5(D) has been revised to exclude the limited-energy cable types previously excluded when Chapter 8 was independent. It was also put into list format for usability.

Response Message: SR-7632-NFPA 70-2024

Public Comment No. 338-NFPA 70-2024 [Section No. 720.5(D)]

Public Comment No. 1508-NFPA 70-2024 [Section No. 720.5(D)]

Second Revision No. 7634-NFPA 70-2024 [Section No. 720.5(E)]

~~**(E)** Splices and Taps.~~

~~Direct-buried limited-energy and communications conductors or cables shall be permitted to be spliced or tapped without the use of splice boxes. The splices or taps shall be made in accordance with 110.14(B) .~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 12:15:52 EDT 2024

Committee Statement

Committee Statement: The requirements in Section 110.14(B) apply per Section 90.3, and there is no requirement for splices to be in a box. Therefore, there is no need for an exception.

Response Message: SR-7634-NFPA 70-2024

Public Comment No. 1509-NFPA 70-2024 [Section No. 720.5(E)]

Public Comment No. 339-NFPA 70-2024 [Section No. 720.5(E)]

Second Revision No. 7635-NFPA 70-2024 [Section No. 720.5(J)]

~~**(I)** Separation From Light or Power, Non-Power-Limited Fire Alarm, or Class 1 Circuits.~~

~~Direct-buried limited-energy and communication wires and cables shall be separated at least 300 mm (12 in.) from conductors of any light or power, non-power-limited fire alarm circuit conductors, or Class 1 circuit.~~

~~*Exception Informational Note No. 1:* Separation shall not be required if electric service conductors or all the direct-buried communications wires and cables, CATV-type coaxial cables, and network-powered broadband communications cables are installed in raceways or have metal cable armor.~~

~~*Exception Informational Note No. 2:* Separation shall not be required under one of the following conditions:~~

~~*(0) If the electric light or power branch-circuit or feeder conductors or Class 1 circuit conductors are installed in a raceway or in metal-sheathed, metal-clad, or Type UF or Type USE cables*~~

~~*(0) If all the direct-buried communications wires cables, CATV-type coaxial cables, and network-powered broadband communications cables have metal cable armor or are installed in raceway*~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 12:18:47 EDT 2024

Committee Statement

Committee Statement: Section 720.5(J) has been deleted as this is covered in Section 800.47 for communications cables outside and entering buildings and in Section 722.13 for all other limited-energy cable applications.

Response Message: SR-7635-NFPA 70-2024

Public Comment No. 1510-NFPA 70-2024 [Section No. 720.5(J)]

Public Comment No. 340-NFPA 70-2024 [Section No. 720.5(J)]

Second Revision No. 7730-NFPA 70-2024 [Section No. 720.6]

720.6 Protection Against Physical Damage.

(A) General.

Where subject to physical damage, conductors, raceways, and limited energy ~~and communications~~ cables shall be protected.

Informational Note No. 1: See ANSI/TIA-568.0-D-2015, *Generic Telecommunications Cabling for Customer Premises*, and ANSI/TIA 568.3-D-2016, *Optical Fiber Cabling and Components Standard*, for accepted industry practices.

Informational Note No. 2: See ANSI/BICSI N1-2019, *Installation Practices for Telecommunications and IC Cabling and Related Cabling Infrastructure*; ANSI/TIA-568.1- E-2020, *Commercial Building Telecommunications Infrastructure Standard*; ANSI/TIA-569-E-2019, *Telecommunications Pathways and Spaces*; ANSI/TIA-570-C-2012, *Residential Telecommunications Infrastructure Standard*; ANSI/TIA-1005-A-2012, *Telecommunications Infrastructure Standard for Industrial Premises*; ANSI/TIA-1179-A-2017, *Healthcare Facility Telecommunications Infrastructure Standard*; ANSI/TIA-4966-2014, *Telecommunications Infrastructure Standard for Educational Facilities*; and other ANSI-approved installation standards for accepted industry practices.

(B) Cables or Conductors Installed in Raceways.

~~Wires and cables used for limited-energy and communications systems shall be permitted to be installed in any raceway included in Chapter 3 .~~

(1) Types.

Wires and cables used for limited-energy ~~and communications~~ systems shall be permitted to be installed in any raceway included in Chapter 3.

(2) Number and Size of Cables or Conductors in a Raceway.

The number and size of limited-energy ~~and communications conductors and~~ cables ~~installed~~ in ~~any~~ a complete raceway shall ~~be determined in accordance with all of the following:~~ not exceed the allowable fill percentage specified in Chapter 9 Table 1

(0) ~~Not more cables or conductors as permitted in Chapter 9~~

(0) ~~To allow for the dissipation of heat~~

(0) ~~To permit ready installation or withdrawal of the conductors or cables without damage to the conductors or cables, or to their insulation and sheathing~~

(C) Cables and Raceways Through Wood Members.

(1) Bored Holes.

In both exposed and concealed locations, where a cable- or raceway-type wiring method is installed through bored holes in joists, rafters, or wood members, holes shall be bored so that the edge of the hole is not less than 32 mm (1¼ in.) from the edges of the wood member. Where this distance cannot be maintained, the cable or raceway shall be protected from penetration by screws or nails by a steel plate(s) or bushing(s) at least 1.6 mm (1⁄16 in.) thick, and of appropriate length and width, installed to cover the area of the wiring.

Exception No. 1: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid PVC conduit, RTRC, or electrical metallic tubing.

Exception No. 2: A listed and marked steel plate less than 1.6 mm (1⁄16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

(2) Notches in Wood.

Where there is no objection because of weakening the building structure, in both exposed and concealed locations, cables or raceways shall be permitted to be laid in notches in wood studs, joists, rafters, or other wood members where the cable or raceway at those points is protected from penetration by nails or screws by a steel plate at least 1.6 mm (1⁄16 in.) thick, and of appropriate length and width, installed to cover the area of the wiring. The steel plate shall be installed before the building finish is applied.

Exception No. 1: Steel plates shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

Exception No. 2: A listed and marked steel plate less than 1.6 mm (1⁄16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

(D) Limited-Energy Cables without Metallic Cable Armor Through Metal Framing Members.

(1) Limited-Energy Cables without Metallic Armor.

In both exposed and concealed locations where limited-energy cables without metallic armor pass through either factory- or field-punched, cut, or drilled slots or holes in metal members, the cable shall be protected by listed bushings or listed grommets covering all metal edges that are securely fastened in the opening prior to installation of the cable.

(2) Limited-Energy Cables Installed in ~~HDPE~~ LFNC or ENT.

Where nails or screws are likely to penetrate limited-energy cables without a metallic cable armor, where installed in ~~HDPE~~ LFNC , ENT, or similar flexible nonmetallic raceways, a protection method as specified in 720.6 shall be used to protect the cable and tubing.

Exception: A listed and marked steel plate less than 1.6 mm (1⁄16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

(E) Cables and Raceways Parallel to Framing Members and Furring Strips.

In both exposed and concealed locations, where a cable- or raceway-type wiring method is installed parallel to framing members, such as joists, rafters, or studs, or is installed parallel to furring strips, the cable or raceway shall be installed and supported so that the nearest outside surface of the cable or raceway is not less than 32 mm (1 ¼ in.) from the nearest edge of the framing member or furring strips where nails or screws are likely to penetrate. Where this distance cannot be maintained, the cable or raceway shall be protected from penetration by nails or screws by a steel plate, sleeve, or equivalent at least 1.6 mm (1⁄16 in.) thick.

Exception No. 1: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or electrical metallic tubing.

Exception No. 2: For concealed work in finished buildings or finished panels for prefabricated buildings where such supporting is impracticable, it shall be permissible to fish the cables between access points.

Exception No. 3: A listed and marked steel plate less than 1.6 mm (1⁄16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

(F) Cables, Raceways, or Boxes Installed in or Under Metal-Corrugated Roof Decking.

A cable, raceway, or box, installed in exposed or concealed locations under metal-corrugated sheet roof decking, shall be installed and supported so there is not less than 38 mm (1 ½ in.) measured from the lowest surface of the roof decking to the top of the cable, raceway, or box. A cable, raceway, or box shall not be installed in concealed locations in metal-corrugated, sheet decking–type roof.

Note: Roof decking material is often repaired or replaced after the initial raceway or cabling and roofing installation and might be penetrated by screws or other mechanical devices designed to provide “hold down” strength of the waterproof membrane or roof insulating material.

Exception No. 1: Rigid metal conduit and intermediate metal conduit, with listed steel or malleable iron fittings and boxes, shall not be required to comply with 720.6(G).

Exception No. 2: The 38 mm (1 ½ in.) spacing is not required where metal-corrugated sheet roof decking is covered with a minimum thickness 50 mm (2 in.) concrete slab, measured from the top of the corrugated roofing.

(G) Cables and Raceways Installed in Shallow Grooves.

Cable- or raceway-type wiring methods installed in a groove, to be covered by wallboard, siding, paneling, carpeting, or similar finish, shall be protected by 1.6 mm (1⁄16 in.) thick steel plate, sleeve, or equivalent or by not less than 32 mm (1 ¼ in.) free space for the full length of the groove in which the cable or raceway is installed.

Exception No. 1: Steel plates, sleeves, or the equivalent shall not be required to protect rigid metal conduit, intermediate metal conduit, rigid PVC conduit, RTRC, or electrical metallic tubing.

Exception No. 2: A listed and marked steel plate less than 1.6 mm (1⁄16 in.) thick that provides equal or better protection against nail or screw penetration shall be permitted.

(H) Fittings.

Where raceways contain limited-energy ~~and communications~~ cables ~~or conductors~~ , and these cables ~~or conductors~~ enter a cabinet, a box, an enclosure, or a raceway, ~~prior to the installation of conductors,~~ the ~~conductors~~ cables shall be protected in accordance with any of the following:

(1) An identified fitting providing a smoothly rounded insulating surface

(2) A listed metal fitting that has smoothly rounded edges

(3) Separation from the fitting or raceway using an identified insulating material that is securely fastened in place

(4) Threaded hubs or bosses that are an integral part of a cabinet, box, enclosure, or raceway providing a smoothly rounded or flared entry for ~~conductors~~ cables

Conduit bushings constructed wholly of insulating material shall not be used to secure a fitting or raceway. The insulating fitting or insulating material shall have a temperature rating not less than the insulation temperature rating of the installed ~~conductors~~ cables .

(I) Structural Joints.

A listed expansion/deflection fitting or other approved means shall be used where a raceway crosses a structural joint intended for expansion, contraction, or deflection, used in buildings, bridges, parking garages, or other structures.

~~**(J)** In Hoistways.~~

~~In hoistways, limited energy and communications cables shall be installed in rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or electrical metallic tubing. For elevators or similar equipment, these conductors shall be permitted to be installed as provided in 620.21 .~~

(J) Safety-Control Equipment.

Where damage to limited-energy and communications cables and conductors can result in a failure of safety-control equipment that would introduce a direct fire or life hazard, all such conductors and cables shall be protected from physical damage.

~~*Exception: Room thermostats, water temperature regulating devices, and similar controls used in conjunction with electrically controlled household heating and air conditioning shall not be considered safety-control equipment.*~~

Room thermostats, water temperature regulating devices, and similar controls used in conjunction with electrically controlled household heating and air conditioning shall not be considered safety-control equipment.

Supplemental Information

File Name	Description	Approved
720.6_-_Terra_Copy.docx		
720.6_-_SR-7730.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 23:54:01 EDT 2024

Committee Statement

Committee Statement: In Section 720.6(A), (B), (H), and (K) the redundant text “communications cables and/or conductors” has been deleted. The new defined term “Limited-Energy Cables” covers all limited-energy circuit cables including communications cables and conductors. Section 720.6(B) has been divided into two subdivisions for compliance with section 3.5.1.2 of the NEC Style Manual, as there are two separate requirements addressed.

The allowable fill percentage reference was updated to reference Chapter 9, Table 1.

The new exception proposed by PC-343 for 720.6(B)(1) was not added because all Limited-Energy cables can occupy the same raceway, so raceway fill requirements must apply to all cables occupying space within the raceway. Adding an exclusion to communications cables, CATV-type coaxial cables and optical fiber cables would imply that these cables do not take up space in the pathway, which is physically impossible.

HDPE was replaced with LFNC in two places of (D)(2) because HDPE is not permitted inside of a building.

(J) was deleted because this section is general requirements and “in hoistways” is a specific requirement addressed in Article 620.

The exception in (K) was promoted to mandatory text as it wasn’t an exception to any requirements.

Response Message: SR-7730-NFPA 70-2024

Public Comment No. 342-NFPA 70-2024 [Section No. 720.6(B) [Excluding any Sub-Sections]]

Public Comment No. 341-NFPA 70-2024 [Section No. 720.6(A)]

Public Comment No. 886-NFPA 70-2024 [Section No. 720.6(J)]

Public Comment No. 884-NFPA 70-2024 [Section No. 720.6(D)(2)]

Public Comment No. 345-NFPA 70-2024 [Section No. 720.6(J)]

Public Comment No. 1512-NFPA 70-2024 [Section No. 720.6]

Public Comment No. 346-NFPA 70-2024 [Section No. 720.6(K)]

Public Comment No. 883-NFPA 70-2024 [Section No. 720.6(B)]

Public Comment No. 344-NFPA 70-2024 [Section No. 720.6(H)]

Public Comment No. 888-NFPA 70-2024 [Section No. 720.6(K)]

Public Comment No. 343-NFPA 70-2024 [Section No. 720.6(B)(1)]

Second Revision No. 7643-NFPA 70-2024 [Section No. 720.7]

720.7 Protection Against Corrosion and Deterioration.

Raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, fittings, supports, and support hardware, installed for use with limited-energy ~~and communications~~ systems, shall be of materials suitable for the environment in which they are to be installed. For the purposes of this section, enclosures shall not include fences or walls surrounding electrical equipment.

(A) Ferrous Metal Equipment.

Ferrous metal raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, nipples, fittings, supports, and support hardware shall be suitably protected against corrosion ~~inside and outside (except threads at joints)~~ by a coating of approved corrosion-resistant material. Where corrosion protection is necessary and the conduit is threaded anywhere other than at the factory where the product is listed, the threads shall be coated with an approved electrically conductive, corrosion-resistant compound.

Exception: Stainless steel shall not be required to have protective coatings.

(1) Protected from Corrosion Solely by Enamel.

Where protected from corrosion solely by enamel, ferrous metal raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, nipples, fittings, supports, and support hardware shall not be used outdoors or in wet locations as described in 300.6(D).

(2) Organic Coatings on Boxes or Cabinets.

Where boxes, cabinets, or enclosures ~~(other than surrounding fences and walls)~~ have an approved system of organic coatings and are marked “Raintight,” “Rainproof,” or “Outdoor Type,” they shall be permitted outdoors.

(3) In Concrete or in Direct Contact with the Earth.

Ferrous metal raceways, cable armor, boxes, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, nipples, fittings, supports, and support hardware shall be permitted to be installed in concrete, in direct contact with the earth, or in areas subject to severe corrosive influences where made of material approved for the condition or where provided with corrosion protection approved for the condition.

(B) Aluminum Metal Equipment.

Aluminum raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, nipples, fittings, supports, and support hardware embedded or encased in concrete or in direct contact with the earth shall be provided with supplementary corrosion protection.

(C) Nonmetallic Equipment.

Nonmetallic raceways, cable trays, cablebus, auxiliary gutters, boxes, cables with a nonmetallic outer jacket and internal metal armor or jacket, cable sheathing, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , elbows, couplings, nipples, fittings, supports, and support hardware shall be made of material approved for the condition and shall comply with 720.7(C)(1) and 720.7(C)(2) as applicable to the specific installation.

(1) Exposed to Sunlight.

Where exposed to sunlight, the materials shall be listed as sunlight resistant or shall be identified as sunlight resistant.

(2) Chemical Exposure.

Where subject to exposure to chemical solvents, vapors, splashing, or immersion, materials or coatings shall either be inherently resistant to chemicals based on their listing or be identified for the specific chemical reagent.

(D) Indoor Wet Locations.

In portions of dairy processing facilities, laundries, canneries, and other indoor wet locations, and in locations where walls are frequently washed or where there are surfaces of absorbent materials, such as damp paper or wood, the entire wiring system, where installed exposed, including all boxes, cabinets, enclosures ~~(other than surrounding fences and walls)~~ , fittings, raceways, and cable used therewith, shall be mounted so that there is at least a 6 mm (¼ in.) airspace between it and the wall or supporting surface.

Exception: Nonmetallic raceways, boxes, and fittings shall be permitted to be installed without the airspace on a concrete, masonry, tile, or similar surface.

Informational Note: In general, areas where acids and alkali chemicals are handled and stored might present such corrosive conditions, particularly when wet or damp. Severe corrosive conditions might also be present in portions of meatpacking plants, tanneries, glue houses, and some stables; in installations immediately adjacent to a seashore and swimming pool areas; in areas where chemical deicers are used; and in storage cellars or rooms for hides, casings, fertilizer, salt, and bulk chemicals.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 13:27:14 EDT 2024

Committee Statement

Committee Statement: The words “and communications systems” have been deleted as the new definition for Limited-Energy Systems adequately covers communications systems.

The section was modified to comply with NEC Style Manual as it relates to the use of parenthetical language. By indicating that this section does not apply to fences and walls used as enclosures, most of the parenthetical language of this section can be removed.

The deleted text regarding corrosion protection of threaded connection was unnecessary, as it is covered in the last sentence of (A).

Response Message: SR-7643-NFPA 70-2024

Public Comment No. 889-NFPA 70-2024 [Section No. 720.7]

Public Comment No. 1514-NFPA 70-2024 [Section No. 720.7 [Excluding any Sub-Sections]]

Public Comment No. 347-NFPA 70-2024 [Section No. 720.7 [Excluding any Sub-Sections]]

Second Revision No. 7645-NFPA 70-2024 [New Section after 720.8]

720.9 Dwelling Unit Communications Outlet.

For new construction, a minimum of one communications outlet shall be installed in accordance with all the following:

(1) Within a dwelling unit

(2) In an accessible area

(3) Cabled to the service provider demarcation point

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 13:36:03 EDT 2024

Committee Statement

Committee Statement: New language establishing a general requirement for a required communications outlet installed in new construction dwellings has been added in new Section 720.9. This was previously located in 805.156. However, this section was deleted as part of the limited-energy consolidation. Additionally, the section was put into list format to comply with section 3.5.1.2 of the NEC Style Manual.

Response Message: SR-7645-NFPA 70-2024

Public Comment No. 1531-NFPA 70-2024 [New Section after 720.8(B)]

Second Revision No. 7732-NFPA 70-2024 [Section No. 720.8(A)]

(A) ~~Sealing~~ Condensation .

Where portions of a raceway or sleeve are known to be subjected to different temperatures, and where condensation is known to be a problem, as in cold storage areas of buildings or where passing from the interior to the exterior of a building, the raceway or sleeve shall ~~be sealed to prevent the circulation of warm air to a colder section of the raceway or sleeve. Sealants shall be identified for use with cable insulation, conductor insulation, a bare conductor, a shield, or other components. An explosionproof seal shall not be required for this purpose~~ comply with 720.8(A)(1) or 720.8(A)(2) .

(1) Sealants.

The raceway or sleeve shall be sealed to prevent the circulation of warm air to a colder section of the raceway or sleeve. Sealants shall be identified for use with cable insulation, conductor insulation, a bare conductor, a shield, or other components. An explosionproof seal shall not be required for this purpose.

(2) Other Approved Means.

The use of a listed fitting or other approved means identified for the purpose of preventing condensation and the circulation of warm air shall be permitted.

Informational Note: An example of a fitting for the prevention of condensation could be a thermal break coupling.

Supplemental Information

File Name	Description	Approved
NEC_CMP-3_SR-7732_720.8_A_.docx		

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 00:15:59 EDT 2024

Committee Statement

Committee Statement: The section is revised to have parallel structure with 300.9(A).

Response Message: SR-7732-NFPA 70-2024

Second Revision No. 7646-NFPA 70-2024 [Section No. 720.10]

720.10 Installation of Limited-Energy ~~and Communications~~ Cables and Conductors with Non-Electrical Systems.

Raceways or cable trays containing limited-energy ~~or communications~~ cables and conductors shall not contain any pipe, tube, or other means for steam, water, air, gas, drainage, or any service other than electrical installations as permitted elsewhere in this code.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 13:37:58 EDT 2024

Committee Statement

Committee Statement: The words “communications cables” have been deleted as the new definition for Limited-Energy Cables includes communications cables.

Response Message: SR-7646-NFPA 70-2024

Public Comment No. 1515-NFPA 70-2024 [Section No. 720.10]

Public Comment No. 348-NFPA 70-2024 [Section No. 720.10]

Second Revision No. 7648-NFPA 70-2024 [Section No. 720.11]

720.11 Limited-Energy ~~and Communications~~ System Raceways in Wet Locations Above Grade.

Where raceways used for limited-energy ~~and communications~~ systems are installed in wet locations above grade, the interior of these raceways shall be considered to be a wet location. Insulated cables and conductors installed in raceways in wet locations above grade shall comply with 310.10(C).

Exception: The following limited-energy cable types shall not be required to be listed for wet locations:

(1) Optical fiber cable

(2) Communications cable

(3) CATV-Type coaxial cable

(4) Network-powered broadband low-power cable

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 13:40:32 EDT 2024

Committee Statement

Committee Statement: The words “and communications systems” have been deleted as the new definition for Limited-Energy Systems includes communications systems. An exception has been created for certain limited-energy cable types as the independence of Chapter 8 was removed in the first draft. Providing the exception reestablishes the same relaxed requirements for these cable types as permitted in the 2023 edition. Lastly, the reference to 310.10(C) has been revised to reference the listing requirements for limited-energy cables in section 722.2(B).

Response Message: SR-7648-NFPA 70-2024

Public Comment No. 890-NFPA 70-2024 [Section No. 720.11]

Public Comment No. 1516-NFPA 70-2024 [Section No. 720.11]

Public Comment No. 349-NFPA 70-2024 [Section No. 720.11]

Second Revision No. 7649-NFPA 70-2024 [Section No. 720.14]

~~**720.14** Mechanical Continuity — Raceways and Cables.~~

~~**(A)** General.~~

~~Raceways, cable armors, and cable sheaths shall be continuous between cabinets, boxes, conduit bodies, fittings, or other enclosures or outlets.~~

~~*Exception No. 1: Short sections of raceways used to provide support or protection of cable assemblies from physical damage shall not be required to be mechanically continuous.*~~

~~*Exception No. 2: Raceways and cables installed into the bottom of open bottom equipment shall not be required to be mechanically secured to the equipment.*~~

~~**(B)** Limited-Energy and Communications Cables and Conductors Installed in a Raceway.~~

~~Limited-energy and communications cables and conductors installed in a raceway shall be continuous between outlets, boxes, devices, and so forth, unless specifically permitted elsewhere in this code.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 13:45:03 EDT 2024

Committee Statement

Committee Statement: This language was erroneously copied from Article 300 and is not applicable to limited-energy systems.

Response Message: SR-7649-NFPA 70-2024

Public Comment No. 891-NFPA 70-2024 [Section No. 720.14]

Public Comment No. 1519-NFPA 70-2024 [Section No. 720.14(B)]

Public Comment No. 350-NFPA 70-2024 [Section No. 720.14(B)]

Second Revision No. 7650-NFPA 70-2024 [Section No. 720.19]

720.19 Supporting Cables and Conductors in Vertical Raceways.

(A) Spacing Intervals — Maximum.

Limited-energy ~~and communications~~ cables and conductors in vertical raceways exceeding 30 m (100 ft) in elevation change shall be supported in accordance with the following:

(1) At least one support method shall be provided for each conductor at the top of the vertical raceway or as close to the top as practical.

(2) Intermediate supports shall be provided as necessary to limit supported conductor lengths to not greater than 30 m (100 ft).

Exception: Steel wire armor cable shall be supported at the top of the riser with a cable support that clamps the steel wire armor. A safety device shall be permitted at the lower end of the riser to hold the cable in the event there is slippage of the cable in the wire-armored cable support. Additional wedge-type supports shall be permitted to relieve the strain on the equipment terminals caused by expansion of the cable under load.

(B) Fire-Resistive Cables and Conductors.

Support methods and spacing intervals for fire-resistive limited-energy ~~and communications~~ cables and conductors shall comply with any restrictions provided in the listing of the electrical circuit protective system or fire-resistive cable system used, and in no case shall the support intervals be lengths greater than 30 m (100 ft).

(C) Support Methods.

One of the following methods of support shall be used:

(1) Clamping devices constructed of or employing insulating wedges inserted in the ends of the raceways. Where clamping of insulation does not adequately support the cable, the conductor also shall be clamped.

(2) Inserting boxes at the required intervals in which insulating supports are installed and secured in an approved manner to withstand the weight of the conductors attached thereto, and the boxes are provided with covers.

(3) In junction boxes, deflecting the cables not less than 90 degrees and carrying them horizontally to a distance not less than twice the diameter of the cable, with the cables being carried on two or more insulating supports and additionally secured thereto by tie wires, if desired. Where this method is used, cables shall be supported at intervals not greater than 6 m (20 ft).

(4) Other approved means.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 13:46:47 EDT 2024

Committee Statement

Committee Statement: The words “and communications” have been deleted from subsections (A) and (B) as the new definition for Limited-Energy Cables includes communications systems. Additionally, a minimum elevation change was added to provide relief from cable support for vertical raceways not exceeding 30 m (100 ft), as the current language

would require cable support on any length of vertical raceway.

Response Message: SR-7650-NFPA 70-2024

Public Comment No. 351-NFPA 70-2024 [Section No. 720.19(A)]

Public Comment No. 892-NFPA 70-2024 [Section No. 720.19(A)]

Public Comment No. 352-NFPA 70-2024 [Section No. 720.19(B)]

Public Comment No. 1521-NFPA 70-2024 [Section No. 720.19]

Second Revision No. 7653-NFPA 70-2024 [Section No. 720.21]

720.21 Spread of Fire or Products of Combustion.

Limited-energy ~~and communications installations~~ systems in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be ~~made~~ installed so that the possible spread of fire or products of combustion will not be substantially increased. Openings around electrical penetrations into or through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating.

Informational Note: Directories of electrical construction materials published by qualified testing laboratories contain many listing installation restrictions necessary to maintain the fire-resistive rating of assemblies where penetrations or openings are made. Building codes also contain restrictions on membrane penetrations on opposite sides of a fire-resistance-rated wall assembly. An example is the 600 mm (24 in.) minimum horizontal separation that usually applies between boxes installed on opposite sides of the wall. Assistance in complying with the requirements of 720.21 can be found in building codes, fire resistance directories, and product listings.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 14:03:36 EDT 2024

Committee Statement

Committee Statement: The words “and communications” have been deleted as the definition for Limited-Energy Systems includes communications system installations.

The word, “cable,” as proposed by PC-353, was not added because the integrity of a fire resistance rated wall must be maintained around openings such as those created at communications outlets.

Response Message: SR-7653-NFPA 70-2024

Public Comment No. 353-NFPA 70-2024 [Section No. 720.21]

Public Comment No. 1522-NFPA 70-2024 [Section No. 720.21]

Second Revision No. 7659-NFPA 70-2024 [Section No. 720.22]

720.22 Wiring in Ducts Not Used for Air Handling, Fabricated Ducts for Environmental Air, and Other Spaces for Environmental Air (Plenums).

The ~~requirements of this section shall apply to the~~ installation of limited-energy~~, communications, coaxial-type CATV, conductive optical fiber-type OF conductors,~~ cables, and equipment in ducts used for dust, loose stock, or vapor removal, ducts specifically fabricated for environmental air, and other spaces used for environmental air (plenums) shall comply with 720.22(A) through 720.22(C) .

Informational Note: See Article 424~~,~~ Part VI for requirements on duct heaters.

(A) Ducts for Dust, Loose Stock, or Vapor Removal.

No limited-energy ~~or communications wiring~~ systems of any type shall be installed in ducts used to transport dust, loose stock, or flammable vapors. No wiring system of any type shall be installed in any duct, or shaft containing only such ducts, used for vapor removal or for ventilation of commercial-type cooking equipment.

~~Exception: Nonconductive fiber optical cables shall be permitted in ducts used for dust, loose stock, or vapor removal.~~

(B) Ducts Specifically Fabricated for Environmental Air.

Limited-energy ~~and communications~~ equipment, devices, and the wiring methods specified in this section shall be permitted within such ducts only if necessary for the direct action upon, or sensing of, the contained air. Where equipment or devices are installed and illumination is necessary to facilitate maintenance and repair, enclosed gasketed-type luminaires shall be permitted.

Only wiring methods consisting of Type MI cable without an overall nonmetallic covering, Type MC cable employing a smooth or corrugated impervious metal sheath without an overall nonmetallic covering, electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, or rigid metal conduit without an overall nonmetallic covering shall be installed in ducts specifically fabricated to transport environmental air. Flexible metal conduit shall be permitted, in lengths not to exceed 1.2 m (4 ft), to connect physically adjustable equipment and devices permitted to be in these fabricated ducts. The connectors used with flexible metal conduit shall effectively close any openings in the connection.

Exception: Wiring methods and cabling systems, listed for use in other spaces used for environmental air (plenums), shall be permitted to be installed in ducts specifically fabricated for environmental air-handling purposes under both of the following conditions:

(1) The wiring methods or cabling systems shall be permitted only if necessary to connect to equipment or devices associated with the direct action upon or sensing of the contained air.

(2) The total length of such wiring methods or cabling systems shall not exceed 1.2 m (4 ft).

(C) Other Spaces Used for Environmental Air (Plenums).

~~This section~~ The requirements of 720.22(C)(1) through 720.22(C)(3) shall apply to spaces not specifically fabricated for environmental air-handling purposes but used for air-handling purposes as a plenum. This section shall not apply to habitable rooms or areas of buildings, the prime purpose of which is not air handling.

Informational Note No. 1: The space over a hung ceiling used for environmental air-handling purposes is an example of the type of other space to which this section applies.

Informational Note No. 2: See NFPA 90A~~-2024~~ , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, and other mechanical codes for information on how the term *other spaces used for environmental air (plenum)*, as used in this section, correlates with the use of the term plenum where the plenum is used for return air purposes, as well as some other air-handling spaces.

Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants may result in an undetermined alteration of wire and cable properties.

Informational Note No. 4: See NFPA 262 , *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces* , for the test method used to determine that a cable is low-smoke producing and fire resistant, exhibiting a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less.

Exception: ~~This section~~ These requirements shall not apply to the joist or stud spaces of dwelling units where the wiring passes through such spaces perpendicular to the long dimension of such spaces.

(1) Wiring Methods.

The limited-energy ~~and communications c~~ ables used in other spaces used for environmental air shall be limited to those cables specifically listed for use within an air-handling space or listed prefabricated cable assemblies of metallic manufactured wiring systems without nonmetallic sheath. Other types of cables, conductors, and raceways shall be permitted to be installed in electrical metallic tubing, flexible metallic tubing, intermediate metal conduit, rigid metal conduit without an overall nonmetallic covering, flexible metal conduit, or, where accessible, surface metal raceway or metal wireway with metal covers.

Informational Note: See UL 2043, *Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces*, for one method of testing low smoke and heat release properties for nonmetallic cable ties and other nonmetallic cable accessories to determine a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a peak heat release rate of 100 kW or less.

(2) Cable Tray Systems.

The requirements in 720.22(C)(2)(a) or 720.22(C)(2)(b) shall apply to the use of metallic cable tray systems in other spaces used for environmental air (plenums), where accessible.

(a) *Metal Cable Tray Systems.* Metal cable tray systems shall be permitted to support the wiring methods specified in 720.22(C)(1).

(b) *Solid Side and Bottom Metal Cable Tray Systems.* Solid side and bottom metal cable tray systems with solid metal covers shall be permitted to enclose wiring methods and cables not already covered in 720.22(C)(1) in accordance with 392.10(A) and 392.10(B).

(3) Equipment.

Electrical equipment with a metal enclosure, or electrical equipment with a nonmetallic enclosure listed for use within an air-handling space and having low smoke and heat release properties, and associated wiring material suitable for the ambient temperature shall be permitted to be installed in such other spaces unless prohibited elsewhere in this code.

Informational Note No. 1: See UL 2043, *Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces*, for one method of testing low smoke and heat release properties to determine that the equipment exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a peak heat release rate of 100 kW or less.

Informational Note No. 2: See NFPA 90A~~-2024~~ , *Standard for the Installation of Air Conditioning and Ventilating Systems*, for information on listing discrete products as having low smoke and hear release properties.

Exception: Integral fan systems shall be permitted where specifically identified for use within an air-handling space.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 14:12:24 EDT 2024

Committee Statement

Committee Statement: The new definition of limited-energy cables includes all types of communications cables. With this new defined term there is no need to list out all of the various communications cable types in 720.22(A)-(C)(1). As such these redundant terms have been deleted.

The exception in (A) is deleted because the conductivity of a cable does not matter when it comes to installation in a duct that is removing dust, vapors, and similar materials. There was no limit on the amount of such cables, and the duct could have been stuffed with enough cables that it could no longer function, creating a serious fire hazard.

A new informational note no. 4 was added to Section 720.22(C) to provided reference to NFPA 262-2023 for methods of test for flame travel and smoke of wires and cables in air-handling spaces.

References to “this section” were removed in compliance with the Style Manual.

Response Message: SR-7659-NFPA 70-2024

Public Comment No. 895-NFPA 70-2024 [Section No. 720.22(C) [Excluding any Sub-Sections]]

Public Comment No. 1524-NFPA 70-2024 [Section No. 720.22]

Public Comment No. 356-NFPA 70-2024 [Section No. 720.22(B)]

Public Comment No. 354-NFPA 70-2024 [Section No. 720.22 [Excluding any Sub-Sections]]

Public Comment No. 894-NFPA 70-2024 [Section No. 720.22(A)]

Public Comment No. 1303-NFPA 70-2024 [Section No. 720.22(C) [Excluding any Sub-Sections]]

Public Comment No. 355-NFPA 70-2024 [Section No. 720.22(A)]

Public Comment No. 357-NFPA 70-2024 [Section No. 720.22(C)(1)]

Public Comment No. 893-NFPA 70-2024 [Section No. 720.22 [Excluding any Sub-Sections]]

Second Revision No. 7664-NFPA 70-2024 [Section No. 720.24]

720.24 Bends.

~~Where a single run is made up of one or more raceway type wiring methods, maximum degrees of bends~~ The total degree of bends in any combination of conduit or tubing wiring methods used for a single run shall not exceed 360 degrees between pull points .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 14:25:19 EDT 2024

Committee Statement

Committee Statement: The text is revised to add clarity that the maximum number of bends applies between pull points. The words “conduit or tubing” were added to clarify the types of wiring methods that this section applies to. The text is reworded to be consistent with 300.24.

Response Message: SR-7664-NFPA 70-2024

Public Comment No. 897-NFPA 70-2024 [Section No. 720.24]

Second Revision No. 7665-NFPA 70-2024 [Section No. 720.27]

~~**720.27** Temperature Limitations of Limited-Energy Conductors and Cables.~~

~~Limited-energy and communications cables and conductors shall be installed in accordance with 722.27 for temperature limitations.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 14:27:32 EDT 2024

Committee Statement

Committee Statement: Section 720.27 has been deleted as this requirement is covered in Section 722.27.

Response Message: SR-7665-NFPA 70-2024

Public Comment No. 1525-NFPA 70-2024 [Section No. 720.27]

Public Comment No. 907-NFPA 70-2024 [Section No. 720.27]

Public Comment No. 358-NFPA 70-2024 [Section No. 720.27]

Second Revision No. 7667-NFPA 70-2024 [Section No. 720.30(A)]

(A) Secured in Place.

(1) Raceways, Cable Assemblies, Boxes, Cabinets, and Fittings.

Raceways, cable assemblies, boxes, cabinets, and fittings shall be securely fastened in place.

(2) Limited-Energy ~~and Communications~~ Cables.

Limited-energy ~~and communications~~ cables installed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cables will not be damaged by normal building use.

(3) Methods.

Cables shall be secured by hardware, including straps, staples, cable ties listed and identified for securing and supporting, and hangers, or similar fittings designed and installed so as not to damage the cable.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 14:31:05 EDT 2024

Committee Statement

Committee Statement: The words “and communications” have been deleted from the title and charging text in (2) as the newly defined term Limited-Energy Cables includes communications cables. A new (3) has been added for consistency with the general requirements in Article 300 for other systems.

Response Message: SR-7667-NFPA 70-2024

Public Comment No. 908-NFPA 70-2024 [Section No. 720.30(A)]

Public Comment No. 359-NFPA 70-2024 [Section No. 720.30(A)(2)]

Second Revision No. 7669-NFPA 70-2024 [Sections 720.30(B), 720.30(C), 720.30(D)]

(B) ~~Wiring Systems~~ Limited Energy Cables Installed Above Suspended Ceilings.

Limited-energy cables shall be installed above suspended ceilings in accordance with all the following:

(1) Limited-energy cables shall not be secured or supported by the ceiling system, including the ceiling support wires.

(2) Support wires and associated fittings that provide secure support and that are installed in addition to the ceiling grid support wires shall be permitted as the sole support.

(3) If independent support wires are used, they shall comply with the following:

a. Distinguished by color, tagging, or other means from those that are part of the ceiling systems

b. Secured at both ends

(4) Cables and raceways shall not be supported by ceiling grids.

~~Support wires that do not provide secure support shall not be the sole support. Support wires and associated fittings that provide secure support and that are installed in addition to the ceiling grid support wires shall be permitted as the sole support. Where independent support wires are used, they shall be secured at both ends. Cables and raceways shall not be supported by ceiling grids.~~

Exception No. 1: The ceiling support system shall be permitted to support wiring and equipment that have been tested as part of the fire-rated assembly.

Informational Note: See ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, for one method of testing to determine fire rating.

Exception No. 2: The ceiling support system shall be permitted to support branch-circuit wiring and associated equipment if installed in accordance with the ceiling system manufacturer's instructions.

~~**(C)** Fire-Rated Assemblies.~~

~~Wiring located within the cavity of a fire-rated floor-ceiling or roof-ceiling assembly shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent means of secure support shall be provided and shall be permitted to be attached to the assembly. Where independent support wires are used, they shall be distinguishable by color, tagging, or other effective means from those that are part of the fire-rated design.~~

~~*Exception: The ceiling support system shall be permitted to support wiring and equipment that have been tested as part of the fire-rated assembly.*~~

~~Informational Note: See ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials* , for one method of testing to determine fire rating.~~

~~**(D)** Non-Fire-Rated Assemblies.~~

~~Wiring located within the cavity of a non-fire-rated floor-ceiling or roof-ceiling assembly shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent means of secure support shall be provided and shall be permitted to be attached to the assembly. If independent support wires are used, they shall be distinguishable by color, tagging, or other effective means.~~

~~*Exception:* The ceiling support system shall be permitted to support branch-circuit wiring and associated equipment if installed in accordance with the ceiling system manufacturer's instructions.~~

Supplemental Information

File Name	Description	Approved
720.30BCD_-_Terra_Copy.docx		
720.30BCD_-_SR-7669.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Tue Oct 15 14:34:43 EDT 2024

Committee Statement

Committee Statement: NA
Response Message: SR-7669-NFPA 70-2024

Public Comment No. 898-NFPA 70-2024 [Sections 720.30(B), 720.30(C), 720.30(D)]

Second Revision No. 7731-NFPA 70-2024 [Section No. 720.30(E)]

(C) Raceways Used as Means of Support.

Raceways shall be ~~used only as~~ permitted as a means of support for other raceways, cables, or nonelectrical equipment only under any of the following conditions:

(1) If the raceway or means of support is identified as a means of support

(2) If the raceway contains power supply conductors for electrically controlled equipment and is used to support Class 2 or Class 3 circuit conductors or cables that are solely for the purpose of connection to the equipment control circuits

(3) Overhead (aerial) spans of ~~optical fiber-type OF cables, communications drop wires, communications cables, and coaxial-CATV cables~~ limited-energy cable drop wires attached to the exterior of a raceway-type mast intended for the attachment and support of such cables, and where not prohibited elsewhere in this code~~.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 00:11:28 EDT 2024

Committee Statement

Committee Statement: The new defined term Limited-Energy Cables includes all of the communication cable types as identified in list item (3). As such, the language has been simplified using the new defined term. Additionally, the charging text has been modified for clarity as it suggested that raceways could be used only as a means of support.

Response Message: SR-7731-NFPA 70-2024

Public Comment No. 899-NFPA 70-2024 [Section No. 720.30(E)]

Public Comment No. 361-NFPA 70-2024 [Section No. 720.30(E)]

Second Revision No. 7656-NFPA 70-2024 [Section No. 720.30(G)]

(E) Spaces Used for Environmental Air (Plenums).

If nonmetallic cable supports, including cable ties, and other nonmetallic cable accessories are used to secure and support cables installed in other locations used for environmental air (plenums), they shall be listed as having low-smoke and heat-release properties in accordance with 720.22(C)(3).

Informational Note No. 1: See ANSI/BICSI N1-2019, *Installation Practices for Telecommunications and IC Cabling and Related Cabling Infrastructure*; ANSI/TIA-568.1- E-2020, *Commercial Building Telecommunications Infrastructure Standard*; ANSI/TIA-569-E-2019, *Telecommunications Pathways and Spaces*; ANSI/TIA-570-C-2012, Residential Telecommunications Infrastructure Standard; ANSI/TIA-1005-A-2012, *Telecommunications Infrastructure Standard for Industrial Premises*; ANSI/TIA-1179-A-2017, *Healthcare Facility Telecommunications Infrastructure Standard*; ANSI/TIA-4966-2014, *Telecommunications Infrastructure Standard for Educational Facilities*; ANSI/NECA/FOA 301-2016, *Standard for Installing and Testing Fiber Optic Cables*, ANSI/TIA-568.0-d-2015, *General Telecommunications Cabling for Customer Premises*, and ANSI/TIA-568.3-d-2016, *Optical Fiber Cabling and Components Standard*, and other ANSI-approved installation standards for accepted industry practices.

Informational Note No. 2: See NFPA 90A ~~2024~~ , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 8.5.5.6 for listing information of discrete combustible components installed in accordance with 300.25(C).

Informational Note No. 3: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants ~~may~~ could result in an undetermined alteration of wire and cable properties.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 14:10:02 EDT 2024

Committee Statement

Committee Statement: The language in 720.30(G) has been modified to include cable ties, which will allow their use in environmental air plenums as permitted in the 2023 edition.

Response Message: SR-7656-NFPA 70-2024

Public Comment No. 1479-NFPA 70-2024 [Section No. 720.22(C)]

Public Comment No. 636-NFPA 70-2024 [Section No. 720.22(C)]

Second Revision No. 7578-NFPA 70-2024 [Section No. 721.1]

721.1 Scope.

This article covers power source requirements for limited-energy system circuits.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:15:37 EDT 2024

Committee Statement

Committee Statement: The scope is modified to include the term limited-energy system to make the coverage of Article 721 inclusive of all limited-energy systems.

Response Message: SR-7578-NFPA 70-2024

Public Comment No. 1373-NFPA 70-2024 [Section No. 721.1]

Second Revision No. 7579-NFPA 70-2024 [Section No. 721.30(C)]

(C) Marking.

The equipment supplying the circuits shall be durably marked where plainly visible to indicate each circuit that is a Class 2 or Class 3 circuit. The power sources for limited power circuits in 721.30(A)(3), limited power circuits for listed audio/video equipment, listed information technology equipment, listed communications equipment, and listed industrial equipment in 721.30(A)(4) shall have a label indicating the maximum voltage and rated current output per conductor for each connection point on the power source. Where multiple connection points have the same rating, a single label shall be permitted to be used.

Informational Note No. 1: Rated current for power sources covered in ~~794.204~~ 722.140(B) is the output current per conductor the power source is designed to deliver to an operational load at normal operating conditions, as declared by the manufacturer.

Informational Note No. 2: An example of a label is “52V @ 0.433A, 57V MAX” for an IEEE 802.3 compliant Class 8 power source.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:18:07 EDT 2024

Committee Statement

Committee Statement: The cross reference in Informational Note 1 is updated to 722.140(B) as the text in 794.204 has been relocated.

Response Message: SR-7579-NFPA 70-2024

Public Comment No. 936-NFPA 70-2024 [Section No. 721.30(C)]

Second Revision No. 7580-NFPA 70-2024 [New Section after 721.50]

721.60 Power Source for Premise-Powered Broadband Communication Systems.

The power source for circuits intended to provide power over communications cables to remote equipment shall be limited in accordance with Chapter 9 Table 11(B) for voltage sources up to 60 volts dc and be listed as specified in either of the following:

(1) A power source shall be listed as specified in 721.30(A)(1) , 721.30(A)(2) , 721.30(A)(3) , or 721.30(A)(4) . The power sources shall not have the output connections paralleled or otherwise interconnected unless listed for such interconnection.

(2) A power source shall be listed as communications equipment for power-limited power circuits.

Informational Note: See UL 60950-1, *Information Technology Equipment-Safety — Part 1* , or UL 62368-1, *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements* . Typically, such circuits are used to interconnect equipment for the purpose of exchanging information (data).

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:19:40 EDT 2024

Committee Statement

Committee Statement: The power source requirements for Premise-Powered Broadband Communications Systems were deleted from NEC 2023 section 840.170(C) during the first draft reorganization work. They are being restored to Article 721 for limited-energy power sources, specifically section 721.60.

Response Message: SR-7580-NFPA 70-2024

Public Comment No. 944-NFPA 70-2024 [New Section after 721.50(A)]

Second Revision No. 7683-NFPA 70-2024 [New Section after 722.1]

722.2 Listing of Limited-Energy Cables.

Cables installed for limited-energy systems shall be listed in accordance with the 722.2(A) and 722.2(B) .

(A) General.

Cables installed as wiring methods within the buildings for limited-energy systems shall comply with the following:

(1) Be listed as resistant to the spread of fire

(2) Be suitable for the application as specified in Article 722 Parts III through IX.

(B) Wet Locations.

Cable installed in a wet locations shall comply with one of the following:

(1) Be listed for use in wet locations and marked "wet" or "wet location"

(2) Have moisture impervious metal sheath

Exception No. 1: Optical fiber cables that are installed in compliance with 800.48 shall not be required to be listed.

Exception No. 2: Cables that are installed in compliance with 800.48 shall not be required to be listed.

Informational Note No. 1: See UL 1666, *Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts* , for the cable requirements defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note No. 2: See UL 1685, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables* , for the UL flame exposure, vertical tray flame test that is used to determine resistance to the spread of fire when cables do not spread fire to the top of the tray. The smoke measurements in the test method are not applicable.

Informational Note No. 3: See UL 2556, *Wire and Cable Test Methods* , for defining *resistant to the spread of fire* . One method is to demonstrate that the cables do not spread fire to the top of the tray in the UL Flame Exposure, Vertical Tray Flame Test. The smoke measurements in the test method are not applicable. A method of defining *resistant to the spread of fire* is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the FT4 Vertical Flame Test.

Informational Note No. 4: See NFPA 262 , *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces* , for the test method used to determine that a cable is low-smoke producing and fire resistant, exhibiting a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less.

Informational Note No. 5: See CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables* , for the CSA vertical flame test — cables in cable trays, that can also be used to define *resistance to the spread of fire* when the damage (char length) does not exceed 1.5 m (4 ft 11 in.).

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 16:44:59 EDT 2024

Committee Statement

Committee Statement: A new section 722.2 has been created for all the listing requirements for Limited-Energy Cables to comply with section 2.2.1 of the NEC Style Manual for required parallel numbering.

Response Message: SR-7683-NFPA 70-2024

Public Comment No. 924-NFPA 70-2024 [New Section after 722.1]

Public Comment No. 127-NFPA 70-2024 [New Section after 722.1]

Second Revision No. 7733-NFPA 70-2024 [Section No. 722.1]

722.1 Scope.

This article covers the general requirements for the installation of limited-energy cables ~~single- and multiple-conductor cables used in Class 2 and Class 3 power-limited circuits, power-limited fire alarm (PLFA) circuits, Class 4 fault-managed power circuits, optical fiber cables, and communications systems power-limited, remote-control, and signaling circuits that are not an integral part of a device or utilization equipment installed inside of buildings~~ .

~~These general requirements also cover cables used in communications systems and apply to communications circuits, data communications, community antenna television and radio distribution systems, network-powered broadband communications systems, and premises-powered broadband communications systems, unless modified by applicable parts of Articles 800 , 810, 820 , 830 , or 840 .~~

Informational Note No. 1: See Table Informational Note 722.1 for arrangement of this article.

Informational Note No. 2: See 206.4 for classifications of remote-control and signaling circuits.

Informational Note No. 3: Class 4 fault-managed power systems consist of a Class 4 power transmitter and a Class 4 power receiver connected by a Class 4 cabling system. These systems are characterized by monitoring the circuit for faults and controlling the source current to ensure the energy delivered into any fault is limited. Class 4 systems differ from Class 1, Class 2, and Class 3 systems in that they are not limited for power delivered to an appropriate load. They are current limited for faults between the Class 4 transmitter and Class 4 receiver.

Informational Note No. 4: The circuits described herein are characterized by usage and electrical power limitations that differentiate them from non-power-limited electric light and power circuits; therefore, alternative requirements are given regarding minimum wire sizes, ampacity adjustment and correction factors, overcurrent protection, installation requirements, and wiring methods and materials.

Table Informational Note 722.1 Arrangement of this Article

General, 722.1 through 722.27	Part I
Marking Requirements, 722.100	Part II
Limited-Energy Cables and Wiring Methods, 722.120 through 722.122	Part III
Communications Cables and Wiring Methods, 722.130 through 722.136	Part IV
Class 2 or Class 3 Cables and Wiring Methods, 722.140	Part V
Class 4 Cables and Wiring Methods, 722.150 through 722.152	Part VI
Optical Fiber Cables and Wiring Methods, 722.160 through 722.165	Part VII
Power-Limited Fire Alarm (PLFA) Cables and Wiring Methods, 722.170 through 722.172	Part VIII
Circuit Integrity Cables (Type CI), Fire-Resistive Cable Systems, and Electrical Circuit Protective Systems, 722.180 through 722.182	Part IX

Supplemental Information

File Name	Description	Approved
722.1_-_Terra_Copy.docx		
722.1_-_SR-7733.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 00:57:18 EDT 2024

Committee Statement

Committee Statement: The scope of Article 722 has been revised and simplified, utilizing the newly defined term “Limited-Energy Cables”. Additionally, a new informational note and table outlining the structure and nine parts of Article 722 has been created for usability and consistency with other larger articles in this code. CMP 3 understands that the scope belongs to the Correlating Committee and recommends that the scope be updated as suggested.

Response Message: SR-7733-NFPA 70-2024

Public Comment No. 1316-NFPA 70-2024 [Section No. 722.1]

Public Comment No. 25-NFPA 70-2024 [Article 722]

Public Comment No. 235-NFPA 70-2024 [Article 722]

Public Comment No. 856-NFPA 70-2024 [Section No. 794.1]

Second Revision No. 7689-NFPA 70-2024 [Section No. 722.4]

~~**722.4** Other Articles.~~

~~In addition to the requirements of this article, installations of limited-energy and communications wires and cables shall also comply with the following:~~

(0) ~~Class 2 and Class 3 cables: Article 725 , Part II and Article 722 , Parts I and II~~

(0) ~~Class 4 cables: Article 726 , Part II and IV and Article 722 , Parts I and II~~

(0) ~~Fire alarm cables: Article 760 , Part III~~

(0) ~~Optical fiber cables: Article 770 , Part V~~

(0) ~~Coaxial cables — installations of premises (within buildings) CATV and radio distribution circuits: Article 820 , Part V~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 17:07:00 EDT 2024

Committee Statement

Committee Statement: Section 722.4 has been deleted as the references are incorrect or circular. Additionally, a new table was created during the First Draft in 720.4 that identifies all the other limited-energy article scopes.

Response Message: SR-7689-NFPA 70-2024

Public Comment No. 1366-NFPA 70-2024 [Section No. 722.4]

Public Comment No. 192-NFPA 70-2024 [Section No. 722.4]

Public Comment No. 903-NFPA 70-2024 [Section No. 722.4]

Second Revision No. 7690-NFPA 70-2024 [Section No. 722.12]

~~**722.12** Uses Not Permitted.~~

~~Class 4 cables shall not be permitted for any applications that are not part of a Class 4 system.~~

~~*Exception:* *Use of Class 4 cable for other applications shall be permitted if the cable has been listed as suitable for the other applications.*~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 17:09:33 EDT 2024

Committee Statement

Committee Statement: Section 722.12 has been deleted as the requirements have been relocated to 722.150 during the first draft with the other Class 2, 3, and 4 cable requirements. The redundant text is not needed.

Response Message: SR-7690-NFPA 70-2024

Public Comment No. 197-NFPA 70-2024 [Section No. 722.12]

Public Comment No. 904-NFPA 70-2024 [Section No. 722.12]

Public Comment No. 1487-NFPA 70-2024 [Section No. 722.12]

Second Revision No. 7693-NFPA 70-2024 [Section No. 722.14]

~~**722.14** Cables Containing Communications and Power Circuits.~~

~~Cables carrying data or communications circuits as well as power circuits shall be classified as electrical power circuits in accordance with the type of electrical power carried.~~

~~*Exception: PoE circuits shall be permitted to be classified as communications and Class 2 or Class 3.*~~

~~Informational Note: Communications circuits carrying power in accordance with Article 805 , Part II, 820.15 , 830.15 , or 840.160 are considered according to their appropriate article for each type of circuit.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 17:24:23 EDT 2024

Committee Statement

Committee Statement: Now that the independence of Chapter 8 has been removed and all limited energy cables are located in this article, this text is no longer needed. 722.14 is deleted.

Response Message: SR-7693-NFPA 70-2024

Public Comment No. 935-NFPA 70-2024 [Section No. 722.14]

Public Comment No. 906-NFPA 70-2024 [Section No. 722.14]

Public Comment No. 222-NFPA 70-2024 [Section No. 722.14]

Second Revision No. 7696-NFPA 70-2024 [Section No. 722.30]

~~**722.30** Securing and Supporting.~~

~~**(A)** General.~~

~~In addition to the requirements of 720.19 and 720.30 , limited-energy and communications cables shall be installed in accordance with 722.30(A)(1) and 722.30(A)(2) .~~

~~**(1)** Supporting.~~

~~Cables installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use.~~

~~**(2)** Securing.~~

~~Such cables shall be secured by hardware, including straps, staples, cables ties listed and identified for securement and support, and hangers, or similar fittings designed and installed so as not to damage the cable.~~

~~**(B)** Spaces Used for Environmental Air (Plenums).~~

~~Limited-energy and communications cables installed in other spaces used for environmental air (plenums) shall be secured and supported in accordance with 720.30(G) .~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 17:26:47 EDT 2024

Committee Statement

Committee Statement: These requirements are properly located in 720.30(A)(2) and can be deleted here. 722.30 is deleted.

Response Message: SR-7696-NFPA 70-2024

Public Comment No. 909-NFPA 70-2024 [Section No. 722.30]

Public Comment No. 226-NFPA 70-2024 [Section No. 722.30(B)]

Second Revision No. 7698-NFPA 70-2024 [Section No. 722.100]

722.100 Listing of Limited-Energy and Communications Cables.

Cables installed in buildings shall be listed in accordance with 722.100(A)(1) through 722.100(A)(16) .

Exception No. 1: *Optical fiber cables that are installed in compliance with 722.168 shall not be required to be listed.*

Exception No. 2: *Cables installed in compliance with 800.48 shall not be required to be listed.*

(A) Listing of Cables.

Cables installed as wiring methods within buildings shall be listed as resistant to the spread of fire and other criteria in accordance with 722.100(A)(1) through 722.100(A)(16) .

Informational Note No. 1: See UL 13, *Standard for Power-Limited Circuit Cables* , for applicable requirements for listing of Class 2 and Class 3 cable and power-limited tray cable (PLTC).

Informational Note No. 2: See UL 1424, *Cables for Power-Limited Fire-Alarm Circuits* , for applicable requirements for listing of power-limited fire alarm cable.

Informational Note No. 3: See UL 1651, *Optical Fiber Cable* , for applicable requirements for listing of optical fiber cable.

Informational Note No. 4: See UL 1400-2, *Outline for Fault-Managed Power Systems — Part 2: Requirements for Class 4 Cables* , for applicable requirements for listing of Class 4 cable.

(1) Plenum Cable.

Plenum cable shall be listed as suitable for use in ducts, plenums, and other space for environmental air and shall be listed as having adequate fire-resistant and low-smoke producing characteristics. Plenum cable types shall be identified in Table 722.102(A) .

Informational Note: See NFPA 262-2023, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces* , for the test method used to determine that a cable is low-smoke producing and fire resistant, exhibiting a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less.

(2) Riser Cable.

Riser cable shall be listed as suitable for use in a vertical run in a shaft or from floor to floor and shall be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: See ANSI/UL 1666-2012, *Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts* , for the cable requirements defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

(3) General-Purpose Cable.

General-purpose cable shall be listed as resistant to the spread of fire and as suitable for general-purpose use, except for use in risers, ducts, plenums, and other space used for environmental air.

Informational Note: See UL 2556, *Wire and Cable Test Methods*, for defining *resistant to the spread of fire*. One method is to demonstrate that the cables do not spread fire to the top of the tray in the UL Flame Exposure, Vertical Tray Flame Test. The smoke measurements in the test method are not applicable. A method of defining *resistant to the spread of fire* is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the FT4 Vertical Flame Test.

(4) Alternative General-Purpose Cable.

Alternative general-purpose optical fiber cable shall be listed as suitable for general-purpose use, with the exception of risers and plenums, and shall also be resistant to the spread of fire.

Informational Note: See CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables*, for the CSA Vertical Flame Test — cables in cable trays, that can also be used to define *resistant to the spread of fire* when the damage (char length) does not exceed 1.5 m (4 ft 11 in.).

(5) Limited-Use Cable.

Limited-use cable shall be listed as suitable for use in dwellings and raceways and shall be listed as resistant to flame spread.

Informational Note: See ANSI/UL 2556, *Standard for Wire and Cable Test Methods*, for one method of determining that cable is resistant to flame spread by testing the cable to the FV-2/VW-1 test.

(6) Type PLTC.

Type PLTC nonmetallic-sheathed, power-limited tray cable shall be listed as being suitable for cable trays, resistant to the spread of fire, and sunlight- and moisture-resistant. Type PLTC cable used in a wet location shall be listed for use in wet locations and marked “wet” or “wet location.”

Informational Note: See ANSI/UL 1685-2010, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, for the UL Flame Exposure, Vertical Tray Flame Test that is used to determine resistance to the spread of fire when cables do not spread fire to the top of the tray. The smoke measurements in the test method are not applicable. See CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables*, for the CSA Vertical Flame Test — cables in cable trays that can also be used to define *resistant to the spread of fire* when the damage (char length) does not exceed 1.5 m (4 ft 11 in.).

(7) Circuit Integrity (CI) Cable, Fire-Resistive Cable System, or Electrical Circuit Protective System.

Cables that are used for survivability of critical circuits under fire conditions shall comply with 722.100(A)(7)(a) , 722.100(A)(7)(b) , or 722.100(A)(7)(c) .

Informational Note: See *NFPA 72* -2025, *National Fire Alarm and Signaling Code* , 12.4.3 and 12.4.4 for additional information on fire alarm CI cable, fire-resistive cable systems, or electrical circuit protective systems used for fire alarm circuits to comply with the survivability requirements to maintain the circuit's electrical function during fire conditions for a defined period of time.

(0) *CI Cables.* CI cables of the types specified in 722.100(A)(1) , 722.100(A)(2) , 722.100(A)(3) , 722.100(A)(4) , and 722.100(A)(6) and used for survivability of critical circuits shall be marked with the additional classification using the suffix "CI." To maintain its listed fire-resistive rating, CI cable shall only be installed in free air in accordance with 722.180(B) . CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of a fire-resistive cable system as covered in 722.100(A)(7)(b) .

Informational Note: See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables* , and UL 1425, *Cables for Non-Power-Limited Fire-Alarm Circuits* , for information on establishing a rating for CI cable. The *UL Guide Information for Nonpower-limited Fire Alarm Circuits (HNHT)* contains information to identify the cable and its installation limitations to maintain the fire-resistive rating.

(0) *Fire-Resistive Cables.* Fire-resistive cables of the types specified in 722.100(A)(1) , 722.100(A)(2) , 722.100(A)(3) , 722.100(A)(4) , 722.100(A)(6) , and 722.100(A)(7)(a) that are part of a fire-resistive cable system shall be identified with the system identifier and hourly rating marked on the protectant or the smallest unit container and installed in accordance with the listing of the system.

Informational Note: See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables* , for information on establishing a rating for a fire-resistive cable system. The *UL Guide Information for Electrical Circuit Integrity Systems (FHIT)* contains information to identify the system and its installation limitations to maintain a minimum fire-resistive rating.

(0) *Electrical Circuit Protective System.* Protectants for cables of the types specified in 722.100(A)(1) , 722.100(A)(2) , 722.100(A)(3) , 722.100(A)(4) , and 722.100(A)(6) that are part of an electrical circuit protective system shall be identified with the protective system identifier and hourly rating marked on the protectant or the smallest unit container and installed in accordance with the listing of the protective system.

Informational Note: See UL 1724, *Fire Tests for Electrical Circuit Protective Systems* , for information on establishing a rating for an electrical circuit protective system. The *UL Guide Information for Electrical Circuit Integrity Systems (FHIT)* contains information to identify the system and its installation limitations to maintain the fire-resistive rating.

(8) Class 3 Single Conductors.

Class 3 single conductors used as other wiring within buildings shall be listed Type CL3 and shall not be smaller than 18 AWG.

Informational Note: See ANSI/UL 1685-2010, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, for the UL Flame Exposure, Vertical Tray Flame Test that is used to determine resistance to the spread of fire when cables do not spread fire to the top of the tray. The smoke measurements in the test method are not applicable. See CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables*, for the CSA Vertical Flame Test — cables in cable trays that can also be used to define *resistant to the spread of fire* when the damage (char length) does not exceed 1.5 m (4 ft 11 in.).

(9) Limited Power (LP) Cable.

Class 2 and Class 3 LP cables shall be listed as suitable for carrying power and data up to a specified current limit for each conductor without exceeding the temperature rating of the cable. The cables shall be marked with the suffix "-LP (XXA)" where XXA designates the current limit in amperes per conductor.

Informational Note: An example of the marking on 23 AWG, 4-pair, Class 2 cable rated 75°C (167°F) with an LP current rating of 0.6 amperes per conductor is "CL2-LP (0.6A) 75°C 23 AWG 4-pair."

(10) Under-Carpet Cables.

Under-carpet cable shall be listed as suitable for use under carpet, floor covering, modular tiles, and planks.

Informational Note: See UL 444, *Standard for Safety for Communications Cables*, for the compressive loading test used to determine the suitability of cable for under-carpet use.

(11) Wet Locations.

Cable used in a wet location shall be listed for use in wet locations and be marked "wet" or "wet location" or have a moisture-impervious metal sheath.

(12) Field-Assembled Optical Fiber Cables.

Field-assembled optical fiber cable shall comply with 722.100(A)(12)(a) through 722.100(A)(12)(d).

(0) The specific combination of jacket and optical fibers intended to be installed as a field-assembled optical fiber cable shall be one of the types in 722.100(A)(1), 722.100(A)(2), or 722.100(A)(3) and shall be marked in accordance with Table 722.102(A).

(0) The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers with which it is identified for use.

(0) The optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use.

(0) The jacket without fibers shall meet the listing requirements for communications raceways in 722.110 and 722.111 in accordance with the cable marking.

(13) Cables Containing Optical Fibers.

Composite optical fiber cables shall be listed as electrical cables based on the type of electrical conductors.

(14) Class 2 and Class 3 Cable Voltage and Temperature Ratings.

Class 2 cables shall have a voltage rating of not less than 150 volts. Class 3 cables shall have a voltage rating of not less than 300 volts. Class 2 and Class 3 cables shall have a temperature rating of not less than 60°C (140°F).

~~**(15)** Power-Limited Fire Alarm (PLFA) Cables.~~

~~PFLA cables shall comply with 722.100(A)(15)(a) through 722.100(A)(15)(d) .~~

~~(0) Conductors for cables, other than coaxial cables, shall be solid or stranded copper. Coaxial cables shall be permitted to use 30 percent conductivity copper-covered steel center conductor wire.~~

~~(0) The size of conductors in a multiconductor cable shall not be smaller than 26 AWG. Single conductors shall not be smaller than 18 AWG. Conductors of 26 AWG shall be permitted only where spliced with a connector listed as suitable for 26 AWG to 24 AWG or larger conductors that are terminated on equipment or where the 26 AWG conductors are terminated on equipment listed as suitable for 26 AWG conductors.~~

~~(0) Cables shall have a voltage rating of not less than 300 volts.~~

~~(0) Cables shall have a temperature rating of not less than 60°C (140°F).~~

~~**(16)** Class 4 Cable Construction.~~

~~(0) *Sizes.* Conductors of sizes not smaller than 24 AWG shall be permitted to be used.~~

~~(0) *Insulation.* Insulation on conductors shall be rated not less than 450 volts dc.~~

~~(0) *Voltage Rating.* Cables shall have a voltage rating of not less than 450 volts dc. Voltage ratings shall not be marked on the cables.~~

~~(0) *Temperature Rating.* Cables shall have a temperature rating of not less than 60°C (140°F).~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 17:31:18 EDT 2024

Committee Statement

Committee Statement: Section 722.100(A)(1) has been deleted as this requirement for plenum cable listing is adequately covered by the general listing requirements in 722.2 and in the installation and application requirements in Part III. of Article 722.

The informational Note in section 722.100(A)(1) was deleted as it has been relocated to new section 722.2.

Section 722.100(A)(2) was deleted as it is adequately covered by sections 722.2 and 720.120(A). Additionally, informational note for section 722.100(A)(2) was deleted as it was relocated to 722.2.

Section 722.100(A)(3) was deleted as these requirements are adequately covered by new section 722.2 and section/table 722.120(A).

Section 722.100(A)(4) was deleted as these requirements are adequately covered by new Section 722.2, and by the application and installation requirements in Section/ Table 722.160 and by Section 722.161.

Section 722.100(A)(5) and the informational Note was deleted as it adequately covered by 722.2 and 722.120.

Section 722.100(A)(6) was deleted as these requirements are adequately covered by

new 722.2. The informational note was deleted and as it was relocated to new section 722.2.

Sections 722.100(A)(7)(a)-(c) was deleted as these requirements are covered by the newly revised section 722.180(A)-(D). Additionally, the informational notes in 722.100(A)(7)(a)-(c) was deleted as they were added to the appropriate location in 722.180(A)-(D).

Section 722.100(A)(8) was deleted as it is now located in new section 722.2. The informational note in section 722.100(A)(8) was deleted as it has been relocated to 722.2.

Section 722.100(A)(9) and informational note was deleted as this requirement is adequately covered in section 722.140(B)(1)-(2).

Section 722.100(A)(10) was deleted as these requirements are adequately covered by new 722.2. Informational Note to 722.100(A)(10) was deleted as it was added as Informational Note No. 4 to section/table 722.130.

Section 722.100(A)(11) was deleted as it adequately covered in section 722.2(B).

Section 722.100(A)(12) was deleted as it was relocated to 722.160(B).

Now that all limited energy cables are located in this article, this text is no longer needed. 722.100(A)(13) is deleted.

Section 722.100(A)(14) was deleted as a new section 722.140(A)(3) has been created to cover these requirements in the same Part of Article 722 as the other Class 2 and 3 cable requirements.

Section 722.100(A)(15) was deleted as many of these requirements are redundant to the requirements of section 722.171. The requirements related to PLFA cable Material, Size, and Rating have been added to 722.171(B)(1)-(3).

Section 722.100(A)(16) was deleted as these Class 4 Cable requirements have been established in New section 722.151.

The charging text in Section 722.100, 722.100(A), and Exceptions was deleted, as this language has been relocated to 722.2.

Informational Note No. 1 was deleted from section 722.100(A) as it was relocated to section/table 722.120(A).

Informational Note No. 2 was deleted as it has been appropriately relocated to section 722.170 as the referenced standard applies to PLFA Cable applications.

Informational Note No 3. In section 722.100(A) was deleted as it was relocated to the Optical Fiber applications section/table in 722.160.

Informational note No. 4 referencing UL 1400 in section 722.100(A) was deleted as the informational note has been appropriately relocated to 722.151.

Response Message: SR-7698-NFPA 70-2024

Public Comment No. 1415-NFPA 70-2024 [Section No. 722.100(A)]

Public Comment No. 1417-NFPA 70-2024 [Section No. 722.100(A)(15)]

Public Comment No. 927-NFPA 70-2024 [Section No. 722.100(A)(6)]

Public Comment No. 1496-NFPA 70-2024 [Section No. 722.100(A)(9)]

Public Comment No. 1440-NFPA 70-2024 [Section No. 722.100(A)(10)]

Public Comment No. 1423-NFPA 70-2024 [Section No. 722.100(A)(12)]

Public Comment No. 926-NFPA 70-2024 [Section No. 722.100(A)(2)]

Public Comment No. 1428-NFPA 70-2024 [Section No. 722.100(A)]

Public Comment No. 933-NFPA 70-2024 [Section No. 722.100(A)(11)]

Public Comment No. 929-NFPA 70-2024 [Section No. 722.100(A)(3)]

Public Comment No. 930-NFPA 70-2024 [Section No. 722.100(A)(5)]

Public Comment No. 928-NFPA 70-2024 [Section No. 722.100(A)(8)]

Public Comment No. 1435-NFPA 70-2024 [Section No. 722.100(A)(7)]

Public Comment No. 1429-NFPA 70-2024 [Section No. 722.100(A)(16)]

Public Comment No. 1497-NFPA 70-2024 [Section No. 722.100(A)(13)]

Public Comment No. 1421-NFPA 70-2024 [Section No. 722.100(A)]

Public Comment No. 931-NFPA 70-2024 [Section No. 722.100(A)(1)]

Public Comment No. 1438-NFPA 70-2024 [Section No. 722.100(A)(14)]

Public Comment No. 932-NFPA 70-2024 [Section No. 722.100(A)(4)]

Public Comment No. 934-NFPA 70-2024 [Section No. 722.100(A)(1)]

Public Comment No. 1437-NFPA 70-2024 [Section No. 722.100(A)(8)]

Public Comment No. 925-NFPA 70-2024 [Section No. 722.100 [Excluding any Sub-Sections]]

Public Comment No. 1413-NFPA 70-2024 [Section No. 722.100(A) [Excluding any Sub-Sections]]

Second Revision No. 7699-NFPA 70-2024 [Section No. 722.102]

722.100 Marking of Listed Limited-Energy ~~and Communications~~ Cables.

(A) General.

Cables installed in buildings shall be marked in accordance with ~~722.102(A)~~ 722.100(A) , and they shall be permitted to be marked in accordance with 722.100(B).

Cables shall be durably marked on the surface in accordance with the following:

(1) The AWG size or circular mil area shall be repeated at intervals not exceeding 610 mm (24 in.).

(2) All other markings shall be repeated at intervals not exceeding 1.0 m (40 in.).

(3) The proper type designation for the type of cable shall be marked in accordance with Table 722.100(A).

(4) The manufacturer's name, trademark, or other distinctive marking by which the organization responsible for the product can be readily identified shall be marked.

(5) The AWG size or circular mil area shall be marked.

Informational Note No. 1: See Chapter 9~~,~~ Table 8 for conductor area expressed in SI units for conductor sizes specified in AWG or circular mil area.

(6) The temperature rating for a temperature rating exceeding 60°C (140°F) shall be marked.

Informational Note No. 2: A minimum temperature rating of 60°C (140°F) is assumed for cables not marked with a temperature rating.

(7) Voltage ratings shall not be marked on the cables.

Exception: Voltage markings shall be permitted where the cable has multiple listings, and a voltage marking is required for one or more of the listings.

Informational Note No. 3: Voltage markings on cables could be misinterpreted to suggest that the cables may be suitable for Class 1 electric light and power applications.

Informational Note No. 4: Cable types are listed in descending order of fire resistance rating.

Table 722.100(A) Cable Type Markings

Cable Type	Cable Marking
Class 4 plenum cable	CL4P
Class 3 plenum cable	CL3P
Class 2 plenum cable	CL2P
Power-limited fire alarm plenum cable	FPLP
Nonconductive optical fiber plenum cable	OFNP
Conductive optical fiber plenum cable	OFCP
Class 4 riser cable	CL4R
Class 3 riser cable	CL3R
Class 2 riser cable	CL2R
Power-limited fire alarm riser cable	FPLR
Nonconductive optical fiber riser cable	OFNR
Conductive optical fiber riser cable	OFCR
Class 4 general-purpose cable	CL4
Class 3 general-purpose cable	CL3
Class 2 general-purpose cable	CL2
Class 4 outdoor-only use cable	CL4Z
Power-limited fire alarm cable	FPL
Nonconductive general-purpose optical fiber cable	OFN
Conductive general-purpose optical fiber cable	OFC

Cable Type	Cable Marking
Alternative nonconductive general-purpose optical fiber cable	OFNG
Alternative conductive general-purpose optical fiber cable	OFCG
Class 3 cable — limited use	CL3X
Class 2 cable — limited use	CL2X
Under-carpet cable	CMUC

Note: All types of CL2, CL3, CL4, and FPL cables containing optical fibers are provided with the suffix "-OF."

(B) Optional Markings.

Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials.

Informational Note No. 1: Examples of these characteristics include, but are not limited to, limited smoke, halogen free, low smoke and halogen free, and sunlight resistant.

Informational Note No. 2: Some examples of optional markings are ST1 to indicate limited smoke characteristics. See UL 2556, *Wire and Cable Test Methods*, HF to indicate halogen free. See in UL 2885, *Outline of Investigation for Acid Gas, Acidity and Conductivity of Combusted Materials*, and LSHF to indicate halogen free and low-smoke characteristics. See IEC 61034-2, *Measurement of smoke density of cables burning under defined conditions — Part 2: Test procedure and requirements*.

(C) Wet Locations.

Limited-energy cables used in wet locations shall be marked in accordance with 722.2(B) .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 17:48:42 EDT 2024

Committee Statement

Committee Statement: Section 722.102 was renumbered to 722.100, as the old Section 722.100 was deleted by other SRs. A new section (C) was created to point the user to marking requirements for wet locations, now that the listing and marking requirements are in separate locations. "Communications" was deleted from the section title.

Section 722.102(B) was not deleted, as proposed by PC-910, because it would be considered new material.

Response Message: SR-7699-NFPA 70-2024

Public Comment No. 1499-NFPA 70-2024 [Section No. 722.102]

Public Comment No. 910-NFPA 70-2024 [Section No. 722.102]

Second Revision No. 7708-NFPA 70-2024 [Section No. 722.110]

~~**722.110** Application and Installation of Raceways, Cable Routing Assemblies, and Cable Trays.~~

~~**(A)** Application of Listed Communications Raceways in Buildings.~~

Permitted and nonpermitted applications of listed communications raceways shall be in accordance with Table 722.110(A) .

Table 722.110(A) Applications of Listed Communications Raceways in Buildings.

Applications		Listed Communications Raceway Type		
		Plenum	Riser	General-Purpose
In ducts specifically fabricated for environmental air as described in 720.22(B)	In fabricated ducts	N	N	N
	In metal raceway that complies with 300.25(B)	N	N	N
In other spaces used for environmental air (plenums) as described in 720.22(C)	In other spaces used for environmental air	Y	N	N
-	In metal raceway that complies with 300.25(C)	Y	Y	Y
-	In plenum cable routing assemblies	N	N	N
-	Supported by open metal cable trays	Y	N	N
-	Supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y
In risers	In vertical runs	Y	Y	N
	In metal raceways	Y	Y	Y
	In fireproof shafts	Y	Y	Y
	In plenum cable routing assemblies	N	N	N
	In riser cable routing assemblies	N	N	N
	In one- and two-family dwellings	Y	Y	Y
Within buildings in other than air-handling spaces and risers	General	Y	Y	Y
	In one- and two-family dwellings	Y	Y	Y
	In multifamily dwellings	Y	Y	Y
	In nonconcealed spaces	Y	Y	Y
	Supported by cable trays	Y	Y	Y
	Under carpet, modular flooring, and planks	N	N	N
	In distributing frames and cross-connect arrays	Y	Y	Y
	In any raceway recognized in Chapter 3	Y	Y	Y
	In plenum cable routing assemblies	N	N	N
	In riser cable routing assemblies	N	N	N

Applications	Listed Communications Raceway Type		
	Plenum	Riser	General-Purpose
In general-purpose cable routing assemblies	N	N	N

Note: An “N” in the table indicates that the communications raceway type shall not be installed in the application. A “Y” indicates that the communications raceway type shall be permitted to be installed in the application, subject to the limitations described in 722.111 and 722.131.

~~**(B)** Application of Listed Cable Routing Assemblies.~~

Permitted and nonpermitted applications of listed cable routing assemblies shall be in accordance with Table 722.110(B) .

Table 722.110(B) Applications of Listed Cable Routing Assemblies in Buildings.

Applications		Listed Cable Routing Assembly Type		
		Plenum	Riser	General-Purpose
In ducts specifically fabricated for environmental air as described in 720.22(B)	In fabricated ducts	N	N	N
	In metal raceway that complies with 300.25(B)	N	N	N
In other spaces used for environmental air (plenums) as described in 720.22(C)	In other spaces used for environmental air	Y	N	N
	In metal raceway that complies with 300.25(C)	Y	Y	Y
-	In plenum cable routing assemblies	N	N	N
-	Supported by open metal cable trays	Y	N	N
-	Supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y
In risers	In vertical runs	Y	Y	N
-	In metal raceways	Y	Y	Y
-	In fireproof shafts	Y	Y	Y
-	In plenum cable routing assemblies	N	N	N
-	In riser cable routing assemblies	N	N	N
-	In one- and two-family dwellings	Y	Y	Y
Within buildings in other than air-handling spaces and risers	General	Y	Y	Y
	In one- and two-family dwellings	Y	Y	Y
	In multifamily dwellings	Y	Y	Y
	In nonconcealed spaces	Y	Y	Y
	Supported by cable trays	Y	Y	Y
	Under carpet, modular flooring, and planks	N	N	N
	In distributing frames and cross-connect arrays	Y	Y	Y
	In any raceway recognized in Chapter 3	Y	Y	Y

Applications	Listed Cable Routing Assembly Type		
	Plenum	Riser	General-Purpose
In plenum cable routing assemblies	N	N	N
In riser cable routing assemblies	N	N	N
In general-purpose cable routing assemblies	N	N	N

Note: An "N" in the table indicates that the cable routing assembly type shall not be installed in the application. A "Y" indicates that the cable routing assembly type shall be permitted to be installed in the application subject to the limitations described in 722.131.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 18:22:59 EDT 2024

Committee Statement

Committee Statement: Section 722.110 was deleted as these requirements have been relocated to new Article 723 covering Raceways, Cable Routing Assemblies and Cable Trays.

Response Message: SR-7708-NFPA 70-2024

Public Comment No. 1307-NFPA 70-2024 [Section No. 722.110]

Public Comment No. 59-NFPA 70-2024 [Section No. 722.110]

Public Comment No. 236-NFPA 70-2024 [Section No. 722.110(A)]

Public Comment No. 911-NFPA 70-2024 [Section No. 722.110(A)]

Public Comment No. 237-NFPA 70-2024 [Section No. 722.110(B)]

Public Comment No. 912-NFPA 70-2024 [Section No. 722.110(B)]

Second Revision No. 7711-NFPA 70-2024 [Section No. 722.111]

722.111 Installation of Raceways, Cable Routing Assemblies, and Cable Trays.

(A) Types of Raceways.

Wires and cables shall be permitted to be installed in raceways that comply with 722.111(A)(1), 722.111(A)(2), or 722.111(A)(3). Medium-power network-powered broadband communications cables shall not be installed in raceways that comply with 722.111(A)(2).

(1) Permitted Raceways.

Wires and raceways shall be permitted to be in any raceway included in Chapter 3. The raceways shall be installed in accordance with Chapter 3.

(2) Communications Raceways.

Wires and cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with Table 722.110(A), listed in accordance with 722.110(A), and installed in accordance with 722.131 and 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing (ENT) apply.

(3) Innerduct for Communications Wires and Cables, Coaxial Cables, or Network-Powered Broadband Communications Cables.

Listed plenum communications raceways, listed riser communications raceways, and listed general-purpose communications raceways selected in accordance with Table 722.110(A) shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.

(4) Raceway Fill.

The raceway fill requirements of 720.6(B)(1) shall apply to medium-power network-powered broadband communications cables.

(5) Permitted Substitutions.

Substitutions of listed communications raceways shall be permitted in accordance with Table 722.111(A)(5).

Table 722.111(A)(5) Permitted Substitutions of Listed Communications Raceways

Raceway Type	Permitted Substitution
Riser communications raceway	Plenum communications raceway
General purpose communications raceway	Plenum communications raceway, riser communications raceway

(B) Cable Routing Assemblies.

Cables shall be permitted to be installed in plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with Table 722.110(B), listed in accordance with 722.110(B), and installed in accordance with 722.111(B)(1), 722.111(B)(2), and 722.131.

(1) Horizontal Support.

Cable routing assemblies shall be supported where run horizontally at intervals not to exceed 900 mm (3 ft) and at each end or joint, unless listed for other support intervals. In no case shall the distance between supports exceed 3 m (10 ft).

~~**(2)** Vertical Support.~~

~~Vertical runs of cable routing assemblies shall be supported at intervals not exceeding 1.2 m (4 ft), unless listed for other support intervals, and shall not have more than one joint between supports.~~

~~**(3)** Permitted Substitutions.~~

~~Substitutions of listed cable routing assemblies shall be permitted in accordance with Table 722.111(B)(3) .~~

~~Table 722.111(B)(3) Permitted Substitutions of Listed Communications Raceways~~

~~Raceway Type~~	~~Permitted Substitution~~
~~Riser communications raceway~~	~~Plenum communications raceway~~
~~General purpose communications raceway~~	~~Plenum communications raceway, riser communications raceway~~

~~**(C)** Cable Trays.~~

~~Wires and cables and communications raceways shall be permitted to be installed in metal or listed nonmetallic cable tray systems. Ladder cable trays shall be permitted to support cable routing assemblies.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 18:25:20 EDT 2024

Committee Statement

Committee Statement: Section 722.111 was deleted as the requirements for Limited-Energy Raceways, Cable Routing Assemblies and Cable Trays have been relocated to new Article 723.

Response Message: SR-7711-NFPA 70-2024

Public Comment No. 1308-NFPA 70-2024 [Section No. 722.111]

Public Comment No. 61-NFPA 70-2024 [Section No. 722.111]

Public Comment No. 913-NFPA 70-2024 [Section No. 722.111(A)(1)]

Public Comment No. 914-NFPA 70-2024 [Section No. 722.111(A)(4)]

Second Revision No. 7734-NFPA 70-2024 [Section No. 722.112]

722.13

(A) General.

Unless prohibited by this section, plenum, riser, general-purpose, and limited-use limited-energy cables shown in Table 722.13(A) shall be permitted to be installed in the same raceway, cable tray, box, enclosure, or cable routing assembly. Installations shall comply with 722.13(B) through 722.13(H).

Table 722.13(A) Limited-Energy Cable Type

Plenum limited-energy cables	CMP	Communications plenum cables
	CATVP	Community antenna television plenum cables
	BLP	Network-powered broadband communications low-power plenum cables
	FPLP	Power-limited fire alarm plenum cables
	CL4P	Class 4 plenum cables
	CL3P	Class 3 plenum cables
	CL2P	Class 2 plenum cables
	OFNP	Nonconductive optical fiber plenum cables
	OFCP	Conductive optical fiber plenum cables
Riser limited-energy cables	CMR	Communications riser cables
	CATVR	Community antenna television riser cables
	BLR	Network-powered broadband communications low-power riser cables
	FPLR	Power-limited fire alarm riser cables
	CL4R	Class 4 riser cables
	CL3R	Class 3 riser cables
	CL2R	Class 2 riser cables
	OFNR	Nonconductive optical fiber riser cables
	OFCR	Conductive optical fiber riser cables
General-purpose limited-energy cables	CMG, CM	Communications general-purpose cables
	CATV	Community antenna television general-purpose cables
	BL	Network-powered broadband communications low-power general-purpose cables
	FPL	Power-limited fire alarm general-purpose cables
	CL4	Class 4 general-purpose cables
	PLTC	Power-limited tray cables
	CL3	Class 3 general-purpose cables
	CL2	Class 2 general-purpose cables
	OFNG, OFN	Nonconductive optical fiber general-purpose cables
	OFCG, OFC	Conductive Optical Fiber general-purpose cables
Limited-use limited-energy cables	CMX	Communications limited use cables
	CATVX	Community antenna television limited use cables
	BLX	Network-powered broadband communications low-power limited use cables
	CL3X	Class 3 limited use cables
	CL2X	Class 2 limited use cables

Specialty use limited-energy cables	CMUC	Under-carpet communications wires and cables

(B) Two or More Class 2, Class 3, or Class 4 Circuits.

Conductors of two or more limited energy circuits of the same class shall be permitted within the same limited energy cable.

(C) Class 2, Class 3, and Class 4 Circuits with the Same Limited Energy Cable.

(1) Class 3 Cables.

Class 2 circuits shall be permitted to use listed Class 3 cables.

(2) Dual-Listed Class 3/Class 4 Cables.

Class 2 and Class 3 circuits shall be permitted to use dual-listed Class 3/Class 4 cables.

(D) Class 2 and Class 3 Circuits with Communications Circuits.

(1) Communications Cables.

Conductors of one or more Class 2 or Class 3 circuits shall be permitted in the same cable with conductors of communications circuits. The cable shall be listed as a communications cable.

(2) Composite Cables.

Cables constructed of individually listed Class 2, Class 3, and communications cables under a common jacket shall be permitted to be classified and listed as communications cables. The fire resistance rating of the composite cable shall be determined by the combustion characteristics of the composite cable.

(E) Class 2, Class 3, or Class 4 Cables with Other Limited Energy Cables.

(1) Limited-Use Cables.

Plenum, riser, general-purpose, and limited use limited energy cables shall be permitted in the same enclosure or raceway.

(2) Other Than Limited-Use Cables.

Plenum, riser, and general-purpose limited energy cables shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly.

(F) Power-Limited Fire Alarm Circuits.

(1) Multiple PLFA Circuits.

Cable and conductors of two or more power-limited fire alarm circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly.

(2) With Network-Powered Broadband.

Low-power network-powered broadband communications circuits shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly with PLFA cables.

(3) With Class 2 Circuits.

Conductors of one or more Class 2 circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly with conductors of power-limited fire alarm circuits if the insulation of the Class 2 circuit conductors in the cable, enclosure, raceway, or cable routing assembly is at least that required by the power-limited fire alarm circuits.

(4) With Class 3 or Communications Circuits.

Cable and conductors of Class 3 and communications circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly with cables and conductors of power-limited fire alarm circuits.

(5) With 4 Circuits.

Class 4 circuits shall be permitted in the same cable with power-limited fire alarm circuits if the cable is dual-listed.

(6) Audio System Circuits and PLFA Circuits.

Audio system circuits described in 640.9(C) and installed using Class 2, Class 3, or Class 4 wiring methods in compliance with 722.136 shall not be installed in the same cable, cable tray, raceway, or cable routing assembly with PLFA circuits or cables.

(G) Manholes.

Outside plant communications, CATV, and optical fiber cables shall be permitted to be installed together in manholes.

Informational Note: See IEEE C2-2023, *National Electrical Safety Code,* Rules 323 and 341 for information on cable installation in manholes.

(H) Limited-Use and ~~Under-Carpet~~ Undercarpet Limited-Energy Cables.

Limited-use and ~~under-carpet~~ undercarpet limited-energy cables shall not be installed in cable trays or cable routing assemblies.

Supplemental Information

File Name	Description	Approved
722.112_-_Terra_Copy.docx		
NEC_CMP-3_SR-7734_722.112.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 01:07:34 EDT 2024

Committee Statement

Committee Statement: Section 722.112 is relocated to 722.13, establishing general limited-energy cable separation requirements.

A title is added per the Style Manual.

“Under-carpet” is replaced with “undercarpet.”

Response Message: SR-7734-NFPA 70-2024

Public Comment No. 1309-NFPA 70-2024 [Section No. 722.112]

Public Comment No. 1400-NFPA 70-2024 [Section No. 722.112]

Public Comment No. 1684-NFPA 70-2024 [New Section after 722.12]

Public Comment No. 258-NFPA 70-2024 [Section No. 722.112(H)]

Public Comment No. 257-NFPA 70-2024 [Section No. 722.112 [Excluding any Sub-Sections]]

Second Revision No. 7845-NFPA 70-2024 [Section No. 722.113]

722.15 Separation of Limited-Energy ~~Circuits with~~ Cables and Conductors from Non-Power-Limited Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm, and Medium-Power Network-Powered Broadband Communications Circuits in Raceways, Compartments, and Boxes.

Separation shall be provided in accordance with 722.15(A) through 722.15(K) for limited energy cables and conductors, except as provided in 722.164 for optical fiber cables.

(A) General.

Limited energy cables shall be separated by at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits and shall not be placed the same raceway, compartment, enclosure, manhole, outlet box, device box, or similar, unless permitted by ~~the~~ 722.15(B) through 722.15(K).

Exception: Low-power ~~and medium-power~~ network-powered broadband communications circuit cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly as medium-power network-powered broadband communications circuit cables .

(B) Separated by Barriers.

Limited energy cables shall be permitted to be placed in any raceway, compartment, outlet box, junction box, or other enclosure with conductors of electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits if the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits are separated from the limited energy and cables by a permanent barrier that maintains the 50 mm (2 in.) separation or a listed divider.

(C) Raceways Within Enclosures.

Limited energy cables shall be permitted to share the same enclosure with other systems if the limited energy cables are separated by a raceway within the enclosure.

(D) Associated Systems Within Enclosures.

Limited energy cables shall be permitted to be placed in outlet boxes, junction boxes, compartments, or similar with power conductors where such conductors are introduced solely for power supply to the limited energy equipment and ~~722.113(A)(3)(a) or 722.113(A)(3)(b) applies.~~ one of the following is met:

(1) The power circuit conductors ~~shall be~~ are routed within the enclosure to maintain a minimum 6 mm (0.25 in.) separation from the limited energy cables.

(2) The circuit conductors operate at 150 volts or less to ground and ~~the limited energy circuit conductors shall be~~ either of the following is met :

a. The limited-energy circuit conductors are ~~Installed~~ installed as a Class 1 circuit.

b. A limited energy cable of CL3, CL3R, CL3P or a permitted substitute and the conductors that emerge from the cable jacket are separated by a minimum 6 mm (0.25 in.) or by a nonconductive barrier from all other conductors.

(E) Enclosures with Single Opening.

Circuit conductors of limited energy cables entering compartments, enclosures, device boxes, outlet boxes, or similar shall be permitted to be installed with Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to the limited energy circuits. If the limited energy circuit conductors must enter an enclosure that is provided with a single opening, they shall be permitted to enter through a single fitting (such as a tee) if the conductors are separated from the conductors of the other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing.

(F) Elevators.

(1) Traveling Cables.

Separation of circuits shall not be required in elevator traveling cables constructed in accordance with 620.36.

(2) Hoistways.

In hoistways, cables shall be installed in rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or electrical metallic tubing. For elevators or similar equipment, these conductors shall be permitted to be installed as provided in 620.21.

(G) In Raceways or Cables.

Separation shall not be required if either of the following applies:

(1) The conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type AC or Type UF cables.

(2) The limited energy cable conductors are installed in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type TC, or Type UF cables.

(H) Protected by Firmly Fixed Nonconductors.

Separation shall not be required if the limited energy cables are permanently separated from the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.

(I) Manholes.

Underground limited energy circuit conductors and cables in a manhole shall be permitted to be installed with Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits if one of the following conditions is met:

(1) The electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are in a metal-enclosed cable or Type UF cable.

(2) The limited energy circuit conductors are permanently and effectively separated from the conductors of other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing, in addition to the insulation or covering on the wire.

(3) The limited energy circuit conductors are permanently and effectively separated from conductors of the other circuits and securely fastened to racks, insulators, or other approved supports.

(J) Cable Trays.

Limited energy circuit conductors shall be permitted to be installed in cable trays if the conductors of the electric light, Class 1, and non-power-limited fire alarm circuits are separated by a solid fixed barrier of a material compatible with the cable tray or if the limited energy circuits are installed in Type MC cable.

(K) If Protected.

Limited energy circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits if they are functionally associated and installed using Class 1 wiring methods in accordance with 724.46.

Supplemental Information

File Name	Description	Approved
722.113_-_Terra_Copy.docx	for staff use	
722.113_-_SR-7845.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 17:01:36 EDT 2024

Committee Statement

Committee Statement: Section 722.113 has been moved to 722.15. The text is reformatted to comply with the Style Manual.

Response Message: SR-7845-NFPA 70-2024

Public Comment No. 1310-NFPA 70-2024 [Section No. 722.113]

Public Comment No. 915-NFPA 70-2024 [Section No. 722.113(A) [Excluding any Sub-Sections]]

Second Revision No. 7719-NFPA 70-2024 [Section No. 722.122]

722.122 Limited-Energy Cable Substitutions.

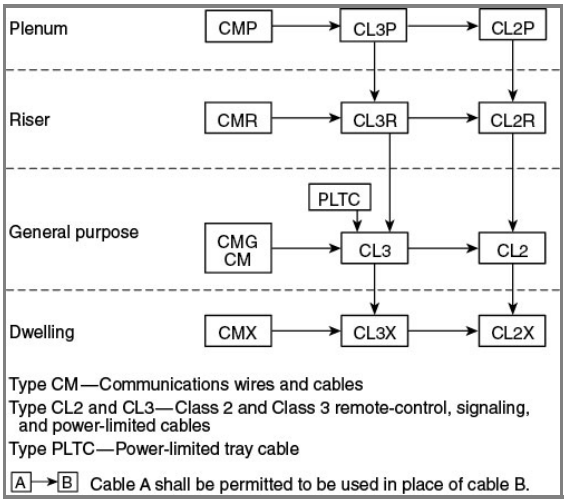
The substitutions for cables listed in Table 722.122 and illustrated in Figure 722.122 shall be permitted. ~~Where substitute cables are installed, the installation requirements of the articles described in 722.4 shall also apply. CI cables shall be permitted to be installed to provide 2-hour circuit integrity. See 722.180(A) .~~

~~Informational Note: See 722.100 for information on Types CMP, CMR, CM, and CMX.~~

Table 722.122 Permitted Limited-Energy Cable Substitutions

Cable Type	Permitted Substitutions
CL3P	CMP
CL2P	CMP, CL3P
CL3R	CMP, CL3P, CMR
CL2R	CMP, CL3P, CL2P, CMR, CL3R
PLTC	None
CL3	CMP, CL3P, CMR, CL3R, CMG, CM, PLTC
CL2	CMP, CL3P, CL2P, CMR, CL3R, CL2R, CMG, CM, PLTC, CL3
CL3X	CMP, CL3P, CMR, CL3R, CMG, CM, PLTC, CL3, CMX
CL2X	CMP, CL3P, CL2P, CMR, CL3R, CL2R, CMG, CM, PLTC, CL3, CL2, CMX, CL3X
FPLP	CMP
FPLR	CMP, FPLP, CMR
FPL	CMP, FPLP, CMR, FPLR, CMG, CM
OFNP	None
OFCP	OFNP
OFNR	OFNP
OFCR	OFNP, OFCP, OFNR
OFNG, OFN	OFNP, OFNR
OFCG, OFC	OFNP, OFCP, OFNR, OFCR, OFNG, OFN
CMUC	None

Figure 722.122 Limited-Energy and Communications Cable Substitution Hierarchy.



Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 19:08:29 EDT 2024

Committee Statement

Committee Statement:	The reference to Table 722.122 was corrected. The remaining text was deleted because the information is covered in Article 720.
Response Message:	SR-7719-NFPA 70-2024

Second Revision No. 7721-NFPA 70-2024 [Section No. 722.130]

722.130 Application of Cables Used for Communications Circuits, Communications Wires, Cables, and Raceways and Listed Cable Routing Assemblies.

Permitted and nonpermitted applications of listed communications wires and cables, coaxial cables, network-powered broadband communications system cables shall be in accordance with Table 722.130.

The permitted applications shall be subject to the installation requirements of ~~722.110~~ Article 723 Parts II, III, and IV .

Table 722.130 Applications of Listed Communications Wires, Cables, Listed CATV-Type Coaxial Cables, and Listed Network-Powered Broadband Communications Cables in Buildings

Applications		Wire and Cable Type								
		Plenum	Riser	BMR	General-Purpose	BM	Limited-Use	Under-carpet	BMU, BLU	C
In ducts specifically fabricated for environmental air as described in 720.22(B)	In fabricated ducts	Y	N	N	N	N	N	N	N	
	In metal raceway that complies with 720.22(B)	Y	Y	Y	Y	Y	Y	N	N	
In other spaces used for environmental air (plenums) as described in 720.22(C)	In other spaces used for environmental air	Y	N	N	N	N	N	N	N	
	In metal raceway that complies with 720.22(C)	Y	Y	Y	Y	Y	Y	N	N	
	In plenum communications raceways	Y	N	N	N	N	N	N	N	
	In plenum cable routing assemblies	Y	N	N	N	N	N	N	N	
	Supported by open metal cable trays	Y	N	N	N	N	N	N	N	
	Supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y	Y	Y	Y	N	N	
In risers	In vertical runs	Y	Y	Y	N	N	N	N	N	
	In metal raceways	Y	Y	Y	Y	Y	Y	N	N	
	In fireproof shafts	Y	Y	Y	Y	Y	Y	N	N	
	In plenum communications raceways	Y	Y	N	N	N	N	N	N	
	In plenum cable routing assemblies	Y	Y	N	N	N	N	N	N	

Applications		Wire and Cable Type								
		Plenum	Riser	BMR	General-Purpose	BM	Limited-Use	Under-carpet	BMU, BLU	C
	In riser communications raceways	Y	Y	N	N	N	N	N	N	
	In riser cable routing assemblies	Y	Y	N	N	N	N	N	N	
	In one- and two-family dwellings	Y	Y	Y	Y	Y	Y	N	N	
Within buildings in other than air-handling spaces and risers	General	Y	Y	Y	Y	Y	Y	N	N	
	In one- and two-family dwellings	Y	Y	Y	Y	Y	Y	Y	N	
	In multifamily dwellings	Y	Y	Y	Y	Y	Y	Y	N	
	In nonconcealed spaces	Y	Y	Y	Y	Y	Y	Y	N	
	Supported by cable trays	Y	Y	Y	Y	Y	N	N	N	
	Under carpet, modular flooring, and planks	N	N	N	N	N	N	Y	N	
	In distributing frames and cross-connect arrays	Y	Y	N	Y	N	N	N	N	
	In rigid metal conduit (RMC) and intermediate metal conduit (IMC)	Y	Y	Y	Y	Y	Y	Y	Y	
	In any raceway recognized in Chapter 3	Y	Y	Y	Y	Y	Y	N	N	
	In plenum communications raceways	Y	Y	N	Y	N	N	N	N	
	In plenum cable routing assemblies	Y	Y	N	Y	N	N	N	N	
	In riser communications raceways	Y	Y	N	Y	N	N	N	N	
	In riser cable routing assemblies	Y	Y	N	Y	N	N	N	N	

Applications	Wire and Cable Type								
	Plenum	Riser	BMR	General-Purpose	BM	Limited-Use	Under-carpet	BMU, BLU	C
In general-purpose communications raceways	Y	Y	N	Y	N	N	N	N	
In general-purpose cable routing assemblies	Y	Y	N	Y	N	N	N	N	

Note: An “N” in the table indicates that the cable type shall not be installed in the application. A “Y” indicates that the cable type shall be permitted to be installed in the application subject to the limitations described in 722.131. The Riser column includes all riser cables except BMR, and the General-Purpose column includes all general-purpose cables except BM.

Informational Note No. 1: Table ~~722.110~~ 723.20 covers the applications of ~~listed communications wires, cables, and raceways in~~ limited-energy cables installed in raceways within buildings.

Informational Note No. 2: See 722.131(B) for restrictions to the installation of communications cables in fabricated ducts.

Informational Note No. 3: See UL 444, *Standard for Safety for Communications Cables* , for the compressive loading test used to determine the suitability of cable for undercarpet use.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 19:14:36 EDT 2024

Committee Statement

Committee Statement: The reference in section 722.130 has been updated to Article 723 Parts II, III, & IV as the requirements for Limited-Energy Raceways, Cable Routing Assemblies and Cables Trays were moved to new Article 723.

The reference in the informational note no. 1 for section 722.130 has been updated to appropriately reference 723.20.

A new informational note no. 3 has been added to section/table 722.130, referencing UL 444, Standard for Safety of Communications Cables. A reference to a standard on communications cables is more appropriately located in 722.130 as this is where installation and application requirements for communications cables are located.

Response Message: SR-7721-NFPA 70-2024

Public Comment No. 1367-NFPA 70-2024 [Section No. 722.130]

Public Comment No. 1368-NFPA 70-2024 [Section No. 722.130]

Public Comment No. 1441-NFPA 70-2024 [Section No. 722.130]

Second Revision No. 7723-NFPA 70-2024 [Section No. 722.131]

722.131 Installation of Cables Used for Communications Circuits, Communications Wires, Cable Routing Assemblies, and Communications Raceways.

Installation of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways shall comply with 722.131(A) through 722.131(L).

(A) ~~General.~~ Cable Types.

~~Installation of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways shall comply with 722.131(A) through 722.131(L) . Installation of cable routing assemblies and communications raceways shall comply also with 722.110 . Types of cables used by this section shall be identified~~ Cables used in communications circuits shall be of a type included in Table 722.131(A).

Table 722.131(A) Cables Used for Communications Circuits

	Listed Cable Types
Plenum cables	CMP, CATVP, BLP, OFNP, OFCP
Riser cables	CMR, CATVR, BMR, BLR, OFNR, OFCR
General-purpose cables	CMG, CM, CATV, BM, BL, OFNG, OFN, OFCG, OFC
Limited-use cables	CMX, CATVX, BLX
Under-carpet	CMUC
Underground	BMU, BLU

(B) Ducts Specifically Fabricated for Environmental Air.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in ducts specifically fabricated for environmental air shall be in accordance with 722.131(B)(1) and 722.131(B)(2).

(1) Uses Permitted.

The following cables shall be permitted in ducts specifically fabricated for environmental air as described in 720.22(B) if they are directly associated with the air distribution system:

(1) Plenum cables up to 1.22 m (4 ft) in length

(2) Plenum, rise, general-purpose, and limited-use cables installed in raceways that are installed in compliance with 720.22(B)

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in ducts specifically fabricated for environmental air as described in 720.22(B):

(1) Plenum, riser, and general-purpose communications raceways

(2) Plenum, riser, and general-purpose cable routing assemblies

(3) Riser, general-purpose, and limited-use cables

(4) Type CMUC cables and wires

(5) Types BMU and BLU cables

(6) Communications wires

(7) Hybrid power and communications cables

Informational Note: See NFPA 90A-~~2024~~ , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for information on fire protection of wiring installed in fabricated ducts.

(C) Other Spaces Used for Environmental Air (Plenums).

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in other spaces used for environmental air (plenums) shall be in accordance with 722.131(C)(1) and 722.131(C)(2).

(1) Uses Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall be permitted in other spaces used for environmental air as described in 720.22(C):

(1) Plenum cables

(2) Plenum communications raceways

(3) Plenum cable routing assemblies

(4) Plenum cables installed in plenum communications raceways

(5) Plenum cables installed in plenum cable routing assemblies

(6) Plenum cables and plenum communications raceways supported by open metal cable tray systems

(7) Plenum, riser, general-purpose, and limited-use cables, and communications wires installed in raceways that are installed in compliance with 720.22(C)

(8) Plenum, riser, general-purpose, limited-use cables and plenum, riser, and general-purpose communications raceways supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 720.22(C)

(9) Plenum, riser, general-purpose, and limited-use cables installed in plenum, riser, and general-purpose communications raceways supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 720.22(C)

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in other spaces used for environmental air as described in 720.22(C):

(1) Riser, general-purpose, and limited-use cables

(2) Riser and general-purpose communications raceways

(3) Riser and general-purpose cable routing assemblies

(4) Type CMUC cables and wires

(5) Types BMR, BM, BMU, and BLU cables

(6) Communications wires

(7) Hybrid power and communications cables

Informational Note: See NFPA 90A-~~2024~~ , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for information on fire protection of wiring installed in other spaces used for environmental air.

(D) Risers — Cables, Cable Routing Assemblies, and Communications Raceways in Vertical Runs.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in risers shall be in accordance with 722.131(D)(1) and 722.131(D)(2).

(1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted in vertical runs penetrating one or more floors and in vertical runs in a shaft:

(1) Plenum and riser cables

(2) Plenum and riser communications raceways

(3) Plenum and riser cable routing assemblies

(4) Plenum and riser cables installed in the following:

a. Plenum communications raceways

b. Riser communications raceways

c. Plenum cable routing assemblies

d. Riser cable routing assemblies

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in risers:

(1) General-purpose and limited-use cables

(2) General-purpose communications raceways

(3) General-purpose cable routing assemblies

(4) Type CMUC cables and wires

(5) Types BMR, BM, BMU, and BLU cables

(6) Communications wires

(7) Hybrid power and communications cables

Informational Note: See 720.21 for firestop requirements for floor penetrations.

(E) Risers — Cables and Innerducts in Metal Raceways.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in metal raceways in a riser having firestops at each floor shall be in accordance with 722.131(E)(1) and 722.131(E)(2).

(1) Uses Permitted.

The following cables and innerducts shall be permitted in metal raceways in a riser having firestops at each floor:

(1) Plenum, riser, general-purpose, and limited-use cables

(2) Plenum, riser, and general-purpose communications raceways (innerduct)

(3) Plenum, riser, general-purpose, and limited-use cables installed in the following:

a. Plenum communications raceways (innerduct)

b. Riser communications raceways (innerduct)

c. General-purpose communications raceways (innerduct)

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in metal raceways in a riser having firestops at each floor:

(1) Plenum, riser, and general-purpose cable routing assemblies

(2) Type CMUC cables and wires

(3) Types BMR, BM, BMU, and BLU cables

(4) Communications wires

(5) Hybrid power and communications cables

Informational Note: See 720.21 for firestop requirements for floor penetrations.

(F) Risers — Cables, Cable Routing Assemblies, and Communications Raceways in Fireproof Shafts.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in fireproof riser shafts having firestops at each floor shall be in accordance with 722.131(F)(1) and 722.131(F)(2).

(1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted to be installed in fireproof riser shafts having firestops at each floor:

(1) Plenum, riser, general-purpose, and limited-use cables

(2) Plenum, riser, and general-purpose communications raceways

(3) Plenum, riser, and general-purpose cable routing assemblies

(4) Plenum, riser, general-purpose, and limited-use cables installed in the following:

a. Plenum communications raceways

b. Riser communications raceways

c. General-purpose communications raceways

d. Plenum cable routing assemblies

e. Riser cable routing assemblies

f. General-purpose cable routing assemblies

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in metal raceways in fireproof riser shafts having firestops at each floor:

(1) Type CMUC cables and wires

(2) Type BMU and BLU cables

(3) Communications wires

(4) Hybrid power and communications cables

Informational Note: See 720.21 for firestop requirements for floor penetrations.

(G) Risers — One- and Two-Family Dwellings.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in risers in one- and two-family dwellings shafts shall be in accordance with 722.131(G)(1) and 722.131(G)(2).

(1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted in one- and two-family dwellings:

(1) Plenum, riser, and general-purpose cables

(2) Limited-use cables less than 6 mm (0.25 in.) in diameter

(3) Plenum, riser, and general-purpose communications raceways

(4) Plenum, riser, and general-purpose cable routing assemblies

(5) Plenum, riser, and general-purpose cables installed in the following:

a. Plenum communications raceways

b. Riser communications raceways

c. General-purpose communications raceways

d. Plenum cable routing assemblies

e. Riser cable routing assemblies

f. General-purpose cable routing assemblies

(2) Uses Not Permitted.

The following cables and wires shall not be permitted in risers in one- and two-family dwellings:

(1) Type CMUC cables and wires

(2) Type BMU and BLU cables

(3) Communications wires

(4) Hybrid power and communications cables

(H) Cable Trays.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways supported by cable trays shall be in accordance with 722.131(H)(1) and 722.131(H)(2).

(1) Uses Permitted.

The following wires, cables, and communications raceways shall be permitted to be supported by cable trays:

(1) Plenum, riser, and general-purpose cables

(2) Plenum, riser, and general-purpose communications raceways

(3) Communications wires, plenum, riser, and general-purpose cables installed in the following:

a. Plenum communications raceways

b. Riser communications raceways

c. General-purpose communications raceways

(2) Uses Not Permitted.

The following cables and wires shall not be supported by cable trays:

(1) Limited-use cables

(2) Type CMUC cables and wires

(3) Type BMU and BLU cables

(4) Communications wires

(5) Hybrid power and communications cables

(I) Distributing Frames and Cross-Connect Arrays.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in distributing frames and cross-connect arrays shall be in accordance with 722.131(I)(1) and 722.131(I)(2).

(1) Uses Permitted.

The following wires, cables, cable routing assemblies, and communications raceways shall be permitted to be installed in distributing frames and cross-connect arrays:

(1) Plenum, riser, general-purpose cables, and communications wires

(2) Plenum, riser, and general-purpose communications raceways

(3) Plenum, riser, and general-purpose cable routing assemblies

(4) Communications wires, plenum, riser, and general-purpose cables installed in the following:

a. Plenum communications raceways

b. Riser communications raceways

c. General-purpose communications raceways

d. Plenum cable routing assemblies

e. Riser cable routing assemblies

f. General-purpose cable routing assemblies

(2) Uses Not Permitted.

The following cables and wires shall not be installed in distributing frames and cross-connect arrays:

(1) Types BMR, BM, BMU, and BLU cables

(2) Limited-use cables

(3) Type CMUC cables and wires

(4) Hybrid power and communications cables

(J) Other Building Locations.

Installations of cables used for communications circuits, cable communications wires, routing assemblies, and communications raceways in building locations other than those covered in 722.131(B) through 722.131(I) shall be in accordance with 722.131(J)(1) and 722.131(J)(2).

(1) Uses Permitted.

The following wires, cables, cable routing assemblies, and communications raceways shall be permitted to be installed in building locations other than the locations covered in 722.131(B) through 722.131(I):

(1) Plenum, riser, and general-purpose cables

(2) Limited-use cables with a maximum of 3 m (10 ft) of exposed length in nonconcealed spaces

(3) Plenum, riser, and general-purpose communications raceways

(4) Plenum, riser, and general-purpose cable routing assemblies

(5) Communications wires, plenum, riser, and general-purpose cables installed in the following:

   a. Plenum communications raceways

   b. Riser communications raceways

   c. General-purpose communications raceways

(6) Plenum, riser, and general-purpose cables installed in the following:

   a. Plenum cable routing assemblies

   b. Riser cable routing assemblies

   c. General-purpose cable routing assemblies

(7) Communications wires and plenum, riser, general-purpose, and limited-use cables installed in raceways recognized in Chapter 3

(8) Type CMUC under-carpet communications wires and cables installed under carpet, modular flooring, and planks.

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be installed in building locations other than the locations covered in 722.131(B) through 722.131(I):

(1) Types BMU and BLU cables

(2) Communications wires

(3) Hybrid power and communications cables

(K) Multifamily Dwellings.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in multifamily dwellings shall be in accordance with 722.131(K)(1) and 722.131(K)(2).

(1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted to be installed in multifamily dwellings in locations other than the locations covered in 722.131(B) through 722.131(G):

(1) Plenum, riser, and general-purpose cables

(2) Limited-use cables less than 6 mm (0.25 in.) in diameter in nonconcealed spaces

(3) Plenum, riser, and general-purpose communications raceways

(4) Plenum, riser, and general-purpose cable routing assemblies

(5) Communications wires and plenum, riser, and general-purpose cables installed in the following:

a. Plenum communications raceways

b. Riser communications raceways

c. General-purpose communications raceways

(6) Plenum, riser, and general-purpose cables installed in the following:

a. Plenum cable routing assemblies

b. Riser cable routing assemblies

c. General-purpose cable routing assemblies

(7) Communications wires and plenum, riser, general-purpose, and limited-use cables installed in raceways recognized in Chapter 3

(8) Type CMUC under-carpet communications wires and cables installed under carpet, modular flooring, and planks

(2) Uses Not Permitted.

The following cables, cable routing assemblies, and communications raceways shall not be installed in multifamily dwellings in locations other than the locations covered in 722.131(B) through 722.131(G):

(1) Types BMU and BLU cables

(2) Communications wires

(3) Hybrid power and communications cable.

(L) One- and Two-Family Dwellings.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in one- and two-family dwellings in locations other than those covered in 722.131(B) through 722.131(F) shall be in accordance with 722.131(L)(1) and 722.131(L)(2).

(1) Uses Permitted.

The following wires, cables, cable routing assemblies, and communications raceways shall be permitted to be installed in one- and two-family dwellings in locations other than the locations covered in 722.131(B) through 722.131(F):

(1) Plenum, riser, and general-purpose cables

(2) Limited-use cables less than 6 mm (0.25 in.) in diameter

(3) Plenum, riser, and general-purpose communications raceways

(4) Plenum, riser, and general-purpose cable routing assemblies

(5) Communications wires and plenum, riser, and general-purpose cables installed in the following:

a. Plenum communications raceways

b. Riser communications raceways

c. General-purpose communications raceways

(6) Plenum, riser, and general-purpose cables installed in the following:

a. Plenum cable routing assemblies

b. Riser cable routing assemblies

c. General-purpose cable routing assemblies

(7) Communications wires and plenum, riser, general-purpose, and limited-use cables installed in raceways recognized in Chapter 3

(8) Type CMUC under-carpet communications wires and cables installed under carpet, modular flooring, and planks

(9) Hybrid power and communications cable listed in accordance with 722.100

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be installed in one- and two-family dwellings in locations other than those covered in 722.131(B) through 722.131(F):

(1) Types BMU and BLU cables

(2) Communications wires

Supplemental Information

File Name	Description	Approved
722.131_-_Terra_Copy.docx	staff use	
722.131_-_SR-7723.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 15 19:31:50 EDT 2024

Committee Statement

Committee Statement: The text was reformatted to comply with the Style Manual. References to other sections of the Code were deleted because they were redundant. The defined term “identified” was incorrectly used, so the sentence was rewritten.

The language in this section only applies to communications circuits and not all limited-energy cables, so the proposed terminology updates were not included.

Section 722.131(A) has been revised deleting the words “cables used for communications circuits and communications wires”. The newly defined term for limited-energy cables has been used which includes communications cables. The references have been updated to the correct Parts of Article 723 and put into list format to provide clarity and promote usability.

Response Message: SR-7723-NFPA 70-2024

Public Comment No. 1369-NFPA 70-2024 [Section No. 722.131(A)]

Second Revision No. 8614-NFPA 70-2024 [Section No. 722.132]

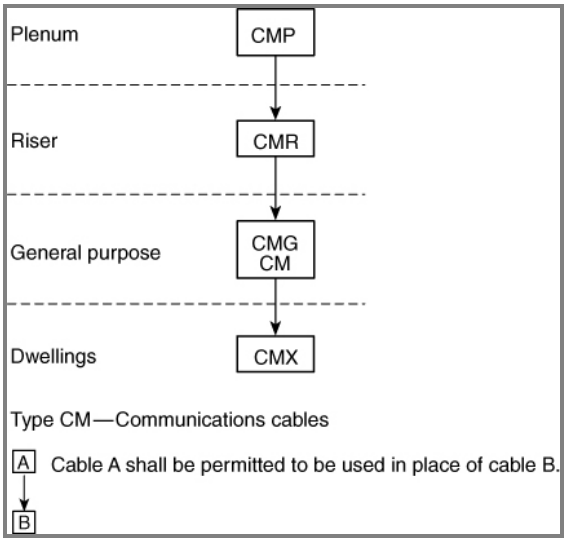
722.132 Permitted Substitutions of Listed Cables Used for Communications Circuits and Communications Wires.

The substitutions for communications cables listed in Table 722.132 and illustrated in Figure 722.132 shall be permitted.

Table 722.132 Listed Communications Cable Substitutions

Cable Type	Permitted Substitutions
CMR	CMP
CMG, CM	CMP, CMR
CMX	CMP, CMR, CMG, CM

Figure 722.132 Listed Communications Cable Substitution Hierarchy.



~~**(A)** Permitted Substitutions of Listed Communications Cables.~~

~~The substitutions for communications cables listed in Table 722.132(A) and illustrated in Figure 722.132(A) shall be permitted.~~

~~Table 722.132(A) Listed Communications Cable Substitutions~~

~~Cable Type~~	~~Permitted Substitutions~~
~~CMR~~	~~CMP~~
~~CMG, CM~~	~~CMP, CMR~~
~~CMX~~	~~CMP, CMR, CMG, CM~~

~~**Figure 722.132(A) Listed Communications Cable Substitution Hierarchy.**~~

Supplemental Information

File Name	Description	Approved
NEC_CMP-3_SR-8614_722.132.docx		

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Dec 06 10:40:44 EST 2024

Committee Statement

Committee Statement: This editorial Second Revision is developed by NFPA staff to delete the first level subdivision arrangement of the requirement. Single requirements do not need to be subdivided.

Response Message: SR-8614-NFPA 70-2024

Second Revision No. 7736-NFPA 70-2024 [Section No. 722.133(E)]

~~**(E)** Dwelling Unit Communications Outlet.~~

~~For new construction, a minimum of one communications outlet shall be installed with the dwelling in a readily accessible area and cabled to the service provider demarcation point.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 11:11:47 EDT 2024

Committee Statement

Committee Statement: Section 722.133(E) has been deleted as the text was relocated to 720.9.

The text in 720.9 incorporates the change proposed by PC-1468 to remove the word “readily” before “accessible” because there is no safety issue if communications outlets are not readily accessible instead of just “accessible.”

Response Message: SR-7736-NFPA 70-2024

Public Comment No. 1533-NFPA 70-2024 [Section No. 722.133(E)]

Public Comment No. 1468-NFPA 70-2024 [Section No. 722.133(E)]

Public Comment No. 280-NFPA 70-2024 [Section No. 722.133(E)]

Second Revision No. 7744-NFPA 70-2024 [Section No. 722.134]

722.134 Installation of Low-Power Network-Powered Broadband Communications Cables and Equipment.

Cable and equipment installations within buildings shall comply with 722.134(A) through 722.134(C), as applicable.

(A) Separation of Conductors.

(1) In Raceways, Cable Trays, Boxes, Enclosures, and Cable Routing Assemblies.

(a) *Low- and Medium-Power Network-Powered Broadband Communications Circuit Cables.* Low- and medium-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly.

(b) *Low-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits.* Low-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with jacketed cables of any of the following circuits:

(1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Article 725, Parts I and II

(2) Power-limited fire alarm systems in compliance with Article 760, Parts I and III

(3) Communications circuits in compliance with Article 722, Parts I and III

(4) Nonconductive and conductive optical fiber cables in compliance with Article 722, Parts I and III

(5) Community antenna television and radio distribution systems in compliance with Article 722, Parts I and III

~~(b) *Medium-Power Network-Powered Broadband Communications Circuit Cables with Optical Fiber Cables and Other Communications Cables.* Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:~~

~~(0) Communications circuits in compliance with Article 722 , Parts I and III~~

~~(0) Conductive optical fiber cables in compliance with Article 722 , Parts I and III~~

~~(0) Community antenna television and radio distribution systems in compliance with Article 722 , Parts I and III~~

~~(b) *Medium-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits.* Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:~~

~~(0) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Article 725 , Parts I and II~~

~~(0) Power-limited fire alarm systems in compliance with Article 760 , Parts I and III~~

(c) *Electric Light, Power, Class 1, Nonpowered Broadband Communications Circuit Cables.* Network-powered broadband communications cable shall not be placed in any raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables.

Exception No. 1: Network-powered broadband communications cable shall be permitted to be placed in a raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables where all of the conductors of electric light, power, Class 1, non-power-limited fire alarm circuits are separated from all of the network-powered broadband communications cables by a permanent barrier or listed divider.

Exception No. 2: Where power circuit conductors are installed in in outlet boxes, junction boxes, or similar fittings or compartments where such conductors are introduced solely for power supply to the network-powered broadband communications system distribution equipment, the power circuit conductors shall be routed within the enclosure to maintain a minimum 6 mm (¼ in.) separation from network-powered broadband communications cables.

(2) Other Applications.

Network-powered broadband communications cable shall be separated at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, and non-power-limited fire alarm circuits.

Exception No. 1: Separation shall not be required where either of the following applies:

(1) All of the conductors of electric light, power, Class 1, and non-power-limited fire alarm circuits are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type AC, or Type UF cables.

(2) All of the network-powered broadband communications cables are encased in a raceway.

Exception No. 2: Separation shall not be required where the network-powered broadband communications cables are permanently separated from the conductors of electric light, power, Class 1, and non-power-limited fire alarm circuits by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.

(B) Support of Network-Powered Broadband Communications Cables.

Raceways shall be used for their intended purpose. Network-powered broadband communications cables shall not be strapped, taped, or attached by any means to the exterior of any conduit or raceway as a means of support.

~~**(C)** Splicing of Medium-Powered Network-Powered Communications Cables.~~

~~Where a medium-powered network-powered broadband communications cable is spliced or extended, a listed junction box or listed patch panel shall be used.~~

(C) Bends.

Bends in network broadband cable shall be made so as not to damage the cable. The radius of the curve of the inner edge of any bend shall not be less than 10 times the diameter of the cable.

Informational Note: See ANSI/TIA-568.0-E, *Generic Telecommunications Cabling for Customer Premises*, for information on bend radii of network broadband cable during different types of installation conditions.

Supplemental Information

File Name	Description	Approved
722.134_-_Terra_Copy.docx		
722.134_-_SR-7744.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 11:47:36 EDT 2024

Committee Statement

Committee Statement: Medium-power network-powered broadband is not a limited-energy system and does not belong in this article.

Response Message: SR-7744-NFPA 70-2024

Public Comment No. 282-NFPA 70-2024 [Section No. 722.134]

Second Revision No. 7745-NFPA 70-2024 [Section No. 722.136]

722.136 Permitted Substitutions of Low-Power Network-Powered Broadband Communications System Cables.

The substitutions for low-power network-powered broadband system cables listed in Table 722.136 shall be permitted.

Table 722.136 Permitted Substitutions of Low-Power Network-Powered Broadband Communications System Cables.

Cable Type	Permitted Cable Substitutions
~~BM~~	~~BMR~~
BLP	CMP, CL3P
BLR	CMP, CL3P, CMR, CL3R, BLP, BMR
BL	CMP, CMR, CM, CMG, CL3P, CL3R, CL3, BMR, BM, BLP, BLR
BLX	CMP, CMR, CM, CMG, CMX, CL3P, CL3R, CL3, CL3X, BMR, BM, BLP, BRP, BL

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 11:52:09 EDT 2024

Committee Statement

Committee Statement: "Low-power" is added throughout the section to clarify that it does not apply to medium-power network-powered broadband communications systems cables. Medium-power, network-powered broadband cables are outside the scope of Article 722, so the substitutions for Type BM are deleted.

Response Message: SR-7745-NFPA 70-2024

Public Comment No. 283-NFPA 70-2024 [Section No. 722.136]

Second Revision No. 7747-NFPA 70-2024 [Section No. 722.140(A)]

(A) General.

Class 2 and Class 3 circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with 722.140(A), 722.140(B), or a combination of both.

(1) Class 1 Wiring Methods and Materials.

Use of Class 1 wiring methods for Class 2 and Class 3 circuits shall be permitted. ~~Separation from electric light, power, Class 1, non-power-limited fire alarm circuit conductors, and medium-power network-powered broadband communications cables shall comply with 725.136 .~~

Exception: The ampacity adjustment factors given in 310.15(C)(1) shall not apply.

(2) Class 2 and Class 3 Wiring Methods and Materials.

Conductors on the load side of the power source shall be ~~insulated in accordance with 722.100 and 722.102 and be~~ installed in accordance with ~~722.110 ,~~ 722.15~~725.136~~ , 722.140(B), and 723.20 ~~and 725.136~~ .

Exception No. 1: As provided for in 620.21 for elevators and similar equipment.

Exception No. 2: Other wiring methods and materials installed in accordance with 720.4(A) , ~~725.3~~ 720.21 , 720.22 , and 750.5 shall be permitted to extend or replace the conductors and cables ~~described in 722.100(A) and~~ permitted by 722.140(A)(2).

Exception No. 3: Bare Class 2 conductors shall be permitted as part of a listed intrusion protection system where installed in accordance with the listing instructions for the system.

(3) Class 2 and Class 3 Cable Voltage and Temperature Ratings.

Class 2 cables shall have a voltage rating of not less than 150 volts. Class 3 cables shall have a voltage rating of not less than 300 volts. Class 2 and Class 3 cables shall have a temperature rating of not less than 60°C (140°F).

(4) Class 3 Single Conductors.

Class 3 single conductors used as other wiring within buildings shall be listed Type CL3 and shall not be smaller than 18 AWG.

Informational Note: See ANSI/UL 1685, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables* , for the UL flame exposure, vertical tray flame test that is used to determine resistance to the spread of fire when cables do not spread fire to the top of the tray. The smoke measurements in the test method are not applicable.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 11:58:50 EDT 2024

Committee Statement

Committee Statement: Text in 722.140(A)(1) was deleted as it was redundant to other sections in this article. A new section 722.140(A)(3) was created to provide requirements for temperature and voltage rating for Class 2 and Class 3 cable conductors. A new section 722.140(A)(4) was created to provide a requirement establishing a minimum size conductor for Class 3

single conductors. A new informational note was added to 722.140(A)(4) referencing UL 1685, and the reference to limited-energy Raceways was updated to the new correct code section: 723.20.

Response Message: SR-7747-NFPA 70-2024

Public Comment No. 1439-NFPA 70-2024 [Section No. 722.140(A)]

Second Revision No. 7749-NFPA 70-2024 [Section No. 722.140(B)(1)]

~~**(1)** Classification of Circuits.~~

~~Circuits carrying data and power shall be classified as electrical power circuits in accordance with the type of electrical power carried.~~

~~*Exception:* *PoE circuits shall be classified as communications and Class 2 or Class 3.*~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 12:04:40 EDT 2024

Committee Statement

Committee Statement: This text is related to and derived from 722.14. The Panel has determined 722.14 is no longer needed and as such, this exception is similarly no longer needed. Therefore, 722.140(B)(1) is deleted.

Response Message: SR-7749-NFPA 70-2024

Public Comment No. 284-NFPA 70-2024 [Section No. 722.140(B)(1)]

Second Revision No. 7769-NFPA 70-2024 [Sections 722.140(B)(3), 722.140(B)(4)]

(2) Use of 4-Pair Class 2 or Class 3 Cables to Transmit Power and Data.

Where Type CL3P, Type CL2P, Type CL3R, Type CL2R, Type CL3, or Type CL2 4-pair cables transmit power and data, the rated current per conductor of the power source shall not exceed the ampacities in ~~Table 722.140(B)~~ Table 722.140(B)(2) at an ambient temperature of 30°C (86°F). For ambient temperatures above 30°C (86°F), the correction factors in Table 310.15(B)(1)(1) or in Equation 310.15(B) shall apply.

Exception: Compliance with ~~Table 722.140(B)~~ Table 722.140(B)(2) shall not be required for installations where conductors are 24 AWG or larger and the rated current per conductor of the power source does not exceed 0.3 amperes.

Informational Note: One example of the use of Class 2 cables is a network of closed-circuit TV cameras using 24 AWG, 60°C (140°F) rated, Type CL2R, Category 5e balanced twisted-pair cabling.

Table 722.140(B)(2) Ampacities of Each Conductor in Amperes in 4-Pair Class 2 or Class 3 Balanced Twisted-Pair Cables Based on Copper Conductors at an Ambient Temperature of 30°C (86°F) with All Conductors in All Cables Carrying Current, 60°C (140°F), 75°C (167°F), and 90°C (194°F) Rated Cables

AWG	Number of 4-Pair Cables in a Bundle														
	1–7			8–19			20–37			38–61			62–91		
	Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating			Temperatur Rating		
	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	9(
26	1	1.23	1.42	0.71	0.87	1.02	0.55	0.68	0.78	0.46	0.57	0.67	0.45	0.55	0.(
24	1.19	1.46	1.69	0.81	1.01	1.17	0.63	0.78	0.91	0.55	0.67	0.78	0.46	0.56	0.(
23	1.24	1.53	1.78	0.89	1.11	1.28	0.77	0.95	1.1	0.66	0.8	0.93	0.58	0.71	0.8
22	1.5	1.86	2.16	1.04	1.28	1.49	0.77	0.95	1.11	0.66	0.82	0.96	0.62	0.77	0.8

Notes:

1. For bundle sizes over 192 cables, or for conductor sizes smaller than 26 AWG, ampacities shall be permitted to be determined by qualified personnel under engineering supervision.

2. Where only half of the conductors in each cable are carrying current, the values in the table shall be permitted to be increased by a factor of 1.4.

Informational Note No. 1: Elevated cable temperatures can reduce a cable's data transmission performance. For information on practices for 4-pair balanced twisted pair cabling, see TIA-TSB-184-A, *Guidelines for Supporting Power Delivery Over Balanced Twisted-Pair Cabling*, and ANSI/TIA-568-C, *Balanced Twisted-Pair Telecommunications Cabling and Components Standard*, 6.4.7, 6.6.3, and Annex G, which provide guidance on adjustments for operating temperatures between 20°C and 60°C (68°F and 140°F).

Informational Note No. 2: The per-contact current rating of connectors can limit the maximum allowable current below the ampacity shown in ~~Table 722.140~~ Table 722.140(B)(2) .

(3) Use of Class 2-LP or Class 3-LP Cables to Transmit Power and Data.

Cables with the suffix "-LP" shall comply with 722.140(B)(3)(a) through 722.140(B)(3)(e). ~~Type CL3P-LP, Type CL2P-LP, Type CL3R-LP, Type CL2R-LP, Type CL3-LP, or Type CL2-LP cables shall be permitted to supply power to equipment from a power source with a rated current per conductor up to the marked current limit located immediately following the suffix "-LP" and shall be permitted to transmit data to the equipment. Where the number of bundled LP cables is 192 or less and the selected ampacity of the cables in accordance with Table 722.140(B)(4) exceeds the marked current limit of the cable, the ampacity determined from the table shall be permitted to be used. For ambient temperatures above 30°C (86°F), the correction factors of Table 310.15(B)(1)(1) or Equation 310.15(B) shall apply. The Class 2-LP and Class 3-LP cables shall comply with the following, as applicable:~~

(a) ~~Type CL3P-LP, Type CL2P-LP, Type CL3R-LP, Type CL2R-LP, Type CL3-LP, or Type CL2-~~ The LP cables shall be permitted to supply power to equipment from a power source with a rated current per conductor up to the marked current limit located immediately following the suffix "-LP" ~~and shall be permitted to transmit data to the equipment~~.

(b) The -LP cables shall be permitted to transmit data to the equipment.

(c) ~~Where~~ If the number of bundled LP cables is 192 or less and the selected ampacity of the cables in accordance with Table 722.140(B)(2) exceeds the marked current limit of the cable, the ampacity determined from the table shall be permitted to be used.

(d) For ambient temperatures above 30°C (86°F), the correction factors of Table 310.15(B)(1)(1) or Equation 310.15(B) shall apply.

(e) The ~~Class 2-LP and Class 3-~~ LP cables shall comply with the following, as applicable:

(1) Cables with the suffix "-LP" shall be permitted to be installed in bundles, raceways, cable trays, communications raceways, and cable routing assemblies.

(2) Cables with the suffix "-LP" and a marked current limit shall follow the substitution hierarchy of 722.122 for the cable type without the suffix "-LP" and without the marked current limit.

(3) System design shall be permitted by qualified persons under engineering supervision.

Informational Note: An example of the marking on a 23 AWG, 4-pair, Class 2 cable rated 75°C (167°F) with an LP current rating of 0.6 amperes per conductor is "CL2-LP(0.6A) 75°C 23 AWG 4-pair". ~~See 722.100(A)(9).~~

Supplemental Information

File Name	Description	Approved
722.140_B_3_-_Terra_Copy.docx	for staff use	
NEC_CMP-3_SR-7769_722.140_B_3_.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 13:06:09 EDT 2024

Committee Statement

Committee Statement: As the section is about any 4-pair cable with a -LP suffix, the list of cables was deleted, simplifying the language for usability. Additionally, the section was reformatted to comply with Style Manual, Section 3.5.1.2. Table 722.140(B)(4) was relocated to 722.140(B)(3), which is the proper location. The word "Cables" was added to the headings in the table

for clarity. The references in 722.140(B)(4) Informational Note No. 1 were updated.

Response Message: SR-7769-NFPA 70-2024

Public Comment No. 285-NFPA 70-2024 [Section No. 722.140(B)(4)]

Public Comment No. 1983-NFPA 70-2024 [Section No. 794.204(B)]

Public Comment No. 1998-NFPA 70-2024 [Section No. 794.204(B)]

Second Revision No. 7772-NFPA 70-2024 [New Section after 722.150]

722.151 Class 4 Cable Construction and Rating.

(A) Class 4 Cable Construction.

(1) Sizes.

Conductors of sizes not smaller than 24 AWG shall be permitted to be used.

(2) Insulation.

Insulation on conductors shall be rated not less than 450 volts dc.

(3) Voltage Rating.

Cables shall have a voltage rating of not less than 450 volts dc.

(4) Temperature Rating.

Cables shall have a temperature rating of not less than 60°C (140°F).

(B) Ampacity.

(1) Conductors Sized 16 AWG to 6 AWG.

For conductors sized 16 AWG to 6 AWG, the ampacity of Class 4 cables shall comply with 310.15 based on the temperature rating of the Class 4 cable.

(2) Conductors Sized 24 AWG to 17 AWG.

For conductors sized 24 AWG to 17 AWG, the Class 4 cable shall have an ampacity in accordance with the marking FMP-XXA, where "-XX" is the ampacity.

Informational Note: See UL 1400-1, *Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements* , and UL 1400-2, *Outline of Investigation for Fault-Managed Power Systems — Part 2: Requirements for Class 4 Cables* , for information on determining maximum ampacities.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 13:29:07 EDT 2024

Committee Statement

Committee Statement: A new section 722.151 was created for the rating and construction requirements for Class 4 cables. The requirement from section 722.100(A)(16) was relocated to this new section. A new section 722.151(B) was created for the Class 4 cable ampacity requirements previously located in 722.150(C).

The proper location for finding the ampacity requirements for conductors is 310.15.

Response Message: SR-7772-NFPA 70-2024

Public Comment No. 792-NFPA 70-2024 [Section No. 722.150(C)]

Public Comment No. 1432-NFPA 70-2024 [New Section after 722.150(C)]

Second Revision No. 7773-NFPA 70-2024 [New Section after 722.150]

722.152 Installation and Wiring Methods for Class 4 Circuit Cables.

(A) Installation in Dwelling Units.

Where Class 4 cables are used in a dwelling unit, not more than 20 current-carrying conductors shall be installed without maintaining spacing.

(B) Two or More Class 4 Circuits.

Conductors of two or more Class 4 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly.

(C) Class 4 Circuits With Class 2, Class 3, or Communications Circuits.

(1) Within the Same Cable.

Conductors of one or more Class 4 circuits shall be permitted within the same cable assembly as conductors of Class 2, Class 3, or communications circuits if the insulation of the Class 2, Class 3, or communications circuit conductors in the cable is at least that required for Class 4 circuits.

(2) Within the Same Enclosure, Raceway, or Cable Routing Assembly.

Class 4 cables shall be permitted within the same enclosure, raceway, or cable routing assembly as limited-energy cables.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 13:30:37 EDT 2024

Committee Statement

Committee Statement: A new Section 722.152 was created for installation and wiring methods for Class 4 circuit cables for usability and to create a similar structure as other limited-energy cable parts of Article 722. New section 722.152(A) was created establishing the Class 4 Cabling requirements for dwelling units. New sections 722.152(B) and (C) were created to establish Class 4 cable installation requirements in the same Part of Article 722 as the rest of the Class 4 cable requirements.

Response Message: SR-7773-NFPA 70-2024

Public Comment No. 1434-NFPA 70-2024 [New Section after 722.150(C)]

Second Revision No. 7774-NFPA 70-2024 [Section No. 722.150]

722.150 Applications~~, Installations, and Wiring Methods~~ for Class 4 Circuit Cables.

Class 4 cables shall be permitted only for the following applications:

(1) Class 4 systems

(2) Other applications as permitted by the cable listing

Informational Note: See UL 1400-2, *Outline for Fault-Managed Power Systems – Part 2: Requirements for Class 4 Cables* , for applicable requirements for listing of Class 4 cables.

~~**(A)** Applications.~~

~~Class 4 cables shall not be permitted for any application that is not part of a Class 4 system.~~

~~*Exception: Use of Class 4 cable for other applications shall be permitted if the cable has been listed as suitable for other applications.*~~

~~**(B)** Installation in Dwelling Units.~~

~~Where Class 4 cables are used in a dwelling unit, 722.150(C) shall apply.~~

~~**(C)** Ampacity.~~

~~The ampacity of Class 4 cables shall comply with 720.6(B)(1) based on the temperature rating of the Class 4 cable for conductors sized 16 AWG to 6 AWG. For conductors sized 24 AWG to 17 AWG, the Class 4 cable shall have an ampacity in accordance with the marking FMP-XXA, where XX is the maximum ampacity permitted. In a dwelling unit(s), not more than 20 current- carrying conductors shall be installed without maintaining spacing.~~

~~Informational Note No. 1: See 722.100(A)(16) for additional Class 4 cable requirements.~~

~~Informational Note No. 2: See UL 1400-1-2022, *Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements* , and UL 1400-2-2023, *Outline of Investigation for Fault-Managed Power Systems — Part 2: Requirements for Class 4 Cables* , for information on determining maximum ampacities.~~

Supplemental Information

File Name	Description	Approved
722.150_-_Terra_copy.docx	staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 13:31:59 EDT 2024

Committee Statement

Committee Statement: Section 722.150 was revised into positive code text and in list format to promote usability. Section 722.150(B) was deleted as the requirements for Class 4 cable installations are now located in new section 722.152. Section 722.150(C) was deleted as Class 4 cable construction requirements are now located in 722.151.

Response Message: SR-7774-NFPA 70-2024

Public Comment No. 1491-NFPA 70-2024 [Section No. 722.150]

Second Revision No. 7802-NFPA 70-2024 [Section No. 722.160]

722.160 Applications of Listed Optical Fiber Cables.

(A) General.

(1) Applications.

Permitted and nonpermitted applications of listed optical fiber cables shall be as indicated in Table 722.160(A)(1). ~~The permitted applications shall be subject to the installation requirements of 722.161 and 722.162 . The substitutions for optical fiber cables in Table 722.165 and illustrated in Figure 722.165 shall be permitted.~~

Informational Note: See UL 1651, *Optical Fiber Cable* , for applicable requirements for listing of optical fiber cable.

Table 722.160(A)(1) Applications of Listed Optical Fiber Cables in Buildings

Applications		Listed Optical Fiber Cable Type		
		OFNP, OFCP	OFNR, OFCR	OFNG, OFCG, OFN, OFC
In ducts specifically fabricated for environmental air as described in 720.22(B).	In fabricated ducts	Y	N	N
	In metal raceway that complies with 720.22(B)	Y	Y	Y
In other spaces used for environmental air (plenums) as described in 720.22(C)	In other spaces used for environmental air	Y	N	N
	In metal raceway that complies with 720.22(C)	Y	Y	Y
	In plenum communications raceways	Y	N	N
	In plenum cable routing assemblies	Y	N	N
	Supported by open metal cable trays	Y	N	N
	Supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y
In risers	In vertical runs	Y	Y	N
	In metal raceways	Y	Y	Y
	In fireproof shafts	Y	Y	Y
	In plenum communications raceways	Y	Y	N
	In plenum cable routing assemblies	Y	Y	N
	In riser communications raceways	Y	Y	N
	In riser cable routing assemblies	Y	Y	N
	In one- and two-family dwellings	Y	Y	Y
Within buildings in other than air-handling spaces and risers	General	Y	Y	Y
	Supported by cable trays	Y	Y	Y
	In distributing frames and cross-connect arrays	Y	Y	Y
	In any raceway recognized in Chapter 3	Y	Y	Y

Applications	Listed Optical Fiber Cable Type		
	OFNP, OFCP	OFNR, OFCR	OFNG, OFCG, OFN, OFC
In plenum communications raceway	Y	Y	Y
In plenum cable routing assemblies	Y	Y	Y
In riser communications raceways	Y	Y	Y
In riser cable routing assemblies	Y	Y	Y
In general-purpose communications raceways	Y	Y	Y
In general-purpose cable routing assemblies	Y	Y	Y

Note: “N” indicates that the cable type shall not be permitted to be installed in the application. “Y” indicates that the cable type shall be permitted to be installed in the application subject to the limitations described in 722.161 and 722.162.

(2) Installation.

The permitted applications shall be subject to the installation requirements of 722.161 and 722.162.

(3) Substitutions.

The substitutions for optical fiber cables in Table 722.165 and illustrated in Figure 722.165 shall be permitted.

(B) Field-Assembled Optical Fiber Cables.

Field-assembled optical fiber cable shall comply with the following:

(1) The specific combination of jacket and optical fibers intended to be installed as a field-assembled optical fiber cable shall be one of the following cable types:

a. Plenum cable

b. Riser cable

c. General purpose cable

(2) The field-assembled optical fiber cable shall be marked in accordance with Table 722.100(A) .

(3) The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers with which it is identified for use.

(4) The optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use.

(5) The jacket without fibers shall meet the listing requirements for communications raceways in 723.2 in accordance with the cable marking.

Supplemental Information

File Name	Description	Approved
722.160_-_Terra_Copy.docx		

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Submitter Information Verification

Committee: NEC-P03

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Committee Statement

Committee Statement: The requirements in Section 722.100(A)(12) were relocated to Section 722.160(B). Informational Note 1 of 722.160 was deleted because it contained circular references and the reference to Article 100 was unnecessary. Lastly, Informational Note 2 in 722.160 was deleted as the reference was incorrect and no longer necessary now that the optical fiber requirements are located in the same part of Article 722.

Response Message: SR-7802-NFPA 70-2024

Public Comment No. 1424-NFPA 70-2024 [Section No. 722.160]

Second Revision No. 7817-NFPA 70-2024 [Section No. 722.161]

722.161 Installation of Optical Fiber Cables.

Installation of optical fiber cables shall comply with 722.161(B) through 722.161(J). ~~Installation of raceways and cable routing assemblies shall comply with 722.110 .~~

(A) General.

(1) In Raceway.

Optical fiber cables in raceways shall comply with Article 723 Part II.

(2) In Cable Routing Assemblies.

Optical fiber cables in cable routing assemblies shall comply with Article 723 Part III.

(B) Ducts Specifically Fabricated for Environmental Air.

~~Installations of optical~~ Optical fiber cables in ducts specifically fabricated for environmental air shall be in accordance with 722.161(B)(1) and 722.161(B)(2).

(1) Uses Permitted.

The following cables shall be permitted in ducts specifically fabricated for environmental air as described in 720.22(B) if they are directly associated with the air distribution system:

(1) Up to 1.22 m (4 ft) of Types OFNP and OFCP

(2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in raceways that are installed in compliance with 722.162

Informational Note: See NFPA 90A-~~2024~~ , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for information on fire protection of wiring installed in fabricated ducts.

(2) Uses Not Permitted.

Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in ducts specifically fabricated for environmental air as described in 720.22(B).

Informational Note: See NFPA 90A-~~2024~~ , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for information on fire protection of wiring installed in fabricated ducts.

(C) Other Spaces Used for Environmental Air (Plenums).

Installations of optical fiber cables in other spaces used for environmental air shall be in accordance with 722.161(C)(1) and 722.161(C)(2).

(1) Uses Permitted.

The following cables shall be permitted in other spaces used for environmental air as described in 720.22(C):

(1) Types OFNP and OFCP

(2) Types OFNP and OFCP installed in plenum communications raceways

(3) Types OFNP and OFCP installed in plenum cable routing assemblies

(4) Types OFNP and OFCP supported by open metal cable tray systems

(5) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in raceways that are installed in compliance with 720.22(C)

(6) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums), as described in 720.22(C)

(7) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in plenum riser and general-purpose communications raceways supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums), as described in 720.22(C)

(2) ~~Risers — Cables in Vertical Runs~~ Uses Not Permitted .

Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in other spaces used for environmental air (plenums).

Informational Note: See NFPA 90A-~~2024~~ , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for information on fire protection of wiring installed in other spaces used for environmental air.

(D) Risers — Cables in Vertical Runs.

Installations of optical fiber cables in ~~other spaces used for environmental air~~ vertical runs shall be in accordance with ~~722.161(C)(1)~~ 722.161(D)(1) and ~~722.161(C)(2)~~ 722.161(D)(2) .

(1) Uses Permitted.

The following cables shall be permitted in vertical runs penetrating one or more floors and in vertical runs in a shaft:

(1) Types OFNP, OFCP, OFNR, and OFCR

(2) Types OFNP, OFCP, OFNR, and OFCR installed in the following:

a. Plenum communications raceways

b. Plenum cable routing assemblies

c. Riser communications raceways

d. Riser cable routing assemblies

(2) Uses Not Permitted.

Types OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in vertical runs.

Informational Note: See ~~770.26~~ 720.21 for firestop requirements for floor penetrations.

(E) Risers — Cables Permitted in Metal Raceways.

The following cables and innerducts shall be permitted in metal raceways in a riser having firestops at each floor:

(1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

a. Plenum communications raceways (innerduct)

b. Riser communications raceways (innerduct)

c. General-purpose communications raceways (innerduct)

Informational Note: See ~~770.26~~ 720.21 for firestop requirements for floor penetrations.

(F) Risers — Cables Permitted in Fireproof Shafts.

The following cables shall be permitted to be installed in fireproof riser shafts having firestops at each floor:

(1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

a. Plenum communications raceways

b. Plenum cable routing assemblies

c. Riser communications raceways

d. Riser cable routing assemblies

e. General-purpose communications raceways

f. General-purpose cable routing assemblies

Informational Note: See ~~770.26~~ 720.21 for firestop requirements for floor penetrations.

(G) Risers — Cables Permitted in One- and Two-Family Dwellings.

The following cables shall be permitted in one- and two-family dwellings:

(1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

a. Plenum communications raceways

b. Plenum cable routing assemblies

c. Riser communications raceways

d. Riser cable routing assemblies

e. General-purpose communications raceways

f. General-purpose cable routing assemblies

(H) Cable Trays — Cables Permitted.

The following cables shall be permitted to be supported by cable trays:

(1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

a. Plenum communications raceways

b. Riser communications raceways

c. General-purpose communications raceways

(I) Distributing Frames and Cross-Connect Arrays — Cables Permitted.

The following cables shall be permitted to be installed in distributing frames and cross-connect arrays:

(1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

a. Plenum communications raceways

b. Plenum cable routing assemblies

c. Riser communications raceways

d. Riser cable routing assemblies

e. General-purpose communications raceways

f. General-purpose cable routing assemblies

(J) Other Building Locations — Cables Permitted.

The following cables shall be permitted to be installed in building locations other than the locations covered in 722.161(B) through 722.161(H):

(1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

a. Plenum communications raceways

b. Plenum cable routing assemblies

c. Riser communications raceways

d. Riser cable routing assemblies

e. General-purpose communications raceways

f. General-purpose cable routing assemblies

(3) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in a raceway of a type recognized in Chapter 3

Supplemental Information

File Name	Description	Approved
722.161_-_Terra_Copy.docx	for staff use	
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Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 15:55:34 EDT 2024

Committee Statement

Committee Statement: Section 722.161 was revised to add a General Subpart (A) to incorporate the references to other sections and Article Parts. The requirements were separated into list format for compliance with section 3.5.1.2 of the NEC Style Manual as there were multiple requirements. The references were updated to the new locations in Article 723 for Limited-Energy Raceways, Cable Routing Assemblies and Cable Trays.

Response Message: SR-7817-NFPA 70-2024

Public Comment No. 1378-NFPA 70-2024 [Section No. 722.161]

Second Revision No. 7819-NFPA 70-2024 [Section No. 722.162(A)(1)]

(1) Communications Raceways.

Optical fiber cables shall be permitted to be installed in listed communications raceways selected in accordance with ~~Table 722.110(A)~~ Table 723.20 .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 16:05:08 EDT 2024

Committee Statement

Committee Statement: The reference in 722.162(A)(1) was updated to new Section 723.20 for communications raceways.

Response Message: SR-7819-NFPA 70-2024

Public Comment No. 1376-NFPA 70-2024 [Section No. 722.162(A)(1)]

Second Revision No. 7822-NFPA 70-2024 [Section No. 722.162(C)]

(C) Cable Routing Assemblies.

Optical fiber cables shall be permitted to be installed in listed cable routing assemblies selected in accordance with ~~Table 722.110(B)~~ Table 723.30 .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 16:09:08 EDT 2024

Committee Statement

Committee Statement: The reference in 722.162(C) was updated to new Section 723.30 for cable routing assemblies.

Response Message: SR-7822-NFPA 70-2024

Public Comment No. 1377-NFPA 70-2024 [Section No. 722.162(C)]

Second Revision No. 7824-NFPA 70-2024 [Section No. 722.163]

722.163 Installation of Optical Fiber Cable in Innerduct.

Listed plenum communications raceways, listed riser communications raceways, and listed general-purpose communications raceways selected in accordance with ~~Table 722.110(A)~~ Table 723.20 shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 16:10:51 EDT 2024

Committee Statement

Committee Statement: The reference in 722.163 was updated to new Section 723.20 for communications raceways

Response Message: SR-7824-NFPA 70-2024

Public Comment No. 1379-NFPA 70-2024 [Section No. 722.163]

Second Revision No. 7826-NFPA 70-2024 [Section No. 722.164(C)]

~~**(C)** With Other Circuits.~~

~~Conductive and nonconductive optical fiber cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly, with conductors of any of the following:~~

(0) ~~Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with 645.6(E)(2) or Article 725, Parts I and II~~

(0) ~~Power-limited fire alarm systems in compliance with Article 760, Parts I and III~~

(0) ~~Communications circuits in compliance with Article 805, Parts I and V~~

(0) ~~Community antenna television and radio distribution systems in compliance with Article 820, Parts I and V~~

(0) ~~Low-power network-powered broadband communications circuits in compliance with Article 830, Parts I and V~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Wed Oct 16 16:12:45 EDT 2024

Committee Statement

Committee Statement: Subsection 722.164(C) is deleted as it is covered in 722.13.
Response Message: SR-7826-NFPA 70-2024

Public Comment No. 1446-NFPA 70-2024 [Section No. 722.164(C)]

Second Revision No. 7827-NFPA 70-2024 [Section No. 722.166]

722.166 Overhead (Aerial) Optical Fiber Cables.

Overhead optical fiber cables containing a non-current-carrying metallic member entering buildings shall comply with 722.166(A) and 722.166(B) .

(A) On Poles and In-Span.

Where outside plant optical fiber cables and electric light or power conductors are supported by the same pole or are run parallel to each other in-span, the conditions described in 722.166(A)(1) through 722.166(A)(4) shall be met.

(1) Relative Location.

Where practicable, the outside plant optical fiber cables shall be located below the electric light or power conductors.

(2) Attachment to Cross-Arms.

Attachment of outside plant optical fiber cables to a cross-arm that carries electric light or power conductors shall not be permitted.

(3) Climbing Space.

The climbing space through outside plant optical fiber cables shall comply with the requirements of 225.14(B) .

(4) Clearance.

Supply service drops and sets of overhead service conductors of 0 volts to 750 volts running above and parallel to optical fiber cable service drops shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of their attachment to the building. Clearance of not less than 1.0 m (40 in.) shall be maintained between the two services at the pole.

(B) Above Roofs.

Outside plant optical fiber cables shall have a vertical clearance of not less than 2.5 m (8 ft) from all points of roofs above which they pass.

Exception No. 1: The requirement of 770.44(B) shall not apply to auxiliary buildings such as garages and the like.

Exception No. 2: A reduction in clearance above only the overhanging portion of the roof to not less than 450 mm (18 in.) shall be permitted if the following applies:

(0) Not more than 1.2 m (4 ft) of optical fiber cable service drop cable passes above the roof overhang.

(0) The cable is terminated at a through- or above-the-roof raceway or approved support.

Exception No. 3: Where the roof has a slope of not less than 100 mm in 300 mm (4 in. in 12 in.), a reduction in clearance to not less than 900 mm (3 ft) shall be permitted.

Informational Note: See ANSI/IEEE C2-2017, *National Electric Safety Code, Part 2, Safety Rules for Overhead Lines* , for additional information regarding overhead wires and cables.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 16:13:56 EDT 2024

Committee Statement

Committee Statement: Section 722.166 was redundant to Section 800.44 and was deleted.

Response Message: SR-7827-NFPA 70-2024

Public Comment No. 1093-NFPA 70-2024 [Section No. 722.166]

Second Revision No. 7828-NFPA 70-2024 [Section No. 722.167]

~~**722.167** Underground Optical Fiber Cables Entering Buildings.~~

~~Underground optical fiber cables entering buildings shall comply with 722.167(A) and 722.167(B) .~~

~~**(A)** Underground Systems with Electric Light, Power, Class 1, or Non-Power-Limited Fire Alarm Circuit Conductors.~~

~~Underground conductive optical fiber cables entering buildings with electric light, power, Class 1, or non-power-limited fire alarm circuit conductors in a raceway, handhole enclosure, or manhole shall be located in a section separated from such conductors by means of brick, concrete, or tile partitions or by means of a suitable barrier.~~

~~**(B)** Direct-Buried Cables and Raceways.~~

~~Direct-buried conductive optical fiber cables shall be separated by at least 300 mm (12 in.) from conductors of any electric light, power, non-power-limited fire alarm circuit conductors, or Class 1 circuit.~~

~~*Exception No. 1:* *Separation shall not be required where the electric service conductors are installed in raceways or have metal cable armor.*~~

~~*Exception No. 2:* *Separation shall not be required where electric light or power branch-circuit or feeder conductors, non-power-limited fire alarm circuit conductors, or Class 1 circuit conductors are installed in a raceway or in metal-sheathed, metal-clad, or Type UF, or Type USE cables.*~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Wed Oct 16 16:15:22 EDT 2024

Committee Statement

Committee Statement: Section 722.167 was redundant to Section 800.47 and was deleted.
Response Message: SR-7828-NFPA 70-2024

Public Comment No. 1095-NFPA 70-2024 [Section No. 722.167]

Second Revision No. 7829-NFPA 70-2024 [Section No. 722.168]

~~**722.168** Unlisted Optical Fiber Cables Entering Buildings.~~

~~**(A)** Conductive and Nonconductive Cables.~~

~~Unlisted conductive and nonconductive outside plant optical fiber cables shall be permitted to be installed in building spaces, other than risers, ducts used for environmental air, plenums used for environmental air, and other spaces used for environmental air, where the length of the cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated in an enclosure. The point of entrance shall be permitted to be extended from the penetration of the external wall, roof, or floor slab by continuously enclosing the entrance optical fiber cables in rigid metal conduit (RMC) or intermediate metal conduit (IMC) to the point of emergence.~~

~~Informational Note: Splice cases or terminal boxes, both metallic and plastic types, typically are used as enclosures for splicing or terminating optical fiber cables.~~

~~**(B)** Nonconductive Cables in Raceway.~~

~~Unlisted nonconductive outside plant optical fiber cables shall be permitted to enter the building from the outside and shall be permitted to be installed in any of the following raceways:~~

(0) ~~Intermediate metal conduit (IMC)~~

(0) ~~Rigid metal conduit (RMC)~~

(0) ~~Rigid polyvinyl chloride conduit (PVC)~~

(0) ~~Electrical metallic tubing (EMT)~~

~~Unlisted nonconductive outside plant cables installed in rigid polyvinyl chloride conduit (PVC) or electrical metallic tubing (EMT) shall not be installed in risers, ducts used for environmental air, plenums used for environmental air, and other spaces used for environmental air.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 16:16:55 EDT 2024

Committee Statement

Committee Statement: Section 722.168 was redundant to Section 800.48 and was deleted.

Response Message: SR-7829-NFPA 70-2024

Public Comment No. 287-NFPA 70-2024 [Section No. 722.168]

Second Revision No. 7830-NFPA 70-2024 [Section No. 722.170]

722.170 Applications of Listed PLFA Cables.

PLFA cables shall comply with the requirements described in Table 722.170 or where cable substitutions are made as shown in 722.172. Where substitute cables are installed, the wiring requirements of Article 760, Parts I and III shall apply. Types FPLP-CI, FPLR-CI, and FPL-CI cables shall be permitted to be installed to provide 2-hour circuit integrity rated cables.

Table 722.170 Applications of Listed PLFA Cables in Buildings

Applications		Cable Type		
		FPLP and FPLP-CI	FPLR and FPLR-CI	FPL and FPL-CI
In fabricated ducts as described in 720.22(B)	In fabricated ducts	Y	N	N
	In metal raceway that complies with 720.22(B)	Y	Y	Y
In other spaces used for environmental air as described in 720.22(C)	In other spaces used for environmental air	Y	N	N
	In metal raceway that complies with 720.22(C)	Y	Y	Y
	In plenum communications raceways	Y	N	N
	In plenum cable routing assemblies	Y	N	N
	Supported by open metal cable trays	Y	N	N
	Supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y
In risers	In vertical runs	Y	Y	N
	In metal raceways	Y	Y	Y
	In fireproof shafts	Y	Y	Y
	In plenum communications raceways	Y	Y	N
	In plenum cable routing assemblies	Y	Y	N
	In riser communications raceways	Y	Y	N
	In riser cable routing assemblies	Y	Y	N
	In one- and two-family dwellings	Y	Y	Y
Within buildings in other than air-handling spaces and risers	General	Y	Y	Y
	Supported by cable trays	Y	Y	Y
	In any raceway recognized in Chapter 3	Y	Y	Y

Applications	Cable Type		
	FPLP and FPLP-CI	FPLR and FPLR-CI	FPL and FPL-CI
In plenum communications raceway	Y	Y	Y
In plenum cable routing assemblies	Y	Y	Y
In riser communications raceways	Y	Y	Y
In riser cable routing assemblies	Y	Y	Y
In general-purpose communications raceways	Y	Y	Y
In general-purpose cable routing assemblies	Y	Y	Y

Note:

"N" indicates that the cable type shall not be permitted to be installed in the application. "Y" indicates that the cable type shall be permitted to be installed in the application subject to the limitations described in 760.133 ~~through~~ and 760.145.

Informational Note: See UL 1424, *Cables for Power-Limited Fire-Alarm Circuits* , for applicable requirements for listing of power-limited fire alarm cable.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 16:19:56 EDT 2024

Committee Statement

Committee Statement: An informational note referencing UL 1424 was added to Section 722.170 as it specifically applies to PLFA cables.

Response Message: SR-7830-NFPA 70-2024

Public Comment No. 1416-NFPA 70-2024 [Section No. 722.170]

Second Revision No. 7831-NFPA 70-2024 [Section No. 722.171]

722.171 Wiring Methods and Materials on Load Side of the PLFA Power Source.

Fire alarm circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with 722.171(A), 722.171(B), or a combination of both. Article 722~~,~~ Parts I and II shall apply.

(A) PLFA Wiring Methods and Materials.

Power-limited fire alarm conductors and cables described in 722.170 shall be installed as detailed in 722.171(A)(1) ~~722.171(B)(1)~~ through 722.171(A)(4) ~~722.171(B)(4)~~ , and 722.172.

(1) In Raceways, Exposed on Ceilings or Sidewalls, or Fished in Concealed Spaces.

Cable splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed such that maximum protection against physical damage is afforded by building construction such as baseboards, door frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

(2) Passing Through a Floor or Wall.

Cables shall be installed in metal raceways or rigid nonmetallic conduit where passing through a floor or wall to a height of 2.1 m (7 ft) above the floor, unless adequate protection can be afforded by building construction such as detailed in 722.171(A)(1) or unless an equivalent solid guard is provided.

(3) Nonconcealed Spaces.

Cables covered by Chapter 3 used for wiring of PLFA circuits and installed in nonconcealed spaces shall comply with the following:

(1) The cables shall be installed in accordance with ~~722.100(A)(15)(a)~~ 722.171(A)(5) and ~~722.100(A)(15)(b)~~ 722.171(B) .

(2) Exposed portions of the cable shall have a length not exceeding 3 m (10 ft).

(4) Portable Fire Alarm Systems.

A portable fire alarm system provided to protect a stage or set when not in use shall be permitted to use wiring methods in accordance with 530.12.

(5) PLFA Wired Using NPLFA Wiring Methods and Materials.

NPLFA wiring methods shall be permitted when used in accordance with 760.46, 760.49, or 760.53 for PLFA circuits. Conductors shall be solid or stranded copper. Separation from electric light, power, Class 1, non-power-limited fire alarm circuit conductors, and medium-power network-powered broadband communications cables shall comply with 722.15 ~~760.136~~ .

(B) Power-Limited Fire Alarm ~~Conductor Size~~ Cables and Conductors .

~~Conductors of 26 AWG shall be permitted only where spliced with a connector listed as suitable for 26 AWG to 24 AWG or larger conductors that are terminated on equipment or where the 26 AWG conductors are terminated on equipment listed as suitable for 26 AWG conductors. Single conductors shall not be smaller than 18 AWG.~~

(1) Material.

Single conductors and conductors for cables shall be solid or stranded copper.

Exception: Coaxial cables shall be permitted to use 30 percent conductivity copper-covered steel center conductor wire.

(2) Size.

(a) Single conductors shall not be smaller than 18 AWG.

(b) The size of conductors in a multiconductor cable shall not be smaller than 26 AWG.

(c) Conductors of 26 AWG shall be permitted only where spliced with a connector listed as suitable for 26 AWG to 24 AWG or larger conductors that are terminated on equipment or where the 26 AWG conductors are terminated on equipment listed as suitable for 26 AWG conductors.

(3) Rating.

(a) Cables shall have a voltage rating not less than 300 volts.

(b) Cables shall have a temperature rating of not less than 60°C (140°F).

(C) Support of Conductors.

Power-limited fire alarm circuit conductors shall not be strapped, taped, or attached by any means to the exterior of any conduit or other raceway as a means of support.

Supplemental Information

File Name	Description	Approved
722.171_-_Terra_Copy.docx	staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 16:22:44 EDT 2024

Committee Statement

Committee Statement: New subsections (B)(1)-(3) were created in Section 722.171 to cover the material, size, and rating requirements for PLFA cables, as previously located in 722.100. Moving these requirements to Section 722.171 enhances usability, as all PLFA cable requirements are in the same part of Article 722. Additionally, the references in 722.171(A)(3) have been updated to the correct code sections reflecting the reorganization of limited-energy requirements.

Response Message: SR-7831-NFPA 70-2024

Public Comment No. 1418-NFPA 70-2024 [Section No. 722.171]

Second Revision No. 7841-NFPA 70-2024 [Section No. 722.172]

722.172 Permitted Substitutions for Power-Limited Fire Alarm Cables.

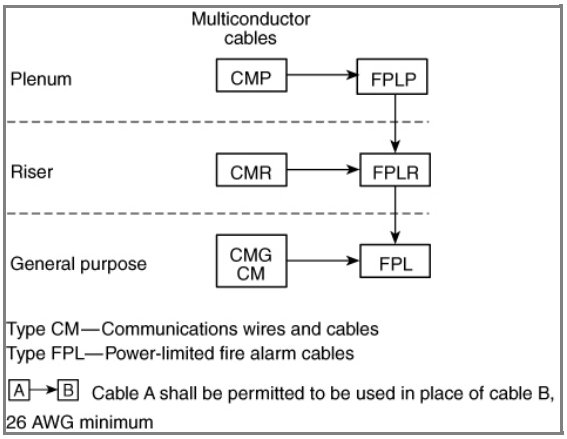
The substitutions for fire alarm cables listed in Table 722.172 and illustrated in Figure 722.172 shall be permitted. Where substitute cables are installed, the wiring requirements of Article 760~~,~~ Parts I and III shall apply.

Informational Note: See ~~722.100~~ 722.132 for information on communications cables (CMP, CMR, CMG, CM).

Table 722.172 Permitted Substitutions for Power-Limited Fire Alarm Cables.

Cable Type	Permitted Substitutions
FPLP	CMP
FPLR	CMP, FPLP, CMR
FPL	CMP, FPLP, CMR, FPLR, CMG, CM

Figure 722.172 Power-Limited Fire Alarm Cable Substitution Hierarchy.



Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 16:53:15 EDT 2024

Committee Statement

Committee Statement: The reference in the informational note in 722.172 was updated to the correct section, 722.132(A).

Response Message: SR-7841-NFPA 70-2024

Public Comment No. 937-NFPA 70-2024 [Section No. 722.172]

Second Revision No. 7842-NFPA 70-2024 [Section No. 722.180]

722.180 Circuit Integrity (CI) Cable, Fire-Resistive Cable System, or Electrical Circuit Protective System.

(A) General.

CI cable, a fire-resistive cable system, or a listed electrical circuit protective system shall be permitted for use in systems that supply critical circuits to ensure survivability for continued circuit operation for a specified time under fire conditions.

Informational Note No. 1: See NFPA 72 , *National Fire Alarm and Signaling Code* , 12.4.3 and 12.4.4 for additional information on fire alarm CI cable, fire-resistive cable systems, or electrical circuit protective systems used for fire alarm circuits to comply with the survivability requirements to maintain the circuit's electrical function during fire conditions for a defined period of time.

Informational Note No. 2: See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables* , for information on establishing a rating for a fire-resistive cable system. The *UL Guide Information for Electrical Circuit Integrity Systems* (FHIT) contains information to identify the system and its installation limitations to maintain a minimum fire-resistive rating.

Informational Note No. 3: See UL 1724, *Fire Tests for Electrical Circuit Protective Systems* , for information on establishing a rating for an electrical circuit protective system. The *UL Guide Information for Electrical Circuit Integrity Systems* (FHIT) contains information to identify the system and its installation limitations to maintain the fire-resistive rating.

(B) Installation.

(1) In Free Air.

Type CI Cables used for survivability of critical circuits and to maintain its fire-resistive rating shall be installed in free air only when supported in accordance with 722.180(C) .

(2) In Raceways.

Type CI Cables shall be permitted to be installed in a raceway only where specifically listed as part of a fire-resistant cable system and marked in accordance with 722.180(D)(3) .

(C) Securing and Supporting.

Circuit integrity type CI cable shall be supported at 610 mm (24 in.) maximum intervals in accordance with the following:

(1) Secured to the noncombustible surface of the building structure

(2) Using steel supports and fasteners

(D) Markings.

In addition to the general marking requirements for cables in 722.100 , Type CI cables, fire-resistive cables, and electrical circuit protective systems shall be marked in accordance with 722.180(D)(1) through 722.180(D)(3) :

(1) Type CI Cables.

Type CI cables used for survivability of critical circuits shall be marked with the additional classification using the suffix "CI".

(2) Fire-Resistive Cables.

Fire-resistive cables that are part of a fire-resistive cable system shall be identified with the system identifier and hourly rating marked on the protectant or the smallest unit container.

(3)_ Electrical Circuit Protective Systems.

Protectant for cables that are part of an electrical circuit protective system shall be identified with the protective system identifier and hourly rating marked on the protectant or the smallest unit container.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 16 16:55:00 EDT 2024

Committee Statement

Committee Statement: New informational notes 1-3 were added in 722.180(A) to reference standards.

A new subsection (B) was created to cover the installation requirements, and a new subsection (D) was created to cover the marking requirements of these cables.

Response Message: SR-7842-NFPA 70-2024

Public Comment No. 1436-NFPA 70-2024 [Section No. 722.180]

Second Revision No. 7572-NFPA 70-2024 [Section No. 724.1]

724.1 Scope.

This article covers Class 1 power-limited circuits, including Class 1 power-limited ~~Class 1~~ remote-control and signaling circuits, that are not an integral part of a device or utilization equipment.

Informational Note: ~~See 300.28 for classifications of remote-control and signaling circuits~~ While Class 1 circuits are power-limited, they are not a limited-energy system and, as such, require physical protection methods found in Chapter 3 .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 17:39:17 EDT 2024

Committee Statement

Committee Statement: The informational note is deleted because non-power-limited Class 1 circuits no longer exist in the Code.

The removal of non-power limited Class 1 in the 2023 cycle has led to confusion as some haven't noticed the nuance that Class 1 now means ONLY power-limited Class 1. As such, the scope is recommended to be modified to not state just "Class 1" but instead "Class 1 power limited," mirroring the section title. A new informational note is added to explain that Class 1 power-limited circuits are not limited energy systems as they can provide 1000 VA continuously into a fault. CMP 3 understands that the Correlating Committee owns the scope and the CMP recommends these changes are made.

Response Message: SR-7572-NFPA 70-2024

Public Comment No. 940-NFPA 70-2024 [Section No. 724.1]

Second Revision No. 8110-NFPA 70-2024 [Section No. 724.40(B)]

(B) Other Class 1 Power Sources.

Power sources other than transformers shall be protected by ~~overcurrent devices~~ OCPDs rated at not more than 167 percent of the volt-ampere rating of the source divided by the rated voltage. The ~~overcurrent devices~~ OCPDs shall not be interchangeable with ~~overcurrent devices~~ OCPDs of higher ratings. The ~~overcurrent device~~ OCPD shall be permitted to be an integral part of the power supply.

To comply with the 1000 volt-ampere limitation of 724.40, the maximum output (VA_{max}) of power sources other than transformers shall be limited to 2500 volt-amperes, and the product of the maximum current (I_{max}) and maximum voltage (V_{max}) shall not exceed 10,000 volt-amperes. These ratings shall be determined with any ~~overcurrent-protective device~~ OCPD bypassed.

VA_{max} is the maximum volt-ampere output after one minute of operation regardless of load and with ~~overcurrent protection~~ OCPD bypassed, if used. Current-limiting impedance shall not be bypassed when determining VA_{max}.

I_{max} is the maximum output current under any noncapacitive load, including short circuit, and with ~~overcurrent protection~~ OCPD bypassed, if used. Current-limiting impedance should not be bypassed when determining I_{max}. Where a current-limiting impedance listed for the purpose or as part of a listed product is used in combination with a stored energy source, such as a storage battery, to limit the output current, I_{max} limits apply after 5 seconds.

$V_{max}$is the maximum output voltage regardless of load with rated input applied.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 21 00:56:24 EDT 2024

Committee Statement

Committee Statement: Using consistent terms will improve usability and accuracy for NEC requirements.

Response Message: SR-8110-NFPA 70-2024

Second Revision No. 7581-NFPA 70-2024 [New Section after 724.45]

724.46 Class 1 Circuit Wiring Methods.

Class 1 circuits shall be installed in accordance with 300.4 through 300.27 .

Exception No. 1: The requirements of 724.48 through 724.51 shall be permitted to apply in installations of Class 1 circuits.

Exception No. 2: Methods permitted or required by other articles of this code shall apply to installations of Class 1 circuits.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:22:17 EDT 2024

Committee Statement

Committee Statement: As a Class 1 circuit is not a limited energy circuit, these circuits should be required to use Chapter 3 wiring methods. This text was lost in the reorganization effort . The requirements as they were in the 2023 NEC are restored.

Response Message: SR-7581-NFPA 70-2024

Public Comment No. 919-NFPA 70-2024 [New Section after 724.45]

Second Revision No. 8112-NFPA 70-2024 [Section No. 724.45(A)]

(A) Point of Supply.

~~Overcurrent devices~~ OCPDs shall be located at the point where the conductor to be protected receives its supply.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 21 01:00:06 EDT 2024

Committee Statement

Committee Statement: Using consistent terms will improve usability and accuracy for NEC requirements.

Response Message: SR-8112-NFPA 70-2024

Second Revision No. 7582-NFPA 70-2024 [Sections 724.45(B), 724.45(C)]

~~**(B)** Feeder Taps.~~

~~Class 1 circuit conductors shall be permitted to be tapped, without overcurrent protection at the tap, where the overcurrent device protecting the circuit conductor is sized to protect the tap conductor.~~

~~**(C)** Branch-Circuit Taps.~~

~~Class 1 circuit conductors 14 AWG and larger that are tapped from the load side of the overcurrent protective device(s) of a controlled light and power circuit shall require only short-circuit and ground-fault protection and shall be permitted to be protected by the branch-circuit overcurrent protective device(s) where the rating of the protective device(s) is not more than 300 percent of the ampacity of the Class 1 circuit conductor.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:23:55 EDT 2024

Committee Statement

Committee Statement: With the deletion of nonpower-limited Class 1 circuits, the allowances for feeders and branch circuits for power limited Class 1 circuits are no longer needed and are deleted.

Response Message: SR-7582-NFPA 70-2024

Public Comment No. 1426-NFPA 70-2024 [Section No. 724.45]

Second Revision No. 8111-NFPA 70-2024 [Section No. 724.45 [Excluding any Sub-Sections]]

~~Overcurrent devices~~ OCPDs shall be located as specified in 724.45(A) through 724.45(C).

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 21 00:59:24 EDT 2024

Committee Statement

Committee Statement: Using consistent terms will improve usability and accuracy for NEC requirements.

Response Message: SR-8111-NFPA 70-2024

Second Revision No. 7583-NFPA 70-2024 [Section No. 725.1]

725.1 Scope.

This article covers power-limited circuits, including power-limited remote-control and signaling circuits, that are not an integral part of a device or of utilization equipment.

Informational Note: The circuits described herein are characterized by usage and electrical power limitations that differentiate them from electric light and power circuits; therefore, alternative requirements are given regarding minimum wire sizes, ampacity adjustment and correction factors, overcurrent protection, insulation requirements, and wiring methods and materials.

~~Informational Note No. 2: See 300.28 for classifications of remote-control and signaling circuits.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:26:56 EDT 2024

Committee Statement

Committee Statement: Informational note 2 is deleted because non-power-limited Class 1 circuits no longer exist in the Code.

Response Message: SR-7583-NFPA 70-2024

Public Comment No. 941-NFPA 70-2024 [Section No. 725.1]

Second Revision No. 8113-NFPA 70-2024 [Section No. 725.127]

725.127 Wiring Methods on Supply Side of the Class 2 or Class 3 Power Source.

Conductors and equipment on the supply side of the power source shall be installed in accordance with the appropriate requirements of Chapters 1 through 4.

Exception: The input leads of a transformer or other power source supplying Class 2 and Class 3 circuits shall be permitted to be smaller than 14 AWG but not smaller than 18 AWG if they are protected by an ~~overcurrent device~~ OCPD rated not over 20 amperes, are not over 305 mm (12 in.) long, and have insulation that complies with 724.49(B).

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 21 01:01:29 EDT 2024

Committee Statement

Committee Statement: Using consistent terms will improve usability and accuracy for NEC requirements.

Response Message: SR-8113-NFPA 70-2024

Second Revision No. 7585-NFPA 70-2024 [Section No. 725.136]

~~**725.136** Separation from Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm Circuit Conductors, and Medium-Power Network-Powered Broadband Communications Cables.~~

~~**(A)** General.~~

~~Cables and conductors of Class 2 and Class 3 circuits shall not be placed in any cable, cable tray, compartment, enclosure, manhole, outlet box, device box, raceway, or similar fitting with conductors of electric light, power, Class 1, non-power-limited fire alarm circuits, and medium-power network-powered broadband communications circuits unless permitted by 725.136(B) through 725.136(I) .~~

~~**(B)** Separated by Barriers.~~

~~Class 2 and Class 3 circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are separated by a barrier.~~

~~**(C)** Raceways Within Enclosures.~~

~~In enclosures, Class 2 and Class 3 circuits shall be permitted to be installed in a raceway to separate them from Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits.~~

~~**(D)** Associated Systems Within Enclosures.~~

~~Class 2 and Class 3 circuit conductors in compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to Class 2 and Class 3 circuits, and where one of the following applies:~~

(0) ~~The electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are routed to maintain a minimum of 6 mm (0.25 in.) separation from the conductors and cables of Class 2 and Class 3 circuits.~~

(0) ~~The circuit conductors operate at 150 volts or less to ground and comply with one of the following:~~

0. ~~The Class 2 and Class 3 circuits are installed using Type CL3, Type CL3R, or Type CL3P or permitted substitute cables if these Class 3 cable conductors extending beyond the jacket are separated by a minimum of 6 mm (0.25 in.) or by a nonconductive sleeve or nonconductive barrier from all other conductors.~~

0. ~~The Class 2 and Class 3 circuit conductors are installed as a Class 1 circuit in accordance with 724.40 .~~

~~**(E)** Enclosures with Single Opening.~~

~~Class 2 and Class 3 circuit conductors entering compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to Class 2 and Class 3 circuits. Where Class 2 and Class 3 circuit conductors must enter an enclosure that is provided with a single opening, they shall be permitted to enter through a single fitting (such as a tee) if the conductors are separated from the conductors of the other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing.~~

~~**(F)** Manholes.~~

~~Underground Class 2 and Class 3 circuit conductors in a manhole shall be permitted to be installed with Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where one of the following conditions is met:~~

(0) ~~The electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are in a metal-enclosed cable or Type UF cable.~~

(0) ~~The Class 2 and Class 3 circuit conductors are permanently and effectively separated from the conductors of other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing, in addition to the insulation or covering on the wire.~~

(0) ~~The Class 2 and Class 3 circuit conductors are permanently and effectively separated from conductors of the other circuits and securely fastened to racks, insulators, or other approved supports.~~

~~**(G)** Cable Trays.~~

~~Class 2 and Class 3 circuit conductors shall be permitted to be installed in cable trays where the conductors of the electric light, Class 1, and non-power-limited fire alarm circuits are separated by a solid fixed barrier of a material compatible with the cable tray or where the Class 2 or Class 3 circuits are installed in Type MC cable.~~

~~**(H)** Where Protected.~~

~~Class 2 and Class 3 circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits if they are functionally associated and are installed using Class 1 wiring methods in accordance with 724.46.~~

~~**(I)** Other Applications.~~

~~For other applications, conductors of Class 2 and Class 3 circuits shall be separated by at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits unless one of the following conditions is met:~~

(0) ~~Either all of the electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors or all of the Class 2 and Class 3 circuit conductors are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type TC, or Type UF cables.~~

(0) ~~All of the electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are permanently separated from all of the Class 2 and Class 3 circuit conductors by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the conductors.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:35:16 EDT 2024

Committee Statement

Committee Statement: These requirements are now located in 722.13. Therefore 725.136 can be deleted.

Response Message: SR-7585-NFPA 70-2024

Public Comment No. 1694-NFPA 70-2024 [Section No. 725.136]

Second Revision No. 7586-NFPA 70-2024 [Section No. 725.139]

~~**725.139** Installation of Conductors of Different Circuits in the Same Cable, Enclosure, Cable Tray, Raceway, or Cable Routing Assembly.~~

~~**(A)** Two or More Class 2 Circuits.~~

~~Conductors of two or more Class 2 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly.~~

~~**(B)** Two or More Class 3 Circuits.~~

~~Conductors of two or more Class 3 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly.~~

~~**(C)** Class 2 Circuits with Class 3 Circuits.~~

~~Conductors of one or more Class 2 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly with conductors of Class 3 circuits if the insulation of the Class 2 circuit conductors in the cable, enclosure, raceway, or cable routing assembly is at least that required for Class 3 circuits.~~

~~**(D)** Class 2 and Class 3 Circuits with Communications Circuits.~~

~~**(1)** Communications Cables.~~

~~Conductors of one or more Class 2 or Class 3 circuits shall be permitted in the same cable with conductors of communications circuits if the cable is a listed communications cable installed in accordance with Part V of Article 800 . The cables shall be listed as communications cables.~~

~~**(2)** Composite Cables.~~

~~Cables constructed of individually listed Class 2, Class 3, and communications cables under a common jacket shall be permitted to be classified as communications cables. The fire resistance rating of the composite cable shall be determined by the performance of the composite cable.~~

~~**(E)** Class 2 or Class 3 Cables with Other Circuit Cables.~~

~~Jacketed cables of Class 2 or Class 3 circuits shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly with jacketed cables of any of the following:~~

(0) ~~Power-limited fire alarm systems in compliance with Article 760 , Parts I and III~~

(0) ~~Nonconductive and conductive optical fiber cables in compliance with Article 722 , Parts I and III~~

(0) ~~Communications circuits in compliance with Article 722 , Parts I and III~~

(0) ~~Community antenna television and radio distribution systems in compliance with Article 722 , Parts I and III~~

(0) ~~Low-power, network-powered broadband communications in compliance with Article 722 , Parts I and III~~

~~**(F)** Audio System Circuits and Power-Limited Fire Alarm (PLFA) Circuits.~~

~~Audio system circuits described in 640.9(C) and installed using Class 2 or Class 3 wiring methods in compliance with 794.135 shall not be installed in the same cable, raceway, or cable routing assembly with PLFA circuits or cables.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:35:57 EDT 2024

Committee Statement

Committee Statement: These requirements are now located in 722.13 and 722.14. Therefore 725.139 can be deleted.

As Part III is now empty, this is also deleted.

Response Message: SR-7586-NFPA 70-2024

Public Comment No. 1536-NFPA 70-2024 [Section No. 725.139]

Second Revision No. 7587-NFPA 70-2024 [Section No. 726.4]

~~**726.4** Other Requirements.~~

~~The listing of cables for Class 4 circuits shall comply with Article 722 , Part II and the installation of cables for Class 4 circuits shall comply with Article 722 , Part I.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:37:57 EDT 2024

Committee Statement

Committee Statement: Section 726.4 is deleted because it is redundant to Article 722.2, which requires limited energy cables to be listed.

Response Message: SR-7587-NFPA 70-2024

Public Comment No. 1383-NFPA 70-2024 [Section No. 726.4]

Second Revision No. 7588-NFPA 70-2024 [Section No. 726.136]

~~**726.136** Separation from Electric Light, Power, Class 1, Non–Power-Limited Fire Alarm Circuit, and Medium-Power Network-Powered Broadband Communications Cables.~~

~~**(A)** General.~~

~~Cables and conductors of Class 4 circuits shall not be placed in any cable, cable tray, compartment, enclosure, manhole, outlet box, device box, raceway, or similar fitting with conductors of electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits unless permitted by 726.136(B) through 726.136(H) .~~

~~**(B)** Separated by Barriers.~~

~~Class 4 circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are separated by a barrier.~~

~~**(C)** Raceways Within Enclosures.~~

~~In enclosures, Class 4 circuits shall be permitted to be installed in a raceway to separate them from Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits.~~

~~**(D)** Associated Systems Within Enclosures.~~

~~Class 4 circuit conductors in compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to Class 4 circuits, and where either of the following applies:~~

(0) ~~The electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are routed to maintain a minimum of 6 mm (0.25 in.) separation from the conductors and cables of Class 4 circuits.~~

(0) ~~The non-Class 4 circuit conductors operate at 150 volts or less to ground and the Class 4 circuits are installed using Type CL4, Type CL4R, or Type CL4P cables and CL4 cable conductors extending beyond the jacket are separated by a minimum of 6 mm (0.25 in.) or by a nonconductive sleeve or nonconductive barrier from all other conductors.~~

~~**(E)** Enclosures with Single Openings.~~

~~Class 4 circuit conductors entering compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to Class 4 circuits. Where Class 4 circuit conductors must enter an enclosure that is provided with a single opening, they shall be permitted to enter through a single fitting (such as a tee) if the conductors are separated from the conductors of the other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing.~~

~~**(F)** Manholes.~~

~~Underground Class 4 circuit conductors in a manhole shall be permitted to be installed with Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where one of the following conditions is met:~~

(0) ~~The electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are in a metal-enclosed cable or Type UF cable.~~

(0) ~~The Class 4 circuit conductors are permanently and effectively separated from the conductors of other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing, in addition to the insulation or covering on the wire.~~

(0) ~~The Class 4 circuit conductors are permanently and effectively separated from conductors of the other circuits and securely fastened to racks, insulators, or other approved supports.~~

~~**(G)** Cable Trays.~~

~~Class 4 circuit conductors shall be permitted to be installed in cable trays where the conductors of the electric light, Class 1, and non–power-limited fire alarm circuits are separated by a solid fixed barrier of a material compatible with the cable tray or where the Class 4 circuits are installed in Type MC cable.~~

~~**(H)** Other Applications.~~

~~For other applications, conductors of Class 4 circuits shall be separated by at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non–power-limited fire alarm, or medium-power network-powered broadband communications circuits unless one of the following conditions is met:~~

(0) ~~Either all of the electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors or all of the Class 4 circuit conductors are in a raceway or in metal-sheathed, metal-clad, non–metallic-sheathed, Type TC, or Type UF cables~~

(0) ~~All of the electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are permanently separated from all of the Class 4 circuit conductors by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the conductors~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:38:52 EDT 2024

Committee Statement

Committee Statement: These requirements are now located in 722.13. Therefore 726.136 can be deleted.

Response Message: SR-7588-NFPA 70-2024

Public Comment No. 1699-NFPA 70-2024 [Section No. 726.136]

Second Revision No. 7589-NFPA 70-2024 [Section No. 726.139]

~~**726.139** Installation of Conductors of Different Circuits in the Same Cable, Enclosure, Cable Tray, Raceway, or Cable Routing Assembly.~~

~~**(A)** Two or More Class 4 Circuits.~~

~~Conductors of two or more Class 4 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly.~~

~~**(B)** Class 4 Circuits With Class 2, Class 3, or Communications Circuits.~~

~~Conductors of one or more Class 4 circuits shall be permitted within the same cable assembly as conductors of Class 2, Class 3, or communications circuits if the insulation of the Class 2, Class 3, or communications circuit conductors in the cable is at least that required for Class 4 circuits. Class 4 cables shall be permitted within the same enclosure, raceway, or cable routing assembly as Class 2, Class 3, or communications circuits.~~

~~**(C)** Class 4 Cables With Other Circuit Cables.~~

~~Jacketed cables of Class 4 circuits shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly with jacketed cables of any of the following:~~

(0) ~~Power-limited fire alarm systems in compliance with Article 760 , Parts I and III~~

(0) ~~Nonconductive and conductive optical fiber cables in compliance with Article 770 , Parts I and IV~~

(0) ~~Communications circuits in compliance with Article 805 , Parts I and IV~~

(0) ~~Community antenna television and radio distribution systems in compliance with Article 820 , Parts I and IV~~

(0) ~~Low-power, network-powered broadband communications in compliance with Article 830 , Parts I and IV~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:41:11 EDT 2024

Committee Statement

Committee Statement: These requirements are now located in 722.150-152. Therefore 726.139 can be deleted.

Response Message: SR-7589-NFPA 70-2024

Public Comment No. 1430-NFPA 70-2024 [Section No. 726.139]

Public Comment No. 1350-NFPA 70-2024 [Section No. 726.139(C)]

Second Revision No. 7591-NFPA 70-2024 [Section No. 742.1]

742.1 Scope.

This article covers the overvoltage protection requirements for ~~Class 1 power-limited circuits, Class 2 circuits, Class 3 circuits, Class 4 circuits, optical fiber systems, communications systems, antenna systems, community antenna systems, network-powered broadband communications systems, premises-powered broadband communications systems, and power-limited fire alarm systems~~ limited energy systems installations .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:46:10 EDT 2024

Committee Statement

Committee Statement: The scope of 742 is simplified by using the revised definition of Limited Energy System. This revised definition does not include Class 1, which is not a limited energy system. CMP-3 understands that the article scope is within the purview of the Correlating Committee and recommends the identified changes.

Response Message: SR-7591-NFPA 70-2024

Public Comment No. 974-NFPA 70-2024 [Section No. 742.1]

Public Comment No. 674-NFPA 70-2024 [Section No. 742.1]

Second Revision No. 7592-NFPA 70-2024 [Section No. 742.10(A)]

(A) Application.

A listed primary protector shall be provided on each communication circuit run partly or entirely in aerial wire or aerial cable not confined within a block. Also, a listed primary protector shall be provided on each circuit, aerial or underground, located within the block containing the building served so as to be exposed to accidental contact with electric light or power conductors operating at over 300 volts to ground. In addition, where there exists a lightning exposure, each interbuilding circuit on a premises shall be protected by a listed primary protector at each end of the interbuilding circuit.

Exception: Primary electrical protection shall not be required on the network-powered broadband communications conductors where electrical protection is provided on the derived circuit(s) (output side of the NIU) in accordance with ~~752.10(D)(3)~~ 742.10(D)(3) .

Informational Note No. 1: On network-powered broadband communications conductors not exposed to lightning or accidental contact with power conductors, providing primary electrical protection in accordance with this section helps protect against other hazards, such as ground potential rise caused by power fault currents, and above-normal voltages induced by fault currents on power circuits in proximity to the network-powered broadband communications conductors.

Informational Note No. 2: Communications circuits are considered to have a lightning exposure unless one or more of the following conditions exists:

(1) Circuits in large metropolitan areas where buildings are close together and sufficiently high to intercept lightning

(2) Areas having an average of five or fewer thunderstorm days each year and earth resistivity of less than 100 ohm-meters, such as found along the Pacific coast

Informational Note No. 3: On a circuit not exposed to accidental contact with power conductors, providing a listed primary protector in accordance with this section helps protect against other hazards, such as lightning and above-normal voltages induced by fault currents on power circuits in proximity to the communications circuit.

Informational Note No. 4: Interbuilding circuits are considered to have a lightning exposure unless one or more of the following conditions exist:

(1) Circuits in large metropolitan areas where buildings are close together and sufficiently high to intercept lightning

(2) Interbuilding cable runs of 42 m (140 ft) or less, directly buried or in underground conduit, where a continuous metallic cable shield or a continuous metal conduit containing the cable is connected to each building grounding electrode system

(3) Areas having an average of five or fewer thunderstorm days per year and earth resistivity of less than 100 ohm-meters, such as found along the Pacific coast

Informational Note No. 5: See NFPA 780-~~2026~~ , *Standard for the Installation of Lightning Protection Systems*, for information on lightning protection systems.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:48:15 EDT 2024

Committee Statement

Committee Statement:	The cross reference is corrected. Article 752 does not exist. The correct reference is 742.10(D)(3).
Response Message:	SR-7592-NFPA 70-2024

Public Comment No. 1384-NFPA 70-2024 [Section No. 742.10(A)]

Second Revision No. 7593-NFPA 70-2024 [Section No. 742.10(C)]

(C) Fused Primary Protectors.

Where the requirements listed under ~~752.10(B)(1)~~ 742.10(B)(1) through ~~752.10(B)(5)~~ 742.10(B)(5) are not met, fused-type primary protectors shall be used. Fused-type primary protectors shall consist of an arrester connected between each line conductor and ground, a fuse in series with each line conductor, and an appropriate mounting arrangement. Primary protector terminals shall be marked to indicate line, instrument, and ground, as applicable.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:50:23 EDT 2024

Committee Statement

Committee Statement: The cross references are corrected. Article 752 does not exist. The correct references are 742.10(B)(1) through 742.10(B)(5).

Response Message: SR-7593-NFPA 70-2024

Public Comment No. 1387-NFPA 70-2024 [Section No. 742.10(C)]

Second Revision No. 7598-NFPA 70-2024 [Article 760]

Article 760 Fire Alarm Systems

Part I. General

760.1 Scope.

This article covers the installation of wiring and equipment of fire alarm systems, including all circuits controlled and powered by the fire alarm system.

Informational Note No. 1: Fire alarm systems include fire detection and alarm notification, guard's tour, sprinkler waterflow, and sprinkler supervisory systems. Circuits controlled and powered by the fire alarm system include circuits for the control of building systems safety functions, elevator capture, elevator shutdown, door release, smoke doors and damper control, fire doors and damper control, and fan shutdown, but only where these circuits are powered by and controlled by the fire alarm system.

Informational Note No. 2: See *NFPA 72* ~~2025~~ , *National Fire Alarm and Signaling Code*, for further information on the installation and monitoring for integrity requirements for fire alarm systems.

760.2 Listing.

(A) Listing and Marking of NPLFA Cables.

Non-power-limited fire alarm cables (NPLFA) installed as wiring within buildings shall be listed in accordance with 760.2(A)(1) and 760.2(A)(2), be listed as resistant to the spread of fire in accordance with 760.2(A)(3) through 760.2(A)(6), and be marked in accordance with 760.2(A)(7). Cable used in a wet location shall be listed for use in wet locations or have a moisture-impervious metal sheath. ~~Non-power-limited fire alarm~~ NPLFA cables shall have a temperature rating of not less than 60°C (140°F). ~~Non-power-limited fire alarm~~ NPLFA cables shall be permitted to contain optical fibers.

Informational Note: See UL 1425, *Standard for Cables for Non-Power-Limited Fire-Alarm Circuits*, for information on ~~non-power-limited fire alarm~~ NPLFA cables.

(1) NPLFA Conductor Materials.

Conductors shall be 18 AWG or larger solid or stranded copper.

(2) Insulated Conductors.

Insulation on conductors shall be rated for the system voltage and not less than 600 ~~V~~ volts . Insulated conductors 14 AWG and larger shall be one of the types listed in Table 310.4(1) or one that is identified for such use. Insulated conductors 18 AWG and 16 AWG shall be in accordance with 760.49.

(3) Type NPLFP.

Type NPLFP ~~non-power-limited fire alarm~~ NPLFA cable for use in other space used for environmental air shall be listed as being suitable for use in other space used for environmental air as described in 300.25(C) and shall also be listed as having adequate fire-resistant and low smoke–producing characteristics.

Informational Note: See NFPA 262-~~2023~~ , *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*, for one method of defining a cable that is low-smoke producing and fire-resistant if the cable exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less when tested.

(4) Type NPLFR.

Type NPLFR ~~non-power-limited fire alarm~~ NPLFA riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: See UL 1666, *Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts*, for one method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

(5) Type NPLF.

Type NPLF ~~non-power-limited fire alarm~~ NPLFA cable shall be listed as being suitable for general-purpose fire alarm use, with the exception of use in risers, ducts, plenums, and other space used for environmental air, and shall also be listed as being resistant to the spread of fire.

Informational Note: See UL 2556, *Wire and Cable Test Methods*, for one method of defining *resistant to the spread of fire*. One method is to demonstrate that the cables do not spread fire to the top of the tray in the “UL Flame Exposure, Vertical Tray Flame Test.” The smoke measurements in the test method are not applicable.

Another method of defining *resistant to the spread of fire* is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the FT4 “Vertical Flame Test.”

(6) Circuit Integrity (CI) Cable, Fire-Resistive Cable System, or Electrical Circuit Protective System.

Cables that are used for survivability of critical circuits under fire conditions shall be listed and meet the requirements of 760.2(A)(6)(a), 760.2(A)(6)(b), or 760.2(A)(6)(c).

Informational Note: See *NFPA 72-2025* , *National Fire Alarm and Signaling Code*, 12.4.3 and 12.4.4 for additional information on circuit integrity (CI) cable, fire-resistive cable systems, or electrical circuit protective systems used for fire alarm circuits to comply with the survivability requirements to maintain the circuit's electrical function during fire conditions for a defined period of time.

(a) *Circuit Integrity (CI) Cables.* Circuit integrity (CI) cables specified in 760.2(A)(3), 760.2(A)(4), and 760.2(A)(5) and used for survivability of critical circuits shall be marked for an additional classification using the suffix "-CI." In order to maintain its listed fire-resistive rating, CI cables shall only be installed in free air in accordance with ~~790.24(A)~~ 722.180(A) through 722.180(D) . CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of an electrical circuit protective fire-resistive cable system as covered in 760.2(A)(6)(b). CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of an electrical circuit protective system as covered in 760.2(A)(6)(b).

Informational Note: See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables*, and UL 1425, *Cables for Non-Power-Limited Fire-Alarm Circuits*, for information on establishing a rating for CI cable. The *UL Guide Information for Nonpower-limited Fire Alarm Circuits* (HNHT) contains information for identifying the cable and its installation limitations to maintain the fire-resistive rating.

(b) *Fire-Resistive Cable Systems.* Cables specified in 760.2(A)(3), 760.2(A)(4), ~~and~~ 760.2(A)(5), and 760.2(A)(6)(a) that are part of a fire-resistive cable system shall be identified with the system identifier and hourly rating marked on the protectant or the smallest unit container and installed in accordance with the listing of the system.

Informational Note: See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables*, for information on establishing a rating for a fire-resistive cable system. The *UL Guide Information for Electrical Circuit Integrity Systems* (FHIT) contains information for identifying the system and its installation limitations to maintain a minimum fire-resistive rating.

(c) *Electrical Circuit Protective System.* Protectants for cables specified in 760.2(A)(3), 760.2(A)(4), and 760.2(A)(5) that are part of an electrical circuit protective system shall be identified with the protective system identifier and hourly rating marked on the protectant or the smallest unit container and installed in accordance with the listing of the protective system.

Informational Note: See UL 1724, *Fire Tests for Electrical Circuit Protective Systems*, for information on establishing a rating for an electrical circuit protective system. The *UL Guide Information for Electrical Circuit Integrity Systems* (FHIT) contains information for identifying the system and its installation limitations to maintain the fire-resistive rating.

(7) NPLFA Cable Markings.

Multiconductor ~~non-power-limited fire alarm~~ NPLFA cables shall be marked in accordance with Table 760.2(A)(7). ~~Non-power-limited fire alarm~~ NPLFA circuit cables shall be permitted to be marked with a maximum usage voltage rating of 150 volts. Cables that are listed for circuit integrity shall be identified with the suffix "-CI" as defined in 760.2(A)(6). The temperature rating shall be marked on the jacket of NPLFA cables that have a temperature rating exceeding 60°C (140°F). The jacket of NPLFA cables shall be marked with the conductor size.

Informational Note: Cable types are listed in descending order of fire performance.

Table 760.2(A)(7) NPLFA Cable Markings

Cable Marking	Type	Reference
NPLFP	~~Non-power-limited fire alarm~~ NPLFA circuit cable for use in other space used for environmental air	760.2(A)(3) and 760.2(A)(7)
NPLFR	~~Non-power-limited fire alarm~~ NPLFA circuit riser cable	760.2(A)(4) and 760.2(A)(7)
NPLF	~~Non-power-limited fire alarm~~ NPLFA circuit cable	760.2(A)(5) and 760.2(A)(7)

Notes:

1. Cables identified in 760.2(A)(3), 760.2(A)(4), and 760.2(A)(5) and meeting the requirements for circuit integrity shall have the additional classification using the suffix "-CI" (for example, NPLFP-CI, NPLFR-CI, and NPLF-CI).

2. Cables containing optical fibers shall be provided with the suffix "-OF".

(B) Listing and Marking of Insulated Continuous Line-Type Fire Detectors.

Insulated continuous line-type fire detectors shall be listed in accordance with 760.2(B)(1) through 760.2(B)(4). Cable used in a wet location shall be listed for use in wet locations or have a moisture-impervious metal sheath.

(1) Listing.

The cable shall be listed as being resistant to the spread of fire in accordance with 722.2(A)(1) ~~794.2(A)(1), 794.2(A)(2), and 794.2(A)(3)~~ .

(2) Voltage and Temperature Rating.

The cable shall have a voltage rating of not less than 300 volts. The cable shall have a temperature rating of not less than 60°C (140°F).

(3) Markings.

The cable shall be marked as fire resistance Type FPLP, Type FPLR, or Type FPL in accordance with 722.100 ~~722.2(B)~~ . The voltage rating shall not be marked on the cable. The temperature rating shall be marked on the jacket of cables that have a temperature rating exceeding 60°C (140°F). The jacket of power-limited fire alarm (PLFA) cables shall be marked with the conductor size.

Informational Note: Voltage ratings on cables might be misinterpreted to suggest that the cables could be suitable for Class 1, electric light, and power applications.

Exception: Voltage markings shall be permitted where the cable has multiple listings and voltage marking is required for one or more of the listings.

(4) Cable Jacket Compound.

The cable jacket compound shall have a high degree of abrasion resistance.

760.4 Other Articles.

Circuits and equipment shall comply with 760.4(A) through 760.4(N). Only those sections of Article 300 referenced in this article shall apply to fire alarm systems.

(A) Spread of Fire or Products of Combustion.

Installation of fire alarm circuits shall comply with ~~300.23 .~~ the following:

(1) NPLFA: 300.23

(2) PLFA: 720.21

(B) Ducts, Plenums, and Other Air-Handling Spaces.

~~Power-limited and non-power-limited fire~~ Fire alarm cables installed in ducts, plenums, or other spaces used for environmental air shall comply with ~~300.25~~ the following: ~~.~~

(1) NPLFA: 300.25

(2) PLFA: 720.22

Exception No. 1: ~~Power-limited fire alarm~~ PLFA cables selected in accordance with ~~Table 794.320~~ Table 722.170 and installed in accordance with ~~794.135~~ 722.171 and ~~300.25(B)~~ 720.22(B) , Exception, ~~,~~ shall be permitted to be installed in ducts specifically fabricated for environmental air.

Exception No. 2: ~~Power-limited fire alarm~~ PLFA cables selected in accordance with ~~Table 794.320~~ Table 722.170 and installed in accordance with ~~794.135~~ 722.171 shall be permitted to be installed in other spaces used for environmental air (plenums).

(C) Corrosive, Damp, or Wet Locations.

Fire alarm circuits and equipment installed in corrosive, damp, or wet locations shall comply with ~~110.11 , 300.7(B) , 300.8 , 300.11 , and 310.10(F) .~~ the following:

(1) NPLFA: 110.11 , 300.7(B) , 300.8 , 300.11 , and 310.10(F)

(2) PLFA: 110.11 , 720.5(A) , 720.7 , 720.11 , and 722.2

~~**(D)** Building Control Circuits.~~

~~Building control systems, such as elevator capture and fan shutdown, associated with the fire alarm system shall comply with Article 724 for Class 1 circuits and Article 725 for Class 2 or Class 3 circuits.~~

(D) Optical Fiber Cables.

Where optical fiber cables are utilized for fire alarm circuits, the cables shall be installed in accordance with Article ~~770~~ 722 Part VII .

(E) Installation of Conductors with Other Systems.

Installations shall comply with ~~300.10 .~~ the following:

(1) NPLFA: 300.10

(2) PLFA: 722.13(F)

(F) Raceways or Sleeves Exposed to Different Temperatures.

Installations shall comply with ~~300.9(A) .~~ the following:

(1) NPLFA: 300.9(A)

(2) PLFA: 720.8(A)

(G) Vertical Support for Fire-Resistive Cables and Conductors.

Vertical installations of circuit integrity (CI) cables and conductors installed in a raceway or conductors and cables of fire-resistive cable systems shall be installed in accordance with ~~300.21~~ 720.19 .

(H) Installation of Cables and Conductors in Raceway.

The number and size of cables and conductors shall comply with ~~300.19~~ . the following:

(1) NPLFA: 300.19

(2) PLFA: 720.6(B)

(I) Bushing.

A bushing shall be installed where cables emerge from raceway used for mechanical support or protection in accordance with 300.17(C)the following:

(1) NPLFA: 300.17(C)

(2) PLFA: 720.6(H)

(J) Cable Routing Assemblies.

~~Power-limited fire alarm~~ PLFA cables shall be permitted to be installed in plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with ~~Table 800.154(c)~~ Table 723.30 , listed in accordance with ~~800.182~~ 723.2 , and installed in accordance with ~~800.110(C) and 800.113~~ 723.32 .

(K) ~~Communications~~ Limited-Energy Raceways.

~~Power-limited fire alarm~~ PLFA cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with Table ~~800.154(c)~~ 723.20 , listed in accordance with ~~800.182~~ 723.2 , and installed in accordance with ~~800.113~~ 723.22 and 362.24 through 362.48, where the requirements applicable to electrical nonmetallic tubing apply.

(L) Temperature Limitations of ~~Power-Limited~~ PLFA and ~~Non-Power-Limited Fire Alarm~~ NPLFA Cables.

The requirements of 310.14(A)(3) on the temperature limitation of conductors shall apply to ~~power-limited fire alarm~~ PLFA cables and ~~non-power-limited fire alarms~~ NPLFA cables.

(M) Identification of Equipment Grounding Conductors.

Equipment grounding conductors shall be identified in accordance with 250.119.

Exception: Conductors with green insulation shall be permitted to be used as ungrounded signal conductors for Types FPLP, FPLR, FPL, and substitute cables installed in accordance with ~~794.157~~ 722.172 .

(N) Cables for ~~Power-Limited Fire Alarm (PLFA)~~ PLFA Circuits.

The listing and installation of cables for ~~power-limited fire alarm~~ PLFA circuits shall comply with Article 760~~,~~ Part III and Article 722~~, Parts I and II~~ Part VIII .

760.10 Hazardous (Classified) Locations.

Cables and equipment shall be permitted to be used in hazardous (classified) locations where specifically permitted by other articles in this code.

760.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.

Access to electrical equipment shall not be denied by an accumulation of conductors and cables that prevents removal of panels, including suspended ceiling panels.

760.25 Abandoned Cables.

The accessible portion of abandoned fire alarm cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

760.30 Fire Alarm Circuit Identification.

Fire alarm circuits shall be identified at terminal and junction locations in a manner that helps to prevent unintentional signals on fire alarm system circuit(s) during testing and servicing of other systems.

760.32 Fire Alarm Circuits Extending Beyond One Building.

~~Non-power-limited fire alarm circuits and power-limited fire alarm~~ Fire alarm circuits that extend beyond one building and run outdoors shall meet the following installation requirements ~~of Article 805 , Parts II, III, and IV and shall meet the installation requirements of Article 300 , Part I.~~ :

(1) NPLFA: 300.4 through 300.27

(2) PLFA: Article 720 Part II, Article 742 Part II, and Article 800 Part II

760.33 Supply-Side Surge-Protective Device (SPD).

A listed surge-protective device (SPD) shall be installed on the supply side of a fire alarm control panel in accordance with Article 242~~,~~ Part II. The SPD shall be as close to the fire alarm control panel as is practicable.

Part II. ~~Non-Power-Limited Fire Alarm (NPLFA)~~ NPLFA Circuits

760.41 NPLFA Circuit Power Source Requirements.

(A) Power Source.

The power source of ~~non–power-limited fire alarm~~ NPLFA circuits shall comply with Chapters 1 through 4, and the output voltage shall be not more than 600 volts, nominal. The fire alarm circuit disconnect shall be permitted to be secured in the “on” position.

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(B) Branch Circuit.

The branch circuit supplying the fire alarm equipment(s) shall supply no other loads. The location of the branch-circuit ~~overcurrent protective device~~ OCPD shall be permanently identified at the fire alarm control unit. The circuit disconnecting means shall have red identification, shall be accessible only to qualified personnel, and shall be identified as “FIRE ALARM CIRCUIT.” The red identification shall not damage the ~~overcurrent protective devices~~ OCPDs or obscure the manufacturer’s markings. This branch circuit shall not be part of a multiwire branch circuit and shall not be supplied through ground-fault circuit interrupters or arc-fault circuit-interrupters.

760.43 NPLFA Circuit Overcurrent Protection.

Overcurrent protection for conductors 14 AWG and larger shall be provided in accordance with the conductor ampacity without applying the ampacity adjustment and correction factors of 310.14 to the ampacity calculation. Overcurrent protection shall not exceed 7 amperes for 18 AWG conductors and 10 amperes for 16 AWG conductors.

760.45 NPLFA Circuit Overcurrent Protective Device Location.

~~Overcurrent devices~~ OCPDs shall be located at the point where the conductor to be protected receives its supply.

Exception No. 1: ~~Transformer secondary conductors.~~ ~~Non-power-limited fire alarm~~ NPLFA circuit conductors supplied by the secondary of a single-phase transformer that has only a 2-wire (single-voltage) secondary shall be permitted to be protected by overcurrent protection provided by the primary (supply) side of the transformer, provided the protection is in accordance with 450.5 and does not exceed the value determined by multiplying the secondary conductor ampacity by the secondary-to-primary transformer voltage ratio. Transformer secondary conductors other than 2-wire shall not be considered to be protected by the primary overcurrent protection.

Exception No. 2: ~~Electronic power source output conductors.~~ Non-power-limited circuit conductors supplied by the output of a single-phase, listed electronic power source, other than a transformer, having only a 2-wire (single-voltage) output for connection to non-power-limited circuits shall be permitted to be protected by overcurrent protection provided on the input side of the electronic power source, provided this protection does not exceed the value determined by multiplying the non-power-limited circuit conductor ampacity by the output-to-input voltage ratio. Electronic power source outputs, other than 2-wire (single voltage), connected to non-power-limited circuits shall not be considered to be protected by overcurrent protection on the input of the electronic power source.

Informational Note: A single-phase, listed electronic power supply whose output supplies a 2-wire (single-voltage) circuit is an example of a non-power-limited power source that meets the requirements of 760.41.

760.46 NPLFA Circuit Wiring.

Installation of ~~non-power-limited fire alarm~~ NPLFA circuits shall be in accordance with 110.3(B), 300.9, 300.13, 300.17, 300.19, 300.21(B), and 300.21(C).

Exception No. 1: As provided in 760.48 through 760.53.

Exception No. 2: Where other articles of this code require other methods.

760.48 Conductors of Different Circuits in Same Cable, Enclosure, or Raceway.

(A) Class 1 with NPLFA Circuits.

Class 1 and ~~non-power-limited fire alarm~~ NPLFA circuits shall be permitted to occupy the same cable, enclosure, or raceway without regard to whether the individual circuits are alternating current or direct current, provided all conductors are insulated for the maximum voltage of any conductor in the enclosure or raceway.

(B) Fire Alarm with Power-Supply Circuits.

Power-supply and fire alarm circuit conductors shall be permitted in the same cable, enclosure, or raceway only where connected to the same equipment.

760.49 NPLFA Circuit Conductors.

(A) Sizes and Use.

Only copper conductors shall be permitted to be used for fire alarm systems. Size 18 AWG and 16 AWG conductors shall be permitted to be used, provided they supply loads that do not exceed the ampacities given in Table 402.5 and are installed in a raceway, an approved enclosure, or a listed cable. Conductors larger than 16 AWG shall not supply loads greater than the ampacities given in 310.14, as applicable.

(B) Insulation.

Insulation on conductors shall be rated for the system voltage and not less than 600 volts. Conductors larger than 16 AWG shall comply with Table 310.4(1). Conductors 18 AWG and 16 AWG shall be Type KF-2, KFF-2, PAFF, PTFF, PF, PFF, PGF, PGFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, or ZFF. Conductors with other types and thickness of insulation shall be permitted if listed for ~~non-power-limited fire alarm~~ NPLFA circuit use.

Informational Note: See Table 402.13 for application provisions.

(C) Conductor Materials.

Conductors shall be solid or stranded copper.

Exception to (B) and (C): Wire Types PAF and PTF shall be permitted only for high-temperature applications between 90°C (194°F) and 250°C (482°F).

760.51 Number of Conductors in Cable Trays and Raceways, and Ampacity Adjustment Factors.

(A) NPLFA Circuits and Class 1 Circuits.

Where only ~~non-power-limited fire alarm~~ NPLFA circuit and Class 1 circuit conductors are in a raceway, the number of conductors shall be determined in accordance with 300.19. The ampacity adjustment factors given in 310.15(C)(1) shall apply if such conductors carry continuous load in excess of 10 percent of the ampacity of each conductor.

(B) Power-Supply Conductors and NPLFA Circuit Conductors.

Where power-supply conductors and non-power-limited fire alarm circuit conductors are permitted in a raceway in accordance with 760.48, the number of conductors shall be determined in accordance with 300.19. The ampacity adjustment factors given in 310.15(C)(1) shall apply as follows:

(1) To all conductors where the fire alarm circuit conductors carry continuous loads in excess of 10 percent of the ampacity of each conductor and where the total number of conductors is more than three

(2) To the power-supply conductors only, where the fire alarm circuit conductors do not carry continuous loads in excess of 10 percent of the ampacity of each conductor and where the number of power-supply conductors is more than three

(C) Cable Trays.

Where fire alarm circuit conductors are installed in cable trays, they shall comply with 392.22 and 392.80(A).

760.53 Multiconductor NPLFA Cables.

Multiconductor ~~non-power-limited fire alarm~~ NPLFA cables that meet the requirements of 760.2(A) shall be permitted to be used on fire alarm circuits operating at 150 volts or less and shall be installed in accordance with 760.53(A) and 760.53(B).

(A) NPLFA Wiring Method.

Multiconductor ~~non-power-limited fire alarm~~ NPLFA circuit cables shall be installed in accordance with 760.53(A)(1), 760.53(A)(2), and 760.53(A)(3).

(1) In Raceways, Exposed on Ceilings or Sidewalls, or Fished in Concealed Spaces.

Cable splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed in such a way that maximum protection against physical damage is afforded by building construction such as baseboards, door frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

(2) Passing Through a Floor or Wall.

Cables shall be installed in metal raceway or rigid nonmetallic conduit where passing through a floor or wall to a height of 2.1 m (7 ft) above the floor, unless adequate protection can be afforded by building construction such as detailed in 760.53(A)(1), or unless an equivalent solid guard is provided.

(3) In Hoistways.

Cables shall be installed in rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or electrical metallic tubing where installed in hoistways.

Exception: As provided for in 620.21 for elevators and similar equipment.

(B) Applications of Listed NPLFA Cables.

The use of ~~non-power-limited fire alarm~~ NPLFA circuit cables shall comply with 760.53(B)(1) through 760.53(B)(4).

(1) Ducts Specifically Fabricated for Environmental Air.

Multiconductor ~~non-power-limited fire alarm~~ NPLFA circuit cables, Types NPLFP, NPLFR, and NPLF, shall not be installed exposed in ducts specifically fabricated for environmental air.

Informational Note: See 300.25(B).

(2) Other Spaces Used for Environmental Air (Plenums).

Cables installed in other spaces used for environmental air shall be Type NPLFP.

Exception No. 1: Types NPLFR and NPLF cables installed in compliance with 300.25(C).

Exception No. 2: Other wiring methods in accordance with 300.25(C) and conductors in compliance with 760.49(C).

Exception No. 3: Type NPLFP-CI cable shall be permitted to be installed to provide a 2-hour circuit integrity rated cable.

(3) Riser.

Cables installed in vertical runs and penetrating one or more floors, or cables installed in vertical runs in a shaft, shall be Type NPLFR. Floor penetrations requiring Type NPLFR shall contain only cables suitable for riser or plenum use.

Exception No. 1: Type NPLF or other cables that are specified in Chapter 3 and are in compliance with 760.49(C) and encased in metal raceway.

Exception No. 2: Type NPLF cables located in a fireproof shaft having firestops at each floor.

Informational Note: See 300.23 for firestop requirements for floor penetrations.

Exception No. 3: Type NPLF-CI cable shall be permitted to be installed to provide a 2-hour circuit integrity rated cable.

(4) Other Wiring Within Buildings.

Cables installed in building locations other than the locations covered in 760.53(B)(1), 760.53(B)(2), and 760.53(B)(3) shall be Type NPLF.

Exception No. 1: Chapter 3 wiring methods with conductors in compliance with 760.49(C).

Exception No. 2: Type NPLFP or Type NPLFR cables shall be permitted.

Exception No. 3: Type NPLFR-CI cable shall be permitted to be installed to provide a 2-hour circuit integrity rated cable.

Part III. Power-Limited Fire Alarm (PLFA) Circuits

760.121 Power Sources for PLFA Circuits.

(A) Power Source.

The power source for a ~~power-limited fire alarm~~ PLFA circuit shall be as specified in the following:

(1) A listed PLFA or Class 3 transformer

(2) A listed PLFA or Class 3 power supply

(3) Listed equipment marked to identify the PLFA power source

Informational Note No. 1: See Chapter 9~~,~~ Tables 12(A) and 12(B)~~,~~ for the listing requirements for power-limited fire alarm circuit sources.

Informational Note No. 2: Examples of listed equipment are a fire alarm control panel with integral power source; a circuit card listed for use as a PLFA source, where used as part of a listed assembly; a current-limiting impedance, listed for the purpose or part of a listed product, used in conjunction with a non-power-limited transformer or a stored energy source, for example, a storage battery, to limit the output current.

(B) Branch Circuit.

The branch circuit supplying the fire alarm equipment(s) shall comply with the following requirements:

(1) The branch circuit shall supply no other loads.

(2) The branch circuit shall not be supplied through ground-fault circuit interrupters or arc-fault circuit interrupters.

(3) The location of the ~~branch-circuit overcurrent protective device~~ OCPD shall be permanently identified at the fire alarm control unit.

(4) The circuit disconnecting means shall have red identification, shall be accessible only to qualified personnel, and shall be identified with the following words: “FIRE ALARM CIRCUIT.” The red identification shall not damage the ~~overcurrent protective devices~~ OCPDs or obscure the manufacturer's markings.

(5) The fire alarm branch-circuit disconnecting means shall be permitted to be secured in the “on” position.

760.124 Circuit Marking.

The equipment supplying PLFA circuits shall be durably marked where plainly visible to indicate each circuit that is a power-limited fire alarm circuit.

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760.127 Overcurrent Protection of the PLFA Power Source.

Transformers or other devices supplied from power-supply conductors shall be protected by an ~~overcurrent device~~ OCPD rated not over 20 amperes.

Exception: The input leads of a transformer or other power source supplying ~~power-limited fire alarm~~ PLFA circuits shall be permitted to be smaller than 14 AWG, but not smaller than 18 AWG, if they are not over 300 mm (12 in.) long and if they have insulation that complies with 760.49(B).

760.133 Installation of Conductors and Equipment in Cables, Compartments, Cable Trays, Enclosures, Manholes, Outlet Boxes, Device Boxes, Raceways, and Cable Routing Assemblies for Power-Limited Fire Alarm Circuits.

Conductors and equipment for power-limited fire alarm circuits shall be installed in accordance with Article 722~~,~~ Parts I and ~~II and~~ ~~760.136~~ ~~through~~ ~~794.223~~ VIII .

~~**760.136** Separation from Electric Light, Power, Class 1, NPLFA, and Medium-Power Network-Powered Broadband Communications Circuit Conductors.~~

(A) General.

Power-limited fire alarm circuit cables and conductors shall not be placed in any cable, cable tray, compartment, enclosure, manhole, outlet box, device box, raceway, or similar fitting with conductors of electric light, power, Class 1, non–power-limited fire alarm circuits, and medium-power network-powered broadband communications circuits unless permitted by 760.136(B) through 760.136(G) .

(B) Separated by Barriers.

Power-limited fire alarm circuit cables shall be permitted to be installed together with Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are separated by a barrier.

(C) Raceways Within Enclosures.

In enclosures, power-limited fire alarm circuits shall be permitted to be installed in a raceway within the enclosure to separate them from Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits.

(D) Associated Systems Within Enclosures.

Power-limited fire alarm conductors in compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to power-limited fire alarm circuits, and shall comply with either of the following conditions:

(0) The electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are routed to maintain a minimum of 6 mm (¼ in.) separation from the conductors and cables of power-limited fire alarm circuits.

(0) The circuit conductors operate at 150 volts or less to ground and also comply with one of the following conditions:

0. The fire alarm power-limited circuits are installed using Type FPL, Type FPLR, Type FPLP, or permitted substitute cables if these power-limited cable conductors extending beyond the jacket are separated by a minimum of 6 mm (¼ in.) or by a nonconductive sleeve or nonconductive barrier from all other conductors.

0. The power-limited fire alarm circuit conductors are installed as non-power-limited circuits in accordance with 760.46 .

(E) Enclosures with Single Opening.

Power-limited fire alarm circuit conductors entering compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to power-limited fire alarm circuits or to other circuits controlled by the fire alarm system to which the other conductors in the enclosure are connected. Where power-limited fire alarm circuit conductors must enter an enclosure that is provided with a single opening, they shall be permitted to enter through a single fitting (such as a tee), provided the conductors are separated from the conductors of the other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing.

(F) In Hoistways.

In hoistways, power-limited fire alarm circuit conductors shall be installed in rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or electrical metallic tubing. For elevators or similar equipment, these conductors shall be permitted to be installed as provided in 620.21 .

~~**(G)** Where Protected.~~

~~PLFA circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits if they are functionally associated and installed using NPFLA wiring methods and materials in accordance with Article 760 , Part II .~~

~~**(H)** Other Applications.~~

~~For other applications, power-limited fire alarm circuit conductors shall be separated by at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non–power-limited fire alarm, or medium-power network-powered broadband communications circuits unless one of the following conditions is met:~~

(0) ~~Either (a) all of the electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors or (b) all of the power-limited fire alarm circuit conductors are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, or Type UF cables.~~

(0) ~~All of the electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are permanently separated from all of the power-limited fire alarm circuit conductors by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the conductors.~~

~~**760.139** Installation of Conductors of Different PLFA Circuits, Class 2, Class 3, and Communications Circuits in the Same Cable, Enclosure, Cable Tray, Raceway, or Cable Routing Assembly.~~

~~**(A)** Two or More PLFA Circuits.~~

~~Cable and conductors of two or more power-limited fire alarm circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly.~~

~~**(B)** Class 2 Circuits with PLFA Circuits.~~

~~Conductors of one or more Class 2 circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly with conductors of power-limited fire alarm circuits if the insulation of the Class 2 circuit conductors in the cable, enclosure, raceway, or cable routing assembly is at least that required by the power-limited fire alarm circuits.~~

~~**(C)** Class 3 and Communications Circuits with PLFA Circuits.~~

~~Cable and conductors of Class 3 and communications circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly with cables and conductors of power-limited fire alarm circuits.~~

~~**(D)** Low-Power Network-Powered Broadband Communications Cables and PLFA Cables.~~

~~Low-power network-powered broadband communications circuits shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly with PLFA cables.~~

~~**(E)** Audio System Circuits and PLFA Circuits.~~

~~Audio system circuits described in 640.9(C) and installed using Class 2 or Class 3 wiring methods in compliance with 794.135 shall not be installed in the same cable, cable tray, raceway, or cable routing assembly with power-limited conductors or cables.~~

760.145 Current-Carrying Continuous Line-Type Fire Detectors.

(A) Application.

Listed continuous line-type fire detectors, including insulated copper tubing of pneumatically operated detectors, employed for both detection and carrying signaling currents shall be permitted to be used in power-limited circuits.

(B) Installation.

Continuous line-type fire detectors shall be installed in accordance with 722.170 and 760.124 through ~~794.220 and~~ 760.133.

~~**Part IV.** Listing Requirements~~

Supplemental Information

File Name	Description	Approved
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Submitter Information Verification

Committee: NEC-P03

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Committee Statement

Committee Statement: In 760.2(A)(6)(a), the reference for CI cable free air installation has been updated to the new location in section 722.180(A)-(D).

Section 760.4(A) has been divided into subsection (1) for NPLFA circuits for a reference to 300.23 and subsection (2) for PLFA circuits for a reference to section 720.21. With the new Article 720 for general requirements for limited-energy systems, there is a need to provide a second reference for PLFA circuits pointing to the limited-energy version of this requirement in 720.21.

Section 760.4(B) has been divided into subsection (1) for NPLFA circuits for a reference to 300.25 and subsection (2) for PLFA circuits for a reference to section 720.22. With the new Article 720 for general requirements for limited-energy systems, there is a need to provide a second reference for PLFA circuits pointing to the limited-energy version of this requirement in 720.22.

The references in section 760.4(B), Exceptions 1 & 2 have been updated to the correct references 722.170 for PLFA Cable applications, 722.171 for PLFA Cable installations, and 720.22(B) for limited-energy installations in spaces used for environmental air.

Section 760.4(C) has been divided into subsection (1) for NPLFA circuits for a reference to 110.11, 300.7(B), 300.8, 300.11 and 310.10(F) and subsection (2) for PLFA circuits for a reference to section 110.11, 720.5(A), 720.7, 720.11 and 722.2. With the new Article 720 for general requirements for limited-energy systems, there is a need to provide a second reference for PLFA circuits pointing to the limited-energy version of these requirements.

Subsection 760.4(D) has been deleted as it is not modifying any requirements and Article 724 would apply to Class 1 Building Control Circuits and Article 725 would apply to Class 2 & 3 Building Control Circuits, with or without the reference here.

Within subsection 760.4(D) formerly 760.4(E), the reference to Optical Fiber Cable requirements has been updated to the new correct location in Article 722 Part VII., as Article 770 was deleted during the first draft.

Section 760.4(E), formerly 760.4(F); has been divided into subsection (1) for NPLFA circuits for a reference to 300.10 and subsection (2) for PLFA circuits for a reference to section 722.13. With the new Article 722 for general limited-energy cables, there is a need to provide a second reference for PLFA circuits pointing to the limited-energy version of this requirement.

Section 760.4(F), formerly 760.4(G); has been divided into subsection (1) for NPLFA circuits for a reference to 300.9(A)and subsection (2) for PLFA circuits for a reference to section 720.8(A). With the new Article 720 for general limited-energy system requirements, there is a need to provide a second reference for PLFA circuits pointing to the limited-energy version of this requirement.

Within subsection 760.4(G), formerly 760.4(H); the reference to section 300.21 for vertical support of CI Cables has been updated to section 720.19 as this is where the vertical support for Type CI Cables is now located.

Section 760.4(H), formerly 760.4(I); has been divided into subsection (1) for NPLFA circuits for a reference to 300.19 and subsection (2) for PLFA circuits for a reference to section 720.6(B). With the new Article 720 for general limited-energy system wiring methods and materials, there is a need to provide a second reference for PLFA circuits pointing to the limited-energy version of this requirement.

Section 760.4(I), formerly 760.4(J); has been divided into subsection (1) for NPLFA circuits for a reference to 300.17(C) and subsection (2) for PLFA circuits for a reference to section 720.6(H). With the new Article 720 for general limited-energy system wiring methods and materials, there is a need to provide a second reference for PLFA circuits pointing to the limited-energy version of this requirement.

The references to the sections for cable routing assemblies in section 760.4(J), formerly 760.4(K); have been updated to the appropriate new locations for these requirements in new Article 723.

The word “Communications” has been replaced with the word “Limited-Energy” for consistency with the other limited-energy requirements. The references to the sections for Raceways in section 760.4(K), formerly 760.4(L); have been updated to the appropriate new locations for these requirements in new Article 723.

The reference in section 760.4(M), formerly 760.4(N); has been updated to the correct new location for PLFA Cable substitutions in section 722.172.

Within section 760.4(N), formerly 760.4(O), the reference to the Parts of Article 722 have been updated to Part VIII as this is where the PLFA Cable requirements now reside.

Section 760.32 has been divided into subsection (1) for NPLFA circuits for a reference to 300.4 through 300.27. and subsection (2) for PLFA circuits for a reference to Article 720-Part II, 742-Part II, and 800-Part II. Article 805 was deleted in the first draft, and the applicable requirements were moved to Part II of 720, 742 and 800. With the new location of these requirements, there is a need to provide a second reference for PLFA circuits pointing to the limited-energy version of this requirement Parts.

The references in section 760.133 have been updated to the correct Parts of Article 722, specifically Article 722, Part II which covers the installation requirements for Limited-Energy Cables and separation from other systems and Article 722, Part VIII which covers application, installation and permitted substitutions for PLFA Cables.

Section 760.136 has been deleted as these requirements are covered by Section 760.133 which points users to Article 722, Part II, which includes section 722.13.

Section 722.13 establishes the same code language found in 760.136 requiring separation from electric light and power, Class 1, NPLFA, and Medium Power Network Powered Broadband communications circuit conductors from all limited-energy cables, including PLFA cables.

Section 760.139 has been deleted as these requirements are covered by Section 760.133 which points users to Article 722, Part II, which includes section 722.13(F).

Section 722.13(F) establishes the same code language found in 760.139 requiring separation from electric light and power, Class 1, NPLFA, and Medium Power Network Powered Broadband communications circuit conductors for PLFA cables.

The references in section 760.145(B) have been updated to the correct location of the application requirements for PLFA Cables now found in section 722.170.

Part IV of Article 760 is deleted as all of the code text in this part of Article 760 was deleted in the first draft, as such there is no need for the Part IV and Title as it will create confusion. The listing requirements for NPLFA and PLFA are covered in 760.2 in accordance with Section 2.2.1 of the NEC Style Manual.

Response Message: SR-7598-NFPA 70-2024

Second Revision No. 7594-NFPA 70-2024 [Article 790]

Article 790 General Requirements for Limited-Energy Systems

790.1 Scope.

This article covers general requirements for limited-energy systems. These general requirements apply to Class 2 and Class 3 power limited circuits, Class 4 fault-managed power systems, power limited fire alarm circuits, and optical fiber cables covered by Articles 725 , 726 , 760 , and 770 and communications systems covered by Articles 800 , 805 , 810 , 820 , 830 , and 840 .

790.4 Other Articles.

Only those sections of Article 300 referenced in this article shall apply.

790.5 Hazardous (Classified) Locations.

Cables and equipment shall be permitted to be used in hazardous (classified) locations where specifically permitted by other articles of this code.

790.6 Spread of Fire or Products of Combustion.

Installation of power-limited circuits shall comply with 300.23 .

790.7 Ducts, Plenums, and Other Air-Handling Spaces.

Circuits installed in ducts, plenums, or other space used for environmental air shall comply with 300.25 .

Exception No. 1: Cables selected in accordance with Table 794.135(A) and installed in accordance with 300.25(B) , Exception shall be permitted to be installed in ducts specifically fabricated for environmental air.

Exception No. 2: Cables selected in accordance with Table 794.135(A) shall be permitted to be installed in other spaces used for environmental air (plenums).

Exception No. 3: Power-limited fire alarm cables selected in accordance with Table 794.157 and installed in accordance with 794.135 and 300.25(B) Exception shall be permitted to be installed in ducts specifically fabricated for environmental air.

Exception No. 4: Power-limited fire alarm cables selected in accordance with Table 794.157 and installed in accordance with 794.135 shall be permitted to be installed in other spaces used for environmental air (plenums).

790.8 Installation of Conductors and Cables with Other Systems.

Installations shall comply with 300.10 .

790.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.

Installations shall comply with 300.26 .

790.24 Mechanical Execution of Work.

(A) General.

The installation shall conform to 300.6 and 300.13 .

Exception: Overhead (aerial) spans of communications drop wires, communications cables, and CATV-type coaxial cables shall be permitted to be attached to the exterior of a raceway-type mast intended for the attachment and support of such wires and cables.

Informational Note No. 1: See ANSI/NECA/FOA 301-2016, *Standard for Installing and Testing Fiber Optic Cables* , ANSI/TIA-568.0-D-2015, *Generic Telecommunications Cabling for Customer Premises* , and ANSI/TIA 568.3-D-2016, *Optical Fiber Cabling and Components Standard* , for accepted industry practices.

Informational Note No. 2: See ANSI/BICSI N1-2019, *Installation Practices for Telecommunications and IC Cabling and Related Cabling Infrastructure* , ANSI/TIA-568.1- E-2020, *Commercial Building Telecommunications Infrastructure Standard* , ANSI/TIA-569-E-2019, *Telecommunications Pathways and Spaces* , ANSI/TIA-570-C-2012, *Residential Telecommunications Infrastructure Standard* , ANSI/TIA-1005-A-2012, *Telecommunications Infrastructure Standard for Industrial Premises* , ANSI/ TIA-1179-A-2017, *Healthcare Facility Telecommunications Infrastructure Standard* , ANSI/TIA-4966-2014, *Telecommunications Infrastructure Standard for Educational Facilities* , and other ANSI-approved installation standards for accepted industry practices.

(B) Circuit Integrity (CI) Cable.

Circuit integrity (CI) cable shall be supported at a distance not exceeding 610 mm (24 in.). Cable shall be secured to the noncombustible surface of the building structure. Cable supports and fasteners shall be steel. Where fire alarm circuits are located within 2.1 m (7 ft) of the floor in accordance with 760.53(A)(1) and 794.220 , as applicable, the cable shall be fastened in an approved manner at intervals of not more than 450 mm (18 in.).

790.25 Abandoned Cables.

The accessible portion of abandoned cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

790.100 Installation of Conductors of Different Limited-Energy Circuits in the Same Cable, Enclosure, Cable Tray, Raceway, or Cable Routing Assembly.

~~Limited-energy cables shall be of a type indicated in Table 790.100 .~~

~~Informational Note: Class 1 cables, non-power-limited fire alarm cables, and network-powered broadband medium-power cables are not limited-energy cable types.~~

~~Table 790.100 Limited-Energy Cable Types~~

~~Application~~	~~Cable Type~~	~~Description~~
~~Plenum limited-energy cables~~	~~CMP~~	~~Communications plenum cables~~
-	~~CATVP~~	~~Community antenna television plenum cables~~
-	~~BLP~~	~~Network-powered broadband communications low-power plenum cables~~
-	~~FPLP~~	~~Power-limited fire alarm plenum cables~~
-	~~CL4P~~	~~Class 4 plenum cables~~
-	~~CL3P~~	~~Class 3 plenum cables~~
-	~~CL2P~~	~~Class 2 plenum cables~~
-	~~OFNP~~	~~Nonconductive optical fiber plenum cables~~
-	~~OFCP~~	~~Conductive optical fiber plenum cables~~
-	-	-
~~Riser limited-energy cables~~	~~CMR~~	~~Communications riser cables~~
-	~~CATVR~~	~~Community antenna television riser cables~~
-	~~BLR~~	~~Network-powered broadband communications low-power riser cables~~
-	~~FPLR~~	~~Power-limited fire alarm riser cables~~
-	~~CL4R~~	~~Class 4 riser cables~~
-	~~CL3R~~	~~Class 3 riser cables~~
-	~~CL2R~~	~~Class 2 riser cables~~
-	~~OFNR~~	~~Nonconductive optical fiber riser cables~~
-	~~OFCR~~	~~Conductive optical fiber riser cables~~
-	-	-
~~General-purpose limited-energy cables~~	~~CMG, CM~~	~~Communications general-purpose cables~~
-	~~CATV~~	~~Community antenna television general-purpose cables~~
-	~~BL~~	~~Network-powered broadband communications low-power general-purpose cables~~
-	~~FPL~~	~~Power-limited fire alarm general-purpose cables~~
-	~~CL4~~	~~Class 4 general-purpose cables~~
-	~~PLTC~~	~~Power-limited tray cables~~
-	~~CL3~~	~~Class 3 general-purpose cables~~
-	~~CL2~~	~~Class 2 general-purpose cables~~
-	~~OFNG, OFN~~	~~Nonconductive optical fiber general-purpose cables~~
-	~~OFCG, OFC~~	~~Conductive optical fiber general-purpose cables~~
-	-	-

Application	Cable Type	Description
Limited-use limited-energy cables	CMX	Communications limited use cables
-	CATVX	Community antenna television limited use cables
-	BLX	Network-powered broadband communications low-power limited use cables
-	CL3X	Class 3 limited use cables
-	CL2X	Class 2 limited use cables
-	-	-
Specialty use limited-energy cables	CMUC	Under-carpet communications wires and cables

(A) General.

Unless prohibited by this section, plenum, riser, general-purpose, and limited-use limited-energy cables shall be permitted to be installed in the same raceway, cable tray, box, enclosure, or cable routing assembly. Installations shall comply with 790.100(B) through 790.100(H) .

(B) Two or More Class 2, Class 3, or Class 4 Circuits.

Conductors of two or more limited-energy circuits of the same class shall be permitted within the same limited-energy cable.

(C) Class 2, Class 3, and Class 4 Circuits with the Same Limited-Energy Cable.

(1) Class 3 Cables.

Class 2 circuits shall be permitted to use listed Class 3 cables.

(2) Dual-Listed Class 3/Class 4 Cables.

Class 2 and Class 3 circuits shall be permitted to use dual-listed Class 3/Class 4 cables.

(D) Class 2 and Class 3 Circuits with Communications Circuits.

(1) Communications Cables.

Conductors of one or more Class 2 or Class 3 circuits shall be permitted in the same cable with conductors of communications circuits. The cable shall be listed as a communications cable.

(2) Composite Cables.

Cables constructed of individually listed Class 2, Class 3, and communications cables under a common jacket shall be permitted to be classified and listed as communications cables. The fire resistance rating of the composite cable shall be determined by the combustion characteristics of the composite cable.

(E) Class 2, Class 3, or Class 4 Cables with Other Limited-Energy Cables.

(1) Limited-Use Cables.

Plenum, riser, general-purpose, and limited-use limited-energy cables shall be permitted in the same enclosure or raceway.

(2) Other Than Limited-Use Cables.

Plenum, riser, and general-purpose limited-energy cables shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly.

(F) Power-Limited Fire Alarm (PLFA) Circuits.

(1) Multiple PLFA Circuits.

Cable and conductors of two or more power-limited fire alarm circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly.

(2) With Network-Powered Broadband.

Low-power network-powered broadband communications circuits shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly with PLFA cables.

(3) With Class 2 Circuits.

Conductors of one or more Class 2 circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly with conductors of power-limited fire alarm circuits if the insulation of the Class 2 circuit conductors in the cable, enclosure, raceway, or cable routing assembly is at least that required by the power-limited fire alarm circuits.

(4) With Class 3 or Communications Circuits.

Cable and conductors of Class 3 and communications circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly with cables and conductors of power-limited fire alarm circuits.

(5) With Class 4 Circuits.

Class 4 circuits shall be permitted in the same cable with power-limited fire alarm circuits if the cable is dual-listed.

(6) Audio System Circuits and PLFA Circuits.

Audio system circuits described in 640.9(C) and installed using Class 2, Class 3, or Class 4 wiring methods in compliance with 794.135 shall not be installed in the same cable, cable tray, raceway, or cable routing assembly with PLFA circuits or cables.

(G) Manholes.

Outside plant communications, CATV, and optical fiber cables shall be permitted to be installed together in manholes.

Informational Note: See IEEE C2-2023, *National Electrical Safety Code*, Rules 323 and 341 for information on cable installation in manholes.

(H) Limited-Use and Under-Carpet Limited-Energy Cables.

Limited-use and under-carpet limited-energy cables shall not be installed in cable trays or cable routing assemblies.

790.136 Limited-Energy Circuits with Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm, and Medium-Power Network-Powered Broadband Communications Circuits in Raceways, Compartments, and Boxes.

Separation shall be provided in accordance with 790.136(A) for limited-energy cables and conductors, except as provided in 790.136(B) for optical fiber cables.

(A) General.

Limited-energy cables shall be separated by at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits and shall not be placed in the same raceway, compartment, enclosure, manhole, outlet box, device box, or similar, unless permitted by 790.136(A)(1) through 790.136(A)(10).

Exception: Low-power and medium-power network-powered broadband communications circuit cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly.

(1) Separated by Barriers.

Limited-energy cables shall be permitted to be placed in any raceway, compartment, outlet box, junction box, or other enclosures with conductors of electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits if the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits are separated from the limited-energy and cables by a permanent barrier that maintains the 50 mm (2 in.) separation or a listed divider.

(2) Raceways Within Enclosures.

Limited-energy cables shall be permitted to share the same enclosure with other systems if the limited-energy cables are separated by a raceway within the enclosure.

(3) Associated Systems Within Enclosures.

Limited-energy cables shall be permitted to be placed in outlet boxes, junction boxes, compartments, or similar with power conductors where such conductors are introduced solely for power supply to the limited-energy equipment and installed in accordance with 790.136(A)(3)(a) or 790.136(A)(3)(b) .

(0) The power circuit conductors shall be routed within the enclosure to maintain a minimum 6 mm (0.25 in.) separation from the limited-energy cables.

(0) The circuit conductors shall operate at 150 volts or less to ground, and the limited-energy circuit conductors shall be one of the following:

(0) Installed as a Class 1 circuit

(0) Cable type CL3, CL3R, CL3P, or a permitted substitute with the conductors that emerge from the cable jacket separated by not less than 6 mm (0.25 in.) or by a nonconductive barrier from all other conductors

(4) Enclosures With a Single Opening.

Circuit conductors of limited-energy cables entering compartments, enclosures, device boxes, outlet boxes, or similar shall be permitted to be installed with Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to the limited-energy circuits. If the limited-energy circuit conductors must enter an enclosure that is provided with a single opening, the conductors shall be permitted to enter through a single fitting (such as a tee) if the conductors are separated from the conductors of the other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing.

(5) Elevators.

(0) *Traveling Cables.* Separation of circuits shall not be required in elevator traveling cables constructed in accordance with 620.36 .

(0) *Hoistways.* In hoistways, cables shall be installed in rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquid-tight flexible nonmetallic conduit, or electrical metallic tubing. For elevators or similar equipment, these conductors shall be permitted to be installed as provided in 620.21 .

(6) In Raceways or Cables.

Separation shall not be required if one of the following conditions is met:

(0) The conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type AC, or Type UF cables

(0) The limited-energy cable conductors are installed in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type TC, or Type UF cables.

(7) Protected by Firmly Fixed Nonconductors.

Separation shall not be required if the limited-energy cables are permanently separated from the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.

(8) Manholes.

Underground limited-energy circuit conductors and cables in a manhole shall be permitted to be installed with Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits if one of the following conditions is met:

(0) The electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are in a metal-enclosed cable or Type UF cable.

(0) The limited-energy circuit conductors are permanently and effectively separated from the conductors of other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing, in addition to the insulation or covering on the wire.

(0) The limited-energy circuit conductors are permanently and effectively separated from conductors of the other circuits and securely fastened to racks, insulators, or other approved supports.

(9) Cable Trays.

Limited-energy circuit conductors shall be permitted to be installed in cable trays if the conductors of the electric light, Class 1, and non-power-limited fire alarm circuits are separated by a solid fixed barrier of a material compatible with the cable tray or if the limited-energy circuits are installed in Type MC cable.

(10) If Protected.

Limited-energy circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits if they are functionally associated and installed using Class 1 wiring methods in accordance with 724.46.

(B) Optical Fiber Cables.

Hybrid optical fiber cables shall be classified as electrical cables in accordance with the type of electrical conductors. They shall be constructed, listed, marked, and installed in accordance with the appropriate article for each type of electrical cable.

(1) Optical Fiber Cables in Cable Trays and Raceways with Electrical Circuits.

(0) Conductive optical fiber cables contained in an armored or metal-clad-type sheath and nonconductive optical fiber cables shall be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits operating at 1000 volts or less.

(0) Conductive optical fiber cables without an armored or metal-clad-type sheath shall not be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits, unless all of the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits are separated from all of the optical fiber cables by a permanent barrier or listed divider.

~~**(2)** Optical Fiber Cables in Cabinets, Outlet Boxes, and Similar Enclosures with electrical Circuits.~~

(0) ~~Nonconductive optical fiber cables shall not be permitted to occupy the same cabinet, outlet box, panel, or similar enclosure housing the electrical terminations of an electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit unless one or more of the following conditions are met:~~

(0) ~~The nonconductive optical fiber cables are functionally associated with the electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit.~~

(0) ~~The conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits operate at 1000 volts or less.~~

(0) ~~The nonconductive optical fiber cables and the electrical terminations of electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit are installed in factory- or field-assembled control centers.~~

(0) ~~The nonconductive optical fiber cables are installed in an industrial establishment where conditions of maintenance and supervision ensure that only qualified persons service the installation.~~

(0) ~~When optical fibers are within the same hybrid cable for electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits operating at 1000 volts or less, they shall be permitted to be installed only where the functions of the optical fibers and the electrical conductors are associated.~~

(0) ~~Optical fibers in hybrid optical fiber cables containing only current-carrying conductors for electric light, power, or Class 1 circuits rated 1000 volts or less shall be permitted to occupy the same cabinet, cable tray, outlet box, panel, raceway, or other termination enclosure with conductors for electric light, power, or Class 1 circuits operating at 1000 volts or less.~~

(0) ~~Optical fibers in hybrid optical fiber cables containing current-carrying conductors for electric light, power, or Class 1 circuits rated over 1000 volts shall be permitted to occupy the same cabinet, cable tray, outlet box, panel, raceway, or other termination enclosure with conductors for electric light, power, or Class 1 circuits in industrial establishments, where conditions of maintenance and supervision ensure that only qualified persons service the installation.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:56:02 EDT 2024

Committee Statement

Committee Statement: The Correlating Committee has directed the panel to delete Article 790 for correlation. A Task Group was formed to ensure that all the information in 790 was appropriately relocated to other sections of the Code.

Response Message: SR-7594-NFPA 70-2024

Public Comment No. 539-NFPA 70-2024 [Article 790]

Public Comment No. 126-NFPA 70-2024 [Article 790]

Second Revision No. 7596-NFPA 70-2024 [Article 794]

Article 794 Limited-Energy Cables for Power-Limited Circuits, Fault-Managed Power Circuits, Optical Fiber Circuits, and Communications Circuits

Part I. General.

794.1 Scope.

This article covers the general requirements for the installation of single- and multiple-conductor cables used in Class 2 and Class 3 power-limited circuits, power-limited fire alarm (PLFA) circuits, Class 4 fault-managed power circuits, optical fiber cables, and communications systems power-limited, remote-control and signaling circuits that are not an integral part of a device or utilization equipment. The circuits described herein are characterized by usage and electrical power limitations that differentiate them from electric light and power circuits; therefore, alternative requirements are given regarding minimum wire sizes, ampacity adjustment and correction factors, overcurrent protection, insulation requirements, and wiring methods and materials. The installation of fire alarm systems covers wiring and equipment including all circuits controlled and powered by the fire alarm system. The general requirements for communications systems apply to communications circuits, community antenna television and radio distribution systems, network-powered broadband communications systems, and premises-powered broadband communications systems, unless modified by Articles 805 , 810 , 820 , 830 , or 840 .

Informational Note No. 1: See 206.4 for classifications of remote-control and signaling circuits.

Informational Note No. 2: Class 4 fault-managed power systems consist of a Class 4 power transmitter and a Class 4 power receiver connected by a Class 4 cabling system. These systems are characterized by monitoring the circuit for faults and controlling the source current to ensure the energy delivered into any fault is limited. Class 4 systems differ from Class 1, Class 2, and Class 3 systems in that they are not limited for power delivered to an appropriate load. They are current limited for faults between the Class 4 transmitter and Class 4 receiver.

Informational Note No. 3: Fire alarm systems include fire detection and alarm notification, guard's tour, sprinkler waterflow, and sprinkler supervisory systems. Circuits controlled and powered by the fire alarm system include circuits for the control of building systems safety functions, elevator capture, elevator shutdown, door release, smoke doors and damper control, fire doors and damper control, and fan shutdown, but only where these circuits are powered by and controlled by the fire alarm system.

Informational Note No. 4: See *NFPA 72* -2025, *National Fire Alarm and Signaling Code* , for further information on the installation and monitoring for integrity requirements for fire alarm systems.

794.2 Listing and Marking of Cables.

Cables installed in buildings shall be listed in accordance with 794.2(A) and marked in accordance with 794.2(B) , and they shall be permitted to be marked in accordance with 794.2(C) .

Exception: Optical fiber cables that are installed in compliance with 800.48 shall not be required to be listed.

(A) Listing of Cables.

Cables installed as wiring methods within buildings shall be listed as resistant to the spread of fire and other criteria in accordance with 794.2(A)(1) through 794.2(A)(16) .

Informational Note No. 1: See UL 13, *Standard for Power-Limited Circuit Cables* , for applicable requirements for listing of Class 2 and Class 3 cable and power-limited tray cable (PLTC).

Informational Note No. 2: See UL 1424, *Cables for Power-Limited Fire-Alarm Circuits* , for applicable requirements for listing of power-limited fire alarm cable.

Informational Note No. 3: See UL 1651, *Optical Fiber Cable* , for applicable requirements for listing of optical fiber cable.

Informational Note No. 4: See UL 1400-2-2023, *Outline of Investigation for Fault-Managed Power Systems — Part 2: Requirements for Class 4 Cables* , for applicable requirements for listing of Class 4 cable.

(1) Plenum Cable.

Plenum cable shall be listed as suitable for use in ducts, plenums, and other space for environmental air and shall be listed as having adequate fire-resistant and low-smoke producing characteristics. Plenum cable types shall be identified in Table 794.2(B) .

Informational Note: See NFPA 262 -2023, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces* , for the test method used to determine that a cable is low-smoke producing and fire-resistant, exhibiting a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less.

(2) Riser Cable.

Riser cable shall be listed as suitable for use in a vertical run in a shaft or from floor to floor and shall be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: See ANSI/UL 1666-2012, *Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts* , for the cable requirements defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

(3) General-Purpose Cable.

General-purpose cable shall be listed as resistant to the spread of fire and as suitable for general-purpose use, except for use in risers, ducts, plenums, and other space used for environmental air.

Informational Note: See UL 2556, *Wire and Cable Test Methods* , for defining *resistant to the spread of fire* . One method is to demonstrate that the cables do not spread fire to the top of the tray in the UL Flame Exposure, Vertical Tray Flame Test. The smoke measurements in the test method are not applicable.

A method of defining *resistant to the spread of fire* is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the FT4 Vertical Flame Test.

(4) Alternative General-Purpose Cable.

Alternative general-purpose optical fiber cable shall be listed as suitable for general-purpose use, with the exception of risers and plenums, and shall also be resistant to the spread of fire.

Informational Note: See CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables* , for the CSA vertical flame test — cables in cable trays, that can also be used to define resistance to the spread of fire when the damage (char length) does not exceed 1.5 m (4 ft 11 in.).

(5) Limited-Use Cable.

Limited-use cable shall be listed as suitable for use in dwellings and raceways and shall be listed as resistant to flame spread.

Informational Note: See ANSI/UL 2556, *Standard for Wire and Cable Test Methods*, for one method of determining that cable is resistant to flame spread by testing the cable to the FV-2/VW-1 test.

(6) Type PLTC.

Type PLTC nonmetallic-sheathed, power-limited tray cable shall be listed as being suitable for cable trays, resistant to the spread of fire, and sunlight- and moisture-resistant. Type PLTC cable used in a wet location shall be listed for use in wet locations and marked "wet" or "wet location."

Informational Note: See ANSI/UL 1685-2010, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables* , for the UL flame exposure, vertical tray flame test that is used to determine resistance to the spread of fire when cables do not spread fire to the top of the tray. The smoke measurements in the test method are not applicable.

See CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables* , for the CSA vertical flame test — cables in cable trays that can also be used to define *resistance to the spread of fire* when the damage (char length) does not exceed 1.5 m (4 ft 11 in.).

(7) Circuit Integrity (CI) Cable, Fire-Resistive Cable System, or Electrical Circuit Protective System.

Cables that are used for survivability of critical circuits under fire conditions shall comply with either 794.2(A)(7)(a) , 794.2(A)(7)(b) , or 794.2(A)(7)(c) .

Informational Note: See *NFPA 72* -2025 , *National Fire Alarm and Signaling Code* , 12.4.3 and 12.4.4 for additional information on fire alarm CI cable, fire-resistive cable systems, or electrical circuit protective systems used for fire alarm circuits to comply with the survivability requirements to maintain the circuit's electrical function during fire conditions for a defined period of time.

(0) *CI Cables* . CI cables of the types specified in 794.2(A)(1) , 794.2(A)(2) , 794.2(A)(3) , 794.2(A)(4) , and 794.2(A)(6) and used for survivability of critical circuits shall be marked with the additional classification using the suffix "CI." To maintain its listed fire-resistive rating, CI cable shall only be installed in free air in accordance with 722.24(B). CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of a fire-resistive cable system as covered in 794.2(A)(7)(b) .

Informational Note: See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables,* and UL 1425, *Cables for Non–Power-Limited Fire-Alarm Circuits* , for information on establishing a rating for CI cable. The *UL Guide Information for Nonpower-limited Fire Alarm Circuits* (HNHT) contains information to identify the cable and its installation limitations to maintain the fire-resistive rating.

(0) *Fire-Resistive Cables* . Fire-resistive cables of the types specified in 794.2(A)(1) , 794.2(A)(2) , 794.2(A)(3) , 794.2(A)(4) , 794.2(A)(6) , and 794.2(A)(7)(a) that are part of a fire-resistive cable system shall be identified with the system identifier and hourly rating marked on the protectant or the smallest unit container and installed in accordance with the listing of the system.

Informational Note: See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables* , for information on establishing a rating for a fire-resistive cable system. The *UL Guide Information for Electrical Circuit Integrity Systems* (FHIT) contains information to identify the system and its installation limitations to maintain a minimum fire-resistive rating.

(0) *Electrical Circuit Protective System* . Protectants for cables of the types specified in 794.2(A)(1) , 794.2(A)(2) , 794.2(A)(3) , 794.2(A)(4) , and 794.2(A)(6) , that are part of an electrical circuit protective system shall be identified with the protective system identifier and hourly rating marked on the protectant or the smallest unit container and installed in accordance with the listing of the protective system.

Informational Note: See UL 1724, *Fire Tests for Electrical Circuit Protective Systems,* for information on establishing a rating for an electrical circuit protective system. The *UL Guide Information for Electrical Circuit Integrity Systems* (FHIT) contains information to identify the system and its installation limitations to maintain the fire-resistive rating.

(8) Class 3 Single Conductors.

Class 3 single conductors used as other wiring within buildings shall be listed Type CL3 and shall not be smaller than 18 AWG.

Informational Note: See ANSI/UL 1685-2010, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, for the UL flame exposure, vertical tray flame test that is used to determine *resistance to the spread of fire* when cables do not spread fire to the top of the tray. The smoke measurements in the test method are not applicable.

See CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables*, for the CSA vertical flame test — cables in cable trays that can also be used to define *resistance to the spread of fire* when the damage (char length) does not exceed 1.5 m (4 ft 11 in.).

(9) Limited Power (LP) Cable.

Class 2 and Class 3 LP cables shall be listed as suitable for carrying power and data up to a specified current limit for each conductor without exceeding the temperature rating of the cable. The cables shall be marked with the suffix "-LP (XXA)" where XXA designates the current limit in amperes per conductor.

Informational Note: An example of the marking on 23 AWG, 4-pair, Class 2 cable rated 75°C (167°F) with an LP current rating of 0.6 amperes per conductor is "CL2-LP (0.6A) 75°C 23 AWG 4-pair."

(10) Under-Carpet Cables.

Undercarpet cable shall be listed as suitable for use under carpet, floor covering, modular tiles, and planks.

Informational Note: See UL 444, *Standard for Safety for Communications Cables*, for the compressive loading test used to determine the suitability of cable for under-carpet use.

(11) Wet Locations.

Cable used in a wet location shall be listed for use in wet locations and be marked "wet" or "wet location" or have a moisture-impervious metal sheath.

(12) Field-Assembled Optical Fiber Cables.

Field-assembled optical fiber cable shall comply with 794.2(A)(12)(a) through 794.2(A)(12)(d).

(0) The specific combination of jacket and optical fibers intended to be installed as a field-assembled optical fiber cable shall be one of the types in 794.2(A)(1), 794.2(A)(2), or 794.2(A)(3), and shall be marked in accordance with Table 794.2(B).

(0) The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers with which it is identified for use.

(0) The optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use.

(0) The jacket without fibers shall meet the listing requirements for communications raceways in 800.182(A), 800.182(B), or 800.182(C) in accordance with the cable marking.

(13) Cables Containing Optical Fibers.

Hybrid optical fiber cables shall be listed as electrical cables based on the type of electrical conductors.

(14) Class 2 and Class 3 Cable Voltage and Temperature Ratings.

Class 2 cables shall have a voltage rating of not less than 150 volts. Class 3 cables shall have a voltage rating of not less than 300 volts. Class 2 and Class 3 cables shall have a temperature rating of not less than 60°C (140°F).

(15) Power-Limited Fire Alarm (PLFA) Cables.

PLFA cables shall comply with 794.2(A)(15)(a) through 794.2(A)(15)(d) .

(0) Conductors for cables, other than coaxial cables, shall be solid or stranded copper. Coaxial cables shall be permitted to use 30 percent conductivity copper-covered steel center conductor wire.

(0) The size of conductors in a multiconductor cable shall not be smaller than 26 AWG. Single conductors shall not be smaller than 18 AWG. Conductors of 26 AWG shall be permitted only where spliced with a connector listed as suitable for 26 AWG to 24 AWG or larger conductors that are terminated on equipment or where the 26 AWG conductors are terminated on equipment listed as suitable for 26 AWG conductors.

(0) The size of conductors in a multiconductor cable shall not be smaller than 26 AWG. Single conductors shall not be smaller than 18 AWG. Conductors of 26 AWG shall be permitted only where spliced with a connector listed as suitable for 26 AWG to 24 AWG or larger conductors that are terminated on equipment or where the 26 AWG conductors are terminated on equipment listed as suitable for 26 AWG conductors.

(0) Cables shall have a temperature rating of not less than 60°C (140°F).

(16) Class 4 Cable Construction.

(0) *Sizes.* Conductors of sizes not smaller than 24 AWG shall be permitted to be used.

(0) *Insulation.* Insulation on conductors shall be rated not less than 450 volts dc.

(0) *Voltage Rating.* Cables shall have a voltage rating of not less than 450 bolts dc. Voltage ratings shall not be marked on the cables.

(0) *Temperature Rating.* Cables shall have a temperature rating of not less than 60°C (140°F).

~~**(B)** Marking.~~

Cables shall be durably marked on the surface in accordance with the following:

(0) The AWG size or circular mil area shall be repeated at intervals not exceeding 610 mm (24 in.).

(0) All other markings shall be repeated at intervals not exceeding 1.0 m (40 in.).

(0) The proper type designation for the type of cable shall be marked in accordance with Table 794.2(B) .

(0) The manufacturer's name, trademark, or other distinctive marking by which the organization responsible for the product can be readily identified shall be marked.

(0) The AWG size or circular mil area shall be marked.

Informational Note No. 1: See Chapter 9, Table 8 for conductor area expressed in SI units for conductor sizes specified in AWG or circular mil area.

(0) The temperature rating for a temperature rating exceeding 60°C (140°F) shall be marked.

Informational Note No. 2: A minimum temperature rating of 60°C (140°F) is assumed for cables not marked with a temperature rating.

(0) Voltage ratings shall not be marked on the cables.

Exception: If the cable has multiple listings and a voltage marking is required for one or more of the listings, voltage ratings shall be marked on the cable.

Informational Note No. 3: Voltage markings on cables could be misinterpreted to suggest that the cables may be suitable for Class 1 electric light and power applications.

Informational Note No. 4: Cable types are listed in descending order of fire resistance rating.

(0) Metallic conductor cables containing optical fibers shall be marked with the suffix "-OF".

Table 794.2(B) Cable Type Markings

Cable Type	Cable Marking
Class 4 plenum cable	CL4P
Class 3 plenum cable	CL3P
Class 2 plenum cable	CL2P
Power-limited fire alarm plenum cable	FPLP
Nonconductive optical fiber plenum cable	OFNP
Conductive optical fiber plenum cable	OFCP
Class 4 riser cable	CL4R
Class 3 riser cable	CL3R
Class 2 riser cable	CL2R
Power-limited fire alarm riser cable	FPLR
Nonconductive optical fiber riser cable	OFNR
Conductive optical fiber riser cable	OFCR
Class 4 general-purpose cable	CL4
Class 3 general-purpose cable	CL3
Class 2 general-purpose cable	CL2
Class 4 outdoor-only use cable	CL4Z
Power-limited fire alarm cable	FPL
Nonconductive general-purpose optical fiber cable	OFN

Cable Type	Cable Marking
Conductive general-purpose optical fiber cable	OFC
Alternative nonconductive general-purpose optical fiber cable	OFNG
Alternative conductive general-purpose optical fiber cable	OFCG
Class 3 cable — limited use	CL3X
Class 2 cable — limited use	CL2X
Under-carpet cable	CMUC

Note: All types of CL2, CL3, CL4, and FPL cables containing optical fibers are provided with the suffix "-OF."

(C) Optional Markings.

Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials.

Informational Note No. 1: Examples of these characteristics include, but are not limited to, limited smoke, halogen free, low smoke and halogen free, and sunlight resistant.

Informational Note No. 2: Some examples of optional markings are ST1 to indicate limited smoke characteristics. See UL 2556, *Wire and Cable Test Methods* , HF to indicate halogen free. See in UL 2885, *Outline of Investigation for Acid Gas, Acidity and Conductivity of Combusted Materials* , and LSHF to indicate halogen free and low-smoke characteristics. See IEC 61034-2, *Measurement of smoke density of cables burning under defined conditions — Part 2: Test procedure and requirements* .

794.4 Other Articles.

In addition to the requirements of this article, installation of cables shall comply with the articles or sections listed in 794.4(A) through 794.4(L) . Only those sections of Article 300 referenced in this article shall apply.

(A) Installation of Cables and Conductors in Raceway.

The number and size of conductors and cables, as well as raceway sizing, shall comply with 300.19 .

(B) Cables in Ducts for Dust, Loose Stock, or Vapor Removal.

Section 300.25(A) for wiring systems shall apply.

(C) Cable Trays.

Cable tray installations shall comply with Article 392 , Parts I and II.

(D) Instrumentation Tray Cable.

Circuits wired using instrumentation tray cable shall comply with 335.1 and 335.10 through 335.90 .

(E) Raceways or Sleeves Exposed to Different Temperatures.

Section 300.9(A) shall apply.

(F) Vertical Support for Fire-Resistive Cables and Conductors.

Vertical installations of circuit integrity (CI) cables and conductors installed in a raceway or conductors and cables of electrical circuit protective systems and fire-resistive-cable systems shall be installed in accordance with 300.21 .

(G) Corrosive, Damp, or Wet Locations.

The installation of power-limited cables installed in corrosive, damp, or wet locations shall comply with 110.11 , 300.7(B) , 300.8 , 300.11 , and 310.10(F) .

(H) Cable Routing Assemblies.

Cables installed in cable routing assemblies shall be selected in accordance with Table 800.154(c), listed in accordance with 800.182, and installed in accordance with 800.110(C)(1), 800.110(C)(2), and 800.113.

(I) Communications Raceways.

Cable communications raceways shall be selected in accordance with Table 800.154(b), listed in accordance with 800.182, and installed in accordance with 800.113 and 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing (ENT) apply.

(J) Temperature Limitation of Cables.

The requirements of 310.14(A)(3) on the temperature limitation of conductors shall apply to power-limited circuit cables and fault-managed power cables.

(K) Identification of Equipment Grounding Conductors.

Equipment grounding conductors shall be identified in accordance with 250.119 .

Exception No. 1: Cables that do not contain an equipment grounding conductor shall be permitted to use a conductor with green insulation, or green insulation with one or more yellow stripes, for other than equipment grounding purposes.

Exception No. 2: Conductors with green insulation shall be permitted to be used as ungrounded signal conductors for Types FPLP, FPLR, FPL, and substitute cables installed in accordance with 760.154(A).

(L) Specific Requirements.

As appropriate, the installation of wires and cables shall also comply with the following:

(0) Class 2 and Class 3 cables: Article 725

(0) Class 4 cables: Article 726 , Part IV of Article 726

(0) Fire alarm cables: Article 760 , Part III of Article 760

(0) Optical fiber cables: Article 770 , Part V

794.12 Uses Not Permitted.

Class 4 cables shall not be permitted for any applications that are not part of a Class 4 system.

Exception: Use of Class 4 cable for other applications shall be permitted if the cable has been listed as suitable for the other applications.

794.27 Temperature Limitation of Optical Fiber Cables.

Optical fiber cable shall not be used in such a manner that its operating temperature exceeds that of its rating.

794.31 Safety-Control Equipment.

Where damage to power-limited circuits can result in a failure of safety-control equipment that would introduce a direct fire or life hazard, all conductors of such circuits shall be installed in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, electrical metallic tubing, Type MI cable, or Type MC cable, or be protected from physical damage. Room thermostats, water temperature regulating devices, and similar controls used in conjunction with electrically controlled household heating and air conditioning shall not be considered safety-control equipment.

794.135 Installation of Cables.

The installation of cables shall comply with 794.135(A) through 794.135(I), as applicable.

~~**(A)** Cables in Buildings.~~

The installation of cables shall comply with Table 794.135(A) .

Table 794.135(A) Installation of Listed Cables in Buildings

Applications		Cable Type [1]					
		Plenum	Riser	General-Purpose	Limited-Use	Under Carpet	PLTC
In ducts specifically fabricated for environmental air as described in 300.25(B) [2]	Cables in lengths as short as practicable to perform the required function	Y	N	N	N	N	N
	In metal raceway that complies with 300.25(B)	Y	Y	Y	Y	N	Y
In other spaces used for environmental air (plenums) as described in 300.25(C)	Cables in other spaces used for environmental air	Y	N	N	N	N	N
	Cables in metal raceway that complies with 300.25(C)	Y	Y	Y	Y	N	Y
	Cables in plenum communications raceways	Y	N	N	N	N	N
	Cables in plenum cable routing assemblies	Y	N	N	N	N	N
	Cables supported by open metal cable trays	Y	N	N	N	N	N
	Cables or cables installed in raceways or cable routing assemblies supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y	Y	N	Y
In risers and vertical runs	Cables in vertical runs penetrating one or more floors and in vertical runs in a shaft	Y	Y	N	N	N	N
	Cables in metal raceways	Y	Y	Y	Y	N	Y
	Cables in fireproof shafts	Y	Y	Y	N	N	Y
	Cables in plenum communications raceways	Y	Y	N	N	N	N
	Cables in plenum cable routing assemblies	Y	Y	N	N	N	N

Applications		Cable Type [1]					
		Plenum	Riser	General-Purpose	Limited-Use	Under Carpet	PLTC
	Cables in riser communications raceways	Y	Y	N	N	N	N
	Cables in riser cable routing assemblies	Y	Y	N	N	N	N
	Cables in one- and two-family dwellings	Y	Y	Y	Y [3]	N	Y
Cables and innerducts installed in metal raceways in a riser having firestops at each floor [2]	Cables	Y	Y	Y	Y	N	Y
	Cables in plenum communications raceways (innerduct)	Y	Y	Y	Y	N	Y
	Cables in riser communications raceways (innerduct)	Y	Y	Y	Y	N	Y
	Cables in general-purpose communications raceways (innerduct)	Y	Y	Y	Y	N	Y
In fireproof riser shafts having firestops at each floor [2]	Cables	Y	Y	Y	N	N	Y
	Cables in plenum communications raceways or plenum cable routing assemblies	Y	Y	Y	N	N	Y
	Cables in riser communications raceways or riser cable routing assemblies	Y	Y	Y	N	N	Y
	Cables in general-purpose communications raceways or general-purpose cable routing assemblies	Y	Y	Y	N	N	Y
In cable trays	Outdoors	N	N	N	N	N	Y
	Cables, or cables in plenum, riser, or general-purpose communications raceways, installed indoors	Y	Y	Y	N	N	Y
In cross-connect arrays	Cables, and cables in plenum, riser, or general-purpose	Y	Y	Y	N	N	Y

Applications		Cable Type [1]					
		Plenum	Riser	General-Purpose	Limited-Use	Under Carpet	PLTC
	communications raceways or cable routing assemblies						
In one-, two-, and multifamily dwellings, and in building locations other than the locations covered above	Cables	Y	Y	Y	Y [3]	N	Y
	Cables in plenum, riser, or general-purpose communications raceways or cable routing assemblies, or raceways recognized in Chapter 3	Y	Y	Y	Y	N	Y
	Cables in nonconcealed spaces	Y	Y	Y	Y [4]	Y	Y
	Under carpet, floor covering, modular flooring, and planks	N	N	N	N	Y	N

[1] "N" indicates that the cable type shall not be installed in the application. "Y" indicates that the cable type shall be permitted to be installed in the application, subject to any limitations described in this article or the articles described in 794.4(L).

[2] In 300.25(B), cables shall be permitted in ducts specifically fabricated for environmental air only if directly associated with the air distribution system.

[3] Limited-use cable shall be permitted to be installed only in one-, two-, and multifamily dwellings and only if the cable is smaller in diameter than 6.35 mm (0.25 in.).

[4] The exposed length of cable shall not exceed 3.05 m (10 ft).

Informational Note No. 1: See NFPA 90A -2024, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for information on fire protection of wiring installed in ducts specifically fabricated for environmental air and other spaces used for environmental air (plenums).

Informational Note No. 2: See 300.23 for firestop requirements for floor penetrations.

Informational Note No. 3: See Chapter 3 for the installation requirements for PLTC cables installed outdoors in cable trays.

Informational Note No. 4: See UL 2024, *Cable Routing Assemblies and Communications Raceways*, for applicable requirements for plenum, riser, and general-purpose cable routing assemblies and raceways.

(B) Industrial Establishments.

In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, Type PLTC cable shall be permitted in accordance with either of the following:

(0) Where the cable is not subject to physical damage, Type PLTC cable that complies with the crush and impact requirements of Type MC cable and is identified as Type PLTC-ER for such use shall be permitted to be exposed between the cable tray and the utilization equipment or device. The cable shall be continuously supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft). Where not subject to physical damage, Type PLTC-ER cable shall be permitted to transition between cable trays and between cable trays and utilization equipment or devices for a distance not to exceed 1.8 m (6 ft) without continuous support. The cable shall be mechanically supported where exiting the cable tray to ensure that the minimum bending radius is not exceeded.

(0) Type PLTC cable, with a metallic sheath or armor in accordance with 794.2(A)(6) , shall be permitted to be installed exposed. The cable shall be continuously supported and protected against physical damage using mechanical protection such as dedicated struts, angles, or channels. The cable shall be secured at intervals not exceeding 1.8 m (6 ft).

(C) In Hoistways.

In hoistways, cables shall be installed in rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or electrical metallic tubing. For elevators or similar equipment, these conductors shall be permitted to be installed as provided in 620.21 .

(D) Cable Substitutions.

The substitutions for cables listed in Table 794.135(D) and illustrated in Figure 794.135(D) shall be permitted. Where substitute cables are installed, the installation requirements of the articles described in 794.4(L) shall also apply. CI cables shall be permitted to be installed to provide 2-hour circuit integrity. See 794.160 .

Informational Note: See 800.179 for information on Types CMP, CMR, CM, and CMX.

Table 794.135(D) Cable Substitutions

Cable Type	Permitted Substitutions
CL3P	CMP
CL2P	CMP, CL3P
CL3R	CMP, CL3P, CMR
CL2R	CMP, CL3P, CL2P, CMR, CL3R
PLTC	None
CL3	CMP, CL3P, CMR, CL3R, CMG, CM, PLTC
CL2	CMP, CL3P, CL2P, CMR, CL3R, CL2R, CMG, CM, PLTC, CL3
CL3X	CMP, CL3P, CMR, CL3R, CMG, CM, PLTC, CL3, CMX
CL2X	CMP, CL3P, CL2P, CMR, CL3R, CL2R, CMG, CM, PLTC, CL3, CL2, CMX, CL3X
FPLP	CMP
FPLR	CMP, FPLP, CMR
FPL	CMP, FPLP, CMR, FPLR, CMG, CM
OFNP	None
OFCP	OFNP
OFNR	OFNP
OFCR	OFNP, OFCP, OFNR
OFNG, OFN	OFNP, OFNR
OFCG, OFC	OFNP, OFCP, OFNR, OFCR, OFNG, OFN
CMUC	None

Figure 794.135(D) Cable Substitution Hierarchy.

794.154 Substitutions for Listed Communications Cables.

The substitutions for communications cables listed in Table 794.154 and illustrated in Figure 794.154 shall be permitted.

Table 794.154 Cable Substitutions

Cable Type	Permitted Substitutions
CMR	CMP
CMG, CM	CMP, CMR
CMX	CMP, CMR, CMG, CM

Figure 794.154 Cable Substitution Hierarchy.

794.155 Substitutions of Listed CATV Cables. Substitutions of Listed CATV Cables.

The substitutions for coaxial cables in Table 794.155 and illustrated in Figure 794.155 shall be permitted.

Informational Note: The substitute cables in Table 794.155 and Figure 794.155 are only coaxial-type cables.

Table 794.155 Coaxial Cable Uses and Permitted Substitutions

Cable Type	Permitted Substitutions
CATVP	CMP, BLP
CATVR	CATVP, CMP, CMR, BMR, BLP, BLR
CATV	CATVP, CMP, CATVR, CMR, CMG, CM, BMR, BM, BLP, BLR, BL
CATVX	CATVP, CMP, CATVR, CMR, CATV, CMG, CM, BMR, BM, BLP, BLR, BL, BLX

Figure 794.155 Coaxial Cable Substitution Hierarchy.

794.156 Substitutions of Network-Powered Broadband Communications System Cables.

The substitutions for network-powered broadband system cables listed in Table 794.156 shall be permitted.

Table 794.156 Cable Substitutions

Cable Type	Permitted Cable Substitutions
BM	BMR
BLP	CMP, CL3P
BLR	CMP, CL3P, CMR, CL3R, BLP, BMR
BL	CMP, CMR, CM, CMG, CL3P, CL3R, CL3, BMR, BM, BLP, BLR
BLX	CMP, CMR, CM, CMG, CMX, CL3P, CL3R, CL3, CL3X, BMR, BM, BLP, BRP, BL

794.157 Substitutions of Fire Alarm Cables.

The substitutions for fire alarm cables listed in Table 794.157 and illustrated in Figure 794.157 shall be permitted. Where substitute cables are installed, the wiring requirements of Article 760, Parts I and III, shall apply.

Informational Note: See 800.179 for information on communications cables (CMP, CMR, CMG, CM).

Figure 794.157 Cable Substitution Hierarchy.

Table 794.157 Cable Substitutions

Cable Type	Permitted Substitutions
FPLP	CMP
FPLR	CMP, FPLP, CMR
FPL	CMP, FPLP, CMR, FPLR, CMG, CM

794.158 Substitutions of Listed Optical Fiber Cables.

The substitutions for optical fiber cables in Table 794.158 and illustrated in Figure 794.158 shall be permitted.

Table 794.158 Cable Substitutions

Cable Type	Permitted Cable Substitutions
BM	BMR
BLP	CMP, CL3P
BLR	CMP, CL3P, CMR, CL3R, BLP, BMR
BL	CMP, CMR, CM, CMG, CL3P, CL3R, CL3, BMR, BM, BLP, BLR
BLX	CMP, CMR, CM, CMG, CMX, CL3P, CL3R, CL3, CL3X, BMR, BM, BLP, BRP, BL

Figure 794.158 Cable Substitution Hierarchy.

794.160 Circuit Integrity (CI) Cable, Fire-Resistive Cable System, or Electrical Circuit Protective System.

CI cable, a fire-resistive cable system, or a listed electrical circuit protective system shall be permitted for use in systems that supply critical circuits to ensure survivability for continued circuit operation for a specified time under fire conditions.

794.161 Thermocouple Circuits.

Conductors in Type PLTC cables used for Class 2 thermocouple circuits shall be permitted to be any of the materials used for thermocouple extension wire.

794.162 Bundling of 4-Pair Cables Transmitting Power and Data.

Where 4-pair cables are used to transmit power and data to a powered device, 794.204 shall apply.

794.163 Installation of Circuit Conductors Extending Beyond One Building.

Circuit conductors that extend beyond one building and are run such that they are subject to accidental contact with electric light or power conductors operating over 300 volts to ground, or are exposed to lightning on interbuilding circuits on the same premises, shall comply with the following:

(0) For other than coaxial conductors, 800.44 , 800.53 , 800.100, 800.50 , 805.93, 805.170(A) , and 805.170(B)

(0) For coaxial conductors, 800.44 , 820.93, and 820.100

(0) The installation requirements of Article 300 , Part I

794.164 Installation in Dwelling Units.

Where Class 4 cables are used in a dwelling unit, 790.214 shall apply.

Part II. Wiring Methods

794.200 Wiring Methods and Materials on Load Side of the Class 2 or Class 3 Power Source.

Class 2 and Class 3 circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with 794.200(A) , 794.200(B) , or a combination of both. Article 722, Parts I and II shall apply.

(A) Class 1 Wiring Methods and Materials.

Use of Class 1 wiring methods for Class 2 and Class 3 circuits shall be permitted. Separation from electric light, power, Class 1, non-power-limited fire alarm circuit conductors, and medium-power network-powered broadband communications cables shall comply with 725.136 .

Exception: The ampacity adjustment factors given in 310.15(C)(1) shall not apply.

(B) Class 2 and Class 3 Wiring Methods and Materials.

Conductors on the load side of the power source shall be insulated in accordance with 794.2 and be installed in accordance with 794.135 and 725.136 through 794.204 .

Exception No. 1: As provided for in 620.21 for elevators and similar equipment.

Exception No. 2: Other wiring methods and materials installed in accordance with 725.3 shall be permitted to extend or replace the conductors and cables described in 794.2(A) and permitted by 794.200(B) .

Exception No. 3: Bare Class 2 conductors shall be permitted as part of a listed intrusion protection system where installed in accordance with the listing instructions for the system.

794.204 Bundling of Cables Transmitting Power and Data.

Sections 794.204(A) and 794.204(B) shall apply to Class 2 and Class 3 circuits that transmit power and data to a powered device over listed cabling. Section 300.13 and Article 725 , Parts I and III shall apply to Class 2 and Class 3 circuits that transmit power and data. The conductors that carry power for the data circuits shall be copper. The current in the power circuit shall not exceed the current limitation of the connectors.

Informational Note No. 1: One example of the use of cables that transmit power and data is the connection of closed-circuit TV cameras (CCTV).

Informational Note No. 2: The 8P8C connector is in widespread use with powered communications systems. IEC 60603-7-2008, *Connectors for electronic equipment — Part 7-1: Detail specification for 8-way, unshielded, free and fixed connectors,* specifies these connectors to have a current-carrying capacity per contact of 1.0 amperes maximum at 60°C (149°F). See IEC 60603-7 for more information on current-carrying capacity at higher and lower temperatures.

Informational Note No. 3: The requirements of Table 725.144 were derived for carrying power and data over 4-pair copper balanced twisted pair cabling. This type of cabling is described in ANSI/TIA 568-C.2-2009, *Commercial Building Telecommunications Cabling Standard — Part 2: Balanced Twisted-Pair Telecommunications Cabling and Components* .

Informational Note No. 4: See TIA-TSB-184-A-2017, *Guidelines for Supporting Power Delivery Over Balanced Twisted-Pair Cabling* , for information on installation and management of balanced twisted pair cabling supporting power delivery.

Informational Note No. 5: See ANSI/NEMA C137.3-2017, *American National Standard for Lighting Systems — Minimum Requirements for Installation of Energy Efficient Power over Ethernet (PoE) Lighting Systems* , for information on installation of cables for PoE lighting systems.

Informational Note No. 6: Rated current for power sources covered in 794.204 is the output current per conductor the power source is designed to deliver to an operational load at normal operating conditions, as declared by the manufacturer. In the design of these systems, the actual current in a given conductor might vary from the rated current per conductor by as much as 20 percent. An increase in current in one conductor is offset by a corresponding decrease in current in one or more conductors of the same cable.

(A) Use of 4-Pair Class 2 or Class 3 Cables to Transmit Power and Data.

Where Type CL3P, Type CL2P, Type CL3R, Type CL2R, Type CL3, or Type CL2 4-pair cables transmit power and data, the rated current per conductor of the power source shall not exceed the ampacities in Table 792.204 at an ambient temperature of 30°C (86°F). For ambient temperatures above 30°C (86°F), the correction factors in Table 310.15(B)(1)(1) or in Equation 310.15(B) shall apply.

Exception: Compliance with Table 792.204 shall not be required for installations where conductors are 24 AWG or larger and the rated current per conductor of the power source does not exceed 0.3 amperes.

Informational Note: One example of the use of Class 2 cables is a network of closed-circuit TV cameras using 24 AWG, 60°C (140°F) rated, Type CL2R, Category 5e balanced twisted-pair cabling.

(B) Use of Class 2-LP or Class 3-LP Cables to Transmit Power and Data.

Type CL3P-LP, Type CL2P-LP, Type CL3R-LP, Type CL2R-LP, Type CL3-LP, or Type CL2-LP cables shall be permitted to supply power to equipment from a power source with a rated current per conductor up to the marked current limit located immediately following the suffix "-LP" and shall be permitted to transmit data to the equipment. Where the number of bundled LP cables is 192 or less and the selected ampacity of the cables in accordance with Table 792.204 exceeds the marked current limit of the cable, the ampacity determined from the table shall be permitted to be used. For ambient temperatures above 30°C (86°F), the correction factors of Table 310.15(B)(1)(1) or Equation 310.15(B) shall apply. The Class 2-LP and Class 3-LP cables shall comply with the following, as applicable:

(0) Cables with the suffix "-LP" shall be permitted to be installed in bundles, raceways, cable trays, communications raceways, and cable routing assemblies.

(0) Cables with the suffix "-LP" and a marked current limit shall follow the substitution hierarchy of 722.135(E) for the cable type without the suffix "-LP" and without the marked current limit.

(0) System design shall be permitted by qualified persons under engineering supervision.

Informational Note: An example of the marking on a 23 AWG, 4-pair, Class 2 cable rated 75°C (167°F) with an LP current rating of 0.6 amperes per conductor is "CL2-LP(0.6A) 75°C 23 AWG 4-pair". See 722.179(A)(9).

Table 792.204 Ampacities of Each Conductor in Amperes in 4-Pair Class 2 or Class 3 Balanced Twisted-Pair Cables Based on Copper Conductors at an Ambient Temperature of 30°C (86°F) with All Conductors in All Cables Carrying Current, 60°C (140°F), 75°C (167°F), and 90°C (194°F) Rated Cables

-	Number of 4-Pair Cables in a Bundle													
-	1–7			8–19			20–37			38–61			62–	
-	Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating			Tempe Rati	
AWG	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°
26	1.00	1.23	1.42	0.71	0.87	1.02	0.55	0.68	0.78	0.46	0.57	0.67	0.45	0.55
24	1.19	1.46	1.69	0.81	1.01	1.17	0.63	0.78	0.91	0.55	0.67	0.78	0.46	0.56
23	1.24	1.53	1.78	0.89	1.11	1.28	0.77	0.95	1.10	0.66	0.80	0.93	0.58	0.71
22	1.50	1.86	2.16	1.04	1.28	1.49	0.77	0.95	1.11	0.66	0.82	0.96	0.62	0.77

Notes:

1. For bundle sizes over 192 cables, or for conductor sizes smaller than 26 AWG, ampacities shall be permitted to be determined by qualified personnel under engineering supervision.

2. Where only half of the conductors in each cable are carrying current, the values in the table shall be permitted to be increased by a factor of 1.4.

Informational Note No. 1: Elevated cable temperatures can reduce a cable's data transmission performance. For information on practices for 4-pair balanced twisted pair cabling, see TIA-TSB-184-A and 6.4.7, 6.6.3, and Annex G of ANSI/TIA-568-C.2, which provide guidance on adjustments for operating temperatures between 20°C and 60°C.

Informational Note No. 2: The per-contact current rating of connectors can limit the maximum allowable current below the ampacity shown in Table 792.204 .

794.214 Ampacity.

The ampacity of Class 4 cables shall comply with 310.15 based on the temperature rating of the Class 4 cable for conductors sized 16 AWG to 6 AWG. For conductors sized 24 AWG to 17 AWG, the Class 4 cable shall have an ampacity in accordance with by the marking FMP-XXA, where XX is the maximum ampacity permitted. In a dwelling unit(s), not more than 20 current- carrying conductors shall be installed without maintaining spacing.

Informational Note No. 1: See 794.2(A)(16) for additional Class 4 cable requirements.

Informational Note No. 2: See UL 1400-1–2022, *Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements* , and UL 1400-2–2023, *Outline of Investigation for Fault-Managed Power Systems — Part 2: Requirements for Class 4 Cables* , for information on determining maximum ampacities.

794.220 Wiring Methods and Materials on Load Side of the PLFA Power Source.

Fire alarm circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with 794.220(A) , 794.220(B) , or a combination of both. Article 722 , Parts I and II shall apply.

(A) NPLFA Wiring Methods and Materials.

NPLFA wiring methods shall be permitted when used in accordance with 760.46 , 760.49 , or 760.53 for PLFA circuits. Conductors shall be solid or stranded copper. Separation from electric light, power, Class 1, non-power-limited fire alarm circuit conductors, and medium-power network-powered broadband communications cables shall comply with 760.136 .

Exception: The ampacity adjustment factors specified in 310.15(C)(1) shall not apply.

(B) PLFA Wiring Methods and Materials.

Power-limited fire alarm conductors and cables described in 794.2 shall be installed as detailed in 794.135 and 794.220(B)(1) through 794.220(B)(4) . Devices shall be installed in accordance with 110.3(B) , 300.13(A) , and 300.17 .

(1) In Raceways, Exposed on Ceilings or Sidewalls, or Fished in Concealed Spaces.

Cable splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices, or utilization equipment. Where installed exposed, cables shall be adequately supported and installed such that maximum protection against physical damage is afforded by building construction such as baseboards, door frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

(2) Passing Through a Floor or Wall.

Cables shall be installed in metal raceways or rigid nonmetallic conduit where passing through a floor or wall to a height of 2.1 m (7 ft) above the floor, unless adequate protection can be afforded by building construction such as detailed in 794.220(B)(1) or unless an equivalent solid guard is provided.

(3) Nonconcealed Spaces.

Cables covered by Chapter 3 used for wiring of PLFA circuits and installed in nonconcealed spaces shall comply with the following:

(0) The cables shall be installed in accordance with 722.179(A)(15)(a) and 722.179(A)(15)(b).

(0) Exposed portions of the cable shall have a length not exceeding 3 m (10 ft).

(4) Portable Fire Alarm Systems.

A portable fire alarm system provided to protect a stage or set when not in use shall be permitted to use wiring methods in accordance with 530.12 .

794.222 Conductor Size.

Conductors of 26 AWG shall be permitted only where spliced with a connector listed as suitable for 26 AWG to 24 AWG or larger conductors that are terminated on equipment or where the 26 AWG conductors are terminated on equipment listed as suitable for 26 AWG conductors. Single conductors shall not be smaller than 18 AWG.

794.223 Support of Conductors.

Power-limited fire alarm circuit conductors shall not be strapped, taped, or attached by any means to the exterior of any conduit or other raceway as a means of support.

794.230 Raceways, Cable Routing Assemblies, and Cable Trays for Optical Fiber Cables.

(A) Types of Raceways.

Optical fiber cables shall be permitted to be installed in any raceway that complies with either 794.230(A)(1) or 794.230(A)(2) .

(1) Raceways Recognized in Chapter 3.

Optical fiber cables shall be permitted to be installed in any raceway included in Chapter 3 . The raceways shall be installed in accordance with Chapter 3

(2) Communications Raceways.

Optical fiber cables shall be permitted to be installed in listed communications raceways selected in accordance with Table 794.340(b) .

(B) Raceway Fill for Optical Fiber Cables.

Raceway fill for optical fiber cables shall comply with either 794.230(B)(1) or 794.230(B)(2) .

(1) Without Electric Light or Power Conductors.

Where optical fiber cables are installed in a raceway without electric light or power conductors, the raceway fill requirements of Chapters 3 and 9 shall not apply.

(2) Nonconductive Optical Fiber Cables with Electric Light or Power Conductors.

Where nonconductive optical fiber cables are installed with electric light or power conductors in a raceway, the raceway fill requirements of Chapters 3 and 9 shall apply.

(C) Cable Routing Assemblies.

Optical fiber cables shall be permitted to be installed in listed cable routing assemblies selected in accordance with Table 794.340(c) .

(D) Cable Trays.

Optical fiber cables shall be permitted to be installed in metal or listed nonmetallic cable tray systems.

794.231 Innerduct for Optical Fiber Cables.

Listed plenum communications raceways, listed riser communications raceways, and listed general-purpose communications raceways selected in accordance with Table 794.340(b) shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3 .

794.233 Installation of Optical Fiber Cables.

Installation of optical fiber cables shall comply with 794.233(A) through 794.233(J). Installation of raceways and cable routing assemblies shall comply with 794.230 .

(A) Listing.

Optical fiber cables installed in buildings shall be listed in accordance with 770.179 and installed in accordance with the limitations of the listing.

Exception: Optical fiber cables that are installed in compliance with 790.434 shall not be required to be listed.

(B) Ducts Specifically Fabricated for Environmental Air.

Installations of optical fiber cables in ducts specifically fabricated for environmental air shall be in accordance with 794.233(B)(1) and 794.233(B)(2) .

(1) Uses Permitted.

The following cables shall be permitted in ducts specifically fabricated for environmental air as described in 300.22(B) if they are directly associated with the air distribution system:

(0) Up to 1.22 m (4 ft) of Types OFNP and OFCP

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in raceways that are installed in compliance with 300.22(B)

Informational Note: See NFPA 90A-2024, *Standard for the Installation of Air-Conditioning and Ventilating Systems* , for information on fire protection of wiring installed in fabricated ducts.

(2) Uses Not Permitted.

Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in ducts specifically fabricated for environmental air as described in 300.22(B).

Informational Note: See NFPA 90A-2024, *Standard for the Installation of Air-Conditioning and Ventilating Systems* , for information on fire protection of wiring installed in fabricated ducts.

(C) Other Spaces Used for Environmental Air (Plenums).

Installations of optical fiber cables in other spaces used for environmental air shall be in accordance with 794.233(C)(1) and 794.233(C)(2) .

(1) Uses Permitted.

The following cables shall be permitted in other spaces used for environmental air as described in 300.22(C):

(0) Types OFNP and OFCP

(0) Types OFNP and OFCP installed in plenum communications raceways

(0) Types OFNP and OFCP installed in plenum cable routing assemblies

(0) Types OFNP and OFCP supported by open metal cable tray systems

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in raceways that are installed in compliance with 300.22(C)

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums), as described in 300.22(C)

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in plenum riser and general-purpose communications raceways supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums), as described in 300.22(C)

(2) Uses Not Permitted.

Types OFNR, OFCR, OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in other spaces used for environmental air (plenums).

Informational Note: See NFPA 90A-2024, *Standard for the Installation of Air-Conditioning and Ventilating Systems* , for information on fire protection of wiring installed in other spaces used for environmental air.

(D) Risers — Cables in Vertical Runs.

Installations of optical fiber cables in vertical runs shall be in accordance with 794.233(D)(1) and 794.233(D)(2) .

(1) Uses Permitted.

The following cables shall be permitted in vertical runs penetrating one or more floors and in vertical runs in a shaft:

(0) Types OFNP, OFCP, OFNR, and OFCR

(0) Types OFNP, OFCP, OFNR, and OFCR installed in the following:

0. Plenum communications raceways
0. Plenum cable routing assemblies
0. Riser communications raceways
0. Riser cable routing assemblies

(2) Uses Not Permitted.

Types OFNG, OFCG, OFN, and OFC shall not be permitted to be installed in vertical runs.

Informational Note: See 770.26 for firestop requirements for floor penetrations.

(E) Risers — Cables Permitted in Metal Raceways.

The following cables and innerducts shall be permitted in metal raceways in a riser having firestops at each floor:

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

0. Plenum communications raceways (innerduct)
0. Riser communications raceways (innerduct)
0. General-purpose communications raceways (innerduct)

Informational Note: See 770.26 for firestop requirements for floor penetrations.

(F) Risers — Cables Permitted in Fireproof Shafts.

The following cables shall be permitted to be installed in fireproof riser shafts having firestops at each floor:

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

0. Plenum communications raceways
0. Plenum cable routing assemblies
0. Riser communications raceways
0. Riser cable routing assemblies
0. General-purpose communications raceways
0. General-purpose cable routing assemblies

Informational Note: See 770.26 for firestop requirements for floor penetrations.

(G) Risers — Cables Permitted in One- and Two-Family Dwellings.

The following cables shall be permitted in one- and two-family dwellings:

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

0. Plenum communications raceways
0. Plenum cable routing assemblies
0. Riser communications raceways
0. Riser cable routing assemblies
0. General-purpose communications raceways
0. General-purpose cable routing assemblies

(H) Cable Trays — Cables Permitted.

The following cables shall be permitted to be supported by cable trays:

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

0. Plenum communications raceways
0. Riser communications raceways
0. General-purpose communications raceways

(I) Distributing Frames and Cross-Connect Arrays — Cables Permitted.

The following cables shall be permitted to be installed in distributing frames and cross-connect arrays:

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

0. Plenum communications raceways
0. Plenum cable routing assemblies
0. Riser communications raceways
0. Riser cable routing assemblies
0. General-purpose communications raceways
0. General-purpose cable routing assemblies

(J) Other Building Locations — Cables Permitted.

The following cables shall be permitted to be installed in building locations other than the locations covered in 794.233(B) through 794.233(I) :

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in the following:

0. Plenum communications raceways
0. Plenum cable routing assemblies
0. Riser communications raceways
0. Riser cable routing assemblies
0. General-purpose communications raceways
0. General-purpose cable routing assemblies

(0) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in a raceway of a type recognized in Chapter 3

794.234 Installation of Optical Fibers and Electrical Conductors.

(A) In Cable Trays and Raceways.

Conductive optical fiber cables contained in an armored or metal-clad-type sheath and nonconductive optical fiber cables shall be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits operating at 1000 volts or less. Conductive optical fiber cables without an armored or metal-clad-type sheath shall not be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits, unless all of the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits are separated from all of the optical fiber cables by a permanent barrier or listed divider.

(B) In Cabinets, Outlet Boxes, and Similar Enclosures.

Nonconductive optical fiber cables shall not be permitted to occupy the same cabinet, outlet box, panel, or similar enclosure housing the electrical terminations of an electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit unless one or more of the following conditions exist:

(0) The nonconductive optical fiber cables are functionally associated with the electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit.

(0) The conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits operate at 1000 volts or less.

(0) The nonconductive optical fiber cables and the electrical terminations of electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuit are installed in factory- or field-assembled control centers.

(0) The nonconductive optical fiber cables are installed in an industrial establishment where conditions of maintenance and supervision ensure that only qualified persons service the installation.

When optical fibers are within the same hybrid cable for electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits operating at 1000 volts or less, they shall be permitted to be installed only where the functions of the optical fibers and the electrical conductors are associated.

Optical fibers in hybrid optical fiber cables containing only current-carrying conductors for electric light, power, or Class 1 circuits rated 1000 volts or less shall be permitted to occupy the same cabinet, cable tray, outlet box, panel, raceway, or other termination enclosure with conductors for electric light, power, or Class 1 circuits operating at 1000 volts or less.

Optical fibers in hybrid optical fiber cables containing current-carrying conductors for electric light, power, or Class 1 circuits rated over 1000 volts shall be permitted to occupy the same cabinet, cable tray, outlet box, panel, raceway, or other termination enclosure with conductors for electric light, power, or Class 1 circuits in industrial establishments, where conditions of maintenance and supervision ensure that only qualified persons service the installation.

(C) With Other Circuits.

Conductive and nonconductive optical fiber cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly, with conductors of any of the following:

(0) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with 645.5(E)(2) or Article 725 , Parts I and II

(0) Power-limited fire alarm systems in compliance with Article 760 , Parts I and III

(0) Communications circuits in compliance with Article 805 , Parts I and V

(0) Community antenna television and radio distribution systems in compliance with Article 820 , Parts I and V

(0) Low-power network-powered broadband communications circuits in compliance with Article 830 , Parts I and V

(D) Support of Optical Fiber Cables.

Raceways shall be used for their intended purpose. Optical fiber cables shall not be strapped, taped, or attached by any means to the exterior of any conduit or raceway as a means of support.

Exception: *Overhead (aerial) spans of optical fiber cables shall be permitted to be attached to the exterior of a raceway-type mast intended for the attachment and support of such cables.*

794.240 Raceways, Cable Routing Assemblies, and Cable Trays.

(A) Types of Raceways.

Wires and cables shall be permitted to be installed in raceways that comply with 794.240(A)(1), 794.240(A)(2), or 794.240(A)(3). Medium-power network-powered broadband communications cables shall not be installed in raceways that comply with 794.240(A)(2).

(1) Raceways Recognized in Chapter 3.

Wires and cables shall be permitted to be installed in any raceway included in Chapter 3. The raceways shall be installed in accordance with Chapter 3.

(2) Communications Raceways.

Wires and cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with Table 790.340(b), listed in accordance with 800.182, and installed in accordance with 794.242 and 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing (ENT) apply.

(3) Innerduct for Communications Wires and Cables, Coaxial Cables, or Network-Powered Broadband Communications Cables.

Listed plenum communications raceways, listed riser communications raceways, and listed general-purpose communications raceways selected in accordance with Table 794.340(b) shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.

(B) Raceway Fill.

The raceway fill requirements of Chapters 3 and 9 shall apply to medium-power network-powered broadband communications cables.

(C) Cable Routing Assemblies.

Cables shall be permitted to be installed in plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with Table 794.340(c), listed in accordance with 800.182, and installed in accordance with 794.240(C)(1), 794.240(C)(2), and 794.242.

(1) Horizontal Support.

Cable routing assemblies shall be supported where run horizontally at intervals not to exceed 900 mm (3 ft) and at each end or joint, unless listed for other support intervals. In no case shall the distance between supports exceed 3 m (10 ft).

(2) Vertical Support.

Vertical runs of cable routing assemblies shall be supported at intervals not exceeding 1.2 m (4 ft), unless listed for other support intervals, and shall not have more than one joint between supports.

(D) Cable Trays.

Wires and cables and communications raceways shall be permitted to be installed in metal or listed nonmetallic cable tray systems. Ladder cable trays shall be permitted to support cable routing assemblies.

794.242 Installation of Cables Used for Communications Circuits, Communications Wires, Cable Routing Assemblies, and Communications Raceways.

Installation of wires, cables, cable routing assemblies, and communications raceways shall comply with 794.242(A) through 794.242(L) . Installation of cable routing assemblies and communications raceways shall comply also with 794.240 . Types of cables used by this section shall be identified in Table 794.242 .

Table 794.242 Cables Used for Communications Circuits

	Listed Cable Types
Plenum cables	CMP, CATVP, BLP, OFNP, OFCP
Riser cables	CMR, CATVR, BMR, BLR, OFNR, OFCR
General-purpose cables	CMG, CM, CATV, BM, BL, OFNG, OFN, OFCG, OFC
Limited-use cables	CMX, CATVX, BLX
Under-carpet	CMUC
Underground	BMU, BLU

(A) Listing.

Cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways installed in buildings shall be listed and installed in accordance with the limitations of the listing.

Exception: Cables installed in compliance with 800.48 shall not be required to be listed.

(B) Ducts Specifically Fabricated for Environmental Air.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in ducts specifically fabricated for environmental air shall be in accordance with 794.242(B)(1) and 794.242(B)(2) .

(1) Uses Permitted.

The following cables shall be permitted in ducts specifically fabricated for environmental air as described in 300.22(B) if they are directly associated with the air distribution system:

(0) Plenum cables up to 1.22 m (4 ft) in length

(0) Plenum, rise, general-purpose, and limited-use cables installed in raceways that are installed in compliance with 300.22(B)

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in ducts specifically fabricated for environmental air as described in 300.22(B) :

(0) Plenum, riser, and general-purpose communications raceways

(0) Plenum, riser, and general-purpose cable routing assemblies

(0) Riser, general-purpose, and limited-use cables

(0) Type CMUC cables and wires

(0) Types BMU and BLU cables

(0) Communications wires

(0) Hybrid power and communications cables

Informational Note: See NFPA 90A-2024, *Standard for the Installation of Air-Conditioning and Ventilating Systems* , for information on fire protection of wiring installed in fabricated ducts.

(C) Other Spaces Used for Environmental Air (Plenums).

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in other spaces used for environmental air (plenums) shall be in accordance with 794.242(C)(1) and 794.242(C)(2) .

(1) Uses Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall be permitted in other spaces used for environmental air as described in 300.22(C):

(0) Plenum cables

(0) Plenum communications raceways

(0) Plenum cable routing assemblies

(0) Plenum cables installed in plenum communications raceways

(0) Plenum cables installed in plenum cable routing assemblies

(0) Plenum cables and plenum communications raceways supported by open metal cable tray systems

(0) Plenum, riser, general-purpose, and limited-use cables, and communications wires installed in raceways that are installed in compliance with 300.22(C)

(0) Plenum, rise, general-purpose, limited-use cables and plenum, riser, and general-purpose communications raceways supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 300.22(C)

(0) Plenum, riser, general-purpose, and limited-use cables installed in plenum, riser, and general-purpose communications raceways supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 300.22(C)

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in other spaces used for environmental air as described in 300.22(C):

(0) Riser, general-purpose, and limited-use cables

(0) Riser and general-purpose communications raceways

(0) Riser and general-purpose cable routing assemblies

(0) Type CMUC cables and wires

(0) Types BMR, BM, BMU, and BLU cables

(0) Communications wires

(0) Hybrid power and communications cables

Informational Note: See NFPA 90A-2024, *Standard for the Installation of Air-Conditioning and Ventilating Systems* , for information on fire protection of wiring installed in other spaces used for environmental air.

(D) Risers — Cables, Cable Routing Assemblies, and Communications Raceways in Vertical Runs.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in risers shall be in accordance with 794.242(D)(1) and 794.242(D)(2) .

(1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted in vertical runs penetrating one or more floors and in vertical runs in a shaft:

(0) Plenum and riser cables

(0) Plenum and riser communications raceways

(0) Plenum and riser cable routing assemblies

(0) Plenum and riser cables installed in the following:

0. Plenum communications raceways
0. Riser communications raceways
0. Plenum cable routing assemblies
0. Riser cable routing assemblies

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in risers:

(0) General-purpose and limited-use cables

(0) General-purpose communications raceways

(0) General-purpose cable routing assemblies

(0) Type CMUC cables and wires

(0) Types BMR, BM, BMU, and BLU cables

(0) Communications wires

(0) Hybrid power and communications cables

Informational Note: See 800.26 for firestop requirements for floor penetrations.

(E) Risers — Cables and Innerducts in Metal Raceways.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in metal raceways in a riser having firestops at each floor shall be in accordance with 794.242(E)(1) and 794.242(E)(2) .

(1) Uses Permitted.

The following cables and innerducts shall be permitted in metal raceways in a riser having firestops at each floor:

(0) Plenum, riser, general-purpose, and limited-use cables

(0) Plenum, riser, and general-purpose communications raceways (innerduct)

(0) Plenum, riser, general-purpose, and limited-use cables installed in the following:

0. Plenum communications raceways (innerduct)
0. Riser communications raceways (innerduct)
0. General-purpose communications raceways (innerduct)

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in metal raceways in a riser having firestops at each floor:

(0) Plenum, riser, and general-purpose cable routing assemblies

(0) Type CMUC cables and wires

(0) Types BMR, BM, BMU, and BLU cables

(0) Communications wires

(0) Hybrid power and communications cables

Informational Note: See 800.26 for firestop requirements for floor penetrations.

(F) Risers — Cables, Cable Routing Assemblies, and Communications Raceways in Fireproof Shafts.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in fireproof riser shafts having firestops at each floor shall be in accordance with 794.242(F)(1) and 794.242(F)(2) .

(1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted to be installed in fireproof riser shafts having firestops at each floor:

(0) Plenum, riser, general-purpose, and limited-use cables

(0) Plenum, riser, and general-purpose communications raceways

(0) Plenum, riser, and general-purpose cable routing assemblies

(0) Plenum, riser, general-purpose, and limited-use cables installed in the following:

0. Plenum communications raceways
0. Riser communications raceways
0. General-purpose communications raceways
0. Plenum cable routing assemblies
0. Riser cable routing assemblies
0. General-purpose cable routing assemblies

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be permitted in metal raceways in fireproof riser shafts having firestops at each floor:

(0) Type CMUC cables and wires

(0) Type BMU and BLU cables

(0) Communications wires

(0) Hybrid power and communications cables

Informational Note: See 800.26 for firestop requirements for floor penetrations.

(G) Risers — One- and Two-Family Dwellings.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in risers in one- and two-family dwellings shafts shall be in accordance with 794.242(G)(1) and 794.242(G)(2) .

(1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted in one- and two-family dwellings:

(0) Plenum, riser, and general-purpose cables

(0) Limited-use cables less than 6 mm (0.25 in.) in diameter

(0) Plenum, riser, and general-purpose communications raceways

(0) Plenum, riser, and general-purpose cable routing assemblies

(0) Plenum, riser, and general-purpose cables installed in the following:

0. Plenum communications raceways
0. Riser communications raceways
0. General-purpose communications raceways
0. Plenum cable routing assemblies
0. Riser cable routing assemblies
0. General-purpose cable routing assemblies

(2) Uses Not Permitted.

The following cables and wires shall not be permitted in risers in one- and two-family dwellings:

(0) Type CMUC cables and wires

(0) Type BMU and BLU cables

(0) Communications wires

(0) Hybrid power and communications cables

(H) Cable Trays.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways supported by cable trays shall be in accordance with 794.242(H)(1) and 794.242(H)(2) .

(1) Uses Permitted.

The following wires, cables, and communications raceways shall be permitted to be supported by cable trays:

(0) Plenum, riser, and general-purpose cables

(0) Plenum, riser, and general-purpose communications raceways

(0) Communications wires, plenum, riser, and general-purpose cables installed in the following:

0. Plenum communications raceways
0. Riser communications raceways
0. General-purpose communications raceways

(2) Uses Not Permitted.

The following cables and wires shall not be supported by cable trays:

(0) Limited-use cables

(0) Type CMUC cables and wires

(0) Type BMU and BLU cables

(0) Communications wires

(0) Hybrid power and communications cables

(I) Distributing Frames and Cross-Connect Arrays.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in distributing frames and cross-connect arrays shall be in accordance with 794.242(I)(1) and 794.242(I)(2) .

(1) Uses Permitted.

The following wires, cables, cable routing assemblies, and communications raceways shall be permitted to be installed in distributing frames and cross-connect arrays:

(0) Plenum, riser, general-purpose cables and communications wires

(0) Plenum, riser, and general-purpose communications raceways

(0) Plenum, riser, and general-purpose cable routing assemblies

(0) Communications wires, plenum, riser, and general-purpose cables installed in the following:

0. Plenum communications raceways
0. Riser communications raceways
0. General-purpose communications raceways
0. Plenum cable routing assemblies
0. Riser cable routing assemblies
0. General-purpose cable routing assemblies

(2) Uses Not Permitted.

The following cables and wires shall not be installed in distributing frames and cross-connect arrays:

(0) Types BMR, BM, BMU, and BLU cables

(0) Limited-use cables

(0) Type CMUC cables and wires

(0) Hybrid power and communications cables

(J) Other Building Locations.

Installations of cables used for communications circuits, cable communications wires, routing assemblies, and communications raceways in building locations other than those covered in 794.242(B) through 794.242(I) shall be in accordance with 794.242(J)(1) and 794.242(J)(2) .

(1) Uses Permitted.

The following wires, cables, cable routing assemblies, and communications raceways shall be permitted to be installed in building locations other than the locations covered in 794.242(B) through 794.242(I) :

(0) Plenum, riser, and general-purpose cables

(0) Limited-use cables with a maximum of 3 m (10 ft) of exposed length in nonconcealed spaces

(0) Plenum, riser, and general-purpose communications raceways

(0) Plenum, riser, and general-purpose cable routing assemblies

(0) Communications wires, plenum, riser, and general-purpose cables installed in the following:

0. Plenum communications raceways
0. Riser communications raceways
0. General-purpose communications raceways

(0) Plenum, riser, and general-purpose cables installed in the following:

0. Plenum cable routing assemblies
0. Riser cable routing assemblies
0. General-purpose cable routing assemblies

(0) Communications wires and plenum, riser, general-purpose, and limited-use cables installed in raceways recognized in Chapter 3

(0) Type CMUC under-carpet communications wires and cables installed under carpet, modular flooring, and planks

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be installed in building locations other than the locations covered in 794.242(B) through 794.242(I) :

(0) Types BMU and BLU cables

(0) Communications wires

(0) Hybrid power and communications cables

(K) Multifamily Dwellings.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in multifamily dwellings shall be in accordance with 794.242(K)(1) and 794.242(K)(2) .

(1) Uses Permitted.

The following cables, cable routing assemblies, and communications raceways shall be permitted to be installed in multifamily dwellings in locations other than the locations covered in 794.242(B) through 794.242(G) :

(0) Plenum, riser, and general-purpose cables

(0) Limited-use cables less than 6 mm (0.25 in.) in diameter in nonconcealed spaces

(0) Plenum, riser, and general-purpose communications raceways

(0) Plenum, riser, and general-purpose cable routing assemblies

(0) Communications wires and plenum, riser, and general-purpose cables installed in the following:

0. Plenum communications raceways
0. Riser communications raceways
0. General-purpose communications raceways

(0) Plenum, riser, and general-purpose cables installed in the following:

0. Plenum cable routing assemblies
0. Riser cable routing assemblies
0. General-purpose cable routing assemblies

(0) Communications wires and plenum, riser, general-purpose, and limited-use cables installed in raceways recognized in Chapter 3

(0) Type CMUC under-carpet communications wires and cables installed under carpet, modular flooring, and planks

(2) Uses Not Permitted.

The following cables, cable routing assemblies, and communications raceways shall not be installed in multifamily dwellings in locations other than the locations covered in 794.242(B) through 794.242(G) :

(0) Types BMU and BLU cables

(0) Communications wires

(0) Hybrid power and communications cables

(L) One- and Two-Family Dwellings.

Installations of cables used for communications circuits, communications wires, cable routing assemblies, and communications raceways in one- and two-family dwellings in locations other than those covered in 794.242(B) through 794.242(F) shall be in accordance with 794.242(L)(1) and 794.242(L)(2) .

(1) Uses Permitted.

The following wires, cables, cable routing assemblies, and communications raceways shall be permitted to be installed in one- and two-family dwellings in locations other than the locations covered in 794.242(B) through 794.242(F) :

(0) Plenum, riser, and general-purpose cables

(0) Limited-use cables less than 6 mm (0.25 in.) in diameter

(0) Plenum, riser, and general-purpose communications raceways

(0) Plenum, riser, and general-purpose cable routing assemblies

(0) Communications wires and plenum, riser, and general-purpose cables installed in the following:

0. Plenum communications raceways
0. Riser communications raceways
0. General-purpose communications raceways

(0) Plenum, riser, and general-purpose cables installed in the following:

0. Plenum cable routing assemblies
0. Riser cable routing assemblies
0. General-purpose cable routing assemblies

(0) Communications wires and plenum, riser, general-purpose, and limited-use cables installed in raceways recognized in Chapter 3

(0) Type CMUC under-carpet communications wires and cables installed under carpet, modular flooring, and planks

(0) Hybrid power and communications cable listed in accordance with 800.179

(2) Uses Not Permitted.

The following cables, wires, cable routing assemblies, and communications raceways shall not be installed in one- and two-family dwellings in locations other than those covered in 794.242(B) through 794.242(F) :

(0) Types BMU and BLU cables

(0) Communications wires

794.244 Installation of Communications Wires and Cables and CATV-Type Coaxial Cables.

Installation of communications wires and cables, from the protector to the equipment, or where no protector is required, communications wires and cables attached to the outside or inside of the building, shall comply with 794.244(A) and 794.244(B) . Installation of CATV-type coaxial cables, beyond the point of grounding as defined in 820.93, shall comply with 794.244(A) through 794.244(C) .

(A) In Raceways, Cable Trays, Boxes, Cables, Enclosures, and Cable Routing Assemblies.

(1) Other Circuits.

Communications cables and CATV-type coaxial cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly together and with jacketed cables of any of the following:

(0) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with 645.5(E)(2) or Article 725 , Parts I and II

(0) Power-limited fire alarm systems in compliance with Article 760 , Parts I and III

(0) Nonconductive and conductive optical fiber cables in compliance with Article 770 , Parts I and V

(0) Communications circuits in compliance with Articles 800 and 805 , Parts I and IV

(0) Community antenna television and radio distribution systems in compliance with Articles 800 and 820 , Parts I and V

(0) Low-power network-powered broadband communications circuits in compliance with Articles 800 and 830 , Parts I and V

(2) Class 2 and Class 3 Circuits.

Class 1 circuits shall not be run in the same cable with communications circuits. Class 2 and Class 3 circuit conductors shall be permitted in the same listed communications cable with communications circuits.

(3) Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm, and Medium-Power Network-Powered Broadband Communications Circuits in Raceways, Compartments, and Boxes.

Communications wires and cables and CATV-type coaxial cables shall not be placed in any raceway, compartment, outlet box, junction box, or similar fitting with conductors of electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits.

Exception No. 1: Communications wires and cables and CATV-type coaxial cables shall be permitted to be placed in any raceway, compartment, outlet box, junction box, or other enclosures with conductors of electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits where all of the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits are separated from all of the communications wires and cables and CATV-type coaxial cables by a permanent barrier or listed divider.

Exception No. 2: Communications wires and cables and CATV-type coaxial cables shall be permitted to be placed in outlet boxes, junction boxes, or similar fittings or compartments with power conductors where such conductors are introduced solely for power supply to the communications and coaxial cable system distribution equipment. The power circuit conductors shall be routed within the enclosure to maintain a minimum 6 mm (¼ in.) separation from the communications wires and cables and the CATV- type coaxial cables.

Exception No. 3: Separation of circuits shall not be required in elevator traveling cables constructed in accordance with by 620.36 .

(B) Other Applications.

Communications wires and cables and CATV-type coaxial cables shall be separated at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits.

Exception No. 1: *Separation shall not be required where either (1) all of the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type AC, or Type UF cables, or (2) all of the communications wires and cables and all of the CATV-type coaxial cables are encased in raceway.*

Exception No. 2: *Separation shall not be required where the communications wires and cables and CATV-type coaxial cables are permanently separated from the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.*

(C) Support of Communications Wires and Cables and CATV-Type Coaxial Cables.

Raceways shall be used for their intended purpose. Communications wires and cables and CATV-type coaxial cables shall not be strapped, taped, or attached by any means to the exterior of any raceway as a means of support.

Exception: *Overhead (aerial) spans of communications drop wires, communications cables, and CATV-type coaxial cables shall be permitted to be attached to the exterior of a raceway-type mast intended for the attachment and support of such wires and cables.*

794.246 Installation of Network-Powered Broadband Communications Cables and Equipment.

Cable and equipment installations within buildings shall comply with 794.246(A) through 794.246(C) , as applicable.

(A) Separation of Conductors.

~~**(1)** In Raceways, Cable Trays, Boxes, Enclosures, and Cable Routing Assemblies.~~

(0) *Low- and Medium-Power Network-Powered Broadband Communications Circuit Cables.* Low- and medium-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly.

(0) *Low-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits.* Low-power network-powered broadband communications cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with jacketed cables of any of the following circuits:

(0) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Article 725 , Parts I and II

(0) Power-limited fire alarm systems in compliance with Article 760 , Parts I and III

(0) Communications circuits in compliance with Article 805 , Parts I and IV

(0) Nonconductive and conductive optical fiber cables in compliance with Article 770 , Parts I and V

(0) Community antenna television and radio distribution systems in compliance with Article 820 , Parts I and V

(0) *Medium-Power Network-Powered Broadband Communications Circuit Cables with Optical Fiber Cables and Other Communications Cables.* Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:

(0) Communications circuits in compliance with Article 805 , Parts I and IV

(0) Conductive optical fiber cables in compliance with Article 770 , Parts I and V

(0) Community antenna television and radio distribution systems in compliance with Article 820 , Parts I and V

(0) *Medium-Power Network-Powered Broadband Communications Circuit Cables with Other Circuits.* Medium-power network-powered broadband communications cables shall not be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly with conductors of any of the following circuits:

(0) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Article 725 , Parts I and II

(0) Power-limited fire alarm systems in compliance with Article 760 , Parts I and III

(0) *Electric Light, Power, Class 1, Nonpowered Broadband Communications Circuit Cables.* Network-powered broadband communications cable shall not be placed in any raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables.

Exception No. 1: Network-powered broadband communications cable shall be permitted to be placed in a raceway, cable tray, compartment, outlet box, junction box, or similar fittings with conductors of electric light, power, Class 1, or non-power-limited fire alarm circuit cables where all of the conductors of electric light, power, Class 1, non-power-limited fire alarm circuits are separated from all of the network-powered broadband communications cables by a permanent barrier or listed divider.

Exception No. 2: Where power circuit conductors in outlet boxes, junction boxes, or similar fittings or compartments where such conductors are introduced solely for power supply to the network-powered broadband communications system distribution

equipment, the power circuit conductors shall be routed within the enclosure to maintain a minimum 6 mm (¼ in.) separation from network-powered broadband communications cables.

(2) Other Applications.

Network-powered broadband communications cable shall be separated at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, and non-power-limited fire alarm circuits.

Exception No. 1: Separation shall not be required where: (1) all of the conductors of electric light, power, Class 1, and non-power-limited fire alarm circuits are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type AC, or Type UF cables, or (2) all of the network-powered broadband communications cables are encased in a raceway.

Exception No. 2: Separation shall not be required where the network-powered broadband communications cables are permanently separated from the conductors of electric light, power, Class 1, and non-power-limited fire alarm circuits by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.

(B) Support of Network-Powered Broadband Communications Cables.

Raceways shall be used for their intended purpose. Network-powered broadband communications cables shall not be strapped, taped, or attached by any means to the exterior of any conduit or raceway as a means of support.

(C) Splicing of Medium-Powered Network-Powered Communications Cables.

Where a medium-powered network-powered broadband communications cable is spliced or extended, a listed junction box or listed patch panel shall be used.

794.248 Bends.

Bends in network broadband cable shall be made so as not to damage the cable. The radius of the curve of the inner edge of any bend shall not be less than 10 times the diameter of the cable.

Informational Note: See ANSI/TIA-568.0-E, *Generic Telecommunications Cabling for Customer Premises*, for information on bend radii of network broadband cable during different types of installation conditions.

Part III. Applications

~~**794.320** Applications of Listed PLFA Cables.~~

PLFA cables shall comply with the requirements described in Table 794.320 or where cable substitutions are made as shown in 794.157 . Where substitute cables are installed, the wiring requirements of Article 760 , Parts I and III, shall apply. Types FPLP-CI, FPLR-CI, and FPL-CI cables shall be permitted to be installed to provide 2-hour circuit integrity rated cables.

Table 794.320 Applications of Listed PLFA Cables in Buildings

Applications		Cable Type		
		FPLP & FPLP-CI	FPLR & FPLR-CI	FPL & FPL-CI
In fabricated ducts as described in 300.25(B)	In fabricated ducts	Y*	N	N
	In metal raceway that complies with 300.25(B)	Y*	Y*	Y*
In other spaces used for environmental air as described in 300.25(C)	In other spaces used for environmental air	Y*	N	N
	In metal raceway that complies with 300.25(C)	Y*	Y*	Y*
	In plenum communications raceways	Y*	N	N
	In plenum cable routing assemblies	Y*	N	N
	Supported by open metal cable trays	Y*	N	N
	Supported by solid bottom metal cable trays with solid metal covers	Y*	Y*	Y*
In risers	In vertical runs	Y*	Y*	N
-	In metal raceways	Y*	Y*	Y*
-	In fireproof shafts	Y*	Y*	Y*
-	In plenum communications raceways	Y*	Y*	N
-	In plenum cable routing assemblies	Y*	Y*	N
-	In riser communications raceways	Y*	Y*	N
-	In riser cable routing assemblies	Y*	Y*	N
-	In one- and two-family dwellings	Y*	Y*	Y*
Within buildings in other than air-handling spaces and risers	General	Y*	Y*	Y*
	Supported by cable trays	Y*	Y*	Y*
-	In any raceway recognized in Chapter 3	Y*	Y*	Y*
-	In plenum communications raceway	Y*	Y*	Y*
-	In plenum cable routing assemblies	Y*	Y*	Y*
-	In riser communications raceways	Y*	Y*	Y*

Applications		Cable Type		
		FPLP & FPLP-CI	FPLR & FPLR-CI	FPL & FPL-CI
	In riser cable routing assemblies	Y*	Y*	Y*
	In general-purpose communications raceways	Y*	Y*	Y*
	In general-purpose cable routing assemblies	Y*	Y*	Y*

Note:

"N" indicates that the cable type shall not be permitted to be installed in the application.

"Y*" indicates that the cable type shall be permitted to be installed in the application subject to the limitations described in 760.133 through 760.145.

~~**794.330** Applications of Listed Optical Fiber Cables.~~

Permitted and nonpermitted applications of listed optical fiber cables shall be as indicated in Table 794.330(a) . The permitted applications shall be subject to the installation requirements of 794.330 and 794.233 . The substitutions for optical fiber cables in Table 794.330(b) and illustrated in Figure 794.330 shall be permitted.

Table 794.330(a) Applications of Listed Optical Fiber Cables in Buildings

Applications		Listed Optical Fiber Cable Type		
		OFNP, OFCP	OFNR, OFCR	OFNG, OFCG, OFN, OFC
In ducts specifically fabricated for environmental air as described in 300.25(B)	In fabricated ducts	Y*	N	N
	In metal raceway that complies with 300.25(B)	Y*	Y*	Y*
In other spaces used for environmental air (plenums) as described in 300.25(C)	In other spaces used for environmental air	Y*	N	N
	In metal raceway that complies with 300.25(C)	Y*	Y*	Y*
	In plenum communications raceways	Y*	N	N
	In plenum cable routing assemblies	Y*	N	N
	Supported by open metal cable trays	Y*	N	N
	Supported by solid bottom metal cable trays with solid metal covers	Y*	Y*	Y*
In risers	In vertical runs	Y*	Y*	N
	In metal raceways	Y*	Y*	Y*
	In fireproof shafts	Y*	Y*	Y*
	In plenum communications raceways	Y*	Y*	N
	In plenum cable routing assemblies	Y*	Y*	N
	In riser communications raceways	Y*	Y*	N
	In riser cable routing assemblies	Y*	Y*	N
	In one- and two-family dwellings	Y*	Y*	Y*
Within buildings in other than air-handling spaces and risers	General	Y*	Y*	Y*
	Supported by cable trays	Y*	Y*	Y*
	In distributing frames and cross-connect arrays	Y*	Y*	Y*
	In any raceway recognized in Chapter 3	Y*	Y*	Y*
	In plenum communications raceway	Y*	Y*	Y*
	In plenum cable routing assemblies	Y*	Y*	Y*

Applications		Listed Optical Fiber Cable Type		
		OFNP, OFCP	OFNR, OFCR	OFNG, OFCG, OFN, OFC
-	In riser communications raceways	Y*	Y*	Y*
-	In riser cable routing assemblies	Y*	Y*	Y*
-	In general-purpose communications raceways	Y*	Y*	Y*
-	In general-purpose cable routing assemblies	Y*	Y*	Y*

Note: "N" indicates that the cable type shall not be permitted to be installed in the application. "Y*" indicates that the cable type shall be permitted to be installed in the application subject to the limitations described in 770.110 and 770.113.

Informational Note No. 1: Article 770 , Part V of covers installation methods within buildings. Table 794.330(a) covers the applications of listed optical fiber cables in buildings. The definition of *point of entrance* is in Article 100 .

Informational Note No. 2: For information on the restrictions to the installation of optical fiber cables in ducts specifically fabricated for environmental air, see 770.113(B).

Table 794.330(b) Cable Substitutions

Cable Type	Permitted Substitutions
OFNP	None
OFCP	OFNP
OFNR	OFNP
OFCR	OFNP, OFCP, OFNR
OFNG, OFN	OFNP, OFNR
OFCG, OFC	OFNP, OFCP, OFNR, OFCR, OFNG, OFN

Figure 794.330 Cable Substitution Hierarchy.

~~**794.340** Applications of Listed Communications Wires, Cables, and Raceways, and Listed Cable Routing Assemblies.~~

Permitted and nonpermitted applications of listed communications wires, cables, coaxial cables, network-powered broadband communications system cables and raceways, and listed cable routing assemblies shall be in accordance with one of the following:

(0) Listed communications wires and cables as indicated in Table 794.340(a)

(0) Listed communications raceways as indicated in Table 794.340(b)

(0) Listed cable routing assemblies as indicated in Table 794.340(c)

The permitted applications shall be subject to the installation requirements of 794.240 and 794.242 .

Table 794.340(a) Applications of Listed Communications Wires, Cables, Listed Optical Fiber Cables, Listed CATV-type Coaxial Cables, and Listed Network-Powered Broadband Communications Cables in Buildings

Applications		Wire and Cable Type							
		Plenum	Riser	BMR	General-Purpose	BM	Limited-Use	Undercarpet	E E
In ducts specifically fabricated for environmental air as described in 300.25(B)	In fabricated ducts	Y	N	N	N	N	N	N	
	In metal raceway that complies with 300.25(B)	Y	Y	Y	Y	Y	Y	N	
In other spaces used for environmental air (plenums) as described in 300.25(C)	In other spaces used for environmental air	Y	N	N	N	N	N	N	
	In metal raceway that complies with 300.25(C)	Y	Y	Y	Y	Y	Y	N	
	In plenum communications raceways	Y	N	N	N	N	N	N	
	In plenum cable routing assemblies	Y	N	N	N	N	N	N	
	Supported by open metal cable trays	Y	N	N	N	N	N	N	
	Supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y	Y	Y	Y	N	
In risers	In vertical runs	Y	Y	Y	N	N	N	N	
	In metal raceways	Y	Y	Y	Y	Y	Y	N	
	In fireproof shafts	Y	Y	Y	Y	Y	Y	N	

Applications		Wire and Cable Type							
		Plenum	Riser	BMR	General-Purpose	BM	Limited-Use	Undercarpet	E E
	In plenum communications raceways	Y	Y	N	N	N	N	N	
	In plenum cable routing assemblies	Y	Y	N	N	N	N	N	
	In riser communications raceways	Y	Y	N	N	N	N	N	
	In riser cable routing assemblies	Y	Y	N	N	N	N	N	
	In one- and two-family dwellings	Y	Y	Y	Y	Y	Y	N	
Within buildings in other than air-handling spaces and risers	General	Y	Y	Y	Y	Y	Y	N	
	In one- and two-family dwellings	Y	Y	Y	Y	Y	Y	Y	
	In multifamily dwellings	Y	Y	Y	Y	Y	Y	Y	
	In nonconcealed spaces	Y	Y	Y	Y	Y	Y	Y	
	Supported by cable trays	Y	Y	Y	Y	Y	N	N	
	Under carpet, modular flooring, and planks	N	N	N	N	N	N	Y	
	In distributing frames and cross-connect arrays	Y	Y	N	Y	N	N	N	
	In rigid metal conduit (RMC) and intermediate metal conduit (IMC)	Y	Y	Y	Y	Y	Y	Y	
	In any raceway recognized in Chapter 3	Y	Y	Y	Y	Y	Y	N	
	In plenum communications raceways	Y	Y	N	Y	N	N	N	

Applications	Wire and Cable Type							
	Plenum	Riser	BMR	General-Purpose	BM	Limited-Use	Undercarpet	E E
In plenum cable routing assemblies	Y	Y	N	Y	N	N	N	
In riser communications raceways	Y	Y	N	Y	N	N	N	
In riser cable routing assemblies	Y	Y	N	Y	N	N	N	
In general-purpose communications raceways	Y	Y	N	Y	N	N	N	
In general-purpose cable routing assemblies	Y	Y	N	Y	N	N	N	

Note: An “N” in the table indicates that the cable type shall not be installed in the application. A “Y” indicates that the cable type shall be permitted to be installed in the application subject to the limitations described in 800.113. The Riser column includes all riser cables except BMR, and the General-Purpose column includes all general-purpose cables except BM.

Informational Note No. 1: Article 800 , Part IV covers installation methods within buildings. Table 794.340(a) covers the applications of listed communications wires, cables, and raceways in buildings.

Informational Note No. 2: See 800.113(B) for restrictions to the installation of communications cables in fabricated ducts.

Table 794.340(b) Applications of Listed Communications Raceways in Buildings

Applications		Listed Communications Raceway Type		
		Plenum	Riser	General-Purpose
In ducts specifically fabricated for environmental air as described in 300.25(B)	In fabricated ducts	N	N	N
	In metal raceway that complies with 300.25(B)	N	N	N
In other spaces used for environmental air (plenums) as described in 300.25(C)	In other spaces used for environmental air	Y	N	N
	In metal raceway that complies with 300.25(C)	Y	Y	Y
	In plenum cable routing assemblies	N	N	N
	Supported by open metal cable trays	Y	N	N
	Supported by solid bottom metal cable trays with solid metal covers	Y	Y	Y
In risers	In vertical runs	Y	Y	N

Applications		Listed Communications Raceway Type		
		Plenum	Riser	General-Purpose
	In metal raceways	Y	Y	Y
	In fireproof shafts	Y	Y	Y
	In plenum cable routing assemblies	N	N	N
	In riser cable routing assemblies	N	N	N
	In one- and two-family dwellings	Y	Y	Y
Within buildings in other than air-handling spaces and risers	General	Y	Y	Y
	In one- and two-family dwellings	Y	Y	Y
	In multifamily dwellings	Y	Y	Y
	In nonconcealed spaces	Y	Y	Y
	Supported by cable trays	Y	Y	Y
	Under carpet, modular flooring, and planks	N	N	N
	In distributing frames and cross-connect arrays	Y	Y	Y
	In any raceway recognized in Chapter 3	Y	Y	Y
	In plenum cable routing assemblies	N	N	N
	In riser cable routing assemblies	N	N	N
	In general-purpose cable routing assemblies	N	N	N

Note: An “N” in the table indicates that the communications raceway type shall not be installed in the application. A “Y” indicates that the communications raceway type shall be permitted to be installed in the application, subject to the limitations described in 800.110 and 800.113.

Table 794.340(c) Applications of Listed Cable Routing Assemblies in Buildings

Applications		Listed Cable Routing Assembly Type		
		Plenum	Riser	General-Purpose
In ducts specifically fabricated for environmental air as described in 300.25(B)	In fabricated ducts	N	N	N
	In metal raceway that complies with 300.25(B)	N	N	N
In other spaces used for environmental air (plenums) as described in 300.25(C)	In other spaces used for environmental air	Y	N	N
	In metal raceway that complies with 300.25(C)	N	N	N
	In plenum communications raceways	N	N	N

Applications		Listed Cable Routing Assembly Type		
		Plenum	Riser	General-Purpose
	Supported by open metal cable trays	Y	N	N
	Supported by solid bottom metal cable trays with solid metal covers	N	N	N
In risers	In vertical runs	Y	Y	N
	In metal raceways	N	N	N
	In fireproof shafts	Y	Y	Y
	In plenum communications raceways	N	N	N
	In riser communications raceways	N	N	N
	In one- and two-family dwellings	Y	Y	Y
Within buildings in other than air-handling spaces and risers	General	Y	Y	Y
	In one- and two-family dwellings	Y	Y	Y
	In multifamily dwellings	Y	Y	Y
	In nonconcealed spaces	Y	Y	Y
	Supported by cable trays	Y	Y	Y
	Under carpet, modular flooring, and planks	N	N	N
	In distributing frames and cross-connect arrays	Y	Y	Y
	In any raceway recognized in Chapter 3	N	N	N
	In plenum communications raceways	N	N	N
	In riser communications raceways	N	N	N
	In general-purpose communications raceways	N	N	N

Note: An “N” in the table indicates that the cable routing assembly type shall not be installed in the application. A “Y” indicates that the cable routing assembly type shall be permitted to be installed in the application subject to the limitations described in 800.113.

Part IV. Outside Entering Buildings

794.430 Overhead (Aerial) Optical Fiber Cables.

Overhead optical fiber cables containing a non-current-carrying metallic member entering buildings shall comply with 800.44(A) and 800.44(B) .

(A) On Poles and In-Span.

Where outside plant optical fiber cables and electric light or power conductors are supported by the same pole or are run parallel to each other in-span, the conditions described in 794.430(A)(1) through 794.430(A)(4) shall be met.

(1) Relative Location.

Where practicable, the outside plant optical fiber cables shall be located below the electric light or power conductors.

(2) Attachment to Cross-Arms.

Attachment of outside plant optical fiber cables to a cross-arm that carries electric light or power conductors shall not be permitted.

(3) Climbing Space.

The climbing space through outside plant optical fiber cables shall comply with the requirements of 225.14(B) .

(4) Clearance.

Supply service drops and sets of overhead service conductors of 0 to 750 volts running above and parallel to optical fiber cable service drops shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of their attachment to the building. Clearance of not less than 1.0 m (40 in.) shall be maintained between the two services at the pole.

(B) Above Roofs.

Outside plant optical fiber cables shall have a vertical clearance of not less than 2.5 m (8 ft) from all points of roofs above which they pass.

Exception No. 1: The requirement of 770.44(B) shall not apply to auxiliary buildings such as garages and the like.

Exception No. 2: A reduction in clearance above only the overhanging portion of the roof to not less than 450 mm (18 in.) shall be permitted if (1) not more than 1.2 m (4 ft) of optical fiber cable service drop cable passes above the roof overhang, and (2) the cable is terminated at a through- or above-the-roof raceway or approved support.

Exception No. 3: Where the roof has a slope of not less than 100 mm in 300 mm (4 in. in 12 in.), a reduction in clearance to not less than 900 mm (3 ft) shall be permitted.

Informational Note: See ANSI/IEEE C2-2017, *National Electric Safety Code, Part 2, Safety Rules for Overhead Lines* , for additional information regarding overhead wires and cables.

794.432 Underground Optical Fiber Cables Entering Buildings.

Underground optical fiber cables entering buildings shall comply with 794.432(A) and 794.432(B) .

(A) Underground Systems with Electric Light, Power, Class 1, or Non-Power-Limited Fire Alarm Circuit Conductors.

Underground conductive optical fiber cables entering buildings with electric light, power, Class 1, or non-power-limited fire alarm circuit conductors in a raceway, handhole enclosure, or manhole shall be located in a section separated from such conductors by means of brick, concrete, or tile partitions or by means of a suitable barrier.

(B) Direct-Buried Cables and Raceways.

Direct-buried conductive optical fiber cables shall be separated by at least 300 mm (12 in.) from conductors of any electric light, power, non-power-limited fire alarm circuit conductors, or Class 1 circuit.

Exception No. 1: Separation shall not be required where the electric service conductors are installed in raceways or have metal cable armor.

Exception No. 2: Separation shall not be required where electric light or power branch-circuit or feeder conductors, non-power-limited fire alarm circuit conductors, or Class 1 circuit conductors are installed in a raceway or in metal-sheathed, metal-clad, or Type UF, or Type USE cables.

794.434 Unlisted Cables Entering Buildings.

~~**(A)** Conductive and Nonconductive Cables.~~

~~Unlisted conductive and nonconductive outside plant optical fiber cables shall be permitted to be installed in building spaces, other than risers, ducts used for environmental air, plenums used for environmental air, and other spaces used for environmental air, where the length of the cable within the building, measured from its point of entrance, does not exceed 15 m (50 ft) and the cable enters the building from the outside and is terminated in an enclosure.~~

~~The point of entrance shall be permitted to be extended from the penetration of the external wall, roof, or floor slab by continuously enclosing the entrance optical fiber cables in rigid metal conduit (RMC) or intermediate metal conduit (IMC) to the point of emergence.~~

~~Informational Note: Splice cases or terminal boxes, both metallic and plastic types, typically are used as enclosures for splicing or terminating optical fiber cables.~~

~~**(B)** Nonconductive Cables in Raceway.~~

~~Unlisted nonconductive outside plant optical fiber cables shall be permitted to enter the building from the outside and shall be permitted to be installed in any of the following raceways:~~

(0) ~~Intermediate metal conduit (IMC)~~

(0) ~~Rigid metal conduit (RMC)~~

(0) ~~Rigid polyvinyl chloride conduit (PVC)~~

(0) ~~Electrical metallic tubing (EMT)~~

~~Unlisted nonconductive outside plant cables installed in rigid polyvinyl chloride conduit (PVC) or electrical metallic tubing (EMT) shall not be installed in risers, ducts used for environmental air, plenums used for environmental air, and other spaces used for environmental air.~~

~~**Part V.** Grounding~~

~~**794.600** Grounding.~~

~~Non-current-carrying conductive members of optical fiber cables shall be bonded to a grounded equipment rack or enclosure, or grounded in accordance with the grounding methods specified by 750.114(B) using a conductor specified in 750.114(A) .~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 14 18:59:31 EDT 2024

Committee Statement

Committee Statement: The panel had a Task Group confirm that all the requirements in 794 have been appropriately relocated elsewhere in the code. Article 794 is deleted.

Response Message: SR-7596-NFPA 70-2024

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