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WORKING DRAFT OF NEC CODE-MAKING PANEL 3 MEETING OUTPUT

CONTENT NOT FINAL – SUBJECT TO REVISION PRIOR TO LETTER BALLOT AND PUBLICATION OF FIRST DRAFT REPORT

Document: National Electrical Code®

Revision Cycle: A2025

Meeting Dates: January 21 - 26, 2024

Panel Activity: Input Stage

This is a working draft, prepared by NFPA staff, to record the output generated at the Code-Making Panel 3 First Draft Meeting. It includes draft copies of the First Revisions and any Global Revisions.

It is being made available to Panel members for the purpose of facilitating early review, particularly for those Panel members who may be seeking input from their respective organizations in preparation for the First Draft Ballot.

First Revision No. 8603-NFPA 70-2024 [Global Input]

Update all references to UL 1400-1 and UL 1400-2 in Articles 722 and 726 to match the following:

UL 1400-1-2022, Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements

UL 1400-2-2023, Outline of Investigation for Fault-Managed Power Systems — Part 2: Requirements for Class 4 Cables

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8603_Global_UL_1400-X.docx	staff use	

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 20:55:00 EST 2024

Committee Statement

Committee Statement: This revision corrects the titles of UL 1400-1 and UL 1400-2 and adds the edition years.
Response Message: FR-8603-NFPA 70-2024

FR-8603 – Global

REVISION:

Update all references to UL 1400-1 and UL 1400-2 in Articles 722 and 726 to match the following:

UL 1400-1-2022, Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements

UL 1400-2-2023, Outline of Investigation for Fault-Managed Power Systems — Part 2: Requirements for Class 4 Cables

STAFF NOTES:

See the following locations:

[722.179(A)]

(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 **722.179(A)(1)** through (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.

[722.179(A)(16)(5)]

(5) Cabling.

Cables shall comply with any requirements provided in the listing of the system.

> Informational Note: See UL 1400-1-2022, *Outline of Investigation for Fault-Managed Power ~~Distribution Technologies~~Systems — Part 1: General Requirements*, for information on determining applicable requirements for the listing of Class 4 power systems. Excessive cable lengths can result in higher capacitance which could affect the safety of the circuit.

[726.121(A)]

(A) Fault Management.

For listing purposes, a transmitter shall interrupt an energized circuit when any of the following conditions occur on the circuit between the transmitter and receiver:

- (1) A short circuit
- (2) A line-to-line fault condition that presents an unacceptable risk of fire or electric shock
- (3) A ground-fault condition that presents an unacceptable risk of fire or electric shock
- (4) An overcurrent condition
- (5) A malfunction of the monitoring or control system that presents an unacceptable risk of fire or electric shock
- (6) Any other condition that presents an unacceptable risk of fire or electric shock

Informational Note: See UL 1400-1-2022, *Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements*, for information on determining applicable requirements for the listing of Class 4 power systems, including safe operation and limiting the risk of fire and electric shock.

[726.144]

726.144 Ampacity.

The ampacity of Class 4 cables shall comply with **300.15** 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 be rated for the intended ampacity as evidenced by the marking FMP-XXA, where XX is the maximum allowable ampacity permitted.

Informational Note No. 1: See **722.179(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 allowable ampacities.

First Revision No. 8607-NFPA 70-2024 [Global Input]

Create new Article 792, as follows:

Article 792 Power Sources for Limited-Energy Systems

792.1 Scope

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

792.30 ~~725.60~~ Power Sources for Class 2 and Class 3 Circuits.

(A) Power Source.

The power source for a Class 2 or a Class 3 circuit shall be as follows:

Informational Note No. 1: Informational Note Figure 792.30 ~~725.60~~ illustrates the relationships between Class 2 or Class 3 power sources, their supply, and the Class 2 or Class 3 circuits.

Informational Note Figure 792.30 ~~725.60~~ Class 2 and Class 3 Circuits.

[FIGURE with Revisions]

Informational Note No. 2: See Chapter 9, Table 11(A) and Table 11(B), for requirements for listed Class 2 and Class 3 power sources.

(1) A listed Class 2 or Class 3 transformer

(2) A listed Class 2 or Class 3 power supply

(3) Other listed equipment marked to identify the Class 2 or Class 3 power source

Exception No. 1 to (3): Thermocouples shall not require listing as a Class 2 power source.

Exception No. 2 to (3): Limited power circuits of listed equipment where these circuits have energy levels rated at or below the limits established in Chapter 9, Table 11(A) and Table 11(B).

Informational Note No. 3: Examples of other listed equipment are as follows:

(1) A circuit card listed for use as a Class 2 or Class 3 power source where used as part of a listed assembly

(2) 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

(3) A thermocouple

(4) Limited voltage/current or limited impedance secondary communications circuits of listed industrial control equipment

(4) Listed audio/video, information technology, communications, and industrial equipment limited-power circuits

Informational Note No. 4: One way to determine applicable requirements for listing of information technology equipment is to refer to UL 60950-1-2019, *Standard for Safety of Information Technology Equipment*. Another way to determine applicable requirements for

listing of audio/video, information technology, and communications equipment is to refer to UL 62368-1-2023, *Safety of audio/video, information and communication technology equipment*. Typically such circuits are used to interconnect data circuits for the purpose of exchanging information data. One way to determine applicable requirements for listing of industrial equipment is to refer to UL 61010-2-201, *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 2-201: Particular requirements for control equipment*, and/or UL 61800-5-1, *Adjustable speed electrical power drive systems — Part 5-1: Safety requirements — Electrical, thermal and energy*.

(5) A battery source or battery source system that is listed and identified as Class 2

(B) Interconnection of Power Sources.

Class 2 or Class 3 power sources shall not have the output connections paralleled or otherwise interconnected unless listed for such interconnection.

(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 ~~725.60~~ 792.30 (A)(3), limited power circuits for listed audio/video equipment, listed information technology equipment, listed communications equipment, and listed industrial equipment in ~~725.60~~ 792.30 (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 ~~725.144~~ 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.

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.

~~726.121~~ 792.50 Power Sources for Class 4 Circuits.

Class 4 circuits shall be supplied from a power source (transmitter) that has a voltage output of not more than 450 volts peak or dc.

Informational Note: Informational Note Figure ~~726.121~~ 792.50 illustrates the relationships between Class 4 power transmitters (power sources), Class 4 circuits, Class 4 power receivers, and utilization equipment.

Informational Note Figure ~~726.121~~ 792.50 Class 4 Circuits.

[FIGURE]

(A) Fault Management.

A transmitter shall interrupt an energized circuit when any of the following conditions occur on the circuit between the transmitter and receiver:

(1) A short circuit

(2) A line-to-line fault condition that presents an unacceptable risk of fire or electric shock

(3) A ground-fault condition that presents an unacceptable risk of fire or electric shock

(4) An overcurrent condition

(5) A malfunction of the monitoring or control system that presents an unacceptable risk of fire or electric shock

(6) Any other condition that presents an unacceptable risk of fire or electric shock

Informational Note: See UL 1400-1-2022, *Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements*, for information on determining applicable requirements for the listing of Class 4 power systems, including safe operation and limiting the risk of fire and electric shock.

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8607_Global_Article_792.docx		
70_CMP3_FR8607_Global_Article_792-new_article_with_moved_sections.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 22:33:25 EST 2024

Committee Statement

Committee Statement: A new article was created to relocate all power source requirements for limited-energy systems into one place, instead of across multiple articles and chapters.

The scope statement is recommended by CMP-3 but is under the purview of the Correlating Committee.

The Panel chose to title the new article as “Power Sources for Limited-Energy Systems,” instead of “Overcurrent Protection” because the power source provides the circuit protection.

See the definitions for Limited-Energy System and Limited-Energy Circuit.

Response Message: FR-8607-NFPA 70-2024

Public Input No. 3332-NFPA 70-2023 [Global Input]

[FR 8607 – GLOBAL – NEW ARTICLE 792]

[NOTE: Relocated sections are shown with all changes implemented.]

Create new Article 792, as follows:

Article 792 Power Sources for Limited-Energy Systems

792.1 Scope

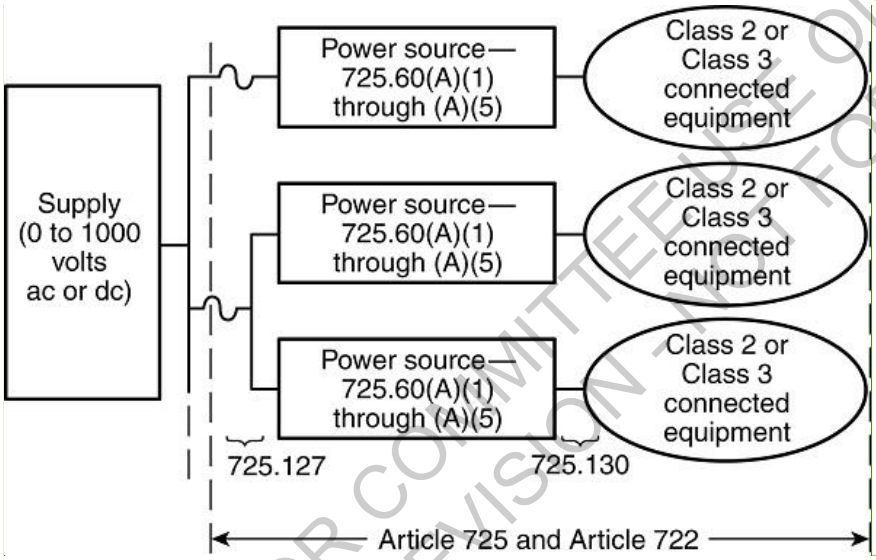
This article covers power source requirements for limited-energy circuits.

792.30~~725.60~~ Power Sources for Class 2 and Class 3 Circuits.

(A) Power Source.

The power source for a Class 2 or a Class 3 circuit shall be as follows:

Informational Note No. 1: Informational Note Figure 792.30~~725.60~~ illustrates the relationships between Class 2 or Class 3 power sources, their supply, and the Class 2 or Class 3 circuits.



Informational Note Figure 792.30~~725.60~~ Class 2 and Class 3 Circuits.

Informational Note No. 2: See Chapter 9, Table 11(A) and Table 11(B), for requirements for listed Class 2 and Class 3 power sources.

(1) A listed Class 2 or Class 3 transformer

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(3) Other listed equipment marked to identify the Class 2 or Class 3 power source

Exception No. 1 to (3): Thermocouples shall not require listing as a Class 2 power source.

Exception No. 2 to (3): Limited power circuits of listed equipment where these circuits have energy levels rated at or below the limits established in Chapter 9, Table 11(A) and Table 11(B).

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2) 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

Commented [BC1]: Revise the figure as follows:
(1) Change "725.60" to "792.30" in 3 places.
(2) No change to "725.127"
(3) Change "725.130" to "794.200"
(4) Change "Article 725 and Article 722" to "Article 725, Article 790, Article 792, and Article 794"

3) A thermocouple
4) Limited voltage/current or limited impedance secondary communications circuits of listed industrial control equipment

(4) Listed audio/video, information technology, communications, and industrial equipment limited-power circuits

Informational Note No. 4: One way to determine applicable requirements for listing of information technology equipment is to refer to UL 60950-1-2019, *Standard for Safety of Information Technology Equipment*. Another way to determine applicable requirements for listing of audio/video, information technology, and communications equipment is to refer to UL 62368-1-2023, *Safety of audio/video, information and communication technology equipment*. Typically such circuits are used to interconnect data circuits for the purpose of exchanging information data. One way to determine applicable requirements for listing of industrial equipment is to refer to UL 61010-2-201, *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 2-201: Particular requirements for control equipment*, and/or UL 61800-5-1, *Adjustable speed electrical power drive systems — Part 5-1: Safety requirements — Electrical, thermal and energy*.

(5) A battery source or battery source system that is listed and identified as Class 2

(B) Interconnection of Power Sources.

Class 2 or Class 3 power sources shall not have the output connections paralleled or otherwise interconnected unless listed for such interconnection.

(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 ~~725.60~~792.30(A)(3), limited power circuits for listed audio/video equipment, listed information technology equipment, listed communications equipment, and listed industrial equipment in ~~725.60~~792.30(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.

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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.

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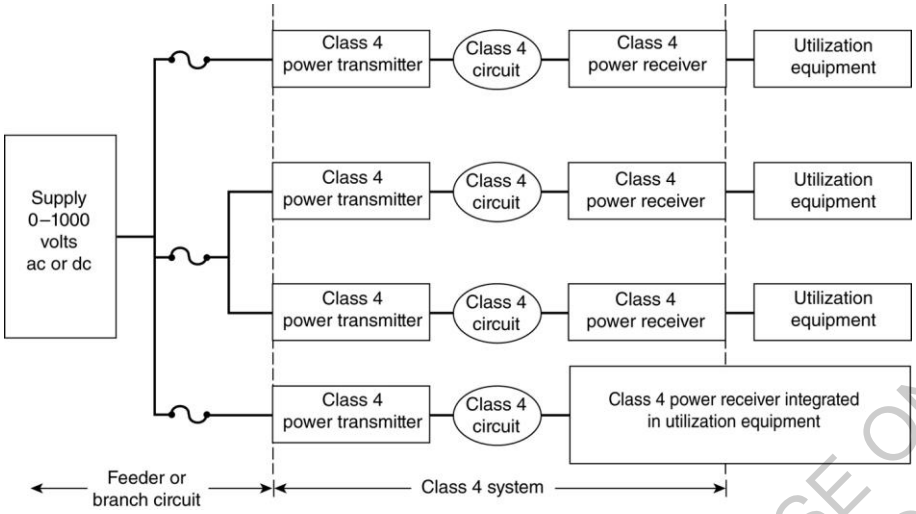
Class 4 circuits shall be supplied from a power source (transmitter) that has a voltage output of not more than 450 volts peak or dc.

Informational Note: Informational Note Figure ~~726.121~~792.50 illustrates the relationships between Class 4 power transmitters (power sources), Class 4 circuits, Class 4 power receivers, and utilization equipment.



Informational Note Figure ~~726.121~~792.50 Class 4 Circuits.

(A) Fault Management.

A transmitter shall interrupt an energized circuit when any of the following conditions occur on the circuit between the transmitter and receiver:

(1) A short circuit

(2) A line-to-line fault condition that presents an unacceptable risk of fire or electric shock

(3) A ground-fault condition that presents an unacceptable risk of fire or electric shock

(4) An overcurrent condition

(5) A malfunction of the monitoring or control system that presents an unacceptable risk of fire or electric shock

(6) Any other condition that presents an unacceptable risk of fire or electric shock

Informational Note: See UL 1400-1-2022, *Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements*, for information on determining applicable requirements for the listing of Class 4 power systems, including safe operation and limiting the risk of fire and electric shock.

First Revision No. 8610-NFPA 70-2024 [Global Input]

Create new Article 790, as follows:

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.

~~**722.10 790.5 Hazardous (Classified) Locations.**~~

~~Class 4 cables~~ Cables and equipment shall be permitted to be used in hazardous (classified) locations where specifically permitted by other articles of this Code.

~~**[722.3](B) 790.6 Spread of Fire or Products of Combustion.**~~

Installation of power-limited circuits shall comply with 300.21.

~~**[722.3](C) 790.7 Ducts, Plenums, and Other Air-Handling Spaces.**~~

~~Power-limited c~~ C ircuits installed in ducts, plenums, or other space used for environmental air shall comply with 300.22.

Exception No. 1: Cables selected in accordance with Table ~~722.135(B)~~ 794.135(A) ~~and installed in accordance with 300.22(B), Exception shall be permitted to be installed in ducts specifically fabricated for environmental air.~~

Exception No. 2: Cables selected in accordance with Table ~~722.135(B)~~ 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 7 94 .15 7 and installed in accordance with 794.135 and 300.22(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 7 94 .15 7 and installed in accordance with 794 .135 shall be permitted to be installed in other spaces used for environmental air (plenums).

~~**[722.3](I) 790.8 Installation of Conductors and Cables with Other Systems.**~~

Installations shall comply with ~~Section~~ 300.8~~shall apply~~ .

~~**722.21 790.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.**~~

~~Access to electrical equipment shall not be denied by an accumulation of cables that prevents removal of panels, including suspended ceiling panels~~ Installations shall comply with 300.2 .

790.24 Mechanical Execution of Work.

The installation shall conform to 300.4 and 300.11.

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.

(A) 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 760.130(B)(1), as applicable, the cable shall be fastened in an approved manner at intervals of not more than 450 mm (18 in.).

~~722.25~~ ~~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 79 0.100.

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
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 (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- E nergy 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 722.135 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 Rules 323 and 341 of IEEE C2-2023, *National Electrical Safety Code* , for information on cable installation in manholes.

(H) Limited-Use and Under-Carpet Limited-Energy Cables.

Limited-use and undercarpet limited-energy cables shall not be installed in cable trays or cable routing assemblies.

79 0.136 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 79 0.136(A) for limited-energy cables and conductors, except as provided in 79 0.136(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 (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 79 0.136(A)(2)(a) or (A)(2)(b).

(a) The power circuit conductors shal l be routed within the enclosure to maintain a minimum 6 mm (0.25 in.) separation from the limited-energy cables.

(b) The circuit conductors shall operate at 150 volts or less to ground and the limited-energy circuit conductors shall be one of the fol lowing :

1. Installed as a Class 1 circuit

2. 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.

(a) *Traveling Cables.* Separation of circuits shall not be required in elevator traveling cables constructed in accordance with 620.36.

(b) *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:

(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.

(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:

(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.

(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.

(a) 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.

(b) 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.

(a) 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 :

(1) 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.

(2) 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.

(3) 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.

(4) 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.

(b) 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.

(c) 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.

(d) 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.

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8610_Global_Article_790.docx	staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 23:31:27 EST 2024

Committee Statement

Committee Statement: A new article was created to relocate all general requirements for limited-energy systems into one place, instead of across multiple articles and chapters.

The scope statement is recommended by CMP-3 but is under the purview of the Correlating Committee.

See the definitions for Limited-Energy System and Limited-Energy Circuit.

Section 790.100 incorporates and combines 725.139, 726.139, and 760.139 with additional changes for the following reasons:

(1) One of the primary changes is to remove an inconsistency between subsections (C) and (E). Subsection (C) only permits Class 2 cables to be in the same raceway, enclosure or cable routing assembly with Class 3 cables if the insulation of the Class 2 cable is rated equal to or greater than the insulation in a Class 3 cable. Subsection (E) permits Class 2 cables, without any step-up in the insulation rating, to be in the same raceway, enclosure or cable routing assembly with power-limited fire alarm and communications cables which have insulation requirements similar to Class 3.

(2) The other primary change is to include Class 4 cables in two places. The text clarifies that Class 2 and Class 3 cables can be installed in the same pathway with Class 4 cables, thereby correlating with 726.139. The text also permits Class 2 or Class 3 circuits to be installed in a Class 4 cable if the cable is dual-listed.

(3) Minor editorial changes were made clarify that the installation, not the circuit, needs to be in compliance with the installation rules. “Circuits” was changed to “cables” to clarify which cables are permitted to be installed together in the same pathway. The subsection headings were expanded to improve usability.

(4) A few other minor editorial changes are included to improve usability, including adding the word “listed” to clarify that all the cables that are permitted to be installed together are listed cables. This clarification is needed to avoid any interpretation that unlisted communications cables are permitted to be installed with the Class 2, Class 3, and Class 4 cables, which are always listed.

(5) The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, “The article number shall precede the part number.” Some of the references were revised because of changes made in the 2023 NEC.

Response Message: FR-8610-NFPA 70-2024

Public Input No. 3923-NFPA 70-2023 [Section No. 760.139]
Public Input No. 3395-NFPA 70-2023 [Sections 725.3(A), 725.3(B)]
Public Input No. 3454-NFPA 70-2023 [Sections 722.3(B), 722.3(C), 722.3(D)]
Public Input No. 3440-NFPA 70-2023 [Sections 760.3(A), 760.3(B)]
Public Input No. 3439-NFPA 70-2023 [Sections 726.136, 726.139]
Public Input No. 3458-NFPA 70-2023 [Section No. 722.25]
Public Input No. 3438-NFPA 70-2023 [Section No. 726.24]
Public Input No. 3397-NFPA 70-2023 [Sections 725.136, 725.139]
Public Input No. 3234-NFPA 70-2023 [Global Input]
Public Input No. 4032-NFPA 70-2023 [Section No. 726.139(C)]
Public Input No. 818-NFPA 70-2023 [Section No. 726.139]
Public Input No. 895-NFPA 70-2023 [Section No. 760.139]
Public Input No. 3457-NFPA 70-2023 [Section No. 722.24(A)]
Public Input No. 2952-NFPA 70-2023 [Section No. 725.139]
Public Input No. 4033-NFPA 70-2023 [Section No. 725.139(E)]
Public Input No. 817-NFPA 70-2023 [Section No. 725.139]
Public Input No. 3442-NFPA 70-2023 [Sections 760.136, 760.139]
Public Input No. 3456-NFPA 70-2023 [Section No. 722.21]
Public Input No. 3441-NFPA 70-2023 [Sections 760.10, 760.21, 760.24, 760.25]
Public Input No. 2955-NFPA 70-2023 [Section No. 726.139(C)]
Public Input No. 3396-NFPA 70-2023 [Sections 725.10, 725.21, 725.24]
Public Input No. 3437-NFPA 70-2023 [Section No. 726.10]
Public Input No. 4041-NFPA 70-2023 [Section No. 760.139]
Public Input No. 3455-NFPA 70-2023 [Section No. 722.10]

[FR 8610 – GLOBAL – NEW ARTICLE 790]

[NOTE: Relocated sections are shown with all changes implemented.]

Create new Article 790, as follows:

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.

~~722.10~~**790.5 Hazardous (Classified) Locations.**

~~Class 4 cables~~ Cables and equipment shall be permitted to be used in hazardous (classified) locations where specifically permitted by other articles of this Code.

~~[722.3](B)~~**790.6 Spread of Fire or Products of Combustion.**

Installation of power-limited circuits shall comply with 300.21.

~~[722.3](C)~~**790.7 Ducts, Plenums, and Other Air-Handling Spaces.**

~~Power-limited c~~Circuits installed in ducts, plenums, or other space used for environmental air shall comply with 300.22.

Exception No. 1: Cables selected in accordance with Table ~~722.135(B)~~794.135(A) and installed in accordance with 300.22(B), Exception shall be permitted to be installed in ducts specifically fabricated for environmental air.

Exception No. 2: Cables selected in accordance with Table ~~722.135(B)~~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 300.22(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).

~~[722.3](I)~~**790.8 Installation of Conductors and Cables with Other Systems.**

Installations shall comply with ~~Section~~ 300.8 ~~shall apply~~.

~~722.21~~**790.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.**

~~Access to electrical equipment shall not be denied by an accumulation of cables that prevents removal of panels, including suspended ceiling panels~~Installations shall comply with 300.2.

790.24 Mechanical Execution of Work.

The installation shall conform to 300.4 and 300.11.

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.

(A) 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 760.130(B)(1), as applicable, the cable shall be fastened in an approved manner at intervals of not more than 450 mm (18 in.).

~~722.25~~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
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 (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 722.135 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 Rules 323 and 341 of IEEE C2-2023, *National Electrical Safety Code*, for information on cable installation in manholes.

(H) Limited-Use and Under-Carpet Limited-Energy Cables.

Limited-use and undercarpet 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 (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)(2)(a) or (A)(2)(b).

(a) 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.

(b) The circuit conductors shall operate at 150 volts or less to ground and the limited-energy circuit conductors shall be one of the following:

1. Installed as a Class 1 circuit

2. 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.

(a) *Traveling Cables.* Separation of circuits shall not be required in elevator traveling cables constructed in accordance with 620.36.

(b) *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:

(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.

(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:

(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.

(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.

(a) 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.

(b) 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.

(a) 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:

(1) 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.

(2) 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.

(3) 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.

(4) 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.

(b) 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.

(c) 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.

(d) 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.

First Revision No. 8611-NFPA 70-2024 [Global Input]

Create new Article 794, as follows:

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 Article 206 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, *National Fire Alarm and Signaling Code*, for further information on the installation and monitoring for integrity requirements for fire alarm systems.

~~**722.3**~~ ~~**794.4**~~ ~~**Other Articles.**~~

In addition to the requirements of this article, installation of cables shall comply with the articles or sections listed in ~~722.3~~ 794.4 (A) through ~~(O)~~ (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 300.17.

[722.3(B) is moved to new Article 790 by FR 8610]

[722.3(C) is moved to new Article 790 by FR 8610]

~~**(D)**~~ **(B)** ~~**Cables in Ducts for Dust, Loose Stock, or Vapor Removal. [Revised by FR 8337]**~~

Section 300.22(A) for wiring systems shall apply.

~~**(E)**~~ **(C)** ~~**Cable Trays. [Revised by FR 8282]**~~

Cable tray installations shall comply with Article 392, Parts I and II.

~~**(F)**~~ **(D)** ~~**Instrumentation Tray Cable. [Revised by FR 8338]**~~

Circuits wired using instrumentation tray cable shall comply with 335.1 and 335.10 through 335.120.

~~**(G)**~~ **(E)** ~~**Raceways or Sleeves Exposed to Different Temperatures.**~~

Section 300.7(A) shall apply.

~~**(H)**~~ **(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 300.19.

[722.3(I) is moved to new Article 790 by FR 8610]

~~**(J)**~~ **(G)** ~~**Corrosive, Damp, or Wet Locations.**~~

The installation of power-limited cables installed in corrosive, damp, or wet locations shall comply with ~~the applicable requirements in~~ 110.11, 300.5(B), 300.6, 300.9, and 310.10(F)~~when installed in corrosive, damp, or wet locations~~ .

~~**(K)**~~ **(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.

~~**(L)**~~ **(I)** ~~**Communications Raceways.**~~

Cables 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.

~~**(M)**~~ **(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.

~~**(N)**~~ **(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).

~~(O)~~ { L } ~~Specific Requirements. [Revised by FR 8289]~~

As appropriate, the installation of wires and cables shall also comply with the following:

(1) Class 2 and Class 3 cables — Article 725, Part II

(2) Class 4 cables — Article 726, Part IV

(3) Fire alarm cables — Article 760, Part III

(4) Optical fiber cables — Article 770, Part V

~~722.12~~ ~~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. [Copy 770.27]

Optical fiber cable shall not be used in such a manner that its operating temperature exceeds that of its rating.

~~722.31~~ ~~794.31~~ ~~Safety-Control Equipment. [Move 722.31; Revised by FR 8341]~~

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.

~~722.135~~ ~~794.135~~ ~~Installation of Cables. [Move 722.135; Revised as indicated below]~~

The installation of cables shall comply with ~~722.135~~ 794.135 (A) through (I), as applicable.

[722.135(A) is deleted by FR 8344]

(A) Cables in Buildings. [722.135(B), renumbered due to deletion of (A) in FR 8344; Revised by FR 8345]

The installation of cables shall comply with Table 722.135(A).

Table 722.135(A) Installation of Listed Cables in Buildings

[TABLE]

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 300.21 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. [722.135(C), renumbered due to deletion of (A) in FR 8344]

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 ~~722.179~~ 794.500 (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. [722.135(D), renumbered due to deletion of (A) in FR 8344]

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. [722.135(E), renumbered due to deletion of (A) in FR 8344; Revised by FR 8379]

The substitutions for cables listed in Table ~~722.135(E)~~ 794.13 5 (D) and illustrated in Figure ~~722.135(E)~~ 794.13 5 (D) shall be permitted. Where substitute cables are installed, the installation requirements of the articles described in ~~722.3(O)~~ 794.4(K) shall also apply. CI cables shall be permitted to be installed to provide 2-hour circuit integrity. See ~~722.135(F)~~ 794.135(E) .

Informational Note: See 800.179 for information on Types CMP, CMR, CM, and CMX.

Table ~~722.135(E)~~ ~~794.135(D)~~ ~~Cable Substitutions~~

[TABLE]

Figure ~~722.135(E)~~ ~~794.135(D)~~ ~~Cable Substitution Hierarchy.~~

[Figure 725.154(A) from the 2020 edition of NFPA 70, inserted by FR 8379]

[722.135(F) through (I) are inserted below in 794.154]

794 .154 Substitutions for Listed Communications Cables. [Copy 805.154]

The substitutions for communications cables listed in Table 794 .154 and illustrated in Figure 794 .154 shall be permitted.

Table 794 .154 Cable Substitutions

[TABLE]

Figure 794 .154 Cable Substitution Hierarchy.

[FIGURE]

794.155 Substitutions of Listed CATV Cables. [Copy 820.154]

The substitutions for coaxial cables in Table 794 .15 5 and illustrated in Figure 794 .15 5 shall be permitted.

Informational Note: The substitute cables in Table 794 .15 5 and Figure 794 .15 5 are only coaxial-type cables.

Table 794 .15 5 Coaxial Cable Uses and Permitted Substitutions

[TABLE]

Figure 794.155 Coaxial Cable Substitution Hierarchy.

[FIGURE]

794.156 Substitutions of Network-Powered Broadband Communications System Cables. [Copy 830.154]

The substitutions for network-powered broadband system cables listed in Table 794 .15 6 shall be permitted.

Table 794 .15 6 Cable Substitutions

[TABLE]

~~[760.154]~~ ~~(A)~~ 794.157 Substitutions of Fire Alarm Cables ~~Substitutions~~ .

The substitutions for fire alarm cables listed in Table ~~760.154(A)~~ 794.157 and illustrated in Figure ~~760.154(A)~~ 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 ~~760.154(A)~~ ~~794.157~~ ~~Cable Substitution Hierarchy.~~

[FIGURE]

Table ~~760.154(A)~~ ~~794.157~~ ~~Cable Substitutions~~

[TABLE]

794.158 Substitutions of Listed Optical Fiber Cables. [Copy parts of 770.154]

The substitutions for optical fiber cables in Table 794.158 and illustrated in Figure 794.158 shall be permitted.

Table 794.158 Cable Substitutions

[TABLE]

Figure 794.158 Cable Substitution Hierarchy.

[FIGURE]

~~[722.135](E)~~ ~~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.

~~[722.135](F)~~ ~~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.

~~[722.135](G) 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, ~~725.144~~ 794.204 shall apply.

~~[722.135](H) 794.163 Installation of Circuit Conductors Extending Beyond One Building. [Revised by FR 8290]~~

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:

(1) For other than coaxial conductors, 800.44, 800.53, 800.100, 805.50, 805.93, 805.170(A), and 805.170(B)

(2) For coaxial conductors, 800.44, 820.93, and 820.100

(3) The installation requirements of Article 300, Part I

~~[722.135](I) 794.164 Installation in Dwelling Units. [Created by FR 8452]~~

Where Class 4 cables are used in a dwelling unit, 790.214 shall apply.

Part II. Wiring Methods

794.200 ~~725.130~~ Wiring Methods and Materials on Load Side of the Class 2 or Class 3 Power Source. [Move 725.130, revised by FR 8294]

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 ~~725.130~~ 794.200 (A), (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 ~~722.179~~ 794.500 and be installed in accordance with 722.135 and 725.136 through 725.144.

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 ~~722.179~~ 794.500 ~~(A) and permitted by 725.130(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 ~~725.144~~ Bundling of Cables Transmitting Power and Data. [Move 725.144, revised by FR 8296]

Sections 725.144(A) and (B) shall apply to Class 2 and Class 3 circuits that transmit power and data to a powered device over listed cabling. Section 300.11 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 725.144 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 725.144 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 725.144 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 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 ~~725.144~~ 794.204 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:

(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 72135(E) 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 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 ~~725.144~~ ~~794.204~~ ~~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~~

[TABLE + NOTES]

794.214 ~~726.144~~ Ampacity. [Move 726.144, revised by FR 8442]

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 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 722.179(A)(16) for additional Class 4 cable requirements.

Informational Note No. 2: See UL 1400-1, Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements, and UL 1400-2, Outline of Fault-Managed Power Systems — Part 2: Requirements for Class 4 Cables, for information on determining maximum ampacities.

794.220 ~~760.130~~ Wiring Methods and Materials on Load Side of the PLFA Power Source. [Move 760.130, revised by FR 8493]

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 760.130(A), (B), or a combination of both. Article 722, Parts I and II of 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 722.179 shall be installed as detailed in 722.135 and 760.130(B)(1) through (B)(4). Devices shall be installed in accordance with 110.3(B), 300.11(A), and 300.15.

(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 760.130(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 non-concealed spaces shall comply with the following:

(1) The cables shall be installed in accordance with 722.179(A)(15)(a) and (A)(15)(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.

794.222 ~~760.142~~ Conductor Size. [Move 760.142]

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 ~~760.143~~ Support of Conductors. [Move 760.143]

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. [Copy 770.110]

(A) Types of Raceways.

Optical fiber cables shall be permitted to be installed in any raceway that complies with either 7 94 . 23 0(A)(1) or (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 7 94 . 23 0(B)(1) or (B)(2).

(1) Without Electric Light or Power Conductors.

Where optical fiber cables are installed in 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. [Copy 770.111]

Listed plenum communications raceways, listed riser communications raceways, and listed general-purpose communications raceways selected in accordance with Table 790.340 (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. [Copy 770.113]

Installation of optical fiber cables shall comply with 794.233 (A) through (J). Installation of raceways and cable routing assemblies shall comply with 7 94 . 23 0.

(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 7 9 0. 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 (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:

(1) Up to 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 300.22(B)

Informational Note: For information on fire protection of wiring installed in fabricated ducts, see NFPA 90A-2018, *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

(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-2021, *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 (C)(2).

(1) Uses Permitted.

The following cables shall be permitted in other spaces used for environmental air as described in 300.22(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 300.22(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 300.22(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 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-2018, *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 (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 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 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 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 794.2 33 (B) through (I):

(1) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC

(2) Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in:

(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

794.234 Installation of Optical Fibers and Electrical Conductors. [Copy 770.133]

(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:

(1) 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.

(2) 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.

(3) 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.

(4) 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:

(1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with 645.5(E)(2) or Parts I and II of Article 725

(2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760

(3) Communications circuits in compliance with Parts I and V of Article 805

(4) Community antenna television and radio distribution systems in compliance with Parts I and V of Article 820

(5) Low-power network-powered broadband communications circuits in compliance with Parts I and V of Article 830

(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. **[Copy 800.110]**

(A) Types of Raceways.

Wires and cables shall be permitted to be installed in raceways that comply with 790.240 (A)(1), 790.240 (A)(2), or 790.240 (A)(3). Medium-power network-powered broadband communications cables shall not be installed in raceways that comply with 790.240 (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 790.340 (c), listed in accordance with 800.182, and installed in accordance with 790.240 (C)(1) and (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. [Copy 800.113]

Installation of wires, cables, cable routing assemblies, and communications raceways shall comply with 794.242 (A) through (L). Installation of cable routing assemblies and communications raceways shall comply also with 794.240 . Types of cables used by this section are identified in Table 794.242 .

Table 794.242 Cables Used for Communications Circuits

[TABLE]

(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 79 4.242 (B)(1) and (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:

(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 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):

(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-2021, *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 (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):

(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 300.22(C)

(8) 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)

(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 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):

(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-2021, *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 (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 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 (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 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 (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 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 (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 794.242 (H)(1) and (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 794.242 (I)(1) and (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, and 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 794.242 (B) through (I) shall be in accordance with 794.242 (J)(1) and (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 (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 undercarpet 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 (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 794.242 (K)(1) and (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 (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 794.242 (B) through (G):

(1) Types BMU and BLU cables

(2) Communications wires

(3) 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 (F) shall be in accordance with 794.242 (L)(1) and (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 (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, 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 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 (F):

(1) Types BMU and BLU cables

(2) Communications wires

794.244 Installation of Communications Wires and Cables and CATV-Type Coaxial Cables. [Copy 800.133]

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 (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:

(1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with 645.5(E)(2) or Parts I and II of Article 725

(2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760

(3) Nonconductive and conductive optical fiber cables in compliance with Parts I and V of Article 770

(4) Communications circuits in compliance with Parts I and IV of Articles 800 and 805

(5) Community antenna television and radio distribution systems in compliance with Parts I and V of Articles 800 and 820

(6) Low-power network-powered broadband communications circuits in compliance with Parts I and V of Articles 800 and 830

(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. [Copy 830.133]

Cable and equipment installations within buildings shall comply with 794.246 (A) through (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 Parts I and II of Article 725

(2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760

(3) Communications circuits in compliance with Parts I and IV of Article 805

(4) Nonconductive and conductive optical fiber cables in compliance with Parts I and V of Article 770

(5) Community antenna television and radio distribution systems in compliance with Parts I and V of Article 820

(c) *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:*

(1) Communications circuits in compliance with Parts I and IV of Article 805

(2) Conductive optical fiber cables in compliance with Parts I and V of Article 770

(3) Community antenna television and radio distribution systems in compliance with Parts I and V of Article 820

(d) *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:*

(1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Parts I and II of Article 725

(2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760

(e) *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. [Copy 830.160]

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 I II . Applications

794.320 ~~760.154~~ Applications of Listed PLFA Cables. [Move 760.154; 760.154(A) inserted above as 794.157]

PLFA cables shall comply with the requirements described in Table ~~760.154~~ 794.320 or where cable substitutions are made as shown in ~~760.154~~ 794.320 (A). 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 ~~760.154~~ ~~794.320~~ ~~Applications of Listed PLFA Cables in Buildings~~

[TABLE]

794.330 Applications of Listed Optical Fiber Cables. [Copy 770.154]

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 794.230 and 794.233 . The substitutions for optical fiber cables in Table 794.330 (b) and illustrated in Figure 7 94.330 shall be permitted.

Table 794.330 (a) Applications of Listed Optical Fiber Cables in Buildings

[TABLE]

Table 7 94.330 (b) Cable Substitutions

[TABLE]

Figure 7 94.330 Cable Substitution Hierarchy.

[FIGURE]

794.340 Applications of Listed Communications Wires, Cables, and Raceways, and Listed Cable Routing Assemblies. [Copy 800.154]

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:

(1) Listed communications wires and cables as indicated in Table 794.340 (a)

(2) Listed communications raceways as indicated in Table 794.340 (b)

(3) 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, and Network-Powered Broadband Communications System Cables in Buildings

[TABLE]

Table 794.340 (b) Applications of Listed Communications Raceways in Buildings

[TABLE]

Table 794.340 (c) Applications of Listed Cable Routing Assemblies in Buildings

[TABLE]

Part I V. Outside Entering Buildings

794.430 Overhead (Aerial) Optical Fiber Cables. [Copy 770.44]

Overhead optical fiber cables containing a non–current-carrying metallic member entering buildings shall comply with 800.44(A) and (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 (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. [Copy 770.47]

Underground optical fiber cables entering buildings shall comply with 794.432 (A) and (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. [Copy 770.48]

(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:

(1) Intermediate metal conduit (IMC)

(2) Rigid metal conduit (RMC)

(3) Rigid polyvinyl chloride conduit (PVC)

(4) 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. Listing Requirements

794.500 ~~722.179~~ Listing and Marking of Cables. [Move 722.179; Revised by FR 8350, 8352, 8619, 8354]

Cables installed in buildings shall be listed in accordance with ~~722.179~~ 794.500 (A) and marked in accordance with 722.179(B), and they shall be permitted to be marked in accordance with ~~722.179~~ 794.500 (C).

E*xception: Optical fiber cables that are installed in compliance with 770.48 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 ~~722.179~~ 794.500 (A)(1) through (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. Refer to Table ~~722.179~~ 794.500 (B) for plenum cable types.

Informational Note: See NFPA 262-2019, *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 ~~722.179~~ 794.500 (A)(7)(a), (A)(7)(b), or (A)(7)(c).

Informational Note: 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.

(a) *CI Cables.* CI cables of the types specified in ~~722.179~~ 794.500 (A)(1), (A)(2), (A)(3), (A)(4), and (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(C). 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 ~~722.179~~ 794.500 (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.

(b) *Fire-Resistive Cables.* Fire-resistive cables of the types specified in ~~722.179~~ 794.500 (A)(1), (A)(2), (A)(3), (A)(4), (A)(6), and (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.

(c) *Electrical Circuit Protective System.* Protectants for cables of the types specified in ~~722.179~~ 794.500 (A)(1), (A)(2), (A)(3), (A)(4), and (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 with an LP current rating of 0.6 amperes per conductor is "CL2-LP (0.6A) 75°C 23 AWG 4-pair."

(10) Undercarpet 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 undercarpet 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 ~~722.179~~ 794.500 (A)(12)(a) through (d).

(a) 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 ~~722.179~~ 794.500 (A)(1), (A)(2), or (A)(3) and shall be marked in accordance with Table ~~179~~ 794.500 (B).

(b) 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.

(c) The optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use.

(d) The jacket without fibers shall meet the listing requirements for communications raceways in 800.182(A), (B), or (C) in accordance with the cable marking.

(13) Cables Containing Optical Fibers. [Revised by FR 8350]

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. [Revised by FR 8352]

PLFA cables shall comply with ~~722.179~~ 794.500 (A)(15)(a) through (A)(15)(d).

(a) 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.

(b) 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.

(c) Cables shall have a voltage rating of not less than 300 volts.

(d) Cables shall have a temperature rating of not less than 60°C (140°F).

(16) 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. Voltage ratings shall not be marked on the cables.

(4) Temperature Rating.

Cables shall have a temperature rating of not less than 60°C (140°F).

[770.179(A)(16)(5) is deleted by FR 8619]

(B) Marking. [Revised by FR 8354]

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 ~~722.179~~ 794.500 (B).

(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.

(1) 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 is assumed for cables not marked with a temperature rating.

(1) 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.

(1) Metallic conductor cables containing optical fibers shall be marked with the suffix "-OF".

Table 722.179(B) Cable Type Markings

[TABLE]

(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*.

Part VI. Grounding

794. 60 0 Grounding. [Copy 770.114]

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 770.100(B) using a conductor specified in 770.100(A).

Supplemental Information

File Name	Description	Approved
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Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 23:33:33 EST 2024

Committee Statement

Committee Statement: A new article was created to relocate all cable requirements for limited-energy systems into one place, instead of across multiple articles and chapters.

The scope statement is recommended by CMP-3 but is under the purview of the Correlating Committee.

The revision incorporates cabling requirements from Article 770 and Chapter 8.

Response Message: FR-8611-NFPA 70-2024

Public Input No. 3686-NFPA 70-2023 [Article 726]

Public Input No. 3673-NFPA 70-2023 [Article 722]

Public Input No. 3687-NFPA 70-2023 [Article 760]

Public Input No. 3684-NFPA 70-2023 [Article 725]

Public Input No. 3339-NFPA 70-2023 [Global Input]

[FR 8611 – GLOBAL – NEW ARTICLE 794]

[NOTE: Relocated sections are shown with all changes implemented.]

Create new Article 794, as follows:

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 Article 206 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, *National Fire Alarm and Signaling Code*, for further information on the installation and monitoring for integrity requirements for fire alarm systems.

~~722.3~~794.4 Other Articles.

In addition to the requirements of this article, installation of cables shall comply with the articles or sections listed in ~~722.3~~794.4(A) through ~~(O)~~(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 300.17.

[722.3(B) is moved to new Article 790 by FR 8610]

[722.3(C) is moved to new Article 790 by FR 8610]

~~(D)~~(B) Cables in Ducts for Dust, Loose Stock, or Vapor Removal. [Revised by FR 8337]

Section 300.22(A) for wiring systems shall apply.

~~(E)~~(C) Cable Trays. [Revised by FR 8282]

Cable tray installations shall comply with Article 392, Parts I and II.

~~(F)~~(D) Instrumentation Tray Cable. [Revised by FR 8338]

Circuits wired using instrumentation tray cable shall comply with 335.1 and 335.10 through 335.120.

~~(G)~~(E) Raceways or Sleeves Exposed to Different Temperatures.

Section 300.7(A) shall apply.

~~(H)~~(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 300.19.

[722.3(I) is moved to new Article 790 by FR 8610]

~~(J)~~(G) Corrosive, Damp, or Wet Locations.

The installation of power-limited cables installed in corrosive, damp, or wet locations shall comply with ~~the applicable requirements in~~ 110.11, 300.5(B), 300.6, 300.9, and 310.10(F) ~~when installed in corrosive, damp, or wet locations~~.

~~(K)~~(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.

~~(L)~~(I) Communications Raceways.

Cables 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.

~~(M)~~(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.

~~(N)~~(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).

~~(O)~~(L) Specific Requirements. [Revised by FR 8289]

As appropriate, the installation of wires and cables shall also comply with the following:

(1) Class 2 and Class 3 cables — Article 725, Part II

(2) Class 4 cables — Article 726, Part IV

(3) Fire alarm cables — Article 760, Part III

(4) Optical fiber cables — Article 770, Part V

~~722.12~~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. [Copy 770.27]

Optical fiber cable shall not be used in such a manner that its operating temperature exceeds that of its rating.

~~722.31~~794.31 Safety-Control Equipment. [Move 722.31; Revised by FR 8341]

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.

~~722.135~~794.135 Installation of Cables. [Move 722.135; Revised as indicated below]

The installation of cables shall comply with ~~722.135~~794.135(A) through (I), as applicable.

[722.135(A) is deleted by FR 8344]

(A) Cables in Buildings. [722.135(B), renumbered due to deletion of (A) in FR 8344; Revised by FR 8345]

The installation of cables shall comply with Table 722.135(A).

Table 722.135(A) Installation of Listed Cables in Buildings

[TABLE]

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 300.21 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. [722.135(C), renumbered due to deletion of (A) in FR 8344]

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 ~~722.179~~794.500(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. [722.135(D), renumbered due to deletion of (A) in FR 8344]

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. [722.135(E), renumbered due to deletion of (A) in FR 8344; Revised by FR 8379]

The substitutions for cables listed in Table ~~722.135(E)~~794.135(D) and illustrated in Figure ~~722.135(E)~~794.135(D) shall be permitted. Where substitute cables are installed, the installation requirements of the articles described in ~~722.3(O)~~794.4(K) shall also apply. CI cables shall be permitted to be installed to provide 2-hour circuit integrity. See ~~722.135(F)~~794.135(E).

Informational Note: See 800.179 for information on Types CMP, CMR, CM, and CMX.

Table ~~722.135(E)~~794.135(D) Cable Substitutions

[TABLE]

Figure ~~722.135(E)~~794.135(D) Cable Substitution Hierarchy.

[Figure 725.154(A) from the 2020 edition of NFPA 70, inserted by FR 8379]

[722.135(F) through (I) are inserted below in 794.154]

794.154 Substitutions for Listed Communications Cables. [Copy 805.154]

The substitutions for communications cables listed in Table 794.154 and illustrated in Figure 794.154 shall be permitted.

Table 794.154 Cable Substitutions

[TABLE]

Figure 794.154 Cable Substitution Hierarchy.

[FIGURE]

794.155 Substitutions of Listed CATV Cables. [Copy 820.154]

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

[TABLE]

Figure 794.155 Coaxial Cable Substitution Hierarchy.

[FIGURE]

794.156 Substitutions of Network-Powered Broadband Communications System Cables. [Copy 830.154]

The substitutions for network-powered broadband system cables listed in Table 794.156 shall be permitted.

Table 794.156 Cable Substitutions

[TABLE]

~~[760.154] (A)~~794.157 Substitutions of Fire Alarm Cable~~s Substitutions~~.

The substitutions for fire alarm cables listed in Table ~~760.154(A)~~794.157 and illustrated in Figure ~~760.154(A)~~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 ~~760.154(A)~~794.157 Cable Substitution Hierarchy.

[FIGURE]

Table ~~760.154(A)~~794.157 Cable Substitutions

[TABLE]

794.158 Substitutions of Listed Optical Fiber Cables. [Copy parts of 770.154]

The substitutions for optical fiber cables in Table 794.158 and illustrated in Figure 794.158 shall be permitted.

Table 794.158 Cable Substitutions

[TABLE]

Figure 794.158 Cable Substitution Hierarchy.

[FIGURE]

~~[722.135](E)~~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.

~~[722.135](F)~~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.

~~[722.135](G)~~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, ~~725.144~~794.204 shall apply.

~~[722.135](H)~~794.163 Installation of Circuit Conductors Extending Beyond One Building. [Revised by FR 8290]

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:

1) For other than coaxial conductors, 800.44, 800.53, 800.100, 805.50, 805.93, 805.170(A), and 805.170(B)
2) For coaxial conductors, 800.44, 820.93, and 820.100
3) The installation requirements of Article 300, Part I

~~[722.135](I)~~794.164 Installation in Dwelling Units. [Created by FR 8452]

Where Class 4 cables are used in a dwelling unit, 790.214 shall apply.

Part II. Wiring Methods

794.200~~725.130~~ Wiring Methods and Materials on Load Side of the Class 2 or Class 3 Power Source. [Move 725.130, revised by FR 8294]

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 ~~725.130~~794.200(A), (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 ~~722.179~~794.500 and be installed in accordance with 722.135 and 725.136 through 725.144.

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 ~~722.179~~794.500(A) and permitted by 725.130(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~~725.144~~ Bundling of Cables Transmitting Power and Data. [Move 725.144, revised by FR 8296]

Sections 725.144(A) and (B) shall apply to Class 2 and Class 3 circuits that transmit power and data to a powered device over listed cabling. Section 300.11 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 725.144 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 725.144 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 725.144 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 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 ~~725.144~~794.204 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:

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 722.135(E) 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 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 ~~725.144~~794.204 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

[TABLE + NOTES]

794.214~~726.144~~ Ampacity. [Move 726.144, revised by FR 8442]

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 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 722.179(A)(16) for additional Class 4 cable requirements.

Informational Note No. 2: See UL 1400-1, Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements, and UL 1400-2, Outline of Fault-Managed Power Systems — Part 2: Requirements for Class 4 Cables, for information on determining maximum ampacities.

794.220~~760.130~~ Wiring Methods and Materials on Load Side of the PLFA Power Source. [Move 760.130, revised by FR 8493]

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 760.130(A), (B), or a combination of both. Article 722, Parts I and II of 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 722.179 shall be installed as detailed in 722.135 and 760.130(B)(1) through (B)(4). Devices shall be installed in accordance with 110.3(B), 300.11(A), and 300.15.

(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 760.130(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 non-concealed spaces shall comply with the following:

1. The cables shall be installed in accordance with 722.179(A)(15)(a) and (A)(15)(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.

794.222~~760.142~~ Conductor Size. [Move 760.142]

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~~760.143~~ Support of Conductors. [Move 760.143]

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. [Copy 770.110]

(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 (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 (B)(2).

(1) Without Electric Light or Power Conductors.

Where optical fiber cables are installed in 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. [Copy 770.111]

Listed plenum communications raceways, listed riser communications raceways, and listed general-purpose communications raceways selected in accordance with Table 790.340(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. [Copy 770.113]

Installation of optical fiber cables shall comply with 794.233(A) through (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 (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:

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 300.22(B)

Informational Note: For information on fire protection of wiring installed in fabricated ducts, see NFPA 90A-2018, *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

(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-2021, *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 (C)(2).

(1) Uses Permitted.

The following cables shall be permitted in other spaces used for environmental air as described in 300.22(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 300.22(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 300.22(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 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-2018, *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 (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 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 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 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 794.233(B) through (I):

1. Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC
2. Types OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN, and OFC installed in:
   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

794.234 Installation of Optical Fibers and Electrical Conductors. [Copy 770.133]

(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:

1) 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.
2) 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.
3) 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.
4) 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:

1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with 645.5(E)(2) or Parts I and II of Article 725
2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760
3) Communications circuits in compliance with Parts I and V of Article 805
4) Community antenna television and radio distribution systems in compliance with Parts I and V of Article 820
5) Low-power network-powered broadband communications circuits in compliance with Parts I and V of Article 830

(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. [Copy 800.110]

(A) Types of Raceways.

Wires and cables shall be permitted to be installed in raceways that comply with 790.240(A)(1), 790.240(A)(2), or 790.240(A)(3). Medium-power network-powered broadband communications cables shall not be installed in raceways that comply with 790.240(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 790.340(c), listed in accordance with 800.182, and installed in accordance with 790.240(C)(1) and (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. [Copy 800.113]

Installation of wires, cables, cable routing assemblies, and communications raceways shall comply with 794.242(A) through (L). Installation of cable routing assemblies and communications raceways shall comply also with 794.240. Types of cables used by this section are identified in Table 794.242.

Table 794.242 Cables Used for Communications Circuits

[TABLE]

(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 (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:

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 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):

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-2021, *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 (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):

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 300.22(C)
8) 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)
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 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):

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-2021, *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 (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 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 (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 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 (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 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 (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 794.242(H)(1) and (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 794.242(I)(1) and (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, and 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 794.242(B) through (I) shall be in accordance with 794.242(J)(1) and (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 (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 undercarpet 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 (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 794.242(K)(1) and (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 (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 794.242(B) through (G):

1) Types BMU and BLU cables
2) Communications wires
3) 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 (F) shall be in accordance with 794.242(L)(1) and (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 (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, 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 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 (F):

1) Types BMU and BLU cables
2) Communications wires

794.244 Installation of Communications Wires and Cables and CATV-Type Coaxial Cables. [Copy 800.133]

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 (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:

1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with 645.5(E)(2) or Parts I and II of Article 725
2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760
3) Nonconductive and conductive optical fiber cables in compliance with Parts I and V of Article 770
4) Communications circuits in compliance with Parts I and IV of Articles 800 and 805
5) Community antenna television and radio distribution systems in compliance with Parts I and V of Articles 800 and 820
6) Low-power network-powered broadband communications circuits in compliance with Parts I and V of Articles 800 and 830

(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 (1⁄4 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. [Copy 830.133]

Cable and equipment installations within buildings shall comply with 794.246(A) through (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 Parts I and II of Article 725
2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760
3) Communications circuits in compliance with Parts I and IV of Article 805
4) Nonconductive and conductive optical fiber cables in compliance with Parts I and V of Article 770
5) Community antenna television and radio distribution systems in compliance with Parts I and V of Article 820

(c) *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:

1) Communications circuits in compliance with Parts I and IV of Article 805
2) Conductive optical fiber cables in compliance with Parts I and V of Article 770
3) Community antenna television and radio distribution systems in compliance with Parts I and V of Article 820

(d) *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:

1) Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Parts I and II of Article 725
2) Power-limited fire alarm systems in compliance with Parts I and III of Article 760

(e) *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 (1⁄4 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. [Copy 830.160]

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~~760.154~~ Applications of Listed PLFA Cables. [Move 760.154; 760.154(A) inserted above as 794.157]

PLFA cables shall comply with the requirements described in Table ~~760.154~~794.320 or where cable substitutions are made as shown in ~~760.154~~794.320(A). 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 ~~760.154~~794.320 Applications of Listed PLFA Cables in Buildings

[TABLE]

794.330 Applications of Listed Optical Fiber Cables. [Copy 770.154]

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 794.230 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

[TABLE]

Table 794.330(b) Cable Substitutions

[TABLE]

Figure 794.330 Cable Substitution Hierarchy.

[FIGURE]

794.340 Applications of Listed Communications Wires, Cables, and Raceways, and Listed Cable Routing Assemblies. [Copy 800.154]

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:

1) Listed communications wires and cables as indicated in Table 794.340(a)
2) Listed communications raceways as indicated in Table 794.340(b)
3) 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, and Network-Powered Broadband Communications System Cables in Buildings

[TABLE]

Table 794.340(b) Applications of Listed Communications Raceways in Buildings

[TABLE]

Table 794.340(c) Applications of Listed Cable Routing Assemblies in Buildings

[TABLE]

Part IV. Outside Entering Buildings

794.430 Overhead (Aerial) Optical Fiber Cables. [Copy 770.44]

Overhead optical fiber cables containing a non–current-carrying metallic member entering buildings shall comply with 800.44(A) and (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 (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. **[Copy 770.47]**

Underground optical fiber cables entering buildings shall comply with 794.432(A) and (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. [Copy 770.48]

(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:

1) Intermediate metal conduit (IMC)
2) Rigid metal conduit (RMC)
3) Rigid polyvinyl chloride conduit (PVC)
4) 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. Listing Requirements

794.500~~722.179~~ Listing and Marking of Cables. [Move 722.179; Revised by FR 8350, 8352, 8619, 8354]

Cables installed in buildings shall be listed in accordance with ~~722.179~~794.500(A) and marked in accordance with 722.179(B), and they shall be permitted to be marked in accordance with ~~722.179~~794.500(C).

E*xception: Optical fiber cables that are installed in compliance with 770.48 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 ~~722.179~~794.500(A)(1) through (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. Refer to Table ~~722.179~~794.500(B) for plenum cable types.

Informational Note: See NFPA 262-2019, *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 ~~722.179~~794.500(A)(7)(a), (A)(7)(b), or (A)(7)(c).

Informational Note: 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.

(a) *CI Cables.* CI cables of the types specified in ~~722.179~~794.500(A)(1), (A)(2), (A)(3), (A)(4), and (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(C). 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 ~~722.179~~794.500(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.

(b) *Fire-Resistive Cables.* Fire-resistive cables of the types specified in ~~722.179~~794.500(A)(1), (A)(2), (A)(3), (A)(4), (A)(6), and (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.

(c) *Electrical Circuit Protective System.* Protectants for cables of the types specified in ~~722.179~~794.500(A)(1), (A)(2), (A)(3), (A)(4), and (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 with an LP current rating of 0.6 amperes per conductor is "CL2-LP (0.6A) 75°C 23 AWG 4-pair."

(10) Undercarpet 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 undercarpet 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 ~~722.179~~794.500(A)(12)(a) through (d).

(a) 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 ~~722.179~~794.500(A)(1), (A)(2), or (A)(3) and shall be marked in accordance with Table ~~179~~794.500(B).

(b) 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.

(c) The optical fibers shall have a permanent marking, such as a marker tape, indicating the jacket with which they are identified for use.

(d) The jacket without fibers shall meet the listing requirements for communications raceways in 800.182(A), (B), or (C) in accordance with the cable marking.

(13) Cables Containing Optical Fibers. [Revised by FR 8350]

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. [Revised by FR 8352]

PLFA cables shall comply with ~~722.179~~794.500(A)(15)(a) through (A)(15)(d).

(a) 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.

(b) 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.

(c) Cables shall have a voltage rating of not less than 300 volts.

(d) Cables shall have a temperature rating of not less than 60°C (140°F).

(16) 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. Voltage ratings shall not be marked on the cables.

(4) Temperature Rating.

Cables shall have a temperature rating of not less than 60°C (140°F).

[770.179(A)(16)(5) is deleted by FR 8619]

(B) Marking. [Revised by FR 8354]

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 ~~722.179~~794.500(B).
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 is assumed for cables not marked with a temperature rating.

7) 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.

8) Metallic conductor cables containing optical fibers shall be marked with the suffix "-OF".

Table 722.179(B) Cable Type Markings

[TABLE]

(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*.

Part VI. Grounding

794.600 Grounding. [Copy 770.114]

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 770.100(B) using a conductor specified in 770.100(A).

First Revision No. 8811-NFPA 70-2024 [Global Input]

Create new Article 206, as follows:

ARTICLE 206 Remote-Control and Signaling Circuits

206.1 Scope.

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

~~300.26~~ 206.4 ~~Remote-Control and Signaling~~ Circuit~~s~~ Classification.

Remote-control and signaling circuits shall be classified as either power-limited or non-power-limited and shall comply with ~~300.26~~ 206.4 (A) through (C).

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

Class 1 power-limited remote-control and signaling circuits shall comply with 724.3through 724.52 .

(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 725.3through 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 300.2 through 300.25 and shall comply with ~~300.26~~ 206.4 (C)(1) through (C)(3).

(1) Sizes and Use.

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

(b) ~~Conductors that are~~ 14 AWG copper-clad aluminum conductors shall only be permitted ~~to be used~~ in Type MC cable and Type TC cable. ~~The continuous load~~ They shall only supply loads not exceeding 8 amperes.

(c) Conductors larger than 16 AWG copper or ~~14 AWG~~ copper-clad aluminum shall not supply loads greater than the ampacities specified in 310.14without applying the ampacity adjustment and correction factors specified in 310.15 to the ampacity calculation .

(d) 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.

(a) ~~Insulation~~ Conductor insulation ~~on conductors~~ shall be rated for the system voltage and not less than 600 volts.

(b) 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.

(c) 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.

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

(3) 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.

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

~~(a) 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.~~

~~(b) 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 300.26(C)(3)(a) and 300.26(C)(3)(b) shall not be required where this Code requires or permits other overcurrent protection ratings.*~~

Supplemental Information

File Name	Description	Approved
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Submitter Information Verification

Committee: NEC-P03
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Committee Statement

Committee Statement: Article 206 was created to provide the general requirements for remote control and signaling circuits, particularly nonpower-limited remote-control and signaling circuits. It

borrows heavily from Tentative Interim Amendment (TIA) 23-8, issued March 21, 2023.

During the 2023 NEC revision process, Article 725 was revised by removing Class 1 circuits and placing them in the new Article 724. Article 724's scope is limited to power-limited remote-control and signaling circuits because the technical requirements for a nonpower-limited remote-control or signaling circuit are nearly identical to those of circuits for electric light and power and including them in Article 724 seemed redundant.

Section 300.26 was also created as part of this revision. It points the Code user to Article 725 for Class 2 or Class 3 circuits, and to Article 724 for Class 1 power-limited remote-control and signaling circuits. For nonpower-limited remote-control and signaling circuits, it tells the Code user to use Article 300. Not all of the necessary requirements for nonpower-limited remote-control and signaling circuits can be found in Article 300, however, so a Tentative Interim Amendment was issued to correct the mistake by expanding 300.26. As a result of the TIA, provisions for conductor ampacity and overcurrent protection were added and the problem was solved, at least until the 2026 revision cycle.

For the 2026 cycle the text of the TIA was relocated to Chapter 2, as that is a more appropriate location for circuiting requirements. In addition to the relocations, the following changes were made to the TIA text:

Several editorial revisions were made to remove unnecessary language, to provide clarity, or to improve readability without changing the technical requirements.

Sections 206.4(A) and (B) now reference all of Article 724 and 725, respectively, as simply pointing to 724.3 and 725.3 without requiring compliance with the remainder of the article is not adequate.

The allowance for ignoring ampacity adjustment and temperature correction was relocated to 206.4(C)(1)(a) because ampacity adjustment and temperature correction are ampacity concerns, not overcurrent protection concerns.

Section 206.4(C)(1)(b) was revised by removing the language about continuous loads. The issue of continuous loads is an overcurrent protection concern and is better handled in 240.4(D).

The language regarding "listing" of conductors for Class 1 use in 206.4(C)(1)(d) was revised because conductors are not "listed" for Class 1 use like a Class 2 or Class 3 cable is.

The requirements for overcurrent protection formerly found in the TIA version of 300.26(C)(3) were deleted because Article 240 already covers the issue, and that is the correct article to do so.

206.4(C)(3) was added to address separation of nonpower-limited remote-control and signaling circuits from other nonpower-limited circuits, such those used for power and lighting.

The minimum size permitted for copper-clad remote-control and signaling conductors has been expanded as a result of the technical substantiation provided by public inputs 1418 and 1427.

Response Message: FR-8811-NFPA 70-2024

Public Input No. 3612-NFPA 70-2023 [Section No. 300.26(C)(3)]

Public Input No. 1418-NFPA 70-2023 [Section No. 300.26(C)(1)]

Public Input No. 4257-NFPA 70-2023 [Section No. 300.26]

Public Input No. 1428-NFPA 70-2023 [Section No. 300.26(C)(3)]

Public Input No. 1584-NFPA 70-2023 [Section No. 300.26]

Public Input No. 1427-NFPA 70-2023 [Section No. 300.26(C)(2)]

Public Input No. 2520-NFPA 70-2023 [New Section after 300.3(C)]

[FR 8811 – New Article 206]

ARTICLE 206 Remote-Control and Signaling Circuits

206.1 Scope.

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

~~300.26~~206.4 ~~Remote-Control and Signaling~~ Circuit~~s~~ Classification.

Remote-control and signaling circuits shall be classified as either power-limited or non-power-limited and shall comply with ~~300.26~~206.4(A) through (C).

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

Class 1 power-limited remote-control and signaling circuits shall comply with 724.3 through 724.52.

(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 300.2 through 300.25 and shall comply with ~~300.26~~206.4(C)(1) through (C)(3).

(1) Sizes and Use.

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

(b) ~~Conductors that are~~ 14 AWG copper-clad aluminum conductors shall only be permitted ~~to be used~~ in Type MC cable and Type TC cable. ~~The continuous load~~They shall only supply loads not exceeding 8 amperes.

(c) Conductors larger than 16 AWG copper or ~~14 AWG~~ 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.

(d) 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.

(a) ~~Insulation~~ Conductor insulation ~~on conductors~~ shall be rated for the system voltage and not less than 600 volts.

(b) 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.

(c) 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.

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

(3) 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.

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

~~(a) 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.~~

~~(b) 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 300.26(C)(3)(a) and 300.26(C)(3)(b) shall not be required where this Code requires or permits other overcurrent protection ratings.*~~

First Revision No. 9277-NFPA 70-2024 [Global Input]

Revise Articles 300, 590, 722, 725, and 760 to comply with the NEC Style Manual Section 2.2 for parallel numbering in accordance with the following:

(1) In Article 300, renumber 300.2 through 300.26 as 300.4 through 300.28.
(2) In Article 590:
  (a) Relocate 590.5 to 590.2.
  (b) Renumber all subsequent sections as 300.4 through 300.9.
(3) In Article 722:
  (a) Relocate 722.179 to 722.2.
  (b) Renumber 722.3 as 722.4.
(4) In Article 725, relocate 725.160 to 725.2.
(5) In Article 760:
  (a) Create new section: 760.2 Listing.
  (b) Relocate 760.176 to 760.2(A).
  (c) Relocate 760.179 to 760.2(B).
  (d) Renumber 760.3 as 760.4.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 28 15:42:14 EST 2024

Committee Statement

Committee Statement: The sections in Articles 300, 590, 722, 725, and 760 are renumbered to comply with the NEC Style Manual, 2.2.1, for parallel numbering.
Response Message: FR-9277-NFPA 70-2024

First Revision No. 8246-NFPA 70-2024 [Definition: Cable, Limited Use. (Limited-Use Cable)]

Cable, Limited Use. (Limited-Use Cable)

Cables that are intended to be used with protection such as a raceway or for specific restricted applications. (~~722) (~~ CMP-3)

Informational Note: Limited use cables are denoted by an “X” suffix, for example Types CL2X or CMX.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 08:53:24 EST 2024

Committee Statement

Committee Statement: The informational note was added to give a few examples without alluding that it is an exhaustive list.
Response Message: FR-8246-NFPA 70-2024

Public Input No. 823-NFPA 70-2023 [Definition: Cable, Limited Use. (Limited-Use Cable)]

First Revision No. 8249-NFPA 70-2024 [Definition: Class 2 Circuit.]

Class 2 Circuit.

The portion of the wiring system between the load side of a Class 2 power source and the connected equipment. ~~Due to its power limitations, a Class 2~~ (CMP-3)

Informational note: The design of a Class 2 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock ~~. (CMP-3)~~ due to its power limitations.

Supplemental Information

File Name	Description	Approved
NEC_CMP3_FR-8249_Class_2_Circuit_def.docx		

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 09:05:36 EST 2024

Committee Statement

Committee Statement: The second sentence of the definition is not a definition. It is appropriate to move it to an informational note. As a circuit cannot consider something, “the design” was added to the front of the informational note.

Response Message: FR-8249-NFPA 70-2024

Public Input No. 1204-NFPA 70-2023 [Definition: Class 2 Circuit.]

Class 2 Circuit.
The portion of the wiring system between the load side of a Class 2 power source and the connected equipment. ~~Due to its power limitations, a Class 2 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock.~~ (CMP-3)

Informational Note: ~~Due to its power limitations,~~The design of a Class 2 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock due to its power limitations.

First Revision No. 8250-NFPA 70-2024 [Definition: Class 3 Circuit.]

Class 3 Circuit.

The portion of the wiring system between the load side of a Class 3 power source and the connected equipment. ~~Due to its power limitations, a Class 3~~ (CMP-3)

Informational Note: The design of a Class 3 circuit considers safety from a fire initiation standpoint. Since higher levels of voltage and current than ~~for Class 2~~ a Class 2 circuit are permitted, additional safeguards are specified to provide acceptable protection from ~~an~~ electric shock ~~hazard that could be encountered~~ . ~~(CMP-3)~~

Supplemental Information

File Name	Description	Approved
NEC_CMP3_FR-8250_Class_3_Circuit_def.docx		

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 09:06:36 EST 2024

Committee Statement

Committee Statement: The second and third sentences of the definition are not definitions. They are moved to an informational note. As a circuit cannot consider something, “the design” was added to the front of the informational note.

Response Message: FR-8250-NFPA 70-2024

Public Input No. 1211-NFPA 70-2023 [Definition: Class 3 Circuit.]

Class 3 Circuit.
The portion of the wiring system between the load side of a Class 3 power source and the connected equipment. ~~Due to its power limitations, a Class 3 circuit considers safety from a fire initiation standpoint. Since higher levels of voltage and current than for Class 2 are permitted, additional safeguards are specified to provide protection from an electric shock hazard that could be encountered.~~ (CMP-3)

Informational Note: ~~Due to its power limitations,~~The design of a Class 3 circuit considers safety from a fire initiation standpoint. Since higher levels of voltage and current than ~~for~~ a Class 2 circuit are permitted, additional safeguards are specified to provide acceptable protection from ~~an~~ electric shock ~~hazard that could be encountered~~.

First Revision No. 8252-NFPA 70-2024 [Definition: Class 4 Circuit.]

Class 4 Circuit.

The portion of the wiring system between the load side of a Class 4 transmitter and the Class 4 receiver or Class 4 utilization equipment, as appropriate. (CMP-3)

Informational Note No. 1: A Class 4 circuit is also commonly referred to as a fault-managed power circuit.

Informational Note No. 2: Due to the active monitoring and control of the voltage and current provided, the design of a

~~Class 4~~

Class 4 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock.

~~(726) (CMP-3)~~

~~Informational Note: A Class 4 circuit is also commonly referred to as a fault-managed power circuit.~~

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8252_Def_Class_4_Circuit.docx		
70_CMP3_FR8252_Class_4_Circuit_def.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Sun Jan 21 09:12:13 EST 2024

Committee Statement

Committee Statement: The second sentence of the definition is not a definition. They are moved to an informational note. As a circuit cannot consider something, “the design” was added to the informational note.726 was deleted from the definition as Class 4 is used in places other than 726.

Response Message: FR-8252-NFPA 70-2024

Public Input No. 1960-NFPA 70-2023 [Definition: Class 4 Circuit.]

[FR 8252]

Class 4 Circuit.

The portion of the wiring system between the load side of a Class 4 transmitter and the Class 4 receiver or Class 4 utilization equipment, as appropriate. ~~Due to the active monitoring and control of the voltage and current provided, a Class 4 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock. (726)~~ (CMP-3)

Informational Note No. 1: A Class 4 circuit is also commonly referred to as a fault-managed power circuit.
Informational Note No. 2: Due to the active monitoring and control of the voltage and current provided, the design of a Class 4 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock.

First Revision No. 8962-NFPA 70-2024 [New Definition after Definition: Cable Termination.]

Cable Tie.

A band or length of material, employing a locking device, used for bundling, securing, and/or supporting cable, flexible conduit, or flexible tubing.

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

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

(2) 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: Wed Jan 24 14:03:13 EST 2024

Committee Statement

Committee Statement: The increased usage of limited energy systems necessitates a clear understanding of terms used for cable support.

Response Message: FR-8962-NFPA 70-2024

Public Input No. 3400-NFPA 70-2023 [New Definition after Definition: Cable Termination.]

First Revision No. 8963-NFPA 70-2024 [New Definition after Definition: Cable Termination.]

Cable Tie Fixing Device.

A component, such as a block or bracket, specifically designed to secure cable tie(s) to a mounting surface.

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

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

(2) 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: Wed Jan 24 14:07:58 EST 2024

Committee Statement

Committee Statement: The increased usage of limited energy systems necessitates a clear understanding of terms used for cable support.

Response Message: FR-8963-NFPA 70-2024

Public Input No. 3401-NFPA 70-2023 [New Definition after Definition: Cable Termination.]

First Revision No. 8966-NFPA 70-2024 [New Definition after Definition: Cable Termination.]

Cable Tie Integral Device.

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

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

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

(2) 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: Wed Jan 24 14:11:56 EST 2024

Committee Statement

Committee Statement: The increased usage of limited energy systems necessitates a clear understanding of terms used for cable support.

Response Message: FR-8966-NFPA 70-2024

Public Input No. 3402-NFPA 70-2023 [New Definition after Definition: Cable Termination.]

First Revision No. 8254-NFPA 70-2024 [New Definition after Definition: Circuit Breaker.]

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: Sun Jan 21 09:16:27 EST 2024

Committee Statement

Committee Statement: It is appropriate to add a definition for Power-Limited Circuit. The scope for Article 725 and the title of Article 722 include the term "power-limited circuits," which was an undefined term.

Response Message: FR-8254-NFPA 70-2024 - The panel did not include the proposed informational note because it contained an undefined term and the information is not needed.

Public Input No. 1209-NFPA 70-2023 [New Definition after Definition: Circuit Breaker.]

First Revision No. 8525-NFPA 70-2024 [New Definition after Definition: Limited Care Facility.]

Limited-Energy System.

The equipment and cables of an end-to-end system that are power-restricted to ensure the energy delivered into any fault provides acceptable protection for fire prevention and electric shock. (CMP-3)

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 15:24:42 EST 2024

Committee Statement

Committee Statement: The term “Limited-Energy System” is used in new Articles 790, 792, and 794.
Response Message: FR-8525-NFPA 70-2024

Public Input No. 3330-NFPA 70-2023 [New Definition after Definition: Limited Care Facility.]

First Revision No. 8622-NFPA 70-2024 [Section No. 300.1(C)]

(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	⅜
16	½
21	¾
27	1
35	1¼
41	1½
53	2
63	2½
78	3
91	3½
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.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Tue Jan 23 08:14:51 EST 2024

Committee Statement

Committee Statement: Limiting conduit to trade sizes 6" max is restrictive for electrical installations. Electrical installation 8” inch conduit is commercially available.

Response Message: FR-8622-NFPA 70-2024

Public Input No. 1862-NFPA 70-2023 [Section No. 300.1(C)]

First Revision No. 8702-NFPA 70-2024 [New Section after 300.2(B)]

300.2(C) Damaged Conductors.

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 1: See NEMA GD 1-2019, *Evaluating Water-Damaged Electrical Equipment* , for information on electrical equipment and wiring methods damaged by water.

Informational Note 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.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Jan 23 12:45:32 EST 2024

Committee Statement

Committee Statement: Authorities having jurisdiction need enforceable language to ensure that damaged portions of conductors are replaced. This text enhances electrical safety and helps satisfy the "practical safeguarding" objective contemplated in 90.2. The informational notes are included for reference.

Response Message: FR-8702-NFPA 70-2024

First Revision No. 8625-NFPA 70-2024 [Section No. 300.3(B)(4)]

(4) Column-Width ~~Panelboard Enclosures~~ 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: Tue Jan 23 08:20:39 EST 2024

Committee Statement

Committee Statement: The auxiliary gutter is an extension of the panelboard's enclosure, not the panelboard itself. The text was updated to use the defined term.
Response Message: FR-8625-NFPA 70-2024

Public Input No. 791-NFPA 70-2023 [Section No. 300.3(B)(4)]

First Revision No. 8628-NFPA 70-2024 [Section No. 300.3(C)(1)]

(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, 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 725.136(A) for Class 2 and Class 3 circuit conductors.

Informational Note No. ~~2:~~ 2: See 726.136(A) for Class 4 circuit conductors.

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

Supplemental Information

File Name	Description	Approved
NEC_CMP3_FR-8628_300.3_C_1_.docx		

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Tue Jan 23 08:37:09 EST 2024

Committee Statement

Committee Statement: The text is separated into paragraphs to meet 3.5.1.2 of the NEC Style Manual. A new Informational Note was added to include Class 4 circuit conductors.

Response Message: FR-8628-NFPA 70-2024

Public Input No. 3911-NFPA 70-2023 [Section No. 300.3(C)(1)]

Public Input No. 4143-NFPA 70-2023 [Section No. 300.3(C)(1)]

(1) 1000 Volts ac, 1500 volts dc, Nominal, or Less. [Move text to (a) and (b)]

~~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.~~

~~Secondary wiring to electric-discharge lamps of 1000 volts ac, 1500 volts dc, 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 725.136(A) for Class 2 and Class 3 circuit conductors.~~

~~Informational Note No. 2: See 690.31(B) for photovoltaic source and output circuits.~~

(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, 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 725.136(A) for Class 2 and Class 3 circuit conductors.

Informational Note No. 2: See 726.136(A) for Class 4 circuit conductors.

Informational Note No. ~~2~~3: See 690.31(B) for photovoltaic source and output circuits.

First Revision No. 8656-NFPA 70-2024 [Section No. 300.4(E)]

(E) ~~Cables, Raceways, or Boxes Installed in or Under Metal-Corrugated~~ Wiring Methods and Materials Beneath Roof Decking.

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

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 300.4(E).

Exception No. 2: The 38 mm (1½in.) spacing ~~is~~ 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 Section 314.29.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Tue Jan 23 09:47:23 EST 2024

Committee Statement

Committee Statement: Wiring methods and materials beneath any roof deck can be damaged by screws used for roofing materials, PV equipment, or other applications, so the types of roof deck that this rule applies to were increased.

The language regarding cables, raceways, conduit bodies, etc. were condensed to “wiring methods and materials” to ensure that all components of the installation are afforded the protection required by this section.

Exception No. 2 was revised to use mandatory text.

Exception No. 3 was added to address raceways with 2” of concrete encasement. Such an installation is not likely to experience physical damage.

Response Message: FR-8656-NFPA 70-2024

Public Input No. 1422-NFPA 70-2023 [Section No. 300.4(E)]

Public Input No. 1830-NFPA 70-2023 [Section No. 300.4(E)]

First Revision No. 8680-NFPA 70-2024 [Section No. 300.5(D)(3)]

(3) Service Conductors and Raceways .

Underground service conductors and raceways 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: Tue Jan 23 11:12:50 EST 2024

Committee Statement

Committee Statement: The revision adds clarity that a warning ribbon is required for all service conductors.
Response Message: FR-8680-NFPA 70-2024

Public Input No. 1858-NFPA 70-2023 [Section No. 300.5(D)(3)]
Public Input No. 2193-NFPA 70-2023 [Section No. 300.5(D)(3)]

First Revision No. 8721-NFPA 70-2024 [Section No. 300.5(J)]

(J) Earth Movement.

Where direct-buried conductors, raceways, or cables are subject to movement by settlement or frost, direct-buried conductors, raceways, or cables shall be arranged so as to prevent damage to the enclosed conductors, to raceways, or to equipment connected to the raceways.

Informational Note: This section recognizes “S” loops in underground direct burial cables and conductors to raceway transitions, expansion fittings in raceway risers to fixed equipment, and, generally, the provision of flexible connections to equipment subject to settlement or frost heaves.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Tue Jan 23 13:17:55 EST 2024

Committee Statement

Committee Statement: The revised text makes it clear that raceways shall be protected from damage due to earth movement.
Response Message: FR-8721-NFPA 70-2024

Public Input No. 1999-NFPA 70-2023 [Section No. 300.5(J)]

First Revision No. 8724-NFPA 70-2024 [Section No. 300.7(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 one of the following:

(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 fitting or other approved means identified for the purpose of preventing condensation shall be permitted.

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

Supplemental Information

File Name	Description	Approved
NEC_CMP3_FR-8724_300.7_A_.docx		

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Tue Jan 23 13:24:41 EST 2024

Committee Statement

Committee Statement: List item two is added to recognize another method for preventing the buildup of condensation on the inside and the outside of the conduit especially in food processing facilities.

Response Message: FR-8724-NFPA 70-2024

Public Input No. 3942-NFPA 70-2023 [Section No. 300.7(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.~~one of the following:

(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 fitting or other approved means identified for the purpose of preventing condensation shall be permitted.

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

First Revision No. 8729-NFPA 70-2024 [Section No. 300.8]

300.8 Installation of Conductors With Other Systems.

Raceways or cable trays containing electrical conductors or cables shall not contain any pipe, tube, or ~~equal~~ other means for steam, water, air, gas, drainage, or any service other than electrical.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Tue Jan 23 13:33:44 EST 2024

Committee Statement

Committee Statement: Adding “or cables” makes it clear that cables are permitted no other foreign equipment can be in a raceway or cable tray with electrical conductors or cables.

"Equal" is changed to "other means" for clarity.

Response Message: FR-8729-NFPA 70-2024

Public Input No. 2028-NFPA 70-2023 [Section No. 300.8]

First Revision No. 8739-NFPA 70-2024 [Section No. 300.10]

300.10 Electrical Continuity of Metal Raceways, Cable Armor, and Enclosures.

Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electrical conductor and shall be connected to all boxes, fittings, and cabinets to provide ~~effective electrical continuity. Unless specifically permitted elsewhere in this *Code* , raceways and cable assemblies shall be mechanically secured to boxes, fittings, cabinets, and other enclosures.~~ an effective ground fault current path.

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 made electrically continuous.

Exception No. 2: Equipment enclosures to be isolated, as permitted by 250.96(B), shall not be required to be metallically joined to the metal raceway.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Jan 23 13:49:15 EST 2024

Committee Statement

Committee Statement: The term “effective ground fault current path” is defined in Article 100 and is the appropriate term to be used.

The second sentence is deleted and relocated to 300.12, as it is more appropriately located in the mechanical continuity requirement.

Response Message: FR-8739-NFPA 70-2024 - [Public Input 3080] The proposed deletion of “short sections” of raceways is not accepted, as unlimited lengths of raceways that are not bonded could prove to be a safety hazard.

Public Input No. 3080-NFPA 70-2023 [Section No. 300.10]

Public Input No. 665-NFPA 70-2023 [Section No. 300.10]

First Revision No. 8755-NFPA 70-2024 [Section No. 300.11(B)]

(B) Wiring Systems Installed Above Suspended Ceilings.

~~Support wires that do not provide secure support~~ Wiring shall not be ~~the sole support~~ 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. ~~Where~~ If independent support wires are used, they shall be ~~secured at both ends. Cables and raceways shall not be supported by ceiling grids.~~

~~**(1)** 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~~

ceiling system .

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

Informational Note: See ASTM E119 -22 , *Standard Test Methods for Fire Tests of Building Construction and Materials* , for one method of testing to determine fire rating.

~~**(2)** 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. Where independent support wires are used, they shall be distinguishable by color, tagging, or other effective means.~~

~~Exception~~

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

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8755_300.11_B_.docx		
70_CMP3_FR8755_300.11_B.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Jan 23 14:59:44 EST 2024

Committee Statement

Committee Statement: The requirements for ceilings with a fire-resistance rating and those without one are now the same, so there is no need to have two independent subsections. Furthermore, the phrase “fire-rated” is changed to “fire-resistance-rated” for consistency with ASTM E119.

Response Message: FR-8755-NFPA 70-2024

Public Input No. 552-NFPA 70-2023 [Section No. 300.11(B)]

Public Input No. 1355-NFPA 70-2023 [Section No. 300.11]

[FR 8755, 300.11]

(B) Wiring Systems Installed Above Suspended Ceilings.

~~Support wires that do not provide secure support~~Wiring shall not be ~~the sole support~~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. ~~Where~~ If independent support wires are used, they shall be ~~secured at both ends. Cables and raceways shall not be supported by ceiling grids~~distinguishable by color, tagging, or other means from those that are part of the ceiling system.

~~**(1) 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 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.

~~**(2) 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. Where independent support wires are used, they shall be distinguishable by color, tagging, or other effective means.~~

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

First Revision No. 8764-NFPA 70-2024 [Section No. 300.11(C)]

(C) Raceways Used as Means of Support.

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

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

(2) ~~Where~~ 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) ~~Where~~ 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: Tue Jan 23 15:16:06 EST 2024

Committee Statement

Committee Statement: The addition of item (4) aligns with 250.102(E), which allows bonding jumpers or conductors and equipment bonding jumpers to be installed inside or outside of a raceway or an enclosure.

The word “where” was changed to “if” in multiple locations to comply with the 2023 NEC Style Manual, section 3.5.4.

Response Message: FR-8764-NFPA 70-2024

Public Input No. 188-NFPA 70-2023 [Section No. 300.11(C)]

First Revision No. 8770-NFPA 70-2024 [Section No. 300.11(D)]

(D) Cables and Conductors Not Used as Means of Support.

Cable and conductor wiring methods shall not be used as a means of support for other cables, conductors, raceways, or nonelectrical equipment.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Tue Jan 23 15:26:03 EST 2024

Committee Statement

Committee Statement: Similar to cables, conductors must not be used as a means of support.

Response Message: FR-8770-NFPA 70-2024 - The word "single" was not included to ensure that the requirement applies to wiring methods, such as knob-and-tube, messenger-supported, and open wiring on insulators.

Public Input No. 2325-NFPA 70-2023 [Section No. 300.11(D)]

First Revision No. 8779-NFPA 70-2024 [Section No. 300.12]

300.12 Mechanical Continuity — Raceways and Cables.

Raceways, cable armors, and cable sheaths shall be continuous between cabinets, boxes, conduit bodies, fittings, wireways, or other enclosures or outlets. Unless specifically permitted elsewhere in this Code, raceways and cable assemblies shall be mechanically secured to boxes, fittings, cabinets, and other enclosures.

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, such as switchboards, motor control centers, and floor or pad-mounted transformers, shall not be required to be mechanically secured to the equipment.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Jan 23 15:38:27 EST 2024

Committee Statement

Committee Statement: Adding “wireway” makes it clear that raceways and cables must secured to a wireway.

The second sentence is relocated from 300.10 to recognize that this requirement is for mechanical continuity.

Response Message: FR-8779-NFPA 70-2024

Public Input No. 3083-NFPA 70-2023 [Section No. 300.12]

Public Input No. 666-NFPA 70-2023 [Section No. 300.12]

First Revision No. 8832-NFPA 70-2024 [Section No. 300.14]

300.14 Length of Free Conductors at Outlets, Junctions, and Switch Points.

(A) General. At least 150 mm (6 in.) of free conductor, measured from the point in the box where it emerges from its raceway or cable sheath, shall be left at each outlet, junction, and switch point for splices or the connection of luminaires or devices. The 150 mm (6 in.) free conductor shall be permitted to be spliced or unspliced. ~~Where~~

(B) Openings Smaller Than 200 mm (8 in.). If the opening to an outlet, junction, or switch point is less than 200 mm (8 in.) in any dimension, each conductor shall comply with all the following:

(1) Each conductor shall have free conductor in accordance with 300.14(A).

(2) Each conductor shall be long enough to extend at least 75 mm (3 in.) outside the opening.

Exception: Conductors that are not spliced or terminated at the outlet, junction, or switch point shall not be required to comply with 300.14.

Supplemental Information

File Name	Description	Approved
NEC_CMP3_FR-8832_300.14.docx		

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Jan 24 08:05:04 EST 2024

Committee Statement

Committee Statement: Breaking up 300.14 into a list item format to facilitate understanding for Code users. In accordance with NFPA Style Manual section 3.5.1.2 additional subdivisions shall be used where multiple requirements can be broken into independent requirements. Additionally, the panel titled each new sub-section to reflect when each requirement will be applicable.

Response Message: FR-8832-NFPA 70-2024

Public Input No. 3936-NFPA 70-2023 [Section No. 300.14]

300.14 Length of Free Conductors at Outlets, Junctions, and Switch Points. [Move text to (A) and (B)]

~~At least 150 mm (6 in.) of free conductor, measured from the point in the box where it emerges from its raceway or cable sheath, shall be left at each outlet, junction, and switch point for splices or the connection of luminaires or devices. The 150 mm (6 in.) free conductor shall be permitted to be spliced or unspliced. Where the opening to an outlet, junction, or switch point is less than 200 mm (8 in.) in any dimension, each conductor shall be long enough to extend at least 75 mm (3 in.) outside the opening.~~

~~*Exception: Conductors that are not spliced or terminated at the outlet, junction, or switch point shall not be required to comply with 300.14.*~~

(A) General.

At least 150 mm (6 in.) of free conductor, measured from the point in the box where it emerges from its raceway or cable sheath, shall be left at each outlet, junction, and switch point for splices or the connection of luminaires or devices. The 150 mm (6 in.) free conductor shall be permitted to be spliced or unspliced.

(B) Openings Smaller Than 200 mm (8 in.).

~~Where~~ If the opening to an outlet, junction, or switch point is less than 200 mm (8 in.) in any dimension, each conductor shall comply with all of the following:

(1) Each conductor shall have free conductor in accordance with 300.14(A).

(2) Each conductor shall be long enough to extend at least 75 mm (3 in.) outside the opening.

Exception: Conductors that are not spliced or terminated at the outlet, junction, or switch point shall not be required to comply with 300.14.

First Revision No. 8834-NFPA 70-2024 [Section No. 300.15(F)]

(F) Fitting.

A fitting identified for the use shall be permitted in lieu of a box or conduit body where conductors are not spliced or terminated within the fitting. ~~The~~ If used as a pull point, the fitting shall be accessible after installation~~, unless listed for concealed installation~~ .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Jan 24 08:15:40 EST 2024

Committee Statement

Committee Statement: Clearly identifying that fittings that are used as a pull point shall be accessible after installation clarifies the intent. Removing "unless listed for concealment" meets the current listing standards.

Response Message: FR-8834-NFPA 70-2024

Public Input No. 4317-NFPA 70-2023 [Section No. 300.15(F)]

Public Input No. 2690-NFPA 70-2023 [Section No. 300.15(F)]

Public Input No. 3179-NFPA 70-2023 [Section No. 300.15(F)]

First Revision No. 8835-NFPA 70-2024 [Section No. 300.15(L)]

(L) Manholes and Handhole Enclosures.

A box or conduit body shall not be required for conductors in manholes or handhole enclosures, except where connecting to electrical equipment. The installation shall comply with ~~Part V of~~ Article 110 ~~for~~ , Part V for manholes, and 314.30 for handhole enclosures.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Wed Jan 24 08:22:49 EST 2024

Committee Statement

Committee Statement: The change meets the NEC Style Manual requirement in section 4.1.4.
Response Message: FR-8835-NFPA 70-2024

Public Input No. 2654-NFPA 70-2023 [Section No. 300.15(L)]

First Revision No. 8836-NFPA 70-2024 [Section No. 300.17]

300.17 Number ~~and Size~~ of Conductors and Cables in Raceway.

The number and size of conductors and cables in ~~any~~ a complete raceway run shall not ~~be more than will permit dissipation of the heat and ready installation or withdrawal of the conductors or cables without damage to the conductors or cables, or to their insulation.~~

~~Informational Note: See the following sections of this *Code* : intermediate metal conduit, 342.22 ; rigid metal conduit, 344.22 ; flexible metal conduit, 348.22 ; liquidtight flexible metal conduit, 350.22 ; PVC conduit, 352.22 ; HDPE conduit, 353.22 ; RTRC, 355.22 ; liquidtight nonmetallic flexible conduit, 356.22 ; electrical metallic tubing, 358.22 ; flexible metallic tubing, 360.22 ; electrical nonmetallic tubing, 362.22 ; cellular concrete floor raceways, 372.22 ; cellular metal floor raceways, 374.22 ; metal wireways, 376.22 ; nonmetallic wireways, 378.22 ; surface metal raceways, 386.22 ; surface nonmetallic raceways, 388.22 ; underfloor raceways, 390.22 ; fixture wire, 402.7 ; theaters, 520.6 ; signs, 600.31(C) ; elevators, 620.33 ; audio signal processing, amplification, and reproduction equipment, 640.23(A) and 640.24 ; Class 1 circuits, 724.3(A) ; Class 2, Class 3, Class 4, and power-limited fire alarm (PLFA) circuits, 722.3(A) ; non-power-limited fire alarm (NPLFA) circuits, 760.3(H) ; and optical fiber cables and raceways, 770.110(B) .~~

exceed the allowable percentage fill specified in Table 1, Chapter 9.

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8836_300.17.docx	staff use	

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Wed Jan 24 08:26:35 EST 2024

Committee Statement

Committee Statement: The general requirement to make sure the percentage fills in Table 1, Chapter 9 are enforceable and not just an informational note.

Response Message: FR-8836-NFPA 70-2024

Public Input No. 2399-NFPA 70-2023 [Section No. 300.17]

[FR 8836]

300.17 Number ~~and Size~~ of Conductors and Cables in Raceway.

The number and size of conductors and cables in ~~any~~ a complete raceway shall not exceed the allowable percentage fill specified in Table 1, Chapter 9~~be more than will permit dissipation of the heat and ready installation or withdrawal of the conductors or cables without damage to the conductors or cables, or to their insulation~~.

~~Informational Note: See the following sections of this *Code*: intermediate metal conduit, 342.22; rigid metal conduit, 344.22; flexible metal conduit, 348.22; liquidtight flexible metal conduit, 350.22; PVC conduit, 352.22; HDPE conduit, 353.22; RTRC, 355.22; liquidtight nonmetallic flexible conduit, 356.22; electrical metallic tubing, 358.22; flexible metallic tubing, 360.22; electrical nonmetallic tubing, 362.22; cellular concrete floor raceways, 372.22; cellular metal floor raceways, 374.22; metal wireways, 376.22; nonmetallic wireways, 378.22; surface metal raceways, 386.22; surface nonmetallic raceways, 388.22; underfloor raceways, 390.22; fixture wire, 402.7; theaters, 520.6; signs, 600.31(C); elevators, 620.33; audio signal processing, amplification, and reproduction equipment, 640.23(A) and 640.24; Class 1 circuits, 724.3(A); Class 2, Class 3, Class 4, and power-limited fire alarm (PLFA) circuits, 722.3(A); non-power-limited fire alarm (NPLFA) circuits, 760.3(H); and optical fiber cables and raceways, 770.110(B).~~

First Revision No. 8840-NFPA 70-2024 [Section No. 300.18(A)]

(A) Complete Runs.

Raceways ~~other than busways, listed manufactured assemblies in accordance with~~ 604.100 ~~, or exposed raceways having hinged or removable covers~~ shall be installed complete between outlet, junction, or splicing points prior to the installation of conductors or cables~~. Where~~ , unless permitted by one of the following:

(1) Busways

(2) Listed manufactured assemblies in accordance with Section 604.100

(3) Exposed raceways having hinged or removable covers

(4) Raceways installed without terminating connections at the equipment, where required to facilitate the installation of utilization equipment

~~, the raceway shall be permitted to be initially installed without a terminating connection at the equipment.~~

(1)

(2) Prewired raceway assemblies

~~shall be permitted~~

(1) , only where specifically permitted in this

~~Code~~

(1) code for the applicable wiring method

~~.~~

(1)

~~Exception:~~

(1) Short sections of raceways used to contain conductors or cable assemblies for protection from physical damage

~~shall not be required to be installed complete between outlet, junction, or splicing points.~~

(1)

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8840_300.18_A_.docx	staff use	

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Wed Jan 24 08:38:59 EST 2024

Committee Statement

Committee Statement: The panel has separated section 300.18(A) into a list item format to facilitate understanding for Code users. In accordance with NFPA Style Manual section 3.5.1.2 additional subdivisions shall be used where multiple requirements can be broken into independent requirements. This revision will also allow the exception to be removed and written in positive code text in accordance with Section 2.1.9.1 of the NEC Style Manual. Additionally, there are no metallic raceways designed or listed for welding, so this language was removed.

Response Message: FR-8840-NFPA 70-2024

Public Input No. 3939-NFPA 70-2023 [Section No. 300.18(A)]

[FR 8840; 300.18]

(A) Complete Runs.

Raceways ~~other than busways, listed manufactured assemblies in accordance with 604.100, or exposed raceways having hinged or removable covers~~ shall be installed complete between outlet, junction, or splicing points prior to the installation of conductors or cables, unless permitted by one of the following: ~~Where required to facilitate the installation of utilization equipment, the raceway shall be permitted to be initially installed without a terminating connection at the equipment. Prewired raceway assemblies shall be permitted only where specifically permitted in this *Code* for the applicable wiring method.~~

1) Busways
2) Listed manufactured assemblies in accordance with Section 604.100
3) Exposed raceways having hinged or removable covers
4) Raceways installed without terminating connections at the equipment, where required to facilitate the installation of utilization equipment
5) Prewired raceway assemblies, only where specifically permitted in the code for the applicable wiring method
~~1)~~6) Short sections of raceways used to contain conductors or cable assemblies for protection from physical damage

~~*Exception: Short sections of raceways used to contain conductors or cable assemblies for protection from physical damage shall not be required to be installed complete between outlet, junction, or splicing points.*~~

First Revision No. 8797-NFPA 70-2024 [Section No. 300.18(B)]

(B) Welding.

Metal raceways shall not be supported, terminated, or connected by welding to the raceway ~~unless specifically designed to be or otherwise specifically permitted to be in this~~ ~~*Code*~~ .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Jan 23 16:52:55 EST 2024

Committee Statement

Committee Statement: Removing the verbiage clarifies that conduits shall not be welded. Welding has the possibility of damaging the interior of the raceway, which could damage the conductors. In addition, welding of raceways is not recognized by any certifying body and could result in changes to the characteristics of the raceway that have not been evaluated.

Response Message: FR-8797-NFPA 70-2024

Public Input No. 2266-NFPA 70-2023 [Section No. 300.18(B)]

First Revision No. 8845-NFPA 70-2024 [Section No. 300.19(A)]

(A) Spacing Intervals — Maximum.

Conductors in vertical raceways shall be supported if the vertical rise exceeds the values in Table 300.19(A). 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. Intermediate supports shall be provided as necessary to limit supported conductor lengths to not greater than those values specified in Table 300.19(A).

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.

Table 300.19(A) Spacings for Conductor ~~Supports~~

- -

Supports [swap the columns for "Aluminum or Copper-Clad Aluminum" and "Copper"]

Conductor Size	Support of Conductors in Vertical Raceways	Conductors				
		Aluminum or Copper-Clad Aluminum		-	Copper	
		m	ft	-	m	ft
18 AWG through 8 AWG	Not greater than	30	100	-	30	100
6 AWG through 1/0 AWG	Not greater than	60	200	-	30	100
2/0 AWG through 4/0 AWG	Not greater than	55	180	-	25	80
Over 4/0 AWG through 350 kcmil	Not greater than	41	135	-	18	60
Over 350 kcmil through 500 kcmil	Not greater than	36	120	-	15	50
Over 500 kcmil through 750 kcmil	Not greater than	28	95	-	12	40
Over 750 kcmil	Not greater than	26	85	-	11	35

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8845_300.19_A_.docx	staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Jan 24 08:49:15 EST 2024

Committee Statement

Committee Statement: The table columns are rearranged to be consistent with other tables in the code.

Response Message: FR-8845-NFPA 70-2024

Public Input No. 2055-NFPA 70-2023 [Section No. 300.19(A)]

[FR 8845; 300.19]

(A) Spacing Intervals — Maximum.

Conductors in vertical raceways shall be supported if the vertical rise exceeds the values in Table 300.19(A). 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. Intermediate supports shall be provided as necessary to limit supported conductor lengths to not greater than those values specified in Table 300.19(A).

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.

Table 300.19(A) Spacings for Conductor Supports

Conductor Size	Support of Conductors in Vertical Raceways	Conductors			
		~~Aluminum or~~ ~~Copper-Clad~~ ~~Aluminum~~Copper		Aluminum or Copper-Clad Aluminum~~Copper~~	
		m	ft	m	ft
18 AWG through 8 AWG	Not greater than	30	100	30	100
6 AWG through 1/0 AWG	Not greater than	~~60~~30	~~200~~100	~~30~~60	~~100~~200
2/0 AWG through 4/0 AWG	Not greater than	~~55~~25	~~180~~80	~~25~~55	~~80~~180
Over 4/0 AWG through 350 kcmil	Not greater than	~~41~~18	~~135~~60	~~18~~41	~~60~~135
Over 350 kcmil through 500 kcmil	Not greater than	~~36~~15	~~120~~50	~~15~~36	~~50~~120
Over 500 kcmil through 750 kcmil	Not greater than	~~28~~12	~~95~~40	~~12~~28	~~40~~95
Over 750 kcmil	Not greater than	~~26~~11	~~85~~35	~~11~~26	~~35~~85

First Revision No. 8855-NFPA 70-2024 [Section No. 300.22 [Excluding any Sub-Sections]]

The requirements of this section shall apply to the installation and uses of electrical wiring 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).

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

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Wed Jan 24 09:04:45 EST 2024

Committee Statement

Committee Statement: The cross-reference is updated in accordance with 4.1.4 of the NEC Style Manual.
Response Message: FR-8855-NFPA 70-2024

Public Input No. 2655-NFPA 70-2023 [Section No. 300.22 [Excluding any Sub-Sections]]

First Revision No. 8839-NFPA 70-2024 [New Section after 300.23]

300.24 Bends.

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

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Jan 24 08:34:06 EST 2024

Committee Statement

Committee Statement: The added text will clarify the requirement to not exceed 360 degrees between pull points, even if you transition to another type of raceway. The text is located in 300.24 to be consistent with the 3xx.24 sections of other Chapter 3 requirements.

Response Message: FR-8839-NFPA 70-2024

Public Input No. 324-NFPA 70-2023 [Section No. 300.17]

First Revision No. 8862-NFPA 70-2024 [Article 335]

Article 335 Instrumentation Tray Cable: Type ITC

Part I. General

335.1 Scope.

This article covers the use, installation, and construction specifications of instrumentation tray cable (Type ITC) for application to instrumentation and control circuits operating at 150 volts or less and 5 amperes or less.

335. ~~3~~ 2 Listing.

The cable shall be listed as being resistant to the spread of fire. The outer jacket shall be sunlight and moisture resistant.

Informational Note No. 1: See ANSI/UL 1685-2010, *Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables* , for one method of defining *resistant to the spread of fire* , which tests 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.

Informational Note No. 2: See CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables* , for another method of defining *resistant to the spread of fire* , which tests that the damage (char length) does not exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test.

335.4 Other Articles.

In addition to the provisions of this article, installation of Type ITC cable shall comply with other applicable articles of this *Code*.

Part II. Installation

335.~~4~~ 10 Uses Permitted.

Type ITC cable shall be permitted to be used as follows in industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation:

(1) In cable trays.

(2) In raceways.

(3) In hazardous locations as permitted in 501.10, 502.10, 503.10, 504.20, 504.30, 504.80, and 505.15.

(4) Enclosed in a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor applied over the nonmetallic sheath in accordance with 335.6. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).

(5) Cable, without a metallic sheath or armor, that complies with the crush and impact requirements of Type MC cable and is identified for such use with the marking *ITC-ER* 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).

Exception to (5): Where not subject to physical damage, Type ITC-ER 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.

(6) As aerial cable on a messenger.

(7) Direct buried where identified for the use.

(8) Under raised floors in rooms containing industrial process control equipment and rack rooms where arranged to prevent damage to the cable.

(9) Under raised floors in information technology equipment rooms in accordance with 645.5(E)(2).

335.~~5~~ 12 Uses Not Permitted.

Type ITC cable shall not be installed on circuits operating at more than 150 volts or more than 5 amperes.

Installation of Type ITC cable with other cables shall be subject to the stated requirements of the specific articles for the other cables. Where the governing articles do not contain stated requirements for installation with Type ITC cable, the installation of Type ITC cable with the other cables shall not be permitted.

Type ITC cable shall not be installed with power, lighting, Class 1 circuits that are not power limited, or non–power-limited circuits.

Exception No. 1: Where terminated within equipment or junction boxes and separations are maintained by insulating barriers or other means.

Exception No. 2: Where a metallic sheath or armor is applied over the nonmetallic sheath of the Type ITC cable.

Part III. Construction Specifications

335.6~~.~~ 100 . Construction.

The insulated conductors of Type ITC cable shall be in sizes 22 AWG through 12 AWG. The conductor material shall be copper or thermocouple alloy. Insulation on the conductors shall be rated for 300 volts. Shielding shall be permitted.

The cable shall be

~~listed as being~~

resistant to the spread of fire. The outer jacket shall be sunlight - and moisture - resistant.

Where a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor is applied over the nonmetallic sheath, an overall nonmetallic jacket shall not be required.

~~Informational Note: One method of defining *resistant to the spread of fire* is that the cables do not spread fire to the top of the tray in the UL flame exposure, vertical tray flame test in ANSI/UL 1685-2010, *Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables* . 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 CSA vertical flame test — cables in cable trays, as described in CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables* .~~

~~335.7~~

335.120 . Marking.

The cable shall be marked in accordance with 310.8(A)(2) through (A)(5). Voltage ratings shall not be marked on the cable.

335.

~~8~~

80 . Ampacity.

The ampacity of the conductors shall be 5 amperes, except for 22 AWG conductors, which shall have an ampacity of 3 amperes.

335.

~~9~~

90 . Overcurrent Protection. [locate in Part II]

Overcurrent protection shall not exceed 5 amperes for 20 AWG and larger conductors, and 3 amperes for 22 AWG conductors.

335.

~~10~~

24 . Bends.

Bends in Type ITC cables shall be made so as not to damage the cable.

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8862_Art_335.docx	staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Jan 24 09:25:44 EST 2024

Committee Statement

Committee Statement:	The Article is reorganized in accordance with 2.2.1.1 of the NEC Style Manual. The revised Informational Notes comply with the NEC Style Manual, 2.1.10.3.
Response Message:	FR-8862-NFPA 70-2024

Public Input No. 3132-NFPA 70-2023 [Article 335]

Public Input No. 1628-NFPA 70-2023 [Article 335]

Public Input No. 4236-NFPA 70-2023 [Article 335]

[FR 8862]

Article 335 Instrumentation Tray Cable: Type ITC

Part I. General

335.1 Scope.

This article covers the use, installation, and construction specifications of instrumentation tray cable (Type ITC) for application to instrumentation and control circuits operating at 150 volts or less and 5 amperes or less.

335.2 Listing.

Type ITC cable shall be listed.

Informational Note No. 1: See ANSI/UL 1685-2010, *Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*, for one method of defining *resistant to the spread of fire*, which tests 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.

Informational Note No. 2: See CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables*, for another method of defining *resistant to the spread of fire*, which tests that the damage (char length) does not exceed 1.5 m (4 ft 11 in.) when performing the CSA vertical flame test.

335.~~3~~4 Other Articles.

In addition to the provisions of this article, installation of Type ITC cable shall comply with other applicable articles of this *Code*.

Part II. Installation

335.10~~4~~ Uses Permitted.

Type ITC cable shall be permitted to be used as follows in industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation:

(1) In cable trays.

(2) In raceways.

(3) In hazardous locations as permitted in 501.10, 502.10, 503.10, 504.20, 504.30, 504.80, and 505.15.

(4) Enclosed in a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor applied over the nonmetallic sheath in accordance with 335.6. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft).

(5) Cable, without a metallic sheath or armor, that complies with the crush and impact requirements of Type MC cable and is identified for such use with the marking *ITC-ER* 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).

Exception to (5): Where not subject to physical damage, Type ITC-ER 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.

(6) As aerial cable on a messenger.

(7) Direct buried where identified for the use.

(8) Under raised floors in rooms containing industrial process control equipment and rack rooms where arranged to prevent damage to the cable.

(9) Under raised floors in information technology equipment rooms in accordance with 645.5(E)(2).

335.125 Uses Not Permitted.

Type ITC cable shall not be installed on circuits operating at more than 150 volts or more than 5 amperes.

Installation of Type ITC cable with other cables shall be subject to the stated requirements of the specific articles for the other cables. Where the governing articles do not contain stated requirements for installation with Type ITC cable, the installation of Type ITC cable with the other cables shall not be permitted.

Type ITC cable shall not be installed with power, lighting, Class 1 circuits that are not power limited, or non–power-limited circuits.

Exception No. 1: Where terminated within equipment or junction boxes and separations are maintained by insulating barriers or other means.

Exception No. 2: Where a metallic sheath or armor is applied over the nonmetallic sheath of the Type ITC cable.

335.10 24 Bends.

Bends in Type ITC cables shall be made so as not to damage the cable.

335.8 80 Ampacity.

The ampacity of the conductors shall be 5 amperes, except for 22 AWG conductors, which shall have an ampacity of 3 amperes.

335.9 90 Overcurrent Protection.

Overcurrent protection shall not exceed 5 amperes for 20 AWG and larger conductors, and 3 amperes for 22 AWG conductors.

Part III. Construction Specifications

335.1006 Construction.

The insulated conductors of Type ITC cable shall be in sizes 22 AWG through 12 AWG. The conductor material shall be copper or thermocouple alloy. Insulation on the conductors shall be rated for 300 volts. Shielding shall be permitted.

The cable shall be listed as being resistant to the spread of fire. The outer jacket shall be sunlight and moisture resistant.

Where a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor is applied over the nonmetallic sheath, an overall nonmetallic jacket shall not be required.

Informational Note: One method of defining *resistant to the spread of fire* is that the cables do not spread fire to the top of the tray in the UL flame exposure, vertical tray flame test in ANSI/UL 1685-2010, *Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. 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 CSA vertical flame test — cables in cable trays, as described in CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables*.

335.1207 Marking.

The cable shall be marked in accordance with 310.8(A)(2) through (A)(5). Voltage ratings shall not be marked on the cable.

First Revision No. 8875-NFPA 70-2024 [Section No. 590.4(A)]

~~(A)~~ ~~Services.~~

~~Services shall be installed in conformance with Parts I through VIII of Article~~ ~~230~~ ~~, as applicable.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Jan 24 10:38:33 EST 2024

Committee Statement

Committee Statement: This section was deleted to comply with 4.1.1 of the NEC Style Manual. The requirements of Article 230 already apply via 90.3, so referencing them here is not needed.

Response Message: FR-8875-NFPA 70-2024

Public Input No. 165-NFPA 70-2023 [Section No. 590.4(A)]

Public Input No. 2769-NFPA 70-2023 [Section No. 590.4(A)]

Public Input No. 2977-NFPA 70-2023 [Section No. 590.4(A)]

Public Input No. 667-NFPA 70-2023 [Section No. 590.4(A)]

First Revision No. 8876-NFPA 70-2024 [Section No. 590.4(B)]

(B) Feeders.

Overcurrent protection shall be provided in accordance with 240.4, 240.5, 245.26, 445.12, and 445.13, as applicable . Conductors shall be permitted within cable assemblies or within multiconductor cords or cables of a type identified in Table 400.4 for hard usage or extra-hard usage. For the purpose 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 ~~height~~ limitation ~~or 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: Single insulated conductors shall be permitted where installed for the purpose(s) specified in 590.3(C) and accessible only to qualified persons.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Jan 24 10:41:06 EST 2024

Committee Statement

Committee Statement: The words “as applicable” are added to clarify that only specific overcurrent protection requirements shall apply to specific installations, rather than all of those rules applying to every installation. The words "height limitation" in 590.4(B)(1) are deleted because there is not a building or structure height limitation for Type NM, Type NMC, and Type SE cables.

Response Message: FR-8876-NFPA 70-2024

Public Input No. 166-NFPA 70-2023 [Section No. 590.4(B)]

Public Input No. 2404-NFPA 70-2023 [Section No. 590.4(B)]

First Revision No. 8879-NFPA 70-2024 [Section No. 590.4(C)]

(C) 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 overcurrent 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 ~~height~~ limitation ~~or 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 590.3(B) or 590.3(C) shall be permitted to be run as single insulated conductors. Where the wiring is installed in accordance with 590.3(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: Wed Jan 24 10:44:53 EST 2024

Committee Statement

Committee Statement: "Panelboard" was changed to "enclosed panelboard" to make the text technically correct.

The words “as applicable” are added to clarify that only specific overcurrent protection requirements shall apply to specific installations, rather than all of those rules applying to every installation.

The words "height limitation" in 590.4(B)(1) are deleted because there is not a building or structure height limitation for Type NM, Type NMC, and Type SE cables.

Response Message: FR-8879-NFPA 70-2024

Public Input No. 167-NFPA 70-2023 [Section No. 590.4(C)]

Public Input No. 2080-NFPA 70-2023 [Section No. 590.4(C)]

Public Input No. 2405-NFPA 70-2023 [Section No. 590.4(C)]

First Revision No. 8882-NFPA 70-2024 [Section No. 590.4(D)]

(D) Receptacles.

~~**(1)** All Receptacles.~~

~~All~~

receptacles shall be of the grounding type. Unless installed in a continuous metal raceway that qualifies as an equipment grounding conductor in accordance with 250.118 or a continuous metal-covered cable that qualifies as an equipment grounding conductor in accordance with 250.118 , all branch circuits shall include a separate equipment grounding conductor, and all receptacles shall be electrically connected to the equipment grounding conductor(s). Receptacles on construction sites shall not be installed on any branch circuit that supplies temporary lighting.

~~**(2)** Receptacles in Wet Locations.~~

~~All 15- and 20-ampere, 125- and 250-volt receptacles installed in a wet location shall comply with 406.9(B)(1) .~~

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8882_590.4_A_.docx		
70_CMP3_FR8882_590.4_D_.docx	For prod use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Jan 24 10:50:29 EST 2024

Committee Statement

Committee Statement: Receptacles in wet locations are required to comply with 406.9(B). Article 590 does not modify this requirement. In accordance with the NEC Style Manual, section 4.1.1, general requirements in Chapters 1 through 4 shall not be repeated in other articles of the document.

Response Message: FR-8882-NFPA 70-2024

Public Input No. 1499-NFPA 70-2023 [Section No. 590.4(D)(2)]

Public Input No. 2406-NFPA 70-2023 [Section No. 590.4(D)]

[FR 8882; 590.4]

(D) Receptacles.

All receptacles shall be of the grounding type. Unless installed in a continuous metal raceway that qualifies as an equipment grounding conductor in accordance with 250.118 or a continuous metal-covered cable that qualifies as an equipment grounding conductor in accordance with 250.118, all branch circuits shall include a separate equipment grounding conductor, and all receptacles shall be electrically connected to the equipment grounding conductor(s). Receptacles on construction sites shall not be installed on any branch circuit that supplies temporary lighting.

~~**(1) All Receptacles.**~~

~~All receptacles shall be of the grounding type. Unless installed in a continuous metal raceway that qualifies as an equipment grounding conductor in accordance with 250.118 or a continuous metal-covered cable that qualifies as an equipment grounding conductor in accordance with 250.118, all branch circuits shall include a separate equipment grounding conductor, and all receptacles shall be electrically connected to the equipment grounding conductor(s). Receptacles on construction sites shall not be installed on any branch circuit that supplies temporary lighting.~~

~~**(2) Receptacles in Wet Locations.**~~

~~All 15- and 20-ampere, 125- and 250-volt receptacles installed in a wet location shall comply with 406.9(B)(1).~~

First Revision No. 8883-NFPA 70-2024 [Section No. 590.4(F)]

(F) Lamp Protection.

All lamps for general illumination shall be protected from accidental contact or breakage by a ~~suitable luminaire or lampholder with a~~ guard.

Metal ~~guarded sockets shall not be used unless the metal guard is~~ guards of lampholders and metal guards secured to conductive enclosure parts shall be connected to the circuit equipment grounding conductor.

Exception: A guard shall not be required for non-replaceable LED lamps integral to a listed temporary lighting string.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Jan 24 10:55:45 EST 2024

Committee Statement

Committee Statement: An exception has been added for not requiring a guard for non-replaceable LED listed temporary lighting strings. The product standard for listing this temporary lighting string is UL 1088. Clarification has been made for metal guards.

Response Message: FR-8883-NFPA 70-2024

Public Input No. 2302-NFPA 70-2023 [Section No. 590.4(F)]

Public Input No. 637-NFPA 70-2023 [Section No. 590.4(F)]

First Revision No. 8889-NFPA 70-2024 [Section No. 590.4(G)]

(G) Splices.

A box, conduit body, or other enclosure, with a cover installed, shall be required for all splices.

Exception No. 1: On construction sites, a box, conduit body, or other enclosure shall not be required for either of the following conditions:

(1) The circuit conductors being spliced are all from nonmetallic multiconductor cord or cable assemblies, provided that the equipment grounding continuity is maintained with or without the box.

(2) The circuit conductors being spliced are all from metal-sheathed cable assemblies terminated in listed fittings that mechanically secure the cable sheath to maintain effective electrical continuity.

Exception No. 2: On construction sites, branch-circuits that are permanently installed in framed walls and ceilings and are used to supply temporary power or lighting,and that are GFCI protected, the following shall be permitted:

(1) A box cover shall not be required for splices installed completely inside of junction boxes~~- with plaster rings~~ , outlet boxes, or device boxes .

(2) Listed pigtail-type lampholders shall be permitted to be installed in ceiling-mounted junction boxes~~- with plaster rings~~ , outlet boxes, or device boxes .

(3) Finger safe devices shall be permitted for supplying and connection of devices.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Jan 24 11:05:44 EST 2024

Committee Statement

Committee Statement: Exception 2 is revised to permit splices that are completely contained inside a junction box, outlet box, or device box with or without a plaster ring.

Response Message: FR-8889-NFPA 70-2024

Public Input No. 1816-NFPA 70-2023 [Section No. 590.4(G)]

First Revision No. 8894-NFPA 70-2024 [Section No. 590.4(J)]

(J) Support.

(1) Protection from Physical Damage. Cable assemblies and flexible cords and cables shall be supported in place at intervals that ensure that they will be protected from physical damage. Support shall be in the form of staples, cable ties, straps, or similar type fittings installed so as not to cause damage.

(2) Cords and Cables. Cable assemblies and flexible cords and cables installed as branch circuits or feeders shall not be installed on the floor or on the ground. Extension cords shall not be required to comply with 590.4(J).

(3) Vegetation Not Used for Support. Vegetation shall not be used for support of overhead spans of branch circuits or feeders.

Exception: For holiday lighting in accordance with 590.3(B), where the conductors or cables are arranged with strain relief devices, tension take-up devices, or other approved means to avoid damage from the movement of the live vegetation, trees shall be permitted to be used for support of overhead spans of branch-circuit conductors or cables.

Supplemental Information

File Name	Description	Approved
NEC_CMP3_FR-8894_590.4_J_.docx		

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Wed Jan 24 11:12:07 EST 2024

Committee Statement

Committee Statement: In accordance with NFPA Style Manual, section 3.5.1.2, breaking up 590.4(J) into a list item format facilitates more user-friendly text.

Response Message: FR-8894-NFPA 70-2024

Public Input No. 4194-NFPA 70-2023 [Section No. 590.4(J)]

(J) Support. [Move text to (1)—(3)]

~~Cable assemblies and flexible cords and cables shall be supported in place at intervals that ensure that they will be protected from physical damage. Support shall be in the form of staples, cable ties, straps, or similar type fittings installed so as not to cause damage. Cable assemblies and flexible cords and cables installed as branch circuits or feeders shall not be installed on the floor or on the ground. Extension cords shall not be required to comply with 590.4(J). Vegetation shall not be used for support of overhead spans of branch circuits or feeders.~~

~~*Exception: For holiday lighting in accordance with 590.3(B), where the conductors or cables are arranged with strain relief devices, tension take-up devices, or other approved means to avoid damage from the movement of the live vegetation, trees shall be permitted to be used for support of overhead spans of branch-circuit conductors or cables.*~~

(1) Protection from Physical Damage.

Cable assemblies and flexible cords and cables shall be supported in place at intervals that ensure that they will be protected from physical damage. Support shall be in the form of staples, cable ties, straps, or similar type fittings installed so as not to cause damage.

(2) Cords and Cables.

Cable assemblies and flexible cords and cables installed as branch circuits or feeders shall not be installed on the floor or on the ground. Extension cords shall not be required to comply with 590.4(J).

(3) Vegetation Not Used for Support.

Vegetation shall not be used for support of overhead spans of branch circuits or feeders.

Exception: For holiday lighting in accordance with 590.3(B), where the conductors or cables are arranged with strain relief devices, tension take-up devices, or other approved means to avoid damage from the movement of the live vegetation, trees shall be permitted to be used for support of overhead spans of branch-circuit conductors or cables.

First Revision No. 8896-NFPA 70-2024 [Section No. 590.6(A)]

(A) Receptacle Outlets.

Temporary receptacle installations used to supply temporary power to equipment used by personnel during construction, remodeling, maintenance, repair, or demolition of buildings, structures, equipment, or similar activities shall comply with the requirements of 590.6(A)(1) through (A)(3), as applicable.

Exception: In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified personnel are involved, an assured equipment grounding conductor program as specified in 590.6(B)(2) shall be permitted for only those receptacle outlets used to supply equipment that would create a greater hazard if power were interrupted or having a design that is not compatible with GFCI protection.

(1) Receptacle Outlets Not Part of Permanent Wiring.

All 125-volt, single-phase, 15-, 20-, and 30-ampere receptacle outlets that are not a part of the permanent wiring of the building or structure and that are in use by personnel shall have ~~ground-fault circuit-interrupter~~ GFCI protection for personnel. ~~In addition to this required ground-fault circuit-interrupter protection for personnel, listed cord sets or devices incorporating listed ground-fault circuit-interrupter protection for personnel identified for portable use shall be permitted.~~

(2) Receptacle Outlets Existing or Installed as Permanent Wiring.

Ground-fault circuit-interrupter protection for personnel shall be provided for all 125-volt, single-phase, 15-, 20-, and 30-ampere receptacle outlets installed or existing as part of the permanent wiring of the building or structure and used for temporary electric power. ~~Listed cord sets or devices incorporating listed ground-fault circuit-interrupter~~

Exception: A listed cord set or device incorporating listed GFCI protection for personnel, identified for portable use shall be permitted for compliance with this section.

(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 (B). ~~Listed cord sets or devices incorporating listed ground-fault circuit-interrupter~~

Exception: A listed cord set or device incorporating listed GFCI protection for personnel, identified for portable use shall be permitted for

~~use with 15-kW or less portable generators~~
compliance with this section where the portable generator was manufactured or remanufactured prior to January 1, 2015.

Supplemental Information

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Submitter Information Verification

Committee: NEC-P03
Submittal Date: Wed Jan 24 11:14:30 EST 2024

Committee Statement

Committee Statement:	Clarifications were made to the requirements by changing permissive text to exceptions. The acronym "GFCI" has also been used, as it is previously defined in the section.
Response Message:	FR-8896-NFPA 70-2024

Public Input No. 3084-NFPA 70-2023 [Section No. 590.6(A)]

Public Input No. 93-NFPA 70-2023 [Section No. 590.6]

[FR 8896; 590.6]

(A) Receptacle Outlets.

Temporary receptacle installations used to supply temporary power to equipment used by personnel during construction, remodeling, maintenance, repair, or demolition of buildings, structures, equipment, or similar activities shall comply with the requirements of 590.6(A)(1) through (A)(3), as applicable.

Exception: In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified personnel are involved, an assured equipment grounding conductor program as specified in 590.6(B)(2) shall be permitted for only those receptacle outlets used to supply equipment that would create a greater hazard if power were interrupted or having a design that is not compatible with GFCI protection.

(1) Receptacle Outlets Not Part of Permanent Wiring.

All 125-volt, single-phase, 15-, 20-, and 30-ampere receptacle outlets that are not a part of the permanent wiring of the building or structure and that are in use by personnel shall have ~~ground-fault circuit-interrupter~~ GFCI protection for personnel. ~~In addition to this required ground-fault circuit-interrupter protection for personnel, listed cord sets or devices incorporating listed ground-fault circuit-interrupter protection for personnel identified for portable use shall be permitted.~~

(2) Receptacle Outlets Existing or Installed as Permanent Wiring.

Ground-fault circuit-interrupter protection for personnel shall be provided for all 125-volt, single-phase, 15-, 20-, and 30-ampere receptacle outlets installed or existing as part of the permanent wiring of the building or structure and used for temporary electric power. ~~Listed cord sets or devices incorporating listed ground-fault circuit-interrupter protection for personnel identified for portable use shall be permitted.~~

Exception A listed cord set or device incorporating listed GFCI protection for personnel, identified for portable use shall be permitted for compliance with this section.

(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 (B). ~~Listed cord sets or devices incorporating listed ground-fault circuit-interrupter protection for personnel identified for portable use shall be permitted for use with 15-kW or less portable generators manufactured or remanufactured prior to January 1, 2015.~~

Exception A listed cord set or device incorporating listed GFCI protection for personnel, 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.

First Revision No. 8919-NFPA 70-2024 [Section No. 590.8(A)]

(A) Where Reused.

Overcurrent protective devices that have been previously used and are installed in a temporary installation shall be examined to ensure they have been properly ~~installedand~~ 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, ~~*Recommended Practice*~~ *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*

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Wed Jan 24 12:55:01 EST 2024

Committee Statement

Committee Statement: A space is added between "installed" and "and".
Response Message: FR-8919-NFPA 70-2024

Public Input No. 1512-NFPA 70-2023 [Section No. 590.8(A)]

First Revision No. 8337-NFPA 70-2024 [Section No. 722.3(D)]

(D) Cables in Ducts for Dust, Loose Stock, or Vapor Removal.

Section 300.22(A) for wiring systems shall apply.

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

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 14:21:42 EST 2024

Committee Statement

Committee Statement: The exception to 722.3(D) to specifically allow nonconductive optical fiber cables was deleted to align with 300.22(A). The specific exception had been inadvertently added during the 2023 reorganization that produced Article 722.

Response Message: FR-8337-NFPA 70-2024

Public Input No. 32-NFPA 70-2023 [Section No. 722.3(D)]

First Revision No. 8282-NFPA 70-2024 [Section No. 722.3(E)]

(E) Cable Trays.

Cable tray installations shall comply with Article 392, Parts I and II ~~of Article 392~~ .

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 10:49:12 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.
Response Message: FR-8282-NFPA 70-2024 - See also the revision on 722.3(O).

Public Input No. 2945-NFPA 70-2023 [Section No. 722.3]

First Revision No. 8338-NFPA 70-2024 [Section No. 722.3(F)]

(F) Instrumentation Tray Cable.

Circuits wired using instrumentation tray cable shall comply with 335.1 and 335.~~4 through~~ 10 through 335.~~9~~ 120 .

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 14:29:53 EST 2024

Committee Statement

Committee Statement: The cross-references were updated to reflect the new arrangement in Article 335.
Response Message: FR-8338-NFPA 70-2024

Public Input No. 4447-NFPA 70-2023 [Section No. 722.3(F)]

First Revision No. 8289-NFPA 70-2024 [Section No. 722.3(O)]

(O) Specific Requirements.

As appropriate, the installation of wires and cables shall also comply with the following:

(1) Class 2 and Class 3 cables — ~~Part II of~~ Article 725, Part II

(2) Class 4 cables — ~~Part IV of~~ Article 726 , Part IV

(3) Fire alarm cables — ~~Part III of~~ Article 760 , Part III

(4) Optical fiber cables — ~~Part V of~~ Article 770 , Part V

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 10:55:41 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.

Response Message: FR-8289-NFPA 70-2024

Public Input No. 31-NFPA 70-2023 [Section No. 722.3(O)]

First Revision No. 8340-NFPA 70-2024 [Section No. 722.24]

722.24 Mechanical Execution of Work.

(A) General.

~~Cables shall be installed in a neat and workmanlike manner. 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. Such cables shall be secured by hardware, including straps, staples, hangers, listed cable ties identified for securement and support, or similar fittings, designed and installed so as not to damage the cable.~~ The installation shall conform to 300.4 and 300.11.

~~A bushing shall be installed where cables emerge from raceway used for mechanical support or protection in accordance with 300.15(C) .~~

~~Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 300.22(C) .~~

~~Informational Note No. 1:~~

~~See NFPA 90A-2021, *Standard for the Installation of Air-Conditioning and Ventilating Systems* , for discrete combustible components.~~

~~Informational Note No. 2: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants could result in an undetermined alteration of cable properties.~~

(B)

~~Support of Cables.~~

~~Cables shall not be strapped, taped, or attached by any means to the exterior of any conduit or other raceway as a means of support.~~

~~*Exception No. 1:* *Class 2 circuit conductors or cables shall be permitted to be installed as permitted by 300.11(C)(2)* .~~

~~*Exception No. 2:* *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.*~~

~~**(C)** 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.~~

Supplemental Information

File Name	Description	Approved
NEC_CMP3_FR-8340_722.24.docx		

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Sun Jan 21 14:35:04 EST 2024

Committee Statement

Committee Statement: Requirements relating to the subject matter already exist in 110.12.
Response Message: FR-8340-NFPA 70-2024

722.24 Mechanical Execution of Work.

(A) General.

The installation shall conform to 300.4 and 300.11.~~Cables shall be installed in a neat and workmanlike manner. 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. Such cables shall be secured by hardware, including straps, staples, hangers, listed cable ties identified for securement and support, or similar fittings, designed and installed so as not to damage the cable. The installation shall conform to 300.4 and 300.11.~~

~~A bushing shall be installed where cables emerge from raceway used for mechanical support or protection in accordance with 300.15(C).~~

~~Nonmetallic cable ties and other nonmetallic cable accessories used to secure and support cables in other spaces used for environmental air (plenums) shall be listed as having low smoke and heat release properties in accordance with 300.22(C).~~

~~Informational Note No. 1: See NFPA 90A-2021, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, for discrete combustible components.~~

~~Informational Note No. 2: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants could result in an undetermined alteration of cable properties.~~

~~**(B) Support of Cables.**~~

~~Cables shall not be strapped, taped, or attached by any means to the exterior of any conduit or other raceway as a means of support.~~

~~*Exception No. 1: Class 2 circuit conductors or cables shall be permitted to be installed as permitted by 300.11(C)(2).*~~

~~*Exception No. 2: 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.*~~

(~~C~~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.

First Revision No. 8341-NFPA 70-2024 [Section No. 722.31]

722.31 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, ~~the power-limited circuits shall be installed using Class 1 circuit wiring methods in accordance with~~ 724.46 ~~. All~~ 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 ~~otherwise suitably~~ 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.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Sun Jan 21 14:45:17 EST 2024

Committee Statement

Committee Statement: The Panel removed the external reference to 724.46 and included the requirements from 724.46 in this text, removing the need for the reader to jump to multiple sections for this limited amount of information.

Response Message: FR-8341-NFPA 70-2024

First Revision No. 8344-NFPA 70-2024 [Section No. 722.135(A)]

~~(A)~~ ~~Listing.~~

~~Cables installed in buildings shall be listed.~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 14:58:25 EST 2024

Committee Statement

Committee Statement: This text is redundant to 722.179 and has been deleted.
Response Message: FR-8344-NFPA 70-2024

Public Input No. 2842-NFPA 70-2023 [Section No. 722.135(A)]

First Revision No. 8345-NFPA 70-2024 [Section No. 722.135(B)]

(B) Cables in Buildings.

The installation of cables shall comply with Table 722.135(B).

Table 722.135(B) Installation of Listed Cables in Buildings

Applications		Plenum	Riser	Cable Type[1] General-Purpose	Limited-Use	Under Carpet	PLTC
In ducts specifically fabricated for environmental air as described in 300.22(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 300.22(B)	Y	Y	Y	Y	N	Y
In other spaces used for environmental air (plenums) as described in 300.22(C)	Cables in other spaces used for environmental air	Y	N	N	N	N	N
	Cables in metal raceway that complies with 300.22(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
	Cables in riser communications	Y	Y	N	N	N	N

Applications		Plenum	Riser	Cable Type[1]			
				General-Purpose	Limited-Use	Under Carpet	PLTC
	raceways						
	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 communications	Y	Y	Y	N	N	Y

Applications		Plenum	Riser	Cable Type[1] General-Purpose	Limited-Use	Under Carpet	PLTC
	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 722.3(O).

[2] In 300.22(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 ~~2021~~ 2024 , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, ~~4.3.4 and 4.3.11.3.3,~~ 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 300.21 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.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Sun Jan 21 15:00:53 EST 2024

Committee Statement

Committee Statement: The Regulations Governing the Development of NFPA Standards, Section 3.3.6.2, requires that edition dates be included, so the dated reference remains and is updated to the current revision. The referred section is deleted as it is a burden to ensure this doesn't change in the referenced standard each code cycle.

Response Message: FR-8345-NFPA 70-2024

Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)]

First Revision No. 8379-NFPA 70-2024 [Section No. 722.135(E)]

(E) Cable Substitutions.

The substitutions for cables listed in Table 722.135(E) ~~shall~~ and illustrated in Figure 722.135(E) shall be permitted. Where substitute cables are installed, the installation requirements of the articles described in 722.3(O) shall also apply. CI cables shall be permitted to be installed to provide 2-hour circuit integrity. See 722.135(F).

Informational Note: See 800.179 for information on Types CMP, CMR, CM, and CMX.

Figure 722.135(E) Cable Substitution Hierarchy. [locate figure after Table 722.135(E)]

[Insert Figure 725.154(A) from the 2020 edition of NFPA 70.]

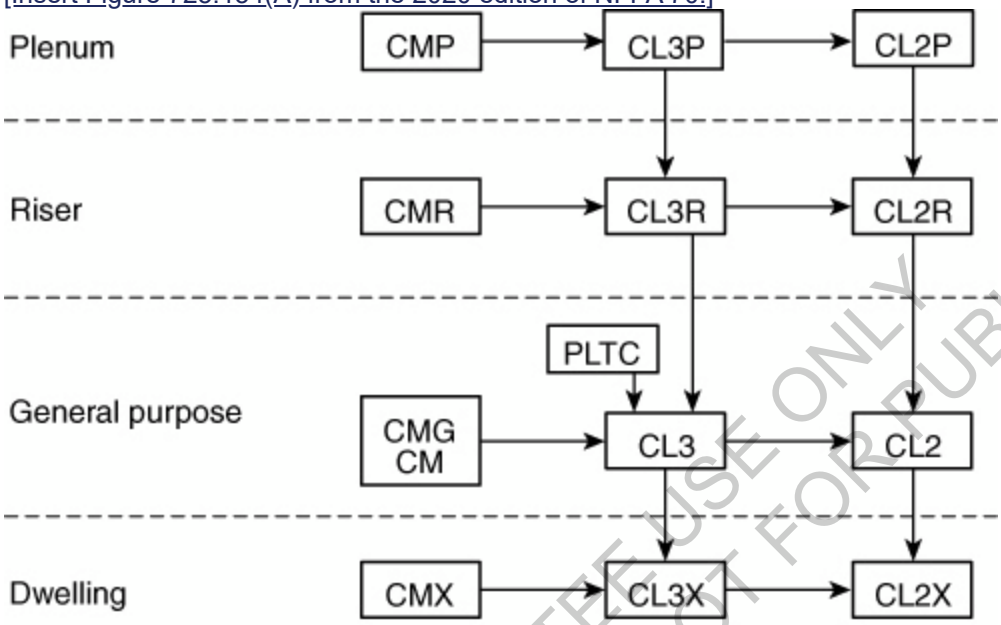


Table 722.135(E) Cable Substitutions

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

Cable Type	Permitted Substitutions
OFCR	OFNP, OFCP, OFNR
OFNG, OFN	OFNP, OFNR
OFCG, OFC	OFNP, OFCP, OFNR, OFCR, OFNG, OFN
CMUC	None

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 16:48:54 EST 2024

Committee Statement

Committee Statement: An illustration that was lost in the relocation of cable requirements from Article 725 to Article 722 in the 2023 cycle is restored.

Response Message: FR-8379-NFPA 70-2024

Public Input No. 208-NFPA 70-2023 [Sections 722.135(E), 722.135(F)]

First Revision No. 8452-NFPA 70-2024 [New Section after 722.135(I)]

(I) Installation in Dwelling Units.

Where Class 4 cables are used in a dwelling unit, 790.214 shall apply.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 11:36:47 EST 2024

Committee Statement

Committee Statement: The dwelling unit restriction on Class 4 circuits has been removed in Article 726. This adds an installation requirement to ensure limited heating.

Response Message: FR-8452-NFPA 70-2024

Public Input No. 4391-NFPA 70-2023 [Section No. 722.135]

First Revision No. 8290-NFPA 70-2024 [Section No. 722.135(I)]

(I) 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:

(1) For other than coaxial conductors, 800.44, 800.53, 800.100, 805.50, 805.93, 805.170(A), and 805.170(B)

(2) For coaxial conductors, 800.44, 820.93, and 820.100

(3) The installation requirements of ~~Part I of~~ Article 300 , Part I

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Sun Jan 21 10:58:52 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.

Response Message: FR-8290-NFPA 70-2024

Public Input No. 2946-NFPA 70-2023 [Section No. 722.135(I)]

First Revision No. 8350-NFPA 70-2024 [Section No. 722.179(A)(13)]

(13) Cables Containing Optical Fibers.

~~Composite~~ Hybrid optical fiber cables shall be listed as electrical cables based on the type of electrical conductors.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 15:22:40 EST 2024

Committee Statement

Committee Statement: The text is revised to use the defined term for a cable containing optical fibers and current-carrying electrical conductors.
Response Message: FR-8350-NFPA 70-2024

Public Input No. 37-NFPA 70-2023 [Section No. 722.179(A)(13)]

First Revision No. 8352-NFPA 70-2024 [Section No. 722.179(A)(15)]

(15) Power-Limited Fire Alarm (PLFA) Cables.

~~PFLA~~ PLFA cables shall comply with 722.179(A)(15)(a) through (A)(15)(d).

(a) 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.

(b) 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.

(c) Cables shall have a voltage rating of not less than 300 volts.

(d) Cables shall have a temperature rating of not less than 60°C (140°F).

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 15:29:08 EST 2024

Committee Statement

Committee Statement: The edit fixes the typographical error in the sentence.
Response Message: FR-8352-NFPA 70-2024

Public Input No. 2971-NFPA 70-2023 [Section No. 722.179(A)(15)]

First Revision No. 8619-NFPA 70-2024 [Section No. 722.179(A)(16)(5)]

~~**(5)** Cabling.~~

~~Cables shall comply with any requirements provided in the listing of the system.~~

~~Informational Note: See UL 1400-1, *Outline for Fault-Managed Power Distribution Technologies — Part 1: General Requirements*, for information on determining applicable requirements for the listing of Class 4 power systems. Excessive cable lengths can result in higher capacitance which could affect the safety of the circuit.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Jan 23 08:04:30 EST 2024

Committee Statement

Committee Statement: The deleted requirement for cabling is in the cabling listing standard and is not needed in the Code.

Response Message: FR-8619-NFPA 70-2024

First Revision No. 8354-NFPA 70-2024 [Section No. 722.179(B)]

(B) Marking.

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 722.179(B).

(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 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*~~ *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.

(8) Metallic conductor cables containing optical fibers shall be marked with the suffix "-OF".

Table 722.179(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
Conductive general-purpose optical fiber cable	OFC
Alternative nonconductive general-purpose optical fiber cable	OFNG

Cable Type	Cable Marking
Alternative conductive general-purpose optical fiber cable	OFCG
Class 3 cable — limited use	CL3X
Class 2 cable — limited use	CL2X
Undercarpet cable	CMUC

Note: All types of CL2, CL3, CL4, and FPL cables containing optical fibers are provided with the suffix "-OF."

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Sun Jan 21 15:32:54 EST 2024

Committee Statement

Committee Statement: The exception in item (7) was rewritten in mandatory text rather than permissive.

Item (8) is added as it inadvertently wasn't brought forward in the 2023 creation of Article 722.

CL4Z is a new addition to UL 1400-2 and is added to Table 722.179(B).

CL4 is added to the table note as CL4 cables can also contain optical fiber.

Response Message: FR-8354-NFPA 70-2024 - The deletions in the table were not made as Article 722 is being expanded to cover all cabling in Chapter 7 and Chapter 8, to include optical fiber cables.

Public Input No. 2974-NFPA 70-2023 [Section No. 722.179(B)]

Public Input No. 38-NFPA 70-2023 [Section No. 722.179(B)]

Public Input No. 566-NFPA 70-2023 [Section No. 722.179(B)]

First Revision No. 8361-NFPA 70-2024 [Sections 724.3, 724.21, 724.24]

Sections 724.3, 724.21, 724.24

~~**724.3** Other Articles.~~

~~In addition to the requirements of this article, circuits and equipment shall comply with 724.3(A) through (J).~~

~~**(A)** Number and Size of Conductors in Raceway.~~

~~The number and size of conductors shall comply with 300.17 .~~

~~**(B)** Spread of Fire or Products of Combustion.~~

~~Installation of Class 1 circuits shall comply with 300.21 .~~

~~**(C)** Ducts, Plenums, and Other Air-Handling Spaces.~~

~~Class 1 circuits installed in ducts, plenums, and other spaces used for environmental air shall comply with 300.22 .~~

~~**(D)** Hazardous (Classified) Locations.~~

~~Class 1 circuits shall not be installed in any hazardous (classified) locations except as permitted by other articles of this *Code* .~~

~~**(E)** Cable Trays.~~

~~Cable tray installations shall comply with Parts I and II of Article 392 .~~

~~**(F)** Raceways Exposed to Different Temperatures.~~

~~Installation of raceways shall comply with 300.7(A) .~~

~~**(G)** Vertical Support for Fire-Rated 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 shall comply with 300.19 .~~

~~**(H)** Bushings.~~

~~Bushings shall be installed where cables emerge from raceways used for mechanical support or protection in accordance with 300.15(C) .~~

~~**(I)** Installation of Conductors With Other Systems.~~

~~Installation of conductors with other systems shall comply with 300.8 .~~

~~**(J)** Identification of Equipment Grounding Conductors.~~

~~Equipment grounding conductors shall be identified in accordance with 250.119 .~~

~~**724.21** Access to Electrical Equipment Behind Panels Designed to Allow Access.~~

~~Access to electrical equipment shall not be denied by an accumulation of wires and cables preventing the removal of panels, including suspended ceiling panels.~~

~~**724.24** Mechanical Execution of Work.~~

~~Class 1 circuits shall be installed in a neat and workmanlike manner. Cables and conductors installed exposed on the surfaces of ceilings and sidewalls shall be supported by the building structure such that the cable will not be damaged by normal building use. Such cables shall be supported by straps, staples, hangers, cable ties, or similar fittings that are designed and installed to not damage the cable. The installation shall also comply with the requirements of 300.4 and 300.11 .~~

~~Informational Note: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants can result in an undetermined alteration of Class 1 cable properties.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Sun Jan 21 15:58:37 EST 2024

Committee Statement

Committee Statement: In the 2023 code cycle, when Class 1 was separated out from Article 725, this text was created. Because Article 724 is not independent of Article 300, this is redundant to 724.46 and 90.3.

Response Message: FR-8361-NFPA 70-2024

Public Input No. 2488-NFPA 70-2023 [Section No. 724.24]

Public Input No. 1384-NFPA 70-2023 [Section No. 724.24]

Public Input No. 2010-NFPA 70-2023 [Section No. 724.24]

Public Input No. 53-NFPA 70-2023 [Section No. 724.24]

Public Input No. 565-NFPA 70-2023 [Section No. 724.24]

Public Input No. 1489-NFPA 70-2023 [Sections 724.3, 724.21, 724.24]

Public Input No. 2947-NFPA 70-2023 [Section No. 724.3(E)]

First Revision No. 8291-NFPA 70-2024 [Section No. 724.40(A)]

(A) Class 1 Transformers.

Transformers shall be permitted to supply Class 1 circuits.

Informational Note: See Article 450, Parts I and ~~II of Article 450 for~~ II for information on transformers used to supply a Class 1 circuit.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 11:00:08 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.
Response Message: FR-8291-NFPA 70-2024

Public Input No. 2948-NFPA 70-2023 [Section No. 724.40(A)]

First Revision No. 8367-NFPA 70-2024 [Section No. 724.43]

724.43 Class 1 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 specified in 310.15 to the ampacity calculation. Overcurrent protection shall not exceed 7 amperes for ~~18 AWG conductors and~~ 18 AWG copper and 16 AWG copper-clad aluminum conductors and 10 amperes for ~~16 AWG~~ 16 AWG copper and 14 AWG copper-clad aluminum conductors .

Exception: Where other articles of this Code permit or require other overcurrent protection.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 16:12:52 EST 2024

Committee Statement

Committee Statement: The minimum size permitted for copper-clad remote-control and signaling conductors has been expanded as a result of the technical substantiation provided with public inputs 1418 and 1427.

Response Message: FR-8367-NFPA 70-2024

Public Input No. 1429-NFPA 70-2023 [Section No. 724.43]

First Revision No. 8376-NFPA 70-2024 [Section No. 724.49]

724.49 Class 1 Circuit Conductors.

(A) Sizes and Use.

Conductors that are 18 AWG and 16 AWG 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. Conductors larger than 16 AWG shall not supply loads greater than the ampacities specified in 310.14. Flexible cords shall comply with the requirements of ~~Article~~ Table 400. 4 .

(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 the requirements of ~~Article 310.~~ Table 310.4(1). Conductors that are 18 AWG and 16 AWG 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. Conductors with other types and thicknesses of insulation shall be permitted if listed for Class 1 circuit use.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 16:33:29 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.
Response Message: FR-8376-NFPA 70-2024 - Table 310.4(2) was not included because it applies to conductors rated at 2000 V.

Public Input No. 3365-NFPA 70-2023 [Section No. 724.49]

First Revision No. 8292-NFPA 70-2024 [Section No. 724.52]

724.52 Circuits Extending Beyond One Building.

Class 1 circuits that extend aerially beyond one building shall also meet the requirements of ~~Part I of~~ Article 225, Part I .

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 11:01:19 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.
Response Message: FR-8292-NFPA 70-2024

Public Input No. 2949-NFPA 70-2023 [Section No. 724.52]

First Revision No. 8393-NFPA 70-2024 [Sections 725.3, 725.10, 725.21, 725.24, 725.30, 725.31]

Sections 725.3, 725.10, 725.21, 725.24, 725.30, 725.31

~~**725.3** Other Articles.~~

~~In addition to the requirements of this article, circuits and equipment shall comply with the articles or sections listed in 725.3(A) through (E). Only those sections of Article 300 referenced in this article shall apply to Class 2 and Class 3 circuits.~~

~~**(A)** Spread of Fire or Products of Combustion.~~

~~Installation of Class 2 and Class 3 circuits shall comply with 300.21 .~~

~~**(B)** Ducts, Plenums, and Other Air-Handling Spaces.~~

~~Class 2 and Class 3 circuits installed in ducts, plenums, or other space used for environmental air shall comply with 300.22 .~~

~~**(C)** Motor Control Circuits.~~

~~Motor control circuits tapped from the load side of the motor branch-circuit protective device(s) as specified in 430.72(A) shall comply with Part IV of Article 430.~~

~~**(D)** Identification of Equipment Grounding Conductors.~~

~~Equipment grounding conductors shall be identified in accordance with 250.119 .~~

~~**(E)** Cables for Class 2 and Class 3 Circuits.~~

~~The listing and installation of cables for Class 2 and Class 3 circuits shall comply with Part I and Part II of Article 722.~~

~~**725.10** 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* .~~

~~**725.21** Access to Electrical Equipment Behind Panels Designed to Allow Access.~~

~~Access to electrical equipment shall not be denied by an accumulation of wires and cables that prevents removal of panels, including suspended ceiling panels.~~

~~**725.24** Mechanical Execution of Work.~~

~~Class 2 and Class 3 equipment shall be installed in a neat and workmanlike manner. The installation shall also comply with 300.4 and 300.11 .~~

~~**725.30** Class 2 and Class 3 Circuit Identification.~~

~~Class 2 and Class 3 circuits shall be identified at terminal and junction locations in a manner that prevents unintentional interference with other circuits during testing and servicing.~~

~~**725.31** 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, the power-limited circuits shall be installed in accordance with 724.31 . 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.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 08:12:49 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.1.

Response Message: FR-8393-NFPA 70-2024

Public Input No. 2506-NFPA 70-2023 [Sections 725.3, 725.10, 725.21, 725.24, 725.30, 725.31]

Public Input No. 815-NFPA 70-2023 [Section No. 725.3]

Public Input No. 2950-NFPA 70-2023 [Section No. 725.3]

Public Input No. 1696-NFPA 70-2023 [New Section after 725.21]

Public Input No. 1390-NFPA 70-2023 [Section No. 725.24]

Public Input No. 1697-NFPA 70-2023 [Section No. 725.24]

Public Input No. 2011-NFPA 70-2023 [Section No. 725.24]

Public Input No. 2491-NFPA 70-2023 [Section No. 725.24]

Public Input No. 285-NFPA 70-2023 [Section No. 725.24]

Public Input No. 3798-NFPA 70-2023 [Section No. 725.24]

Public Input No. 4239-NFPA 70-2023 [Section No. 725.24]

Public Input No. 54-NFPA 70-2023 [Section No. 725.24]

First Revision No. 8604-NFPA 70-2024 [Section No. 725.60]

725.60 Power Sources for Class 2 and Class 3 Circuits.

(A) Power Source.

The power source for a Class 2 or a Class 3 circuit shall be as follows:

Informational Note No. 1: Informational Note Figure 725.60 illustrates the relationships between Class 2 or Class 3 power sources, their supply, and the Class 2 or Class 3 circuits.

[MOVE FIGURE FROM 725.60(B)]

Figure Informational Note Figure 725.60 Class 2 and Class 3 Circuits.

Informational Note No. 2: See Chapter 9, Table 11(A) and Table 11(B), for requirements for listed Class 2 and Class 3 power sources.

(1) A listed Class 2 or Class 3 transformer

(2) A listed Class 2 or Class 3 power supply

(3) Other listed equipment marked to identify the Class 2 or Class 3 power source

Exception No. 1 to (3): Thermocouples shall not require listing as a Class 2 power source.

Exception No. 2 to (3): Limited power circuits of listed equipment where these circuits have energy levels rated at or below the limits established in Chapter 9, Table 11(A) and Table 11(B).

Informational Note No. 3: Examples of other listed equipment are as follows:

(1) A circuit card listed for use as a Class 2 or Class 3 power source where used as part of a listed assembly

(2) 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

(3) A thermocouple

(4) Limited voltage/current or limited impedance secondary communications circuits of listed industrial control equipment

(4) Listed audio/video, information technology ~~(computer)~~ , communications, and industrial equipment limited-power ~~circuits~~ sources

Informational Note No. 4: ~~One way to determine applicable requirements for listing of information technology (computer) equipment is to refer to~~ See UL 60950-1-~~2011~~ 2019 , *Standard for Safety of Information Technology Equipment*. ~~Another~~ , for one way to determine applicable requirements for listing of ~~audio/video,~~ information technology ~~, and communications equipment is to refer to~~ equipment .

Informational Note No. 5: See UL 62368-1-~~2014~~ 2023 , *Safety of audio/video, information and communication technology equipment*, for another way to determine applicable requirements for listing of audio/video, information technology, and communications equipment . Typically such circuits are used to interconnect data circuits for the purpose of exchanging information data. ~~One way to determine applicable requirements for listing of industrial equipment is to refer to~~

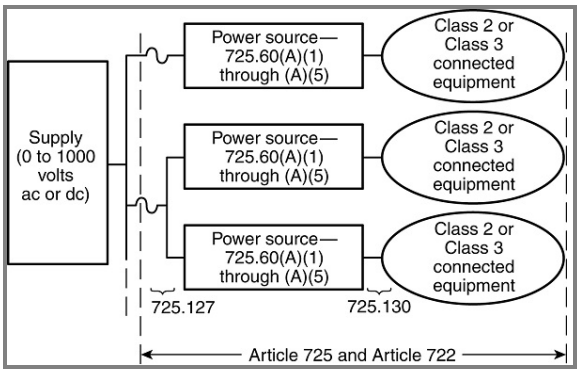
Informational Note No. 6: See UL 61010-2-201, *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 2-201: Particular requirements for control equipment*, and/or UL 61800-5-1, *Adjustable speed electrical power drive systems — Part 5-1: Safety requirements — Electrical, thermal and energy*, for one way to determine applicable requirements for listing of industrial equipment .

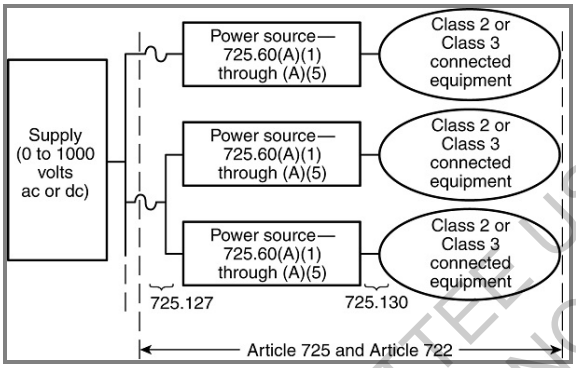
(5) A battery source or battery source system that is listed and identified as Class 2

(B) Interconnection of Power Sources.

Class 2 or Class 3 power sources shall not have the output connections paralleled or otherwise interconnected unless listed for such interconnection.

~~**Figure Informational Note Figure 725.60 Class 2 and Class 3 Circuits.**~~





[MOVE FIGURE TO (A)]

(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 725.60(A)(3) , limited power circuits for listed audio/video equipment, listed information technology equipment, listed communications equipment, and listed industrial equipment in 725.60(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 725.144 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.

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8604_725.60.docx	staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 22:08:06 EST 2024

Committee Statement

Committee Statement:	"Computer" is deleted in item (4) to align with the title of the listing standard and other usage in the NEC, including Article 645. "Circuits" is changed to "sources" in item (4) to align with the title of the section. References are updated in Informational Note No. 4, and the note is revised comply with the NEC Style Manual, 2.1.10.3. The Informational Note Figure is moved from 725.60(B) to 725.60(A) where it is referenced in Informational Note No. 1.
Response Message:	FR-8604-NFPA 70-2024

Public Input No. 4285-NFPA 70-2023 [Section No. 725.60(A)]

Public Input No. 4051-NFPA 70-2023 [Section No. 725.60(A)]

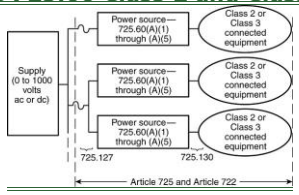
[FR 8604]

725.60 Power Sources for Class 2 and Class 3 Circuits.
(A) Power Source.

The power source for a Class 2 or a Class 3 circuit shall be as follows:

Informational Note No. 1: Informational Note Figure 725.60 illustrates the relationships between Class 2 or Class 3 power sources, their supply, and the Class 2 or Class 3 circuits.

Figure Informational Note Figure 725.60 Class 2 and Class 3 Circuits.



Informational Note No. 2: See Chapter 9, Table 11(A) and Table 11(B), for requirements for listed Class 2 and Class 3 power sources.

(1) A listed Class 2 or Class 3 transformer

(2) A listed Class 2 or Class 3 power supply

(3) Other listed equipment marked to identify the Class 2 or Class 3 power source

Exception No. 1 to (3): Thermocouples shall not require listing as a Class 2 power source.

Exception No. 2 to (3): Limited power circuits of listed equipment where these circuits have energy levels rated at or below the limits established in Chapter 9, Table 11(A) and Table 11(B).

Informational Note No. 3: Examples of other listed equipment are as follows:

(1) A circuit card listed for use as a Class 2 or Class 3 power source where used as part of a listed assembly

(2) 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

(3) A thermocouple

(4) Limited voltage/current or limited impedance secondary communications circuits of listed industrial control equipment

(4) Listed audio/video, information technology ~~(computer)~~, communications, and industrial equipment limited-power circuits

Informational Note No. 4: ~~One way to determine applicable requirements for listing of information technology (computer) equipment is to refer to~~ See UL 60950-1-~~2011~~2019, *Standard for Safety of Information Technology Equipment*, for one way to determine applicable requirements for listing of information technology equipment.

Informational Note No. 5: ~~Another way to determine applicable requirements for listing of audio/video, information technology, and communications equipment is to refer to~~ See UL 62368-1-~~2014~~2023, *Safety of audio/video, information and communication technology equipment*, for another way to determine applicable requirements for listing of audio/video, information technology, and communications equipment. Typically such circuits are used to interconnect data circuits for the purpose of exchanging information data.

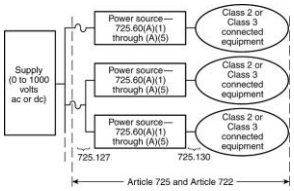
Informational Note No. 6: ~~One way to determine applicable requirements for listing of industrial equipment is to refer to~~ See UL 61010-2-201, *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 2-201: Particular requirements for control equipment*, and/or UL 61800-5-1, *Adjustable speed electrical power drive systems — Part 5-1: Safety requirements — Electrical, thermal and energy*, for one way to determine applicable requirements for listing of industrial equipment.

(5) A battery source or battery source system that is listed and identified as Class 2

(B) Interconnection of Power Sources.

Class 2 or Class 3 power sources shall not have the output connections paralleled or otherwise interconnected unless listed for such interconnection.

~~**Figure Informational Note Figure 725.60 Class 2 and Class 3 Circuits.**~~



(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 725.60(A)(3), limited power circuits for listed audio/video equipment, listed information technology equipment, listed communications equipment, and listed industrial equipment in 725.60(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 725.144 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.

First Revision No. 8294-NFPA 70-2024 [Section No. 725.130 [Excluding any Sub-Sections]]

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 725.130(A), (B), or a combination of both. Article 722, Parts I and ~~II of Article 722 shall~~ II shall apply.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 11:02:27 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.
Response Message: FR-8294-NFPA 70-2024

Public Input No. 2951-NFPA 70-2023 [Section No. 725.130 [Excluding any Sub-Sections]]

First Revision No. 8539-NFPA 70-2024 [Section No. 725.136(H)]

(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 ~~where they are~~ if they are functionally associated and are installed using Class 1 wiring methods in accordance with 724.46~~ and where they are protected by an approved raceway~~ .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 16:03:39 EST 2024

Committee Statement

Committee Statement: Previous versions of the Code allowed this practice only if the circuits were functionally associated. The revision in 2023 unintentionally removed this requirement, which meant that any circuit could be installed in the same raceway as the limited energy circuit. The restriction is restored by this revision.

Response Message: FR-8539-NFPA 70-2024

Public Input No. 1491-NFPA 70-2023 [Section No. 725.136(H)]

First Revision No. 8412-NFPA 70-2024 [Section No. 725.139(F)]

(F) ~~Class 2 or Class 3 Conductors or Cables and~~ 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 722.135 shall not be installed in the same cable, raceway, or cable routing assembly with ~~Class 2 or Class 3 conductors or~~ PLFA circuits or cables.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 09:08:12 EST 2024

Committee Statement

Committee Statement: This change corrects an error in 725.139(F) that was inadvertently introduced in previous revisions of the Code, which deleted PLFA circuits from this requirement. The revised text now aligns with 760.139(E), which does not permit audio systems to be installed with PLFA circuits.

Response Message: FR-8412-NFPA 70-2024

Public Input No. 1196-NFPA 70-2023 [Section No. 725.139(F)]

First Revision No. 8296-NFPA 70-2024 [Section No. 725.144 [Excluding any Sub-Sections]]

Sections 725.144(A) and (B) shall apply to Class 2 and Class 3 circuits that transmit power and data to a powered device over listed cabling. Section 300.11 and Article 725, Parts I and ~~III of Article 725 shall~~ 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 725.144 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.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 11:03:38 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.
Response Message: FR-8296-NFPA 70-2024

Public Input No. 2953-NFPA 70-2023 [Section No. 725.144 [Excluding any Sub-Sections]]

First Revision No. 8421-NFPA 70-2024 [New Section after 726.1]

726.2 Listing Requirements.

Class 4 systems shall be listed in accordance with the following:

(1) The power source shall be a listed Class 4 power transmitter or a listed Class 4 power transmitter as part of a transmitter/receiver system.

(2) Terminals and connecting hardware used on Class 4 distribution systems shall be listed.

(3) The equipment and active components of a Class 4 system shall be listed as a Class 4 device. The listing information shall include compatible devices if a listed Class 4 device depends on specific system devices for interoperability, monitoring, or control.

Informational Note No. 1: See UL 1400-1-2022, Outline of Investigation for Fault-Managed Power Systems — Part I: General Requirements, for information on determining applicable requirements for the listing of Class 4 power systems.

Informational Note No. 2: An example of a dependent active device in a Class 4 system is a transmitter that relies on a particular receiver or receivers as part of the monitoring and control system.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 09:35:25 EST 2024

Committee Statement

Committee Statement: The NEC Style Manual Section 2.2.1 states that technical committees shall use the .2 section for listing requirements. This information is relocated from 726.121, 726.130(A), and 726.170.

Response Message: FR-8421-NFPA 70-2024

Public Input No. 2847-NFPA 70-2023 [New Section after 726.1]

First Revision No. 8297-NFPA 70-2024 [Section No. 726.3]

726.3 ~~—~~ 4 Other ~~Articles~~ 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 . Only those sections of Article 300 referenced in ~~Article~~ 722.3 shall apply to Class 4 circuits.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 11:05:51 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4. The reference to Article 300 is maintained to provide necessary context.

The section is renumbered to 726.4 to comply with the new requirement for parallel numbering in the NEC Style Manual, section 2.2.1.1.

Response Message: FR-8297-NFPA 70-2024

Public Input No. 989-NFPA 70-2023 [Section No. 726.3]

First Revision No. 8432-NFPA 70-2024 [Section No. 726.10]

~~**726.10** Hazardous (Classified) Locations.~~

~~Class 4 power systems shall be permitted to be used in hazardous (classified) locations where specifically permitted by other articles in this *Code* .~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 10:27:52 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.1. This is covered in Article 722.
Response Message: FR-8432-NFPA 70-2024

First Revision No. 8426-NFPA 70-2024 [Section No. 726.12]

~~**726.12** Uses Not Permitted.~~

~~Class 4 power systems shall not be permitted in dwelling units.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 09:58:39 EST 2024

Committee Statement

Committee Statement: Dwelling unit installations were prohibited in the 2023 code as FMP was new and the UL listing standards were still under development. The listing standards are now published, and products are making their way to market, building the confidence in the systems. Cable heating has been evaluated with acceptable results for limited bundle sizes with regard to heating or fire initiation concerns.

Response Message: FR-8426-NFPA 70-2024

Public Input No. 4377-NFPA 70-2023 [Section No. 726.12]

First Revision No. 8433-NFPA 70-2024 [Section No. 726.24]

~~**726.24** Mechanical Execution of Work.~~

~~Class 4 equipment shall be installed in a neat and workmanlike manner. The installation shall also comply with 300.4 and 300.11 .~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 10:29:00 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.1. This is covered in 110.12.
Response Message: FR-8433-NFPA 70-2024

First Revision No. 8436-NFPA 70-2024 [Section No. 726.121]

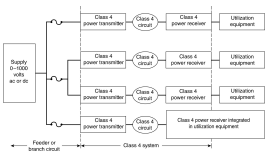
726.121 Power Sources for Class 4 Circuits.

~~The power source shall be a listed~~ Class 4 ~~power transmitter or a listed Class 4 power transmitter as part of a transmitter/receiver system and shall provide the protections in accordance with~~ 726.121(A) ~~. Class 4~~ circuits shall be supplied from a power source (transmitter) that has a voltage output of not more than 450 volts peak or dc.

Informational Note ~~No. 1~~ : Informational Note Figure 726.121 illustrates the relationships between Class 4 power transmitters (power sources), Class 4 circuits, Class 4 power receivers, and utilization equipment.

~~Informational Note No. 2: See UL 1400-1, *Outline for Fault-Managed Power Systems — Part 1: General Requirements* , for information on determining applicable requirements for the listing of Class 4 power systems.~~

Figure Informational Note Figure 726.121 Class 4 Circuits.



(A) Fault Management.

~~For listing purposes, a~~

A transmitter shall interrupt an energized circuit when any of the following conditions occur on the circuit between the transmitter and receiver:

(1) A short circuit

(2) A line-to-line fault condition that presents an unacceptable risk of fire or electric shock

(3) A ground-fault condition that presents an unacceptable risk of fire or electric shock

(4) An overcurrent condition

(5) A malfunction of the monitoring or control system that presents an unacceptable risk of fire or electric shock

(6) Any other condition that presents an unacceptable risk of fire or electric shock

Informational Note: See UL 1400-1, *Outline for Fault-Managed Power Systems — Part 1: General Requirements* , for information on determining applicable requirements for the listing of Class 4 power systems, including safe operation and limiting the risk of fire and electric shock.

Supplemental Information

File Name	Description	Approved
NEC_CMP3_FR-8436_726.121.docx		

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 10:32:21 EST 2024

Committee Statement

Committee Statement: The NEC Style Manual Section 2.2.1 states that technical committees shall use the XXX.2 section for listing requirements. The deleted text is now located accordingly.

Subsection (A) is revised because listing requirements are part of a product standard.

Response Message: FR-8436-NFPA 70-2024

Public Input No. 686-NFPA 70-2023 [Section No. 726.121(A)]

Public Input No. 2848-NFPA 70-2023 [Section No. 726.121 [Excluding any Sub-Sections]]

DO THESE EDITS AFTER GLOBAL FR-8607

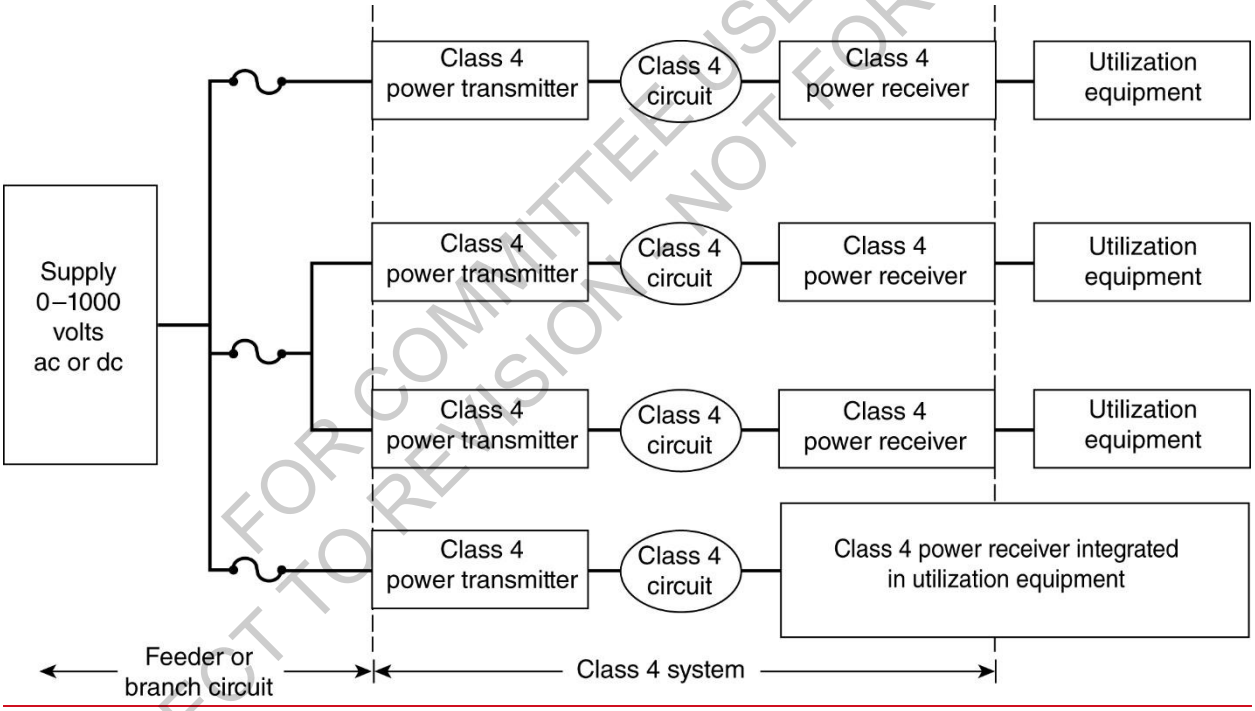
726.121 Power Sources for Class 4 Circuits.

~~The power source shall be a listed Class 4 power transmitter or a listed Class 4 power transmitter as part of a transmitter/receiver system and shall provide the protections in accordance with 726.121(A).~~ Class 4 circuits shall be supplied from a power source (transmitter) that has a voltage output of not more than 450 volts peak or dc.

Informational Note ~~No. 1~~: Informational Note Figure 726.121 illustrates the relationships between Class 4 power transmitters (power sources), Class 4 circuits, Class 4 power receivers, and utilization equipment.

~~Informational Note No. 2: See UL 1400-1, *Outline for Fault-Managed Power Systems – Part 1: General Requirements*, for information on determining applicable requirements for the listing of Class 4 power systems.~~

Figure Informational Note Figure 726.121 Class 4 Circuits.



(A) Fault Management.

~~For listing purposes, a~~A transmitter shall interrupt an energized circuit when any of the following conditions occur on the circuit between the transmitter and receiver:

1. A short circuit
2. A line-to-line fault condition that presents an unacceptable risk of fire or electric shock
3. A ground-fault condition that presents an unacceptable risk of fire or electric shock
4. An overcurrent condition

5. A malfunction of the monitoring or control system that presents an unacceptable risk of fire or electric shock
6. Any other condition that presents an unacceptable risk of fire or electric shock

Informational Note: See UL 1400-1, *Outline for Fault-Managed Power Systems — Part 1: General Requirements*, for information on determining applicable requirements for the listing of Class 4 power systems, including safe operation and limiting the risk of fire and electric shock.

First Revision No. 8302-NFPA 70-2024 [Section No. 726.124(B)(2)]

(2) Output Terminals and Socket Outlets.

Where the Class 4 receiver or Class 4 utilization equipment has outputs, terminals, or socket outlets for providing power to other equipment, each output shall be durably marked where plainly visible. The marking shall include the maximum output voltage and current for each connection point. Where multiple connection points have the same rating, a single label shall be permitted to be used.~~ Class 1, Class 2, and Class 3 circuits shall be identified in accordance with 724.30 or Part II of Article 725 .~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 11:17:09 EST 2024

Committee Statement

Committee Statement: The sentence is deleted because the referenced requirements exist elsewhere and do not need to be restated.
Response Message: FR-8302-NFPA 70-2024

Public Input No. 2954-NFPA 70-2023 [Section No. 726.124(B)(2)]

First Revision No. 8438-NFPA 70-2024 [Section No. 726.130]

726.130 Terminals and Connectors.

~~**(B)** Noninterchangeability.~~

(A)

~~Listing.~~

~~Connecting hardware used on Class 4 distribution systems shall be listed.~~

~~**Non-interchangeability.**~~

~~Connectors for Class 4 circuits shall be designed such that they are not interchangeable with incompatible non-power-limited sources located on the same premises.~~

~~(~~

~~C~~

~~**B)** Guarding.~~

~~Any junctions and mating connectors shall be constructed and installed to guard against inadvertent contact with live parts by persons.~~

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8438_726.130.docx	staff use	

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 10:46:29 EST 2024

Committee Statement

Committee Statement: The NEC Style Manual Section 2.2.1 states that technical committees shall use the .2 section for listing requirements. The deleted text in (A) is relocated accordingly.

The term “non-interchangeability” in the title of (B) is hyphenated to make it an English word.

The addition of “incompatible” in (B) clarifies the intent of the requirement, which could have been confused to allow interchanging with other power-limited sources such as Class 2.

Response Message: FR-8438-NFPA 70-2024

Public Input No. 2852-NFPA 70-2023 [Section No. 726.130(A)]

Public Input No. 687-NFPA 70-2023 [Section No. 726.130(B)]

Public Input No. 4515-NFPA 70-2023 [Section No. 726.130(B)]

[FR 8438]

726.130 Terminals and Connectors.
~~**(A) Listing.**~~

~~Connecting hardware used on Class 4 distribution systems shall be listed.~~

(~~B~~A) Noninterchangeability.

Connectors for Class 4 circuits shall be designed such that they are not interchangeable with non-power-limited sources located on the same premises.

(~~C~~B) Guarding.

Any junctions and mating connectors shall be constructed and installed to guard against inadvertent contact with live parts by persons.

First Revision No. 8440-NFPA 70-2024 [Section No. 726.136(D)]

(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:

(1) 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.

(2) 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 ~~if any~~ 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.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 10:51:13 EST 2024

Committee Statement

Committee Statement: The revised text makes no changes to requirements but adds clarity.
Response Message: FR-8440-NFPA 70-2024

Public Input No. 4521-NFPA 70-2023 [Section No. 726.136(D)]

First Revision No. 8442-NFPA 70-2024 [Section No. 726.144]

726.144 Ampacity.

The ampacity of Class 4 cables shall comply with ~~300~~ 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 ~~be rated for the intended ampacity as evidenced by~~ have an ampacity in accordance with the marking FMP-XXA, where XX is the maximum ~~allowable~~ 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 722.179(A)(16) for additional Class 4 cable requirements.

Informational Note No. 2: See UL 1400-1, *Outline of Investigation for Fault-Managed Power Systems — Part 1: General Requirements*, and UL 1400-2, *Outline of Fault-Managed Power Systems — Part 2: Requirements for Class 4 Cables*, for information on determining maximum ~~allowable~~ ampacities.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 10:58:33 EST 2024

Committee Statement

Committee Statement: The proper section for ampacity is 310.15.

A maximum of 20 conductors (for example, 10 two-conductor cables or 5 four-conductor cables) is a reasonable restriction in a dwelling unit. This restriction allows a margin for elevated temperature or insulation in the small numbers of circuits expected for dwelling unit installation.

The word “allowable” is deleted because there is no "allowable" ampacity.

Response Message: FR-8442-NFPA 70-2024

Public Input No. 557-NFPA 70-2023 [Section No. 726.144]

Public Input No. 4385-NFPA 70-2023 [Section No. 726.144]

Public Input No. 3997-NFPA 70-2023 [Section No. 726.144]

First Revision No. 8455-NFPA 70-2024 [Section No. 728.3]

~~**728.3** Other Articles.~~

~~Wherever the requirements of other articles of this *Code* and Article 728 differ, the requirements of Article 728 shall apply.~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 11:45:52 EST 2024

Committee Statement

Committee Statement: This text is redundant to 90.3.
Response Message: FR-8455-NFPA 70-2024

Public Input No. 990-NFPA 70-2023 [Section No. 728.3]

First Revision No. 8453-NFPA 70-2024 [Section No. 728.4]

728.4 ~~General~~ 2 Listing Requirements .

Fire-resistive cables and conductors and their components shall be tested and listed as a complete system, shall be designated for use in a specific system, and shall not be interchangeable between systems.

Informational Note: ~~One method of defining the fire rating is by testing the system in accordance with~~ See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables*, for one method of defining the fire rating .

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 11:41:05 EST 2024

Committee Statement

Committee Statement: The NEC Style Manual Section 2.2.1 states that technical committees shall use the .2 section for listing requirements.

The revised Informational Note complies with the NEC Style Manual, 2.1.10.3.

Response Message: FR-8453-NFPA 70-2024

Public Input No. 2854-NFPA 70-2023 [Section No. 728.4]

Public Input No. 2853-NFPA 70-2023 [New Section after 728.1]

First Revision No. 8458-NFPA 70-2024 [Section No. 760.3(D)]

(D) Building Control Circuits.

Building control systems (e.g., elevator capture, 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 .

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 11:49:50 EST 2024

Committee Statement

Committee Statement: These circuits can be Class 1, 2, or 3 and the move of Class 1 to Article 724 in the 2023 code requires an update of the reference.

Response Message: FR-8458-NFPA 70-2024 - Per the Style Manual section 4.1.4 references to entire articles are permitted when required to provide the necessary context.

Public Input No. 3371-NFPA 70-2023 [Section No. 760.3(D)]

First Revision No. 8309-NFPA 70-2024 [Section No. 760.3(O)]

(O) Cables for Power-Limited Fire Alarm (PLFA) Circuits.

The listing and installation of cables for power-limited fire alarm circuits shall comply with Part III of this article and Article 722, Parts I and II ~~of Article 722~~ .

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 12:37:29 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.
Response Message: FR-8309-NFPA 70-2024

Public Input No. 2956-NFPA 70-2023 [Section No. 760.3(O)]

First Revision No. 8460-NFPA 70-2024 [Section No. 760.24]

~~**760.24** Mechanical Execution of Work.~~

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

~~Fire alarm circuits shall be installed in a neat and workmanlike manner. Cables and conductors 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. Such cables shall be supported by hardware, including straps, staples, hangers, listed cable ties identified for securement and support, or similar fittings designed and installed so as not to damage the cable. The installation shall also comply with 300.4 and 300.11.~~

~~Informational Note: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants might result in an undetermined alteration of PLFA and NPLFA cable properties.~~

~~**(B)** Circuit Integrity (CI) Cable.~~

~~Circuit integrity (CI) cables shall be supported at a distance not exceeding 610 mm (24 in.). Where located within 2.1 m (7 ft) of the floor in accordance with 760.53(A)(1) and 760.130(B)(1), as applicable, the cable shall be fastened in an approved manner at intervals of not more than 450 mm (18 in.). Cable supports and fasteners shall be steel.~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 11:56:59 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.1.
Response Message: FR-8460-NFPA 70-2024

First Revision No. 8310-NFPA 70-2024 [Section No. 760.32]

760.32 Fire Alarm Circuits Extending Beyond One Building.

Non–power-limited fire alarm circuits and power-limited fire alarm circuits that extend beyond one building and run outdoors shall meet the installation requirements of Article 805, Parts II, III, and ~~IV of Article 805 and~~ IV and shall meet the installation requirements of ~~Part I of~~ Article 300 , Part I .

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 12:38:59 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.
Response Message: FR-8310-NFPA 70-2024

Public Input No. 2957-NFPA 70-2023 [Section No. 760.32]

First Revision No. 8466-NFPA 70-2024 [Section No. 760.33]

760.33 Supply-Side ~~Overvoltage Protection~~ 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 ~~Part II of~~ Article 242~~.~~ , Part II. The SPD shall be as close to the fire alarm control panel as is practicable.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 12:21:54 EST 2024

Committee Statement

Committee Statement: Changing the section title is appropriate as this section is about surge-protective devices and not overvoltage.

The editorial change in the reference to Article 242, Part II, is made to comply with the NEC Style Manual, section 4.1.4.

A requirement to place the SPD as close as practicable is added to ensure protection of the control panel.

Response Message: FR-8466-NFPA 70-2024 - [Response to PI-3412] Deleting the article 242 reference is a disservice to the reader as a fire alarm technician may not know the contents of Article 242. The pointer provides a valuable service.

Public Input No. 2959-NFPA 70-2023 [Section No. 760.33]

Public Input No. 3412-NFPA 70-2023 [Section No. 760.33]

First Revision No. 8475-NFPA 70-2024 [Section No. 760.35]

~~**760.35** Fire Alarm Circuit Requirements.~~

~~Fire alarm circuits shall comply with 760.35(A) and (B).~~

~~**(A)** Non-Power-Limited Fire Alarm (NPLFA) Circuits.~~

~~See Parts I and II.~~

~~**(B)** Power-Limited Fire Alarm (PLFA) Circuits.~~

~~See Parts I and III.~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 12:44:51 EST 2024

Committee Statement

Committee Statement: The existing text was superfluous and has been deleted. It's not possible to install a fire alarm without already complying with this requirement.
Response Message: FR-8475-NFPA 70-2024

Public Input No. 3065-NFPA 70-2023 [Section No. 760.35]
Public Input No. 562-NFPA 70-2023 [Section No. 760.35]

First Revision No. 8484-NFPA 70-2024 [Section No. 760.41(B)]

(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 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 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.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 14:04:12 EST 2024

Committee Statement

Committee Statement: Multiwire branch circuits often employ common trip functionality allowing one fault on a non-associated circuit to deenergize the fire alarm control panel. This revision eliminates that possibility.

Response Message: FR-8484-NFPA 70-2024

Public Input No. 3184-NFPA 70-2023 [Section No. 760.41(B)]

Public Input No. 3292-NFPA 70-2023 [Section No. 760.41(B)]

First Revision No. 8485-NFPA 70-2024 [Section No. 760.43]

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.

~~*Exception:* *Where other articles of this Code permit or require other overcurrent protection.*~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 14:06:45 EST 2024

Committee Statement

Committee Statement: The exception violates the Style Manual section 4.1.4 by referring to every article and is overly broad.
Response Message: FR-8485-NFPA 70-2024

Public Input No. 561-NFPA 70-2023 [Section No. 760.43]

First Revision No. 8487-NFPA 70-2024 [Section No. 760.45]

760.45 NPLFA Circuit Overcurrent Device Location.

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

Exception No. ~~1~~ 1 : ~~Where the overcurrent device protecting the larger conductor also protects the smaller conductor. Exception No. 2:~~ 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 450.3 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. ~~3~~ 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.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 14:08:33 EST 2024

Committee Statement

Committee Statement: The existing exception was not a complete sentence and upon further examination, deleting it does not appear to remove any requirements.
Response Message: FR-8487-NFPA 70-2024

Public Input No. 2504-NFPA 70-2023 [Section No. 760.45]

First Revision No. 8311-NFPA 70-2024 [Section No. 760.46]

760.46 NPLFA Circuit Wiring.

Installation of non–power-limited fire alarm circuits shall be in accordance with 110.3(B), 300.7, 300.11, 300.15, 300.17, 300.19(B), and ~~other appropriate articles of Chapter 3~~ . 300.26(C).

Exception No. 1: As provided in 760.48 through 760.53.

Exception No. 2: Where other articles of this Code require other methods.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 12:40:36 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.
Response Message: FR-8311-NFPA 70-2024

Public Input No. 3376-NFPA 70-2023 [Section No. 760.46]

First Revision No. 8312-NFPA 70-2024 [Section No. 760.49(B)]

(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 ~~Article~~ 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 circuit use.

Informational Note: See Table 402.3 for application provisions.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 12:42:31 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.

Response Message: FR-8312-NFPA 70-2024 - Table 310.4(2) was not included because it applies to conductors rated at 2000 V.

Public Input No. 3373-NFPA 70-2023 [Section No. 760.49(B)]

First Revision No. 8488-NFPA 70-2024 [Section No. 760.121(B)]

(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 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 or obscure the manufacturer's markings.

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

~~Informational Note: See 210.8(A)(5), Exception, for requirements on receptacles in dwelling-unit unfinished basements that supply power for fire alarm systems.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 14:12:16 EST 2024

Committee Statement

Committee Statement: The exception referred to in the Informational Note was deleted in the 2023 Code, therefore the exception is deleted.

Response Message: FR-8488-NFPA 70-2024

Public Input No. 1488-NFPA 70-2023 [Section No. 760.121(B)]

Public Input No. 560-NFPA 70-2023 [Section No. 760.121(B)]

First Revision No. 8491-NFPA 70-2024 [Section No. 760.127]

760.~~127~~ ~~Wiring Methods on Supply Side~~ 127 Overcurrent Protection of the PLFA Power Source.

~~Conductors and equipment on the supply side of the power source shall be installed in accordance with the appropriate requirements of Part II and Chapters 1 through 4.~~
Transformers or other devices supplied from power-supply conductors shall be protected by an overcurrent device 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).

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 14:18:24 EST 2024

Committee Statement

Committee Statement: The first sentence was deleted as compliance with Chapters 1 -4 is already required by 90.3. The title was changed to more accurately reflect the contents of the section.
Response Message: FR-8491-NFPA 70-2024

Public Input No. 3082-NFPA 70-2023 [Section No. 760.127]

First Revision No. 8493-NFPA 70-2024 [Section No. 760.130]

760.130 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 760.130(A), (B), or a combination of both. Article 722 , Parts I and II of ~~Article 722~~ 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 722.179 shall be installed as detailed in 722.135 and 760.130(B)(1) through (B)(4). Devices shall be installed in accordance with 110.3(B), 300.11(A), and 300.15.

(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 760.130(B)(1) or unless an equivalent solid guard is provided.

(3) Nonconcealed Spaces.

Cables ~~specified in Chapter 3 and meeting the requirements of~~ covered by Chapter 3 used for wiring of PLFA circuits and installed in non-concealed spaces shall comply with the following:

(1) The cables shall be installed in accordance with 722.179(A)(15)(a) and (A)(15)(b)

~~shall be permitted to be installed in nonconcealed spaces where the exposed length of cable does not exceed~~

(1) .

(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.

Supplemental Information

File Name	Description	Approved
70_CMP3_FR8493_760.130.docx	staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Jan 22 14:21:41 EST 2024

Committee Statement

Committee Statement: The editorial change in the charging text is made to comply with the NEC Style Manual, section 4.1.4.

In 760.130(B)(3), the text is revised to ensure the code user can be certain that the requirement applies only to non-PLFA Cable used on the load-side of a Fire Alarm.

Response Message: FR-8493-NFPA 70-2024

Public Input No. 1703-NFPA 70-2023 [Section No. 760.130]

Public Input No. 2960-NFPA 70-2023 [Section No. 760.130 [Excluding any Sub-Sections]]

[FR 8493]

760.130 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 760.130(A), (B), or a combination of both. Article 722, Parts I and II of ~~Article 722~~ 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 722.179 shall be installed as detailed in 722.135 and 760.130(B)(1) through (B)(4). Devices shall be installed in accordance with 110.3(B), 300.11(A), and 300.15.

(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 760.130(B)(1) or unless an equivalent solid guard is provided.

(3) Nonconcealed Spaces.

Cables ~~specified in~~ covered by Chapter 3 used for wiring of PLFA circuits and installed in non-concealed spaces shall comply with the following:~~and meeting the requirements of 722.179(A)(15)(a) and (A)(15)(b) shall be permitted to be installed in nonconcealed spaces where the exposed length of cable does not exceed 3 m (10 ft).~~

1. The cables shall be installed in accordance with 722.179(A)(15)(a) and (A)(15)(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.

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First Revision No. 8313-NFPA 70-2024 [Section No. 760.133]

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 of Article 722 and~~ II and 760.136 through 760.143.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Sun Jan 21 12:44:59 EST 2024

Committee Statement

Committee Statement: The editorial change is made to comply with the NEC Style Manual, section 4.1.4.
Response Message: FR-8313-NFPA 70-2024

Public Input No. 2961-NFPA 70-2023 [Section No. 760.133]

First Revision No. 8496-NFPA 70-2024 [Section No. 760.136(G)]

(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 ~~where they are~~ if they are functionally-associated and installed using NPFLA wiring methods and materials in accordance with ~~Part II of~~ Article 760- ~~and are protected by an approved method~~ , Part II .

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 14:27:37 EST 2024

Committee Statement

Committee Statement: Previous versions of the Code allowed this practice only if the circuits were functionally associated. The revision in 2023 unintentionally removed this requirement, which meant that any circuit could be installed in the same raceway as the limited energy circuit. The restriction is restored by this revision.

The editorial change in the reference to Article 760 is made to comply with the NEC Style Manual, section 4.1.4.

Response Message: FR-8496-NFPA 70-2024

Public Input No. 1490-NFPA 70-2023 [Section No. 760.136(G)]

Public Input No. 2962-NFPA 70-2023 [Section No. 760.136(G)]

First Revision No. 8394-NFPA 70-2024 [Part II.]

[Article 725] **Part II.** ~~Class 2 and Class 3 Circuits~~ Installation Requirements

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 08:22:18 EST 2024

Committee Statement

Committee Statement: The title of Part II is revised to be consistent with the changes made to the article's scope in 2023.
Response Message: FR-8394-NFPA 70-2024

Public Input No. 2505-NFPA 70-2023 [Part II.]

First Revision No. 8451-NFPA 70-2024 [Sections Part III., 726.170]

~~**Sections Part III., 726.170**~~

~~**Part III.** Listing Requirements~~

~~**726.170** Listing of Equipment for Class 4 Systems.~~

~~The active components of a Class 4 system shall be listed as a Class 4 device. The listing information shall include compatible devices if a listed Class 4 device depends on specific system devices for interoperability, monitoring, or control.~~

~~Informational Note No. 1: See UL 1400-1, *Outline for Fault-Managed Power Systems — Part I: General Requirements* , for information on determining applicable requirements for the listing of Class 4 power systems.~~

~~Informational Note No. 2: An example of a dependent active device in a Class 4 system is a transmitter that relies on a particular receiver or receivers as part of the monitoring and control system.~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Jan 22 11:29:28 EST 2024

Committee Statement

Committee Statement: The NEC Style Manual Section 2.2.1 states that technical committees shall use the .2 section for listing requirements. The deleted text is relocated accordingly.
Response Message: FR-8451-NFPA 70-2024

Public Input No. 2851-NFPA 70-2023 [Sections Part III., 726.170]