Second Revision No. 8261-NFPA 70-2021 [Detail]

726.1 Scope.

This article covers the installation of wiring and equipment of fault-managed power (FMP) systems in occupancies other than dwelling units , including utilization equipment incorporating parts of these systems.

Informational Note No. 1: See Article 100 for definitions related to this section.

Informational Note No. 2: Class 4 power systems consist of a Class 4 power transmitter and a Class 4 power receiver connected by a cabling system. These systems are characterized by monitoring the circuit for faults and controlling the power transmitted to ensure the energy and power 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 power limited with respect to risk of shock and fire between the Class 4 transmitter and Class 4 receiver.

Informational Note No. 3: The circuits described in this article are characterized by monitoring and control systems that differentiate them from electric light and power circuits; therefore, alternative requirements to those of Chapters 1 through 4 are given regarding minimum wire sizes, ampacity adjustment and correction factors, overcurrent protection, insulation requirements, and wiring methods and materials.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 25 12:37:50 EDT 2021

Committee Statement

Committee Statement: The application of class 4 systems in a dwelling unit environment has not been adequately studied at this time.

Response Message: SR-8261-NFPA 70-2021

Public Comment No. 1517-NFPA 70-2021 [Section No. 726.1]

Second Revision No. 8380-NFPA 70-2021 [Detail]

Change the title of Article 722 as follows:

Article 722 Cables for Power-Limited Circuits, Fault-Managed Power (Class 4) Circuits, and Optical Fiber

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 12:24:42 EDT 2021

Committee Statement

Committee Statement: The Article title has been revised to accommodate the addition of Class 4 cables which are not strictly power limited and optical fiber cables which are also not considered power limited cables.

Response Message: SR-8380-NFPA 70-2021

Second Revision No. 8462-NFPA 70-2021 [Detail]

Change the title of Article 724 as follows:

Article 724 Class 1 Power-Limited Circuits and Class 1 Power-Limited Remote-Control and Signaling Circuits

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 17:29:17 EDT 2021

Committee Statement

Committee Statement: The title of Article 724 is changed to make it clear that Class 1 circuits are power-limited and that Class 1 remote-control and signaling circuits are included. The Panel recognizes that titles of Articles are the purview of the Correlating Committee.

Response Message: SR-8462-NFPA 70-2021

Public Comment No. 179-NFPA 70-2021 [Section No. 724.40]

Second Revision No. 8485-NFPA 70-2021 [Detail]

Change the title of Article 305 as follows:

Article 305 General Requirements for Wiring Methods and Materials for Systems Rated Over 1000 Volts ac, 1500 Volts dc, Nominal

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 15:40:13 EDT 2021

Committee Statement

Committee Statement: Article 305 is general requirements for medium voltage. “Part I General was deleted and thus “General” was added to the Article title.

Response Message: SR-8485-NFPA 70-2021

Second Revision No. 8487-NFPA 70-2021 [Detail]

Move the definition of "Outdoor Overhead Conductors" to Article 100 from 305.2 and delete 305.2 from Article 305.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 16:00:03 EDT 2021

Committee Statement

Committee Statement: All definition are being moved to Article 100 to comply with the NEC Style Manual. This definition will be general and would not reside under the purview of CMP3.

Response Message: SR-8487-NFPA 70-2021

Second Revision No. 8641-NFPA 70-2021 [Detail]

Move the definitions of "General-Purpose Cables, Cable Routing Assemblies, and Raceways," "Cables for Limited Use," Plenum Cable, Cable Routing Assemblies, and Raceways," "Riser Cable, Cable Routing Assemblies, and Raceways," and "Under Carpet Cable," to Article 100 from 722.2 and delete 722.2 from Article 722 including the deletion of the definition of "Abandoned Cable" from 722.2.

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Fri Oct 29 12:40:56 EDT 2021

Committee Statement

Committee Statement: All definitions are being moved to Article 100 to comply with the NEC Style Manual.

Response Message: SR-8641-NFPA 70-2021

Public Comment No. 2117-NFPA 70-2021 [Section No. 722.2]

Second Revision No. 8718-NFPA 70-2021 [Detail]

726.130 Terminals and Connectors.

(A) Listing.

Connecting hardware used on Class 4 distribution systems shall be listed.

(B) Noninterchangeability.

~~Receptacles, cord connectors, and attachment plugs used on~~Connectorsfor Class 4 ~~distribution systems~~circuits shall be ~~constructed so~~designed such that they are not interchangeable with ~~other receptacles, cord connectors, and attachment plugs~~non-power-limited sources located on the same premises.

(C) Guarding.

Any junctions and mating connectors shall be constructed and installed to guard against inadvertent contact with live parts by persons.

~~**726.228 Noninterchangeability.**~~

~~**Receptacles, cord connectors, and attachment plugs used on Class 4 distribution systems shall be constructed so that they are not interchangeable with other receptacles, cord connectors, and attachment plugs.**~~

~~**726.233 Guarding.**~~

~~**Any junctions and mating connectors shall be constructed and installed to guard against inadvertent contact with live parts by persons.**~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Nov 15 13:05:30 EST 2021

Committee Statement

Committee Statement: Section 760.130(A) adds listing requirements since Class 4 systems limit the current available into a fault but not the transmitted voltage and current, these devices need to be evaluated, rated and listed for their intended use. (PC 1946, PC 1791)

Section 726.228 has been moved to 726.130(B) and the title changed to Non-interchangeability. The requirement has been reworded to make it clear that terminals and connectors shall not be interchangeable with those used with power limited systems. (PC 1608, PC 1969)

Section 726.233 is moved to 726.130(C) to include all requirements for terminals and connectors in one Section for clarity and usability.

Response Message: SR-8718-NFPA 70-2021

Public Comment No. 1969-NFPA 70-2021 [Section No. 726.228]

Public Comment No. 1791-NFPA 70-2021 [Sections 726.228, 726.233]

Public Comment No. 1608-NFPA 70-2021 [Section No. 726.228]

Public Comment No. 1946-NFPA 70-2021 [Sections 726.228, 726.233]

Second Revision No. 8720-NFPA 70-2021 [Detail]

726.124 Class 4 Marking.

(B) Class 4 Receiver Marking.

~~**A Class 4 receiver or Class 4 utilization equipment shall be durably marked where plainly visible to indicate each circuit that is a Class 4 circuit. The marking shall also include the maximum input voltage and current for each connection point. Where the Class 4 receiver or Class 4 utilization equipment has user-accessible outputs, each output shall be durably marked where plainly visible. The marking shall also 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.**~~

(1) Class 4 Circuits.

A Class 4 receiver or Class 4 utilization equipment shall be durably marked where plainly visible to indicate each circuit that is a Class 4 circuit. The marking shall ~~also~~ include the maximum input voltage and current for each connection point.

(2) Output Terminals and Socket Outlets.

Where the Class 4 receiver or Class 4 utilization equipment has ~~user-accessible~~ outputs, terminals, or socket outlets for providing power to other equipment, each output shall be durably marked where plainly visible. The marking shall ~~also~~ 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: Thu Dec 02 17:53:44 EST 2021

Committee Statement

Committee Statement: This second revision separates and clarifies the marking requirements for the input Class 4 terminals of the receiver and the output terminals or socket outlets of the receiver that provide power to other equipment. The output ports should be marked with a rating whether or not they are user accessible. This is consistent with the marking requirements for Class 2 circuits in 725.121(C). (PC 1087)

If providing Class 2 or Class 3 circuits, the outputs need to be marked in accordance with Part II of Article 725. (PC 1697)

Response Message: SR-8720-NFPA 70-2021

Public Comment No. 1087-NFPA 70-2021 [Section No. 726.124(B)]

Public Comment No. 1697-NFPA 70-2021 [Section No. 726.124(B)]

Second Revision No. 8621-NFPA 70-2021 [Definition: Abandoned Class 2, Class 3, and PLTC Cable.]

~~**Abandoned Class 2, Class 3, and PLTC Cable.**~~

~~Installed Class 2, Class 3, and PLTC cable that is not terminated at equipment and not identified for future use with a tag. (CMP-3)~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 11:12:09 EDT 2021

Committee Statement

Committee Statement: In accordance with section 2.2.2.4 of the NEC Style Manual a CC task group was formed to work on a single definition for “abandoned cable”. This CC task group consisted of CMPs 3, 12, and 16 members. CMP 3 has accepted the recommendation of this task group to delete the definition for “abandoned Class 2, Class 3, and PLTC Cable.”

Response Message: SR-8621-NFPA 70-2021

Public Comment No. 196-NFPA 70-2021 [Definition: Abandoned Class 2, Class 3, and PLTC Cable.]

Second Revision No. 8622-NFPA 70-2021 [Definition: Abandoned Fire Alarm Cable.]

~~**Abandoned Fire Alarm Cable.**~~

~~Installed fire alarm cable that is not terminated at equipment other than a connector and not identified for future use with a tag. (CMP-3)~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 11:13:59 EDT 2021

Committee Statement

Committee Statement: In accordance with section 2.2.2.4 of the NEC Style Manual a CC task group was formed to work on a single definition for “abandoned cable”. This CC task group consisted of CMPs 3, 12, and 16 members. CMP 3 has accepted the recommendation of this task group to delete the definition for “abandoned fire alarm cable.”

Response Message: SR-8622-NFPA 70-2021

Public Comment No. 197-NFPA 70-2021 [Definition: Abandoned Fire Alarm Cable.]

Second Revision No. 8624-NFPA 70-2021 [Definition: Circuit Integrity (CI) Cable.]

Cable, Circuit Integrity (CI). **[Circuit Integrity (CI) Cable.]**

Cable(s) marked with the suffix “-CI” used for remote-control, signaling, power-limited, fire alarm, optical fiber, or communications systems that supply critical circuits to ensure survivability for continued circuit operation for a specified time under fire conditions. (CMP-3)

Informational Note: See 728.4 for power circuits installed for survivability.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 11:17:04 EDT 2021

Committee Statement

Committee Statement: Starting the definition with the word “cable” will move the definition adjacent to all other cable definitions and complying with section 2.2.2.3.1 of the NEC Style Manual will assist in electronic searching.

Response Message: SR-8624-NFPA 70-2021

Public Comment No. 198-NFPA 70-2021 [Definition: Circuit Integrity (CI) Cable.]

Second Revision No. 8626-NFPA 70-2021 [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. Due to the active monitoring and control of the ~~power transmitted~~ voltage and current provided , a Class 4 circuit ~~is not considered a possible ignition source, and it minimizes the risk of~~ considers safety from a fire initiation standpoint and provides acceptable protection from electric shock. (726) (CMP-3)

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 11:44:43 EDT 2021

Committee Statement

Committee Statement: The Class 4 Circuit definition has been harmonized with the Class 2 Circuit definition.

Response Message: SR-8626-NFPA 70-2021

Public Comment No. 1725-NFPA 70-2021 [Definition: Class 4 Circuit.]

Second Revision No. 8700-NFPA 70-2021 [Definition: Class 4 Transmitter.]

Class 4 Transmitter.

A device that sources Class 4 power~~, monitors the line for faults, ceases power transmission if a fault is sensed, and limits the energy and power into a fault to the levels described in 726.121(A)~~ . (726) (CMP-3)

Informational Note: A Class 4 transmitter is different from traditional power sources in that it monitors the line for faults (both line-to-line and line-to-ground) and ceases power transmission if a fault is sensed.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Nov 01 11:34:25 EDT 2021

Committee Statement

Committee Statement: The definition has been modified to conform to the style manual by removing requirements in the definition and moving them to an informational note.

Response Message: SR-8700-NFPA 70-2021

Public Comment No. 1728-NFPA 70-2021 [Definition: Class 4 Transmitter.]

Second Revision No. 8660-NFPA 70-2021 [Definition: Class 4 Tray Cable (CL4TC).]

~~**Class 4 Tray Cable (CL4TC).**~~

~~A factory assembly of two or more insulated conductors rated to at least 450 volts dc, with or without associated bare or insulated equipment grounding conductors, under a nonmetallic jacket. (CMP-3)~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 14:52:38 EDT 2021

Committee Statement

Committee Statement: Class 4 Tray Cable is not a term used in the NEC and therefore must be removed as a definition.

Response Message: SR-8660-NFPA 70-2021

Second Revision No. 8638-NFPA 70-2021 [Definition: Fault-Managed Power (FMP).]

Fault-Managed Power (FMP).

A powering system that monitors for faults and controls ~~power~~ current delivered to ensure fault energy is limited. ~~The monitoring and control systems differentiate them from electric light and power circuits; therefore, alternative requirements to those of Chapters 1 through 4 are given regarding minimum wire sizes, ampacity adjustment and correction factors, overcurrent protection, insulation requirements, and wiring methods and materials.~~ (726) (CMP-3)

Informational Note: The monitoring and control systems differentiate ~~them~~ fault-managed power from electric light and power circuits; therefore, alternative requirements to those of Chapters 1 through 4 are given regarding minimum wire sizes, ampacity adjustment and correction factors, overcurrent protection, insulation requirements, and wiring methods and materials.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 12:25:00 EDT 2021

Committee Statement

Committee Statement: The listing standard defines current/time requirements and therefore it is not appropriate to refer to the power but instead to the current and/or energy.

The definition has been modified to conform to the style manual by removing requirements in the definition and moving them to an informational note.

Response Message: SR-8638-NFPA 70-2021

Public Comment No. 1724-NFPA 70-2021 [Definition: Fault-Managed Power (FMP).]

Second Revision No. 8625-NFPA 70-2021 [Definition: Fire Alarm Circuit Integrity (CI) Cable.]

Cable, Fire Alarm Circuit Integrity (CI). [Fire Alarm Circuit Integrity (CI) Cable.]

Cable used in fire alarm systems to ensure continued operation of critical circuits during a specified time under fire conditions. (CMP-3)

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 11:21:05 EDT 2021

Committee Statement

Committee Statement: Starting the definition with the word “cable” will move the definition adjacent to all other cable definitions and complying with section 2.2.2.3.1 of the NEC Style Manual will assist in electronic searching.

Response Message: SR-8625-NFPA 70-2021

Public Comment No. 200-NFPA 70-2021 [Definition: Fire Alarm Circuit Integrity (CI) Cable.]

Second Revision No. 8657-NFPA 70-2021 [Definition: Instrumentation Tray Cable (Type ITC).]

Cable, Instrumentation Tray, Type ITC. (Instrumentation Tray Cable) ~~(Type ITC).~~

A factory assembly of two or more insulated conductors, with or without an equipment grounding conductor(s), enclosed in a nonmetallic sheath. (335) (CMP-3)

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 14:45:38 EDT 2021

Committee Statement

Committee Statement: Starting the definition with the word “cable” will move the definition adjacent to all other cable definitions and complying with section 2.2.2.3.1.

Response Message: SR-8657-NFPA 70-2021

Second Revision No. 8701-NFPA 70-2021 [Definition: Non-Power-Limited Fire Alarm Circuit (NPLFA).]

Non-Power-Limited Fire Alarm Circuit (NPLFA).

A fire alarm circuit powered by a source that ~~complies with the requirements of 760.41 and 760.43~~ is not power limited . (760) (CMP-3)

Informational Note: See 760.41 and 760.43 for requirements for non-power-limited fire alarm circuits.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Nov 01 11:49:59 EDT 2021

Committee Statement

Committee Statement: Definition was revised to comply with 2.2.2.2 of the NEC style manual. The definition has been modified to conform to the style manual by removing requirements in the definition and moving them to an informational note.

Response Message: SR-8701-NFPA 70-2021

Second Revision No. 8702-NFPA 70-2021 [Definition: Power-Limited Fire Alarm Circuit (PLFA).]

Power-Limited Fire Alarm Circuit (PLFA).

A fire alarm circuit powered by a power-limited source ~~that complies with the requirements of 760.121~~ . (760) (CMP-3)

Informational Note: See 760.121 for requirements on power-limited fire alarm circuits.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Nov 01 11:55:16 EDT 2021

Committee Statement

Committee Statement: Definition was revised to comply with 2.2.2.2 of the NEC style manual. The definition has been modified to conform to the style manual by removing requirements in the definition and moving them to an informational note.

Response Message: SR-8702-NFPA 70-2021

Second Revision No. 8650-NFPA 70-2021 [Definition: Power-Limited Tray Cable (PLTC).]

Cable, Power-Limited Tray, PLTC. (Power-Limited Tray Cable) ~~(PLTC).~~

A factory assembly of two or more insulated conductors rated at 300 volts, with or without associated bare or insulated equipment grounding conductors, under a nonmetallic jacket. (CMP-3)

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Fri Oct 29 13:08:34 EDT 2021

Committee Statement

Committee Statement: Definition title was revised to comply with 2.2.2.3.1 of the NEC style manual.
Response Message: SR-8650-NFPA 70-2021

Second Revision No. 8654-NFPA 70-2021 [Definitions (100): Remote-Cont... to Remote-Cont...]

~~**Remote-Control Circuit, Branch Circuit.**~~

~~A branch circuit that controls any other branch circuit through a relay or an equivalent device. (CMP-3)~~

Remote-Control Circuit~~, Power-Limited~~ .

Any ~~power-limited~~ electrical circuit that controls any other circuit through a relay or an equivalent device. (CMP-3)

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 13:21:13 EDT 2021

Committee Statement

Committee Statement: The definition of remote-control circuit, branch circuit was deleted as it is not needed.

Response Message: SR-8654-NFPA 70-2021

Second Revision No. 8655-NFPA 70-2021 [Definitions (100): Signaling C... to Signaling C...]

~~**Signaling Circuit, Branch Circuit.**~~

~~Any branch circuit that energizes signaling equipment. (CMP-3)~~

Signaling Circuit~~, Power-Limited~~ .

Any ~~power-limited~~ electrical circuit that energizes signaling equipment. (CMP-3)

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 14:26:40 EDT 2021

Committee Statement

Committee Statement: The definition of signaling circuit, branch circuit was deleted as it is not needed.

Response Message: SR-8655-NFPA 70-2021

Second Revision No. 8615-NFPA 70-2021 [Section No. 300.2(A)]

(A) Voltage.

~~With the exception of those specified in Article 305, wiring~~ Wiring methods specified in Chapter 3 shall be used for 1000 volts ac, 1500 volts dc, nominal, or less where not specifically limited elsewhere in Chapter 3 . ~~Wiring methods~~ They shall be permitted for over 1000 volts ac, 1500 volts dc, nominal, where ~~specified in Article 305~~ specifically permitted elsewhere in this *Code* .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 08:50:32 EDT 2021

Committee Statement

Committee Statement: The text in 300.2 was reverted to closely match what was in the 2020 code and only modified to add “1500 volts dc” in two spots and a reference to 305.1.

Response Message: SR-8615-NFPA 70-2021

Public Comment No. 1878-NFPA 70-2021 [Section No. 300.2]

Second Revision No. 8537-NFPA 70-2021 [Section No. 300.4(A)]

(A) Cables and Raceways Through Wood Members.

(1) Bored Holes.

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

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

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

(2) Notches in Wood.

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

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

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

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 12:17:28 EDT 2021

Committee Statement

Committee Statement: Section 300.4(A) has been revised to make it clear that no matter what side a stud is measured from, the edge of the hole cannot be closer than 32 mm (1¼ in.). Cables installed less than 1 ¼ inches from the edge require protection. Enforcement of the code is the responsibility of the AHJ. Universal enforcement of the code is outside of the scope of the NEC.

Response Message: SR-8537-NFPA 70-2021

Public Comment No. 754-NFPA 70-2021 [Section No. 300.4(D)]

Second Revision No. 8541-NFPA 70-2021 [Section No. 300.4(E)]

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

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

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 ~~or~~ and boxes, shall not be required to comply with 300.4(E).

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

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 12:23:50 EDT 2021

Committee Statement

Committee Statement: Malleable Iron fittings are only one type associated with Rigid Conduit and IMC and there can be arguments made there are better options available that offer superior physical protection. The change to ‘associated listed steel or malleable iron covers these other types.

Response Message: SR-8541-NFPA 70-2021

Public Comment No. 1333-NFPA 70-2021 [Section No. 300.4(E)]

Second Revision No. 8551-NFPA 70-2021 [Section No. 300.5(A)]

(A) Minimum Cover Requirements.

Direct-buried cable, conduit, or other raceways shall be installed to meet the minimum cover requirements of Table 300.5(A).

Table 300.5(A) Minimum Cover Requirements, 0 to 1000 Volts ac, 1500 Volts dc, Nominal, Burial in Millimeters (Inches)

-	Type of Wiring Method or Circuit									
Location of Wiring Method or Circuit	Column 1 Direct Burial Cables or Conductors		Column 2 ~~Electrical Metallic Tubing,~~ Rigid Metal Conduit~~,~~ or Intermediate Metal Conduit		Column 3 Electric Metallic Tubing, Nonmetallic Raceways Listed for Direct Burial Without Concrete Encasement, or Other Approved Raceways		Column 4 Residential Branch Circuits Rated 120 Volts or Less with GFCI Protection and Maximum Overcurrent Protection of 20 Amperes		Column 5 Circuits for Control of Irrigation and Landscape Lighting Limited to Not More Than 30 Volts and Installed with Type UF or in Other Identified Cable or Raceway	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
All locations not specified below	600	24	150	6	450	18	300	12	150[1,2]	6[1,2]
In trench below 50 mm (2 in.) thick concrete or equivalent	450	18	150	6	300	12	150	6	150	6
Under a building	0	0 (in raceway or Type MC or Type MI cable identified for direct burial)	0	0	0	0	0	0 (in raceway or Type MC or Type MI cable identified for direct burial)	0	0 (in raceway or Type MC or Type MI cable identified for direct burial)
Under minimum of 102 mm (4 in.) thick concrete exterior slab with no vehicular traffic and the slab extending not less than 152 mm (6 in.) beyond the underground installation	450	18	100	4	100	4	150 (direct burial) 100 (in raceway)	6 4	150 (direct burial) 100 (in raceway)	6 4

Under streets, highways, roads, alleys, driveways, and parking lots	600	24	600	24	600	24	600	24	600	24
One- and two-family dwelling driveways and outdoor parking areas, and used only for dwelling-related purposes	450	18	450	18	450	18	300	12	450	18
In or under airport runways, including adjacent areas where trespassing is prohibited	450	18	450	18	450	18	450	18	450	18

[1]A lesser depth shall be permitted where specified in the installation instructions of a listed low-voltage lighting system.

[2]A depth of 150 mm (6 in.) shall be permitted for pool, spa, and fountain lighting, installed in a nonmetallic raceway, limited to not more than 30 volts where part of a listed low-voltage lighting system.

Notes:

1. Cover ~~is~~ shall be defined as the shortest distance in mm (in.) measured between a point on the top surface of any direct-buried conductor, cable, conduit, or other raceway and the top surface of finished grade, concrete, or similar cover.

2. Raceways approved for burial only where concrete encased shall require a concrete envelope not less than 50 mm (2 in.) thick.

3. Lesser depths shall be permitted where cables and conductors rise for terminations or splices or where access is otherwise required.

4. Where one of the wiring method types listed in Columns 1 through 3 is used for one of the circuit types in Columns 4 and 5, the shallowest depth of burial shall be permitted.

5. Where solid rock prevents compliance with the cover depths specified in this table, the wiring shall be installed in a metal raceway, or a nonmetallic raceway permitted for direct burial. The raceways shall be covered by a minimum of 50 mm (2 in.) of concrete extending down to rock.

6. Directly buried electrical metallic tubing (EMT) shall comply with 358.10.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 12:59:35 EDT 2021

Committee Statement

Committee There are other types of EMT aside from galvanized, and not all require supplemental

Statement: protection. Pointing the reader to 358.10 will help them decide if supplemental protection is needed.

EMT has been allowed in direct burial applications. UL 797 states that aluminum EMT needs supplemental corrosion protection for direct burial, but it does not mention that galvanized or stainless require supplemental corrosion protection. The guide card mentions that supplementary corrosion protection is generally required in direct contact with earth, but one cannot assume it is required as it would not be required for stainless conduit. One needs to rely on the UL guide card and Article 358 for EMT.

Response Message: SR-8551-NFPA 70-2021

Public Comment No. 1684-NFPA 70-2021 [Section No. 300.5(A)]

Public Comment No. 1540-NFPA 70-2021 [Section No. 300.5]

Public Comment No. 317-NFPA 70-2021 [Section No. 300.5(A)]

Public Comment No. 1764-NFPA 70-2021 [Section No. 300.5(A)]

Public Comment No. 1334-NFPA 70-2021 [Section No. 300.5(A)]

Second Revision No. 8553-NFPA 70-2021 [Section No. 300.5(D) [Excluding any Sub-Sections]]

~~Direct-buried conductors~~ Conductors and cables shall be protected from damage in accordance with 300.5(D)(1) through (D)(4).

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 13:06:32 EDT 2021

Committee Statement

Committee Statement: As indicated in this public comment, the parent text, necessarily setting forth the parameters to which the first-level subdivision will apply, is a single sentence, and the subject of that sentence is "Direct-burial conductors and cables." Therefore, none of the four numbered paragraphs following apply to buried raceways. By removing the words “Direct-buried” from the parent text, the subdivisions will now cover conductors whether they are in a raceway or are direct buried.

Response Message: SR-8553-NFPA 70-2021

Public Comment No. 1778-NFPA 70-2021 [Section No. 300.5(D) [Excluding any Sub-Sections]]

Second Revision No. 8560-NFPA 70-2021 [Section No. 300.6]

300.6 Protection Against Corrosion and Deterioration.

Raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, ~~meter socket enclosures~~ enclosures (other than surrounding fences and walls) , elbows, couplings, fittings, supports, and support hardware shall be of materials suitable for the environment in which they are to be installed.

(A) Ferrous Metal Equipment.

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

~~Informational Note: Field-cut threads are those threads that are cut in conduit, elbows, or nipples anywhere other than at the factory where the product is listed.~~

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

(1) Protected from Corrosion Solely by Enamel.

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

(2) Organic Coatings on Boxes or Cabinets.

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

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

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

(B) Aluminum Metal Equipment.

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

(C) Nonmetallic Equipment.

Nonmetallic raceways, cable trays, cablebus, auxiliary gutters, boxes, cables with a nonmetallic outer jacket and internal metal armor or jacket, cable sheathing, cabinets, ~~meter socket enclosures~~ enclosures (other than surrounding fences and walls) , elbows, couplings, nipples, fittings, supports, and support hardware shall be made of material approved for the condition and shall comply with 300.6(C)(1) and (C)(2) as applicable to the specific installation.

(1) Exposed to Sunlight.

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

(2) Chemical Exposure.

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

(D) Indoor Wet Locations.

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

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

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

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 14:02:24 EDT 2021

Committee Statement

Committee Statement: As indicated by the submitter enclosures are not limited to "meter socket enclosures". Modifying, and adding the text as indicated in this public comment, “enclosures (other than surrounding fences and walls)” will aid in clarity and enforcement.

Deleting the Informational Note and adding “anywhere other than at the factory where the product is listed”, makes it very clear that coating threads with an approved electrically conductive, corrosion-resistant compound is required unless the threads are cut at the factory where the product is listed.

Response Message: SR-8560-NFPA 70-2021

Public Comment No. 664-NFPA 70-2021 [Section No. 300.6(A) [Excluding any Sub-Sections]]

Public Comment No. 1431-NFPA 70-2021 [Section No. 300.6(A)(2)]

Public Comment No. 1542-NFPA 70-2021 [Section No. 300.6]

Second Revision No. 8510-NFPA 70-2021 [Section No. 300.11(B)]

(B) Wiring Systems Installed Above Suspended Ceilings.

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

(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: 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: ~~One method of determining fire rating is testing in accordance with~~ See ~~ANSI/~~ ASTM E119~~-18b~~ , *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: The ceiling support system shall be permitted to support branch-circuit wiring and associated equipment where installed in accordance with the ceiling system manufacturer's instructions.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 11:15:31 EDT 2021

Committee Statement

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

Informational note has been revised to comply with the NEC Style Manual.

The date for the ASTM reference has been deleted to align with the action taken in 90.5(C) during first draft. The most current edition would be the referenced document.

Response Message: SR-8510-NFPA 70-2021

Second Revision No. 8566-NFPA 70-2021 [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, or other enclosures or outlets.

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

Exception No. 2: Raceways and cables installed into the bottom of open bottom equipment, 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: Thu Oct 28 15:16:54 EDT 2021

Committee Statement

Committee Statement: Precedent exists in the titles of the neighboring sections.

“300.15 Boxes, Conduit Bodies, or Fittings — Where Required. “

“300.16 Raceway or Cable to Open or Concealed Wiring.

(A) Box, Conduit Body, or Fitting.”

To remain consistent with other section headings, it is appropriate to add ‘conduit bodies’ to this section.

Response Message: SR-8566-NFPA 70-2021

Public Comment No. 757-NFPA 70-2021 [Section No. 300.12]

Second Revision No. 8567-NFPA 70-2021 [Section No. 300.14]

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

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 ~~is~~ 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.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 15:20:12 EDT 2021

Committee Statement

Committee Statement: The proposed language modification will aid with clarity and consistency and is consistent with other sections of the NEC.

Response Message: SR-8567-NFPA 70-2021

Public Comment No. 1318-NFPA 70-2021 [Section No. 300.14]

Second Revision No. 8521-NFPA 70-2021 [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 raceway 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, Class 2, and Class 3 circuits, Article 725 ; fire alarm circuits, Article 760~~ 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, ~~Article 770~~ 722.135(J) and 770.100(B) .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 11:49:53 EDT 2021

Committee Statement

Committee Statement: Chapter 7 was reorganized which relocated Class 1 circuits out of the article with Class 2 and Class 3. Also, a new Class 4 was created. Fire alarm circuits were divided between PLFA and NPLFA. A new article for limited power and fault manages cables was created. The added text will point the code user to the proper code sections.

Response Message: SR-8521-NFPA 70-2021

Public Comment No. 1785-NFPA 70-2021 [Section No. 300.17]

Public Comment No. 907-NFPA 70-2021 [Section No. 300.17]

Public Comment No. 1966-NFPA 70-2021 [Section No. 300.17]

Second Revision No. 8570-NFPA 70-2021 [Section No. 300.18(A)]

(A) Complete Runs.

Raceways other than busways, listed manufactured assemblies ~~as identified~~ in accordance with 604.100~~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 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.

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.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 15:35:44 EDT 2021

Committee Statement

Committee Statement: As indicated, identified is a defined term in Article 100 and is not applicable as referenced in this sentence. "In accordance with" is the correct wording and will aid in clarity.

Response Message: SR-8570-NFPA 70-2021

Public Comment No. 1320-NFPA 70-2021 [Section No. 300.18(A)]

Second Revision No. 8528-NFPA 70-2021 [Section No. 300.22(C)(1)]

(1) Wiring Methods.

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

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

Informational Note: ~~One method to determine~~ See UL 2043, *Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces* , for one method of testing low smoke and heat release properties ~~is that the~~ for nonmetallic cable ties and other nonmetallic cable accessories ~~exhibit~~ to determine a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a peak heat release rate of 100 kW or less. ~~when tested in accordance with ANSI/UL 2043-2013, *Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces.*~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 12:07:10 EDT 2021

Committee Statement

Committee Statement: Informational note has been revised to comply with the NEC Style Manual.

The date for the NFPA reference has been deleted to align with the action taken in 90.5(C) during the first draft. The most current edition would be the referenced document.

Response Message: SR-8528-NFPA 70-2021

Second Revision No. 8531-NFPA 70-2021 [Section No. 300.22(C)(3)]

(3) Equipment.

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

Informational Note: ~~One method to determine low-smoke and heat release properties is that the equipment exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a peak heat release rate of 100 kW or less when tested in accordance with~~ See ~~ANSI/~~ UL 2043~~-2013~~ , *Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces*, for one method of testing low smoke and heat release properties to determine that the equipment exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a peak heat release rate of 100 kW or less .

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

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 12:12:51 EDT 2021

Committee Statement

Committee Statement: Informational note has been revised to comply with the NEC Style Manual.

The date for the UL reference has been deleted to align with the action taken in 90.5(C)during the first draft. The most current edition would be the referenced document.

Response Message: SR-8531-NFPA 70-2021

Second Revision No. 8525-NFPA 70-2021 [Section No. 300.22(C) [Excluding any Sub-Sections]]

This section shall apply to spaces not specifically fabricated for environmental air-handling purposes but used for air-handling purposes as a plenum. This section shall not apply to habitable rooms or areas of buildings, the prime purpose of which is not air handling.

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

Informational Note No. 2: ~~The phrase *other spaces used for environmental air (plenum)* as used in this section correlates with the use of the term *plenum* in~~ See NFPA 90A~~-2021~~ , *Standard for the Installation of Air-Conditioning and Ventilating Systems*, and other mechanical codes for information on how the term *other spaces used for environmental air (plenum)* , as used in this section, correlates with the use of the term *plenum* where the plenum is used for return air purposes, as well as some other air-handling spaces.

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

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 12:03:10 EDT 2021

Committee Statement

Committee Statement: Informational note has been revised to comply with the NEC Style Manual.

The date for the NFPA reference has been deleted to align with the action taken in 90.5(C) during the first draft. The most current edition would be the referenced document.

Response Message: SR-8525-NFPA 70-2021

Second Revision No. 8481-NFPA 70-2021 [New Section after 300.25]

300.26 Remote-Control and Signaling Circuits Classification.

Remote-control and signaling circuits shall be classified as either power-limited or non-power-limited and comply with the following:

(1) Class 1 power-limited remote-control and signaling circuits shall comply with 724.3 .

(2) Class 2 and Class 3 power-limited remote-control and signaling circuits shall comply with 725.3 .

(3) Non-power-limited remote-control and signaling circuits shall be installed in accordance with 300.2 through 300.25 .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 12:54:24 EDT 2021

Committee Statement

Committee Statement: This action addresses the concerns of the Correlating Committee as stated in PC 666 to clarify the use and application of the terms remote-control, branch circuit and signaling circuit, branch circuit as it applies to the new Article 724.

In the 2020 NEC 725.41 states the classifications for Class 1 power-limited circuits and Class 1 remote-control and signaling circuits. The new section 300.26 expands this classification to include class 2 and class 3 circuits and non-power limited remote-control and signaling circuits.

The panel notes that under separate second revisions an informational note is added to 725.1 and 724.1 to direct the user of the Code to a new section 300.26 on Remote-control and Signaling Circuits Classification. This improves usability of the Code.

Response Message: SR-8481-NFPA 70-2021

Second Revision No. 8571-NFPA 70-2021 [Section No. 300.25]

300.25 Exit Enclosures (Stair Towers).

Where an exit enclosure is required to ~~be separated from the building~~ have a fire resistance rating , only electrical wiring methods serving equipment permitted by the authority having jurisdiction in the exit enclosure shall be installed within the exit enclosure.

Exception: Where egress lighting is required on outside exterior doorways from the exit enclosure, luminaires shall be permitted to be supplied from the inside of the exit enclosure.

Informational Note: See NFPA *101*-2021, *Life Safety Code*, 7.1.3.2.1(10)(b), for more information.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 15:38:22 EDT 2021

Committee Statement

Committee Statement: Fire-resistance rating is a defined term in the building Code and was accepted to add clarity to the section.

Response Message: SR-8571-NFPA 70-2021

Public Comment No. 1321-NFPA 70-2021 [Section No. 300.25]

Second Revision No. 8494-NFPA 70-2021 [Sections 305.3, 305.4, 305.5, 305.6]

305.4 Conductors of Different Systems.

Conductors of circuits rated over 1000 volts ac, 1500 volts dc, nominal, shall not occupy the same equipment wiring enclosure, cable, or raceway with conductors of circuits rated 1000 volts ac, 1500 volts dc, nominal, or less unless otherwise permitted as follows:

(1) Where contained within the individual wiring enclosure, primary leads of electric-discharge lamp ballasts insulated for the primary voltage of the ballast shall be permitted to occupy the same luminaire, sign, or outline lighting enclosure as the branch-circuit conductors.

(2) Excitation, control, relay, and ammeter conductors used in connection with any individual motor or starter shall be permitted to occupy the same enclosure as the motor-circuit conductors.

(3) Conductors of different voltage ratings shall be permitted in motors, transformers, switchgear, switchboards, control assemblies, and similar equipment.

(4) If the conductors of each system in a manhole are permanently and effectively separated from the conductors of the other systems and securely fastened to racks, insulators, or other approved supports, conductors of different voltage ratings shall be permitted.

Conductors having nonshielded insulation and operating at different voltage levels shall not occupy the same enclosure, cable, or raceway.

305.5 Conductor Bending Radius.

The conductor shall not be bent to a radius less than 8 times the overall diameter for nonshielded conductors or 12 times the overall diameter for shielded or lead-covered conductors during or after installation. For multiconductor or multiplexed single-conductor cables having individually shielded conductors, the minimum bending radius shall be 12 times the diameter of the individually shielded conductors or 7 times the overall diameter, whichever is greater.

305.6 Protection Against Induction Heating.

Metallic raceways and associated conductors shall be arranged to avoid heating of the raceway in accordance with 300.20.

305.7 Covers Required.

Suitable covers shall be installed on all boxes, fittings, and similar enclosures to prevent accidental contact with energized parts or physical damage to parts or insulation.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 18:23:14 EDT 2021

Committee Statement

Committee Statement: Since existing 305.7 moved to 305.3 it required the renumbering of existing 305.3 through 305.6 to 305.4 through 305.7.

Response Message: SR-8494-NFPA 70-2021

Second Revision No. 8493-NFPA 70-2021 [Section No. 305.7]

305.3 Wiring Methods.

Conductors shall be permitted to be installed in accordance with any of the wiring methods identified in Table 305.3.

Table 305.3 Wiring Methods Permitted for Use in Systems Rated Over 1000 Volts ac, 1500 Volts dc, Nominal

Wiring Methods Permitted for Use Above 1000 Volts ac, 1500 Volts dc	Voltage Levels	Reference
Pull and junction boxes, conduit bodies, and handhole enclosures	Over 1000	Article ~~305~~ 314 , Part ~~II~~ IV
Metal-clad cable (Type MC)	~~0–35~~ 1000–35 ,000	Article 330
Type P cable	~~0–2000~~ 1000–2000	Article 337
Intermediate metal conduit (Type IMC)	~~Not specified~~ Over 1000	Article 342
Rigid metal conduit (Type RMC)	~~Not specified~~ Over 1000	Article 344
Rigid polyvinyl chloride conduit (Type PVC)	~~Not specified~~ Over 1000	Article 352
Reinforced thermosetting resin conduit (Type RTRC)	~~Not specified~~ Over 1000	Article 355
Electrical metallic tubing (Type EMT)	~~Not specified~~ Over 1000	Article 358
Auxiliary gutters	~~Not specified~~ Over 1000	Article 366
Busway	Over 1000	Article ~~305~~ 368 , Part ~~III~~ IV
Cablebus	~~0–35~~ 1000–35 ,000	Article 370
Cable trays	~~0–35~~ 1000–35 ,000	Article 392
Messenger-supported wiring	~~0–35~~ 1000–35 ,000	Article 396
Outdoor overhead conductors	Over 1000	Article ~~305, Part IV~~ 395
Insulated bus pipe (Type IBP)	~~0–35~~ 1000–35 ,000 ac	Article 369

Exposed runs of Type MV cables, bare conductors, and bare busbars shall be permitted in locations accessible only to qualified persons. Busbars shall be permitted to be either copper or aluminum.

Exception: Airfield lighting cable used in series circuits that are powered by regulators and installed in restricted airport lighting vaults shall be permitted as exposed cable installations.

Informational Note: An example of a common application is FAA L-824 cables installed as exposed runs within a restricted vault area.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 18:16:34 EDT 2021

Committee Statement

Committee Statement: "Not specified" may lead to confusion or interpretation. Replacing "Not specified" with "Over 1000" removes this problem. Since the table title is "…for Use in Systems Rated Over 1000 Volts…", all the minimum voltages are changed from 0 to 1000. This is intended to remove any confusion about permission below 1000V.

Also, the table is relocated to a new section, "Other Articles" to comply with the style manual section 2.5 concerning references to whole articles.

Response Message: SR-8493-NFPA 70-2021

Public Comment No. 1335-NFPA 70-2021 [Section No. 305.7]

Second Revision No. 8581-NFPA 70-2021 [Section No. 590.8]

590.8 Overcurrent Protective Devices.

(A) Where Reused.

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

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

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

(2) NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance*

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

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

(B) Service Overcurrent Protective Devices.

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

~~Informational Note: The phrase "evidence of impending failure" means evidence such as arcing, overheating, loose or bound equipment parts, visible damage, or deterioration exists. The phrase "properly maintained" means the equipment has been maintained in accordance with the manufacturers' recommendations and applicable industry codes and standards. References for manufacturers' recommendations and applicable industry codes and standards include, but are not limited to, the following:~~

(0) ~~NEMA AB 4-2017, *Guidelines for Inspection and Preventative Maintenance of Molded-Case Circuit Breakers Used in Commercial and Industrial Applications*~~

(0) ~~NFPA 70B -2019, *Recommended Practice for Electrical Equipment Maintenance*~~

(0) ~~NEMA GD 1-2016, *Evaluating Water-Damaged Electrical Equipment*~~

(0) ~~IEEE 1458-2017, *IEEE Recommended Practice for the Selection, Field Testing, and Life Expectancy of Molded-Case Circuit Breakers for Industrial Applications*~~

Supplemental Information

File Name	Description	Approved
NEC_CMP_3_SR8581_590.8.docx	For Staff Use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 15:58:00 EDT 2021

Committee Statement

Committee Statement: Informational note has been revised and relocated to section (A) to comply with the Style Manual. As the references are about equipment reuse it is better located under 590.8(A)

The date for the references has been deleted to align with the action taken in 90.5(C) during the first draft. The most current edition would be the referenced document.

The date for the ASTM reference has been deleted to align with the action taken in 90.5(C) during the first draft. The most current edition would be the referenced document.

Response Message: SR-8581-NFPA 70-2021

Second Revision No. 8387-NFPA 70-2021 [Section No. 722.1]

722.1 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, ~~and optical fiber installations. Parts I and V of this article provide the general cable requirements for power-limited circuit conductors and cables. Part II covers additional cable requirements specifically for Class 2 and Class 3 circuits. Part III covers additional cable requirements specifically for fire alarm systems. Part IV covers additional cable requirements specifically for optical fiber cables~~ fault-managed power (Class 4) circuits, and optical fiber installations .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 12:37:08 EDT 2021

Committee Statement

Committee Statement: Section 722.1 was revised to include fault-managed (Class 4) power circuits.

The text relating to the “Parts” was removed since it is no longer relevant now that Parts II, III and IV have been deleted.

Response Message: SR-8387-NFPA 70-2021

Public Comment No. 1860-NFPA 70-2021 [Section No. 722.1]

Second Revision No. 8390-NFPA 70-2021 [Section No. 722.3(F)]

(F) Instrumentation Tray Cable.

Circuits wired using ~~instrument~~ instrumentation tray cable shall comply with 335.1 and 335.4 through 335.9 ~~, 335.12, 335.24, 335.80, 335.100, and 335.120~~ .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 12:44:26 EDT 2021

Committee Statement

Committee Statement: The references were updated to reflect the move of the requirements from Article 341 to Article 335.

Response Message: SR-8390-NFPA 70-2021

Public Comment No. 1777-NFPA 70-2021 [Section No. 722.3(F)]

Second Revision No. 8392-NFPA 70-2021 [Section No. 722.3(M)]

(M) Temperature Limitation of ~~Class 2 and Class 3~~ 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 .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 12:51:59 EDT 2021

Committee Statement

Committee Statement: "Class 2 and Class 3, and PLTC" were deleted since this requirement applies to all cables in Article 722. Fault-managed power cables" was added since Class 4 circuits are fault-limited but not power limited.

Response Message: SR-8392-NFPA 70-2021

Public Comment No. 1795-NFPA 70-2021 [Section No. 722.3(M)]

Second Revision No. 8393-NFPA 70-2021 [Sections 722.3(N), 722.3(O)]

(N) Identification of Equipment Grounding Conductors.

Equipment grounding conductors shall be identified in accordance with ~~Section~~ 250.119 ~~shall apply~~ .

Exception: ~~Conductors with green insulation shall be permitted to be used as ungrounded signal conductors~~ 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 .

(O) Specific Requirements.

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

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

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

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

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

Supplemental Information

File Name	Description	Approved
NEC_CMP_3_SR8393_722.3NO.docx	For Staff Use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 12:55:04 EDT 2021

Committee Statement

Committee Statement: Section 722.3(N) was reworded for clarity. Added parts to the Articles referenced in 722.3(O) to comply with the NEC style manual.

A pointer was added to 722.3(O) for Class 4 cables.

Response Message: SR-8393-NFPA 70-2021

Public Comment No. 2119-NFPA 70-2021 [Section No. 722.3(O)]

Public Comment No. 1794-NFPA 70-2021 [Section No. 722.3(N)]

Public Comment No. 1593-NFPA 70-2021 [Sections 722.3(N), 722.3(O)]

Second Revision No. 8395-NFPA 70-2021 [Section No. 722.12]

722.12 Uses Not Permitted.

~~Cables shall not be installed in any hazardous (classified) location, except as permitted by other articles of this *Code* .~~

~~Informational Note: See Articles 500 through 516 and Article 517, Part IV for information on hazardous locations.~~

(A) Hazardous Locations.

Cables installed in any hazardous (classified) location shall be installed in accordance with 500.1 , 505.1 , and 506.1 .

(B) Other Applications.

Class 4 cables shall not be permitted for any applications that are not part of a Class 4 distribution system.

Exception: Use of CL4 cable for other applications shall be permitted if the cable has been listed as suitable for the other applications.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 13:03:01 EDT 2021

Committee Statement

Committee Statement: Maintaining the requirement in Article 722.12(A) makes it clear that Class 4 cables are not exempt from Haz Loc requirements. The reference to the full articles has been changed to specific references in compliance with the NEC Style Manual. Section 722.12(B) was included to limit the use of Class 4 cables to Class 4 circuits unless the cable is listed for multiple purposes.

Response Message: SR-8395-NFPA 70-2021

Public Comment No. 1591-NFPA 70-2021 [Section No. 722.12]

Second Revision No. 8422-NFPA 70-2021 [Section No. 722.24(A)]

(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 ~~listed and~~ 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 installed in accordance with 300.22(C).

Informational Note No. 2: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants could result in an undetermined alteration of cable properties.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 14:48:24 EDT 2021

Committee Statement

Committee Statement: The text was edited to make it clear that the listing requirement only applies to cable ties. This PC 531 was originally associated with 725.24(A). Since the parts of this section associated with cable ties was moved to 722.24(A) the revisions were made in 722.24(A).

Response Message: SR-8422-NFPA 70-2021

Public Comment No. 531-NFPA 70-2021 [Section No. 725.24(A)]

Second Revision No. 8466-NFPA 70-2021 [Section No. 722.135]

722.135 Installation of Cables.

The installation of cables shall comply with 722.135(A)~~or 722.135(B) or 722.135(C) and 722.135(D)~~ through (~~G~~ J), as applicable .

(A) Listing.

Cables installed in buildings shall be listed.

(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		Cable Type[1]					
		Plenum	Riser	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

Applications		Cable Type[1]					
		Plenum	Riser	General-Purpose	Limited-Use	Under Carpet	PLTC
	Cables in riser communications raceways	Y	Y	N	N	N	N
	Cables in riser cable routing assemblies	Y	Y	N	N	N	N
	Cables in one- and two-family dwellings	Y	Y	Y	Y[3]	N	Y
Cables and innerducts installed in metal raceways in a riser having firestops at each floor[2]	Cables	Y	Y	Y	Y	N	Y
	Cables in plenum communications raceways (innerduct)	Y	Y	Y	Y	N	Y
	Cables in riser communications raceways (innerduct)	Y	Y	Y	Y	N	Y
	Cables in general-purpose communications raceways (innerduct)	Y	Y	Y	Y	N	Y
In fireproof riser shafts having firestops at each floor[2]	Cables	Y	Y	Y	N	N	Y
	Cables in plenum communications raceways or plenum cable routing assemblies	Y	Y	Y	N	N	Y
	Cables in riser communications raceways or riser cable routing assemblies	Y	Y	Y	N	N	Y
	Cables in general-purpose communications raceways or general-purpose cable routing assemblies	Y	Y	Y	N	N	Y
In cable trays	Outdoors	N	N	N	N	N	Y
	Cables, or cables in plenum, riser, or general-purpose communications raceways, installed indoors	Y	Y	Y	N	N	Y
In cross-connect arrays	Cables, and cables in plenum, riser, or general-purpose communications	Y	Y	Y	N	N	Y

Applications		Cable Type[1]					
		Plenum	Riser	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 ~~permitted to 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: For information on fire protection of wiring installed in ducts specifically fabricated for environmental air and other spaces used for environmental air (plenums), see 4.3.4 and 4.3.11.3.3 of NFPA 90A-2021, *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

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, ~~*Standard for Safety for*~~ *Cable Routing Assemblies and Communications Raceways*, for applicable requirements for plenum, riser, and general-purpose cable routing assemblies and raceways.

(C) Industrial Establishments.

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

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

(2) Type PLTC cable, with a metallic sheath or armor in accordance with ~~725.179(E)~~ 722.179(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).

(D) In Hoistways.

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

(E) Cable Substitutions.

The substitutions for cables listed in Table 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 ~~722.154(B)~~ 722.135(F) .

Informational Note: See ~~805.179~~ 800.179 for information on Types CMP, CMR, CM, and CMX~~, see 805.179~~ .

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
OFCR	OFNP, OFCP, OFNR
OFNG, OFN	OFNP, OFNR
OFCG, OFC	OFNP, OFCP, OFNR, OFCR, OFNG, OFN
CMUC	None

(F) 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.

(G) 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.

(H) 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 shall apply.

(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

(J) Raceway Fill for Optical Fiber Cables.

Raceway fill for optical fiber cables shall comply with either 722.135(J)(1) or (J)(2).

(1) Without Electric Light or Power Conductors.

Where optical fiber cables are installed in a raceway without electric light or power conductors, the raceway fill requirements of Chapters 3 and 9 shall not apply.

(2) Nonconductive Optical Fiber Cables with Electric Light or Power Conductors.

Where nonconductive optical fiber cables are installed in a raceway with electric light or power conductors, the raceway fill requirements of Chapters 3 and 9 shall apply.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 18:41:18 EDT 2021

Committee Statement

Committee Statement: Section 722.135 has been revised to comply with the NEC Style Manual. Section 722.135(H) provides a pointer to 724.144 for 4-pair cable. Section 722.135(I) was added to provide requirements for installation of circuit conductors extending beyond one building. Section 722.135(J) was added to address raceway fill for optical fiber cables.

Response Message: SR-8466-NFPA 70-2021

Second Revision No. 8450-NFPA 70-2021 [Section No. 722.179(A)(3)]

(3) General-Purpose Cable.

General-purpose cable shall be listed as resistant to the spread of fire and as suitable for general-purpose use, ~~with the exception of~~ except for use in risers, ducts, plenums, and other space used for environmental air~~, and shall be listed as resistant to the spread of fire~~ .

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~~ 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.

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

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 16:16:05 EDT 2021

Committee Statement

Committee Statement: This action updates the references to the correct UL Standard. The CSA standard previously referenced is now replaced with a trinational standard (US/Canada /Mexico). The US reference for this standard is UL 2556.

This second revision is based on PC 1091 for Section No. 726.379(C) which is now relocated to 722.179(A)(3)

Response Message: SR-8450-NFPA 70-2021

Public Comment No. 1091-NFPA 70-2021 [Section No. 726.379(C)]

Second Revision No. 8613-NFPA 70-2021 [Section No. 722.179(A)(7)]

(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 ~~meet~~ comply with either 722.179(A)(7)(a), (A)(7)(b), or (A)(7)(c).

Informational Note: See ~~section 12.4.3 and 12.4.4 of~~ *NFPA 72*~~-2022~~ , *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 ~~that may be~~ 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(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) ~~722.24(B)~~ . CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of a fire-resistive cable system as covered in 722.179(A)(7)(b).

Informational Note: See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables,*~~as specified in~~ and UL 1425, *Cables for Non–Power-Limited Fire-Alarm Circuits*, for ~~one method of defining CI cable by~~ information on establishing a rating ~~when tested~~ 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(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: ~~One method of defining a fire-resistive cable system is by establishing a rating when tested in accordance with~~ 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(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 ~~one method of defining~~ information on establishing a rating for an electrical circuit protective system ~~by establishing a rating when tested in accordance with~~ . 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.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 22:15:55 EDT 2021

Committee Statement

Committee Statement: PC 704 was originally directed at 760.179(G). This section was removed from 760 and moved into 722.179(A)(7). The revisions were made to 722.179(A)(7).

The informational notes were revised to comply with section 3.1.3 of the NEC Style Manual.

Response Message: SR-8613-NFPA 70-2021

Public Comment No. 704-NFPA 70-2021 [Section No. 760.179(G)]

Second Revision No. 8455-NFPA 70-2021 [Section No. 722.179(A)(9)]

(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 ~~is~~ 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."

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 16:39:13 EDT 2021

Committee Statement

Committee Statement: The extraneous "is" was removed.

The cable marking in the informational note was corrected to remove the parenthesis.

Response Message: SR-8455-NFPA 70-2021

Public Comment No. 1427-NFPA 70-2021 [Section No. 722.179(A)(9)]

Second Revision No. 8458-NFPA 70-2021 [New Section after 722.179(A)(13)]

(14) Class 2 and Class 3 Cable Voltage and Temperature Ratings.

Class 2 cables shall have a voltage rating of not less than 150 volts. Class 3 cables shall have a voltage rating of not less than 300 volts. Class 2 and Class 3 cables shall have a temperature rating of not less than 60°C (140°F).

(15) Power-Limited Fire Alarm (PLFA) Cables.

PFLA cables shall comply with 722.179(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: Tue Oct 26 16:53:36 EDT 2021

Committee Statement

Committee Statement: Sections 722.179(A)(14) and 722.179(A)(15) have been added to 722.179 to address cable constructions.

Response Message: SR-8458-NFPA 70-2021

Second Revision No. 8459-NFPA 70-2021 [New Section after 722.179(A)(13)]

(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).

(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 Oct 26 17:05:22 EDT 2021

Committee Statement

Committee Statement: Section 722.179(A)(16) has been added to Article 722 to address Class 4 cable construction. The panel notes that the correct reference is UL 1400-1 as stated, not UL 1400-2 since the requirement is related to Class 4 systems, not just the cable.

Response Message: SR-8459-NFPA 70-2021

Public Comment No. 1906-NFPA 70-2021 [Section No. 726.379(E)(5)]

Public Comment No. 1793-NFPA 70-2021 [Section No. 726.379(E)(5)]

Second Revision No. 8448-NFPA 70-2021 [Section No. 722.179(A) [Excluding any Sub-Sections]]

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)(~~13~~ 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.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 16:10:52 EDT 2021

Committee Statement

Committee Statement: Since Article 722 includes Class 4 cables additional subsections are needed to be added to 722.179(A) and references changed to include those subsections. Informational note 4 was added to include the appropriate standard for Class 4 cables.

Response Message: SR-8448-NFPA 70-2021

Public Comment No. 1792-NFPA 70-2021 [Section No. 726.379 [Excluding any Sub-Sections]]

Public Comment No. 1905-NFPA 70-2021 [Section No. 726.379 [Excluding any Sub-Sections]]

Second Revision No. 8495-NFPA 70-2021 [Section No. 722.179(B)]

(B) Marking.

Cables shall be durably marked on the surface in accordance with the following~~.~~ : ~~The AWG size or circular mil area shall be repeated at intervals not exceeding 610 mm (24 in.). All other markings shall be repeated at intervals not exceeding 1.0 m (40 in.).~~

(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, ~~Conductor Properties,~~ 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 the cable has multiple listings and a voltage marking is required for one or more of the listings.

Informational Note No. 3: Voltage markings on cables could be misinterpreted to suggest that the cables may be suitable for Class 1 electric light and power applications.

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~~ 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
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, and FPL cables containing optical fibers are provided with the suffix “-OF.”

Informational Note No. 4: Cable types are listed in descending order of fire resistance rating.

Supplemental Information

File Name	Description	Approved
NEC_CMP_3_SR8495_722.179_B_.docx	For Staff Use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 18:39:28 EDT 2021

Committee Statement

Committee Statement: Section 722.179(B)(6) was added to address Class 4 cable markings. Table 722.179(B) was revised to add Class 4 cable types.

Response Message: SR-8495-NFPA 70-2021

Second Revision No. 8460-NFPA 70-2021 [Section No. 722.179(C)]

(C) Optional Markings.

Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials.

Informational Note No. 1: ~~These markings~~ Examples of these characteristics include, but are not limited to, ~~markings for~~ 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. ~~in accordance with~~ See UL 2556, *Wire and Cable Test Methods*; HF to indicate halogen free ~~as described~~ . 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 ~~in accordance with~~ . See IEC 61034-2, *Measurement of smoke density of cables burning under defined conditions — Part 2: Test procedure and requirements*.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 17:08:49 EDT 2021

Committee Statement

Committee Statement: This second revision clarifies the informational note 1 to make it clear that these are examples of permitted markings, not required markings.

Informational note 2 is revised to comply with the NEC Style Manual.

Response Message: SR-8460-NFPA 70-2021

Second Revision No. 8464-NFPA 70-2021 [Section No. 724.1]

724.1 Scope.

This article covers Class 1 circuits, including power-limited Class 1 remote-control and signaling circuits, that are not an integral part of a device or utilization equipment.

Informational Note: See 300.26 for classifications of remote-control and signaling circuits.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 17:46:33 EDT 2021

Committee Statement

Committee Statement: A new section 300.26 was added providing classifications including class 2 and class 3 circuits and non-power limited remote- control and signaling circuits.

An informational note is also added to 725.1 to direct the user of the Code to a new section 300.26 on Remote-control and Signaling Circuits Classification. This improves usability of the Code.

Response Message: SR-8464-NFPA 70-2021

Public Comment No. 178-NFPA 70-2021 [New Section after 724.40(B)]

Second Revision No. 8618-NFPA 70-2021 [Section No. 724.3]

724.3 Other Articles.

In addition to the requirements of this article, circuits and equipment shall comply with ~~the requirements in~~ 724.3(A) through (J). ~~Only those sections of Article 300 referenced in this article shall apply to Class 1 circuits.~~

(A) Number and Size of Conductors in Raceway.

The number and size of conductors shall comply with ~~the requirements of~~ 300.17.

(B) Spread of Fire or Products of Combustion.

Installation of Class 1 circuits shall comply with ~~the requirements of~~ 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 ~~the requirements of~~ 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 ~~the requirements of~~ Parts I and II of Article 392.

(F) Raceways Exposed to Different Temperatures.

Installation of raceways shall comply with ~~the requirements of~~ 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 ~~the requirements of~~ 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 ~~the requirements of~~ 300.8.

(J) Identification of Equipment Grounding Conductors.

Equipment grounding conductors shall be identified in accordance with 250.119.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Fri Oct 29 10:38:50 EDT 2021

Committee Statement

Committee Statement: The last sentence in the parent section was deleted since Class 1 circuits must comply with 300.2 through 300.26, as stated in 724.46.

	Class 1 circuits per 725.46 always required compliance with Article 300 Part I. The list of specific sections was left for continuity with 725.3 of the 2020 edition.
Response Message:	SR-8618-NFPA 70-2021

Second Revision No. 8463-NFPA 70-2021 [Section No. 724.40(A)]

(A) Class 1 Transformers.

Transformers ~~used~~ shall be permitted to supply Class 1 circuits ~~shall comply with the requirements of the applicable sections of Parts I and II of Article 450~~ .

Informational Note: See Parts I and II of Article 450 for information on transformers used to supply a Class 1 circuit.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 17:38:11 EDT 2021

Committee Statement

Committee Statement: A reference to Parts I and II of Article 450 is moved to an Informational Note to point the user to appropriate requirements for transformers. This increases usability of the Code.

Panel 3 reviewed the reference to Article 450 and found that it is appropriate since only Parts I and II deal with different constructions that would be applicable depending on the transformer used.

Response Message: SR-8463-NFPA 70-2021

Second Revision No. 8465-NFPA 70-2021 [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 ~~310.14~~ 310.15 to the ampacity calculation. Overcurrent protection shall not exceed 7 amperes for 18 AWG conductors and 10 amperes for 16 AWG.

Exception: Where other articles of this Code permit or require other overcurrent protection.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 18:00:27 EDT 2021

Committee Statement

Committee Statement: Panel 3 checked the reference and 310.15 is correct.

Response Message: SR-8465-NFPA 70-2021

Public Comment No. 1948-NFPA 70-2021 [Section No. 724.43]

Second Revision No. 8496-NFPA 70-2021 [Section No. 724.46]

724.46 Class 1 Circuit Wiring Methods.

Class 1 circuits shall be installed in accordance with ~~Part I of Article 300~~ 300.2 ~~and the wiring methods from the appropriate articles in Chapter 3~~ through 300.26 .

Exception No. 1: The requirements of 724.48 through 724.51 shall be permitted to apply in installations of Class 1 circuits.

Exception No. 2: Methods permitted or required by other articles of this Code shall apply to installations of Class 1 circuits.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 21:48:07 EDT 2021

Committee Statement

Committee Statement: Referring to the entire code is not in compliance with the style manual. The panel changed the reference to include 300.2 through 300.26.

Response Message: SR-8496-NFPA 70-2021

Public Comment No. 180-NFPA 70-2021 [Section No. 724.46]

Second Revision No. 8499-NFPA 70-2021 [Section No. 725.1]

725.1 Scope.

This article covers power-limited circuits, including power-limited remote-control and signaling circuits, that are not an integral part of a device or of utilization equipment.

Informational Note No. 1: The circuits described herein are characterized by usage and electrical power limitations that differentiate them from electric light and power circuits; therefore, alternative requirements ~~to those of Chapters~~ 1 ~~through~~ 4 are given ~~with regard to~~ regarding minimum wire sizes, ampacity adjustment and correction factors, overcurrent protection, insulation requirements, and wiring methods and materials.

Informational Note No. 2: See 300.26 for classifications of remote-control and signaling circuits.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 22:44:59 EDT 2021

Committee Statement

Committee Statement: An Informational Note No. 2 was added to direct the user of the Code to a new section 300.26 on Remote-control and Signaling Circuits Classification. This improves usability of the Code. This action addresses the concerns of the Correlating Committee as stated in PC 666 to clarify the use and application of the terms remote-control, branch circuit and signaling circuit, branch circuit as it applies to the new Article 724.

Response Message: SR-8499-NFPA 70-2021

Public Comment No. 712-NFPA 70-2021 [Section No. 725.1]

Second Revision No. 8473-NFPA 70-2021 [Section No. 725.3(E)]

(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~~, Parts I, II, and V~~ .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 11:21:28 EDT 2021

Committee Statement

Committee Statement: Section 725.3(E) reference has been corrected to reflect changes in Article 722.

Response Message: SR-8473-NFPA 70-2021

Second Revision No. 8500-NFPA 70-2021 [Section No. 725.12]

725.12 ~~Uses Not Permitted~~ Hazardous (Classified) Locations .

Cables and equipment installed in any hazardous (classified) location shall ~~not~~ be installed in ~~any hazardous (classified) location, except as permitted by other articles of this *Code*~~ accordance with 500.1 , 505.1 , and 506.1 .

~~Informational Note: Hazardous locations are covered in Articles 500 through 516 and in Article 517, Part IV.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 22:51:21 EDT 2021

Committee Statement

Committee Statement: This action changes the requirement into a permissive statement to add clarity and make the Code more user friendly. It also brings this section into compliance with the NEC style manual to not reference full Articles. In addition, it aligns the text of 725 with Article 760 relating to hazardous locations. Hazardous locations in Articles 516 and 517 are appropriately covered in those Articles and are not required in the Informational Note.

Response Message: SR-8500-NFPA 70-2021

Second Revision No. 8717-NFPA 70-2021 [Section No. 725.24]

725.24 Mechanical Execution of Work.

Class 2 and Class 3 ~~circuits~~ equipment shall be installed in a neat and workmanlike manner. The installation shall also comply with 300.4 and 300.11.

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

~~Class 2 and Class 3 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 straps, staples, hangers, cable ties listed and 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.~~

~~**(B)**~~

~~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.~~

~~Informational Note: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants can result in an undetermined alteration of Class 2, Class 3, and PLTC cable properties.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Nov 11 16:53:04 EST 2021

Committee Statement

Committee Statement: This second revision removes cables from this section since cables are now in Article 722 and mechanical execution of work for cables is in 722.24. The text is revised to reflect that it covers equipment, not cables. Section 725.24(B) was deleted as it is covered in Article 722.

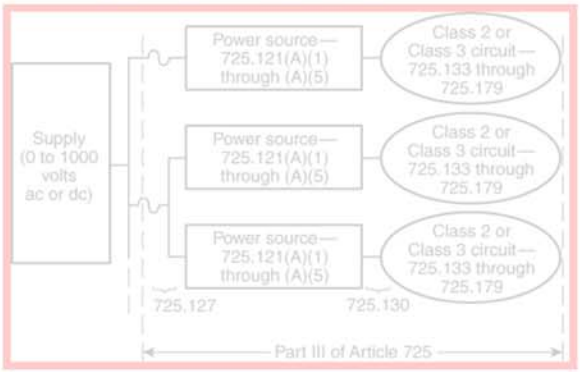
Response Message: SR-8717-NFPA 70-2021

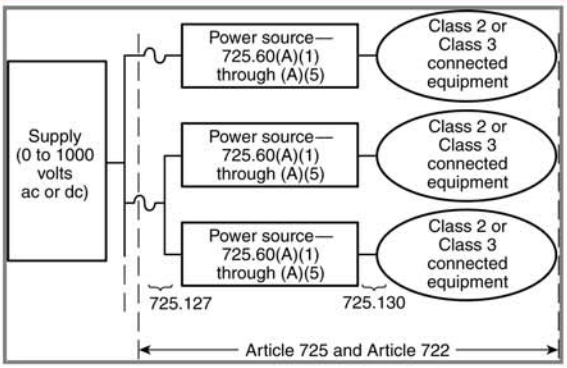
Second Revision No. 8478-NFPA 70-2021 [Section No. 725.60(B)]

(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.





Supplemental Information

File Name	Description	Approved
SR-8478.docx	Revised figure and instructions on how to change the existing figure to align - For Staff Use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 12:30:24 EDT 2021

Committee Statement

Committee Statement: Article 725 has been rearranged and some sections renumbered due to the moving of cable requirements to the new Article 722. The references in the Informational Note Figure 725.60 are now incorrect. This second revision corrects the Section references. This second revision also corrects “Class 2 or Class 3 circuit” in the right hand ovals to “Class 2 or Class 3 Connected Equipment”. By definition Class 2 and Class 3 circuits are between the load side of a power source and the connected equipment.

Response Message: SR-8478-NFPA 70-2021

Second Revision No. 8497-NFPA 70-2021 [Section No. 725.130]

725.130 Wiring Methods and Materials on Load Side of the Class 2 or Class 3 Power Source.

Class 2 and Class 3 circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with 725.130(A) , (B), or a combination of both. Parts I~~,~~ and II~~, and V~~ of Article 722 shall apply ~~to wiring methods and materials on the load side of the Class 2 or Class 3 power source~~ .

(A) Class 1 Wiring Methods and Materials.

~~It shall be permitted to use~~ 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 ~~722.141~~ 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 ~~722.143~~ 722.179 and ~~shall~~ 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(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.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 22:00:50 EDT 2021

Committee Statement

Committee Statement: The revision to section 725.130 adds and corrects references to align with the reinstatement of installation criteria for Class 2 and Class 3 systems into Article 725 from Article 722.

Response Message: SR-8497-NFPA 70-2021

Public Comment No. 1595-NFPA 70-2021 [Section No. 722.140(B)]

Second Revision No. 8498-NFPA 70-2021 [New Section after 725.130(B)]

725.136 Separation from Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm Circuit Conductors, and Medium-Power Network-Powered Broadband Communications Cables.

(A) General.

Cables and conductors of Class 2 and Class 3 circuits shall not be placed in any cable, cable tray, compartment, enclosure, manhole, outlet box, device box, raceway, or similar fitting with conductors of electric light, power, Class 1, non-power-limited fire alarm circuits, and medium-power network-powered broadband communications circuits unless permitted by 725.136(B) through (I).

(B) Separated by Barriers.

Class 2 and Class 3 circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are separated by a barrier.

(C) Raceways Within Enclosures.

In enclosures, Class 2 and Class 3 circuits shall be permitted to be installed in a raceway to separate them from Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits.

(D) Associated Systems Within Enclosures.

Class 2 and Class 3 circuit conductors in compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to Class 2 and Class 3 circuits, and where one of the following applies:

(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 2 and Class 3 circuits.

(2) The circuit conductors operate at 150 volts or less to ground and comply with one of the following:

   a. The Class 2 and Class 3 circuits are installed using Type CL3, Type CL3R, or Type CL3P or permitted substitute cables if these Class 3 cable conductors extending beyond the jacket are separated by a minimum of 6 mm (0.25 in.) or by a nonconductive sleeve or nonconductive barrier from all other conductors.

   b. The Class 2 and Class 3 circuit conductors are installed as a Class 1 circuit in accordance with 724.40 .

(E) Enclosures with Single Opening.

Class 2 and Class 3 circuit conductors entering compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to Class 2 and Class 3 circuits. Where Class 2 and Class 3 circuit conductors must enter an enclosure that is provided with a single opening, they shall be permitted to enter through a single fitting (such as a tee) if the conductors are separated from the conductors of the other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing.

(F) Manholes.

Underground Class 2 and Class 3 circuit conductors in a manhole shall be permitted to be installed with Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where one of the following conditions is met:

(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 Class 2 and Class 3 circuit conductors are permanently and effectively separated from the conductors of other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing, in addition to the insulation or covering on the wire.

(3) The Class 2 and Class 3 circuit conductors are permanently and effectively separated from conductors of the other circuits and securely fastened to racks, insulators, or other approved supports.

(G) Cable Trays.

Class 2 and Class 3 circuit conductors shall be permitted to be installed in cable trays where the conductors of the electric light, Class 1, and non-power-limited fire alarm circuits are separated by a solid fixed barrier of a material compatible with the cable tray or where the Class 2 or Class 3 circuits are installed in Type MC cable.

(H) Where Protected.

Class 2 and Class 3 circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are installed using Class 1 wiring methods in accordance with 724.46 and where they are protected by an approved raceway.

(I) Other Applications.

For other applications, conductors of Class 2 and Class 3 circuits shall be separated by at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non-power-limited fire alarm, or medium-power network-powered broadband communications circuits unless one of the following conditions is met:

(1) Either all of the electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors or all of the Class 2 and Class 3 circuit conductors are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type TC, or Type UF cables.

(2) All of the electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are permanently separated from all of the Class 2 and Class 3 circuit conductors by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the conductors.

725.139 Installation of Conductors of Different Circuits in the Same Cable, Enclosure, Cable Tray, Raceway, or Cable Routing Assembly.

(A) Two or More Class 2 Circuits.

Conductors of two or more Class 2 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly.

(B) Two or More Class 3 Circuits.

Conductors of two or more Class 3 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly.

(C) Class 2 Circuits with Class 3 Circuits.

Conductors of one or more Class 2 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly with conductors of Class 3 circuits if the insulation of the Class 2 circuit conductors in the cable, enclosure, raceway, or cable routing assembly is at least that required for Class 3 circuits.

(D)_ Class 2 and Class 3 Circuits with Communications Circuits.

(1)_ Communications Cables.

Conductors of one or more Class 2 or Class 3 circuits shall be permitted in the same cable with conductors of communications circuits if the cable is a listed communications cable installed in accordance with Part V of Article 800 . The cables shall be listed as communications cables.

(2)_ Composite Cables.

Cables constructed of individually listed Class 2, Class 3, and communications cables under a common jacket shall be permitted to be classified as communications cables. The fire resistance rating of the composite cable shall be determined by the performance of the composite cable.

(E)_ Class 2 or Class 3 Cables with Other Circuit Cables.

Jacketed cables of Class 2 or Class 3 circuits shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly with jacketed cables of any of the following:

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

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

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

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

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

(F)_ Class 2 or Class 3 Conductors or Cables and Audio System 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 cables.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 22:14:41 EDT 2021

Committee Statement

Committee Statement: The installation requirements of 725.136 and 725.139 have been added back into Article 725 and removed from Article 722. The requirements have been editorially revised removing the unnecessary use of “permitted to be” and changed to “shall not be” as directed by the CC.

Response Message: SR-8498-NFPA 70-2021

Public Comment No. 1538-NFPA 70-2021 [Section No. 722.141(H)]

Second Revision No. 8479-NFPA 70-2021 [Section No. 725.144]

725.144 Bundling of ~~4-Pair~~ Cables Transmitting Power and Data.

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 ~~4-pair (8 conductor)~~ cabling. Section 300.11 and Parts I and III of Article 725 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 ~~Types~~ 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.

~~Types~~ 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 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 Ampacities of Each Conductor in Amperes in 4-Pair Class 2 or Class 3 Balanced Twisted-Pair Cables Based on Copper Conductors at an Ambient Temperature of 30°C (86°F) with All Conductors in All Cables Carrying Current, 60°C (140°F), 75°C (167°F), and 90°C (194°F) Rated Cables

-	Number of 4-Pair Cables in a Bundle														
-	1–7			8–19			20–37			38–61			62–91		
-	Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating			Temperatur Rating		
AWG	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	9(
26	1.00	1.23	1.42	0.71	0.87	1.02	0.55	0.68	0.78	0.46	0.57	0.67	0.45	0.55	0.(
24	1.19	1.46	1.69	0.81	1.01	1.17	0.63	0.78	0.91	0.55	0.67	0.78	0.46	0.56	0.(
23	1.24	1.53	1.78	0.89	1.11	1.28	0.77	0.95	1.10	0.66	0.80	0.93	0.58	0.71	0.8
22	1.50	1.86	2.16	1.04	1.28	1.49	0.77	0.95	1.11	0.66	0.82	0.96	0.62	0.77	0.8

Notes:

1. For bundle sizes over 192 cables, or for conductor sizes smaller than 26 AWG, ampacities shall be permitted to be determined by qualified personnel under engineering supervision.

2. Where only half of the conductors in each cable are carrying current, the values in the table shall be permitted to be increased by a factor of 1.4.

Informational Note No. 1: Elevated cable temperatures can reduce a cable's data transmission performance. For information on practices for 4-pair balanced twisted pair cabling, see TIA-TSB-184-A and 6.4.7, 6.6.3, and Annex G of ANSI/TIA-568-C.2, which provide guidance on adjustments for operating temperatures between 20°C and 60°C.

Informational Note No. 2: The per-contact current rating of connectors can limit the maximum allowable current below the ampacity shown in Table 725.144.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 12:40:24 EDT 2021

Committee Statement

Committee Statement: Only Section 725.144(A) is limited to 4-pair cables, not the entire Section.

This second revision makes it clear that 725.144(A) and Table 725.144 only apply to 4-pair cables. This is also stated in the title of the referenced Table.

725.144(B) covers the use of “LP” rated cables for bundled cables transmitting power and data. The “LP” designation is covered in UL 13, which does not limit this rating to 4-pair cables.

This second revision fixes an omission error in the example of an LP cable marking.

Response Message: SR-8479-NFPA 70-2021

Public Comment No. 1429-NFPA 70-2021 [Section No. 725.144(B)]

Public Comment No. 1081-NFPA 70-2021 [Section No. 725.144]

Public Comment No. 1920-NFPA 70-2021 [Section No. 725.144]

Public Comment No. 2156-NFPA 70-2021 [Section No. 725.144 [Excluding any Sub-Sections]]

Second Revision No. 8480-NFPA 70-2021 [Section No. 725.179]

~~**725.179** Listing and Marking of Limited Power (LP) Cables.~~

~~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 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."~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 12:48:04 EDT 2021

Committee Statement

Committee Statement: This second revision deletes a redundant requirement. This material was moved to Article 722 and Article 722 is referenced in 725.3(E).

Response Message: SR-8480-NFPA 70-2021

Public Comment No. 1430-NFPA 70-2021 [Section No. 725.179]

Second Revision No. 8357-NFPA 70-2021 [New Section after 726.1]

726.3 Other Articles.

The listing and installation of cables for Class 4 circuits shall comply with Article 722 . Only those sections of Article 300 referenced in Article 722 shall apply to Class 4 circuits.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 09:32:07 EDT 2021

Committee Statement

Committee Statement: Article 722 contains all of the general requirements for the installation of cables. Providing a reference to Article 722 is needed for usability of the Code.

Response Message: SR-8357-NFPA 70-2021

Second Revision No. 8290-NFPA 70-2021 [Section No. 726.1]

Detail SR-8261

726.1 Scope.

This article covers the installation of wiring systems and equipment, including utilization equipment, of fault-managed power (FMP) systems in occupancies other than dwelling units~~, including utilization equipment incorporating parts of these systems~~.

Informational Note No. 1: See Article 100 for definitions ~~related to this section~~ of *fault-managed power (FMP)*, *Class 4 circuit*, *Class 4 device*, *Class 4 power system*, *Class 4 receiver*, *Class 4 transmitter*, and *Class 4 utilization equipment*.

Informational Note No. 2: Class 4 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 ~~power transmitted~~ source current to ensure the energy ~~and power~~ 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 ~~power~~ current limited ~~with respect to risk of shock and fire~~ for faults between the Class 4 transmitter and Class 4 receiver.

Informational Note No. 3: The circuits described in this article are characterized by monitoring and control systems that differentiate them from electric light and power circuits; therefore, alternative requirements to those of Chapters 1 through 4 are given ~~regarding minimum wire sizes, ampacity adjustment and correction factors, overcurrent protection, insulation requirements, and wiring methods and materials~~.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 25 14:41:36 EDT 2021

Committee Statement

Committee Statement: This action adds clarity to the requirement that the installation of systems and utilization equipment is included. (PC 1083)

Informational Note 1 is expanded to inform the reader of the Code what definitions relating to this technology can be found in Article 100. Tray cable not included because there is no Class 4 tray cable. (PC 1775)

Informational Note 2 is revised to change power to current to make it more technically correct. (PC 1729)

Informational Note 3 is modeled after 725.1 for consistency except the detailed list of alternative requirements is omitted as unnecessary.

In PC709, the correlating committee directs the panel to review the need and location of informational notes in the scope. Because this is a new technology, the informational notes provide useful information and direction to the user of the Code as it applies to this technology.

Response Message: SR-8290-NFPA 70-2021

Public Comment No. 1729-NFPA 70-2021 [Section No. 726.1]

Public Comment No. 1775-NFPA 70-2021 [Section No. 726.1]

Public Comment No. 1083-NFPA 70-2021 [Section No. 726.1]

Second Revision No. 8327-NFPA 70-2021 [Section No. 726.121(A)]

~~**(A)** Fault Energy and Power Limitations.~~

~~For listing purposes, under the conditions specified in 726.121(B), the energy available into a fault shall be limited according to the requirements of the following:~~

(0) ~~A Class 4 power source shall provide protection of personnel against the risk of electric shock by de-energizing the circuit or a portion thereof, or limiting the current, within an established period of time.~~

~~Informational Note No. 1: This time requirement provides an equivalent level of protection from electric shock as Class 2 circuits.~~

(0) ~~The maximum power that can be delivered into a fault between conductors or between any conductor and ground shall not exceed 100 volt-amperes, measured after 5 seconds.~~

~~Informational Note No. 2: This requirement reduces the risk of fire due to resistive heating.~~

(0) ~~A Class 4 power source shall provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected.~~

~~Informational Note No. 3: This requirement reduces the risk of fire due to arcing.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 25 17:08:29 EDT 2021

Committee Statement

Committee Statement: Section 726.121(A) has been deleted and combined with current 726.121(B).

The list of faults was removed as this is appropriately handled by the listing standard to include series faults.

Response Message: SR-8327-NFPA 70-2021

Public Comment No. 2084-NFPA 70-2021 [Section No. 726.121(A)]

Public Comment No. 1085-NFPA 70-2021 [Section No. 726.121(A)]

Public Comment No. 1766-NFPA 70-2021 [Section No. 726.121(A)]

Public Comment No. 1520-NFPA 70-2021 [Section No. 726.121(A)]

Second Revision No. 8341-NFPA 70-2021 [Section No. 726.121(B)]

(A) Fault Management.

~~A listed~~ For listing purposes, a transmitter shall interrupt an energized circuit ~~within the limits of 726.121(A)~~ when any of the following conditions occur on the circuit between the transmitter and receiver :

(0) ~~An abnormal condition such as abnormal voltage, current, waveform, or load condition is identified in the system~~

(1) A short circuit ~~occurs~~

(2) ~~Human skin contacts energized parts~~ A line-to-line fault condition that presents an unacceptable risk of fire or electric shock

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

(4) An overcurrent condition ~~exists~~

(4) ~~Intentional shorting of the line at the receiving or transmitting end to force de-energization for purposes of maintenance or repair occurs~~

(5) A malfunction of the monitoring or control system ~~occurs~~ 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_CMP_3_SR8341_726.121.docx	For Staff Use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 25 17:42:13 EDT 2021

Committee Statement

Committee Statement: (B) was changed to (A) to accommodate the deletion of section (A)

The list has been updated to reflect the behaviors outlined in the listing standard that are critical for safety. (PC 1771)

Editorial changes were made for clarity. (PC 1600)

The addition of new item 6 allows for the Safety Standard and/or the certification agency to address potentially hazardous conditions that might not be specifically mentioned in the original list of items. (PC 1086)

The original item 6 is deleted. (PC 1911)

Response Message: SR-8341-NFPA 70-2021

Public Comment No. 1600-NFPA 70-2021 [Section No. 726.121(B)]

Public Comment No. 1771-NFPA 70-2021 [Section No. 726.121(B)]

Public Comment No. 1911-NFPA 70-2021 [Section No. 726.121(B)]

Public Comment No. 1086-NFPA 70-2021 [Section No. 726.121(B)]

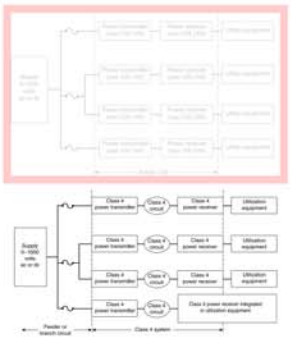
Second Revision No. 8348-NFPA 70-2021 [Section No. 726.121 [Excluding any Sub-Sections]]

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) ~~and (B)~~ . Class 4 circuits shall be supplied from a power source (transmitter) that has a ~~peak~~ voltage output of not more than 450 volts peak or dc ~~line to line or 225 volts dc line to ground~~ .

Informational Note No. 1: Informational Note Figure 726.121 illustrates the relationships between Class 4 power transmitters (power sources), ~~Class 4 power transmitters (power sources) supplies,~~ Class 4 circuits, Class 4 power receivers, and utilization equipment.

Informational Note No. 2: See UL ~~###~~ 1400 -1, *~~Standard~~ Outline for ~~Class 4~~ 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.



Supplemental Information

File Name	Description	Approved
SR-8348_FIGURE_for_Section_726.121.docx	SR-8348 Figure for Section 726.121. For staff use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 25 18:12:16 EDT 2021

Committee Statement

Committee Statement: This second revision makes the following changes.

"As a part of a" replaced "or" in the first sentence as a class 4 power transmitter/receiver pair is not a power source. Redundant text was deleted in Informational Note 1.

Peak voltage was added to address systems that operate with voltages other than dc. (PC 1732, PC 1084)

The line-to-ground voltage was deleted to accommodate systems that employ an asymmetric high resistance ground

scheme. The panel noted that Class 4 cables will be listed for the full 450 volts on all current carrying conductors. (PC 1516)

Adds the correct number (UL 1400-1) and title for the referenced standard in Informational Note 2. (PC 1902, PC 1732, PC 1256)

The figure was revised to show a case where the Class 4 receiver is built into the utilization equipment.

Response Message: SR-8348-NFPA 70-2021

Public Comment No. 1256-NFPA 70-2021 [Section No. 726.121 [Excluding any Sub-Sections]]

Public Comment No. 1732-NFPA 70-2021 [Section No. 726.121 [Excluding any Sub-Sections]]

Public Comment No. 1902-NFPA 70-2021 [Section No. 726.121]

Public Comment No. 1740-NFPA 70-2021 [Section No. 726.121 [Excluding any Sub-Sections]]

Public Comment No. 1084-NFPA 70-2021 [Section No. 726.121 [Excluding any Sub-Sections]]

Public Comment No. 1516-NFPA 70-2021 [Section No. 726.121 [Excluding any Sub-Sections]]

Second Revision No. 8314-NFPA 70-2021 [Section No. 726.122]

726.122 Class 4 Loads.

Outputs of a Class 4 receiver and power outputs of Class 4 utilization equipment shall be considered a separately derived system ~~and shall be subject to requirements in Chapters 1 through 4~~ if the outputs are used as a supply for a feeder or branch circuit .

Informational Note: Class 4 utilization equipment that does not provide power outputs is not subject to these requirements.

Exception: A Class 4 receiver with limited-power circuit outputs shall be permitted to meet the requirements of ~~Parts I thru IV~~ Part II of Article 725.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 25 16:20:55 EDT 2021

Committee Statement

Committee Statement: The reference to Chapters 1 through 4 is deleted. These chapters would automatically apply to separately derived systems. Separately derived systems only apply to circuits used to supply a feeder or a branch circuit. The exception has been revised to comply with the Style Manual.

Response Message: SR-8314-NFPA 70-2021

Public Comment No. 1602-NFPA 70-2021 [Section No. 726.122]

Public Comment No. 1910-NFPA 70-2021 [Section No. 726.122]

Second Revision No. 8470-NFPA 70-2021 [New Section after 726.124(B)]

726.144 Ampacity.

The ampacity of Class 4 cables shall comply with 310.15 based on the temperature rating of the Class 4 cable for conductors sized 16 AWG to 6 AWG. For conductors sized 24 AWG to 17 AWG, the Class 4 cable shall be rated for the intended ampacity as evidenced by the marking FMP-XXA, where XX is the maximum allowable ampacity permitted. Refer to 722.179(A)(16) for additional Class 4 cable requirements.

Informational Note: See UL 1400-2, *Standard for Fault-Managed Power Distribution Technologies — Part 2: Requirements for Class 4 Cables* , for information on determining maximum allowable ampacities.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 22:19:08 EDT 2021

Committee Statement

Committee Statement: Class 4 systems are power systems and Class 4 cables are intended to carry current. Article 726 does not currently contain ampacity requirements. Testing of a variety of 18-24 AWG cables in a typical bundle size of 37 cables has shown that these cables can overheat when carrying expected currents. Varying cable constructions (2-pair, 8-pair, shielded, unshielded, with and without optical fiber, etc.) make it impractical to create ampacity tables for conductors in this AWG range. The FMP-XXA designation ensures that the cables have been tested and are able to carry the marked current safely.

The requirement is added as new 726.144 to align with Article 725 numbering for similar ampacity requirements.

Response Message: SR-8470-NFPA 70-2021

Public Comment No. 1896-NFPA 70-2021 [New Section after 726.203(M)]

Second Revision No. 8317-NFPA 70-2021 [Section No. 726.170]

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 ~~Class 4 transmitter and Class 4 receiver combination or Class 4 transmitter and Class 4 utilization equipment combination~~ listing information shall ~~be listed as a~~ include compatible devices if a listed Class 4 device depends on specific system ~~to confirm~~ devices for interoperability, monitoring, or control .

Informational Note No. 1: See UL ~~###~~ 1400 -1, ~~*Standard*~~ *Outline for* ~~*Class 4*~~ *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 Oct 25 16:46:12 EDT 2021

Committee Statement

Committee Statement: This second revision adds the correct number (UL 1400-1) and title for the referenced standard in Informational Note 1. (PC 1904, PC 1259, PC 1773)

The text was revised to make it clear that dependent devices need to be identified as part of the listing information but that each combination of dependent devices does not require a separate identification and listing. An informational note 2 providing an example is added for clarity. (PC 1912)

Response Message: SR-8317-NFPA 70-2021

Public Comment No. 1259-NFPA 70-2021 [Section No. 726.170]

Public Comment No. 1773-NFPA 70-2021 [Section No. 726.170]

Public Comment No. 1904-NFPA 70-2021 [Section No. 726.170]

Public Comment No. 1912-NFPA 70-2021 [Section No. 726.170]

Second Revision No. 8356-NFPA 70-2021 [Section No. 726.203]

726.203 Other Articles.

In addition to the requirements of this article, circuits and equipment shall comply with the requirements in 726.3(A) through (N). Only those sections of Article 300 referenced in this article shall apply to Class 4 power systems.

(A) Number and Size of Conductors in Raceway.

The number and size of conductors shall comply with the requirements of 300.17.

(B) Spread of Fire or Products of Combustion.

Installation of Class 4 circuits shall comply with the requirements of 300.21.

(C) Ducts, Plenums, and Other Air-Handling Spaces.

Class 4 circuits installed in ducts, plenums, and other spaces used for environmental air shall comply with the requirements of 300.22.

(D) Cable Trays.

Cable tray installations shall comply with the requirements of Parts I and II of Article 392.

(E) Instrumentation Tray Cable.

Instrumentation tray cable (Type ITC) installations shall comply with the requirements of 727.1 and 727.4 through 727.9.

(F) Raceways Exposed to Different Temperatures.

Installations shall comply with the requirements of 300.7(A).

(G) Bushing.

Bushings shall be installed where cables emerge from raceways used for mechanical support or protection in accordance with 300.15(C).

(H) Installation of Conductors With Other Systems.

Installation of conductors with other systems shall comply with the requirements of 300.8.

(I) Corrosive, Damp, or Wet Locations.

Class 4 cables installed in corrosive, damp, or wet locations shall comply with the applicable requirements of 110.11, 300.5(B), 300.6, 300.9, and 310.10(F).

(J) Cable Routing Assemblies.

Class 4 and Type CL4TC cables shall be permitted to be installed in plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with Table 800.154(c), listed in accordance with 800.182, and installed in accordance with 800.110(C) and 800.113.

(K) Communications Raceways.

Where the requirements applicable to electrical nonmetallic tubing (ENT) apply, Class 4 and Type CL4TC cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with Table 800.154(b), listed in accordance with 800.182, and installed in accordance with 800.113 and 362.24 through 362.56.

(L) Temperature Limitation of Class 4 Cables.

The requirements of 310.14(A)(3) on the temperature limitation of conductors shall apply to Class 4 cables.

~~**(M)** Identification of Equipment Grounding Conductors.~~

~~Equipment grounding conductors shall be identified in accordance with 250.119.~~

~~*Exception: Class 4 cables that do not contain an equipment grounding conductor shall be permitted to use a conductor with green or green with one or more yellow stripes insulation for other than equipment grounding purposes.*~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 09:18:58 EDT 2021

Committee Statement

Committee Statement: The requirements have been removed from 726.203 as these cable installation requirements are now addressed by Article 722.

Response Message: SR-8356-NFPA 70-2021

Public Comment No. 1780-NFPA 70-2021 [Section No. 726.203]

Public Comment No. 1798-NFPA 70-2021 [Section No. 726.203(E)]

Public Comment No. 1779-NFPA 70-2021 [Section No. 726.203(E)]

Public Comment No. 1784-NFPA 70-2021 [Sections 726.203(J), 726.203(K)]

Public Comment No. 1786-NFPA 70-2021 [Section No. 726.212]

Second Revision No. 8297-NFPA 70-2021 [Section No. 726.212]

726.12 ~~Uses Not Permitted~~ Hazardous (Classified) Locations .

Cables ~~shall not be~~ and equipment installed in any hazardous (classified) location~~, except as permitted by other articles of this *Code*~~ shall be installed in accordance with 500.1 , 505.1 , and 506.1 .

~~**(A)** Hazardous (Classified) Locations.~~

~~Cables shall not be installed in any hazardous (classified) location, except as permitted by other articles of this *Code* .~~

~~Informational Note: Hazardous locations are covered in Articles 500 through 516 and in Part IV of Article 517.~~

~~**(B)** Other Applications.~~

~~Class 4 cables shall not be permitted for any applications that are not part of a Class 4 distribution system.~~

~~*Exception: Use of CL4 cable for other applications shall be permitted if the cable has multiple listings.*~~

Supplemental Information

File Name	Description	Approved
NEC_CMP_3_SR8297_726.212.docx	For Staff Use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 25 15:15:59 EDT 2021

Committee Statement

Committee Statement: It is important that Article 726 point the user to the hazardous location criteria. Relocating these requirements to 726.12 maintains consistency with Article 725 and Article 760. The requirement has been revised to comply with the Style Manual.

Response Message: SR-8297-NFPA 70-2021

Public Comment No. 1607-NFPA 70-2021 [Section No. 726.212(A)]

Public Comment No. 1088-NFPA 70-2021 [Section No. 726.212(B)]

Second Revision No. 8248-NFPA 70-2021 [Section No. 726.221]

~~**726.221** 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.~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Oct 25 12:15:59 EDT 2021

Committee Statement

Committee Statement: The information in 726.221 is a duplication of what is covered in Article 722.
Response Message: SR-8248-NFPA 70-2021

Public Comment No. 1787-NFPA 70-2021 [Section No. 726.221]

Second Revision No. 8368-NFPA 70-2021 [Section No. 726.224]

726.24 Mechanical Execution of Work.

~~CL4 cables~~ Class 4 equipment 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 CL4 cable properties.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 11:05:10 EDT 2021

Committee Statement

Committee Statement: This second revision removes cables from this section since cables are now in Article 722 and mechanical execution of work for cables is in 722.24 The text is revised to reflect that it covers equipment, not cables, and to align with the 725.24 text. This section is renumbered and relocated to Part I as 726.24 to align it with Article 725 numbering.

The note is deleted since it only applies to cables.

Response Message: SR-8368-NFPA 70-2021

Public Comment No. 1789-NFPA 70-2021 [Section No. 726.224]

Second Revision No. 8294-NFPA 70-2021 [Section No. 726.225]

~~**726.225** Abandoned Cables.~~

~~The accessible portion of abandoned Class 4 and CL4TC 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.~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Oct 25 14:56:05 EDT 2021

Committee Statement

Committee Statement: The information in 726.225 is a duplication of what is covered in Article 722.
Response Message: SR-8294-NFPA 70-2021

Public Comment No. 1089-NFPA 70-2021 [Section No. 726.225]

Public Comment No. 1790-NFPA 70-2021 [Section No. 726.225]

Second Revision No. 8273-NFPA 70-2021 [Section No. 726.335]

~~**726.335** Installation of CL4 Cables.~~

~~Installation of CL4 and CL4TC cables shall comply with the requirements of 726.135(A) through (L) and shall be listed for the application.~~

~~**(A)** Ducts Specifically Fabricated for Environmental Air.~~

~~The following cables shall be permitted in ducts specifically fabricated for environmental air as described in 300.22(B) if directly associated with the air distribution system:~~

~~(0) Type CL4 cables in lengths as short as practicable to perform the required function~~

~~(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in raceways that are installed in compliance with 300.22(B)~~

~~Informational Note: See 4.3.4.1 and 4.3.11.3.3 of NFPA 90A-2018, *Standard for the Installation of Air-Conditioning and Ventilating Systems* , for information on fire protection of wiring installed in fabricated ducts.~~

~~**(B)** Other Spaces Used for Environmental Air (Plenums).~~

~~The following cables shall be permitted in other spaces used for environmental air as described in 300.22(C):~~

~~(0) Type CL4P cables~~

~~(0) Type CL4P cables installed in plenum communications raceways~~

~~(0) Type CL4P cables installed in plenum cable routing assemblies~~

~~(0) Type CL4P cables and plenum communications raceways supported by open metallic cable trays or cable tray systems~~

~~(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in raceways that are installed in compliance with 300.22(C)~~

~~(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 300.22(C)~~

~~(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in plenum communications raceways, riser communications raceways, 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)~~

~~**(C)** Risers — Cables in Vertical Runs.~~

~~The following cables shall be permitted in vertical runs penetrating one or more floors and in vertical runs in a shaft:~~

~~(0) Type CL4R and Type CL4P cables~~

~~(0) Type CL4R and Type CL4P cables installed in the following:~~

~~(0) Plenum communications raceways~~ ~~(0) Plenum cable routing assemblies~~

~~(0) Riser communications raceways~~ ~~(0) Riser cable routing assemblies~~

~~Informational Note: See 300.21 for firestop requirements for floor penetrations.~~

(D) Risers — Cables and Innerducts in Metal Raceways.

The following cables shall be permitted in metal raceways in a riser having firestops at each floor:

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in the following:

- (0) Plenum communications raceways (innerduct)
- (0) Riser communications raceways (innerduct)
- (0) General-purpose communications raceways (innerduct)

Informational Note: See 300.21 for firestop requirements for floor penetrations.

(E) Risers — Cables in Fireproof Shafts.

The following shall be permitted to be installed in fireproof riser shafts having firestops at each floor:

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in the following:

- (0) Plenum communications raceway; (0) Plenum cable routing assemblies
- (0) Riser communications raceway; (0) Riser cable routing assemblies
- (0) General-purpose communications raceways
- (0) General-purpose cable routing assemblies

Informational Note: See 300.21 for firestop requirements for floor penetrations.

(F) Risers — One- and Two-Family Dwellings.

The following cables shall be permitted in one- and two-family dwellings:

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in the following:

- (0) Plenum communications raceway; (0) Plenum cable routing assemblies
- (0) Riser communications raceway; (0) Riser cable routing assemblies
- (0) General-purpose communications raceways
- (0) General-purpose cable routing assemblies

~~**(G)** Cable Trays.~~

~~Cables installed in cable trays outdoors shall be Type CL4TC. The following cables shall be permitted to be supported by cable trays in buildings:~~

(0) ~~Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables~~

(0) ~~Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in the following:~~

- (0) ~~Plenum communications raceway~~
- (0) ~~Riser communications raceways~~
- (0) ~~General-purpose communications raceways~~

~~**(H)** Cross-Connect Arrays.~~

~~The following cables shall be permitted to be installed in cross-connect arrays:~~

(0) ~~Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables~~

(0) ~~Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in the following:~~

- (0) ~~Plenum communications raceway~~
- (0) ~~Plenum cable routing assemblies~~
- (0) ~~Riser communications raceway~~
- (0) ~~Riser cable routing assemblies~~
- (0) ~~General-purpose communications raceways~~
- (0) ~~General-purpose cable routing assemblies~~

~~**(I)** Industrial Establishments.~~

~~In industrial establishments where the conditions of maintenance and supervision ensure that only qualified persons service the installation, Type CL4TC cables shall be permitted in accordance with either 726.335(I)(1) or (I)(2).~~

~~**(1)** Type CL4 TC-ER.~~

~~Where the cable is not subject to physical damage, Type CL4TC cable that complies with the crush and impact requirements of Type MC cable and is identified as Type CL4TC-ER for such use shall be permitted to be exposed between the cable tray and the Class 4 receiver or Class 4 utilization equipment. 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 CL4TC-ER cable shall be permitted to transition between cable trays and between cable trays and the Class 4 receiver or Class 4 utilization equipment 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 CL4 TC.~~

~~Type CL4TC cable, with a metallic sheath or armor in accordance with 725.179(E), 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).~~

(J) Other Building Locations.

The following cables shall be permitted to be installed in building locations other than those covered in 726.135(B) through (I):

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in the following:

- (0) Plenum communications raceway; (0) Plenum cable routing assemblies
- (0) Riser communications raceway; (0) Riser cable routing assemblies
- (0) General-purpose communications raceways
- (0) General-purpose cable routing assemblies

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in raceways recognized in Chapter 3

(K) Multifamily Dwellings.

The following cables shall be permitted to be installed in multifamily dwellings in locations other than those covered in 726.135(B) through (I):

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in the following:

- (0) Plenum communications raceway; (0) Plenum cable routing assemblies
- (0) Riser communications raceway; (0) Riser cable routing assemblies
- (0) General-purpose communications raceways
- (0) General-purpose cable routing assemblies

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC wires and cables installed in raceways recognized in Chapter 3

(L) One- and Two-Family Dwellings.

The following cables shall be permitted to be installed in one- and two-family dwellings in locations other than those covered in 726.135(B) through (I):

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables

(0) Types Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in the following:

- (0) Plenum communications raceway; (0) Plenum cable routing assemblies
- (0) Riser communications raceway; (0) Riser cable routing assemblies
- (0) General-purpose communications raceways
- (0) General-purpose cable routing assemblies

(0) Type CL4, Type CL4R, Type CL4P, and Type CL4TC cables installed in raceways recognized in Chapter 3

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 25 13:36:03 EDT 2021

Committee Statement

Committee Statement: The information in 726.335 is a duplication of what is covered in Article 722, Table 722.135(B). Article 726 as modified in the scope no longer applies to dwelling units and therefore the deletion of 726.335(K) and (L) dealing with dwelling units as part of the entire deletion of 726.335 removes any conflict with the scope.

Response Message: SR-8273-NFPA 70-2021

Public Comment No. 1518-NFPA 70-2021 [Sections 726.335(K), 726.335(L)]

Second Revision No. 8301-NFPA 70-2021 [Section No. 726.336]

726.136 Separation from Electric Light, Power, Class 1, Non–Power-Limited Fire Alarm Circuit, and Medium-Power Network-Powered Broadband Communications Cables.

(A) General.

Cables and conductors of CL4 circuits shall not be placed in any cable, cable tray, compartment, enclosure, manhole, outlet box, device box, raceway, or similar fitting with conductors of electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits unless permitted by 726.136(B) through (I).

(B) Separated by Barriers.

Class 4 circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are separated by a barrier.

(C) Raceways Within Enclosures.

In enclosures, Class 4 circuits shall be permitted to be installed in a raceway to separate them from Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits.

(D) Associated Systems Within Enclosures.

Class 4 circuit conductors in compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to Class 4 circuits, and where either of the following applies:

(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 CL4 cable conductors extending beyond the jacket are separated by a minimum of 6 mm (0.25 in.) or by a nonconductive sleeve or nonconductive barrier from all other conductors.

(E) Enclosures with Single Openings.

Class 4 circuit conductors entering compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to Class 4 circuits. Where Class 4 circuit conductors must enter an enclosure that is provided with a single opening, they shall be permitted to enter through a single fitting (such as a tee) if the conductors are separated from the conductors of the other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing.

(F) Manholes.

Underground Class 4 circuit conductors in a manhole shall be permitted to be installed with Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuits where one of the following conditions is met:

(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 Class 4 circuit conductors are permanently and effectively separated from the conductors of other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing, in addition to the insulation or covering on the wire.

(3) The Class 4 circuit conductors are permanently and effectively separated from conductors of the other circuits and securely fastened to racks, insulators, or other approved supports.

(G) Cable Trays.

Class 4 circuit conductors shall be permitted to be installed in cable trays where the conductors of the electric light, Class 1, and non–power-limited fire alarm circuits are separated by a solid fixed barrier of a material compatible with the cable tray or where the Class 4 circuits are installed in Type MC cable.

~~**(H)** In Hoistways.~~

~~In hoistways, Class 4 circuit conductors shall be installed in rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or electrical metallic tubing. For elevators or similar equipment, these conductors shall be permitted to be installed in accordance with 620.21.~~

(H) Other Applications.

For other applications, conductors of Class 4 circuits shall be separated by at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non–power-limited fire alarm, or medium-power network-powered broadband communications circuits unless one of the following conditions is met:

(1) Either all of the electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors or all of the Class 4 circuit conductors are in a raceway or in metal-sheathed, metal-clad, non–metallic-sheathed, Type TC, or Type UF cables

(2) All of the electric light, power, Class 1, non–power-limited fire alarm, and medium-power network-powered broadband communications circuit conductors are permanently separated from all of the Class 4 circuit conductors by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the conductors

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 25 15:36:03 EDT 2021

Committee Statement

Committee Statement: The information in 726.336(H) is a duplication of what is covered in Article 722. The moving of 726.336 to 726.136 is done to be consistent with the numbering of other Articles. Re-alphabetize subsequent sections.

Response Message: SR-8301-NFPA 70-2021

Public Comment No. 1610-NFPA 70-2021 [Part IV.]

Second Revision No. 8471-NFPA 70-2021 [Section No. 726.339]

726.139 Installation of Conductors of Different Circuits in the Same Cable, Enclosure, Cable Tray, Raceway, or Cable Routing Assembly.

(A) Two or More Class 4 Circuits.

Conductors of two or more Class 4 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly.

(B) Class 4 Circuits With Class 2, Class 3, or Communications Circuits.

Conductors of one or more Class 4 circuits shall be permitted within the same cable~~, enclosure, raceway, or cable routing~~ assembly as conductors of Class 2, Class 3, or communications circuits if the insulation of the Class 2, Class 3, or communications circuit conductors in the ~~cable,~~ cable is at least that required for Class 4 circuits. Class 4 cables shall be permitted within the same enclosure, raceway, or cable routing assembly ~~is at least that required for Class 4 circuits~~ as Class 2, Class 3, or communications circuits .

(C) Class 4 Cables With Other Circuit Cables.

Jacketed cables of Class 4 circuits shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly with jacketed cables of any of the following:

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

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

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

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

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

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 26 22:30:03 EDT 2021

Committee Statement

Committee Statement: These sections were originally numbered to place them at the end of the new article in anticipation of them being moved to the new Article 722 for cables. The correlating committee directed that material that is specific to articles 725, 726, 760 and 770 remain in those articles so this material is not being moved.

These Sections are being renumbered to better integrate them into Article 726 and to align the numbering with that of Article 725 for similar content.

Conductors in the same cable should always be insulated for the highest voltage in the cable to withstand that voltage in the event of an insulation failure. Class 4 cables are jacketed and together with the protection afforded by the Class 4 circuit provide protection against electric shock so requiring other cables in enclosures, raceways or cable routing assemblies to be rated for the Class 4 voltages is unnecessary.

Response Message: SR-8471-NFPA 70-2021

Public Comment No. 1908-NFPA 70-2021 [Section No. 726.339(B)]

Public Comment No. 1909-NFPA 70-2021 [Section No. 726.339(B)]

Second Revision No. 8303-NFPA 70-2021 [Section No. 726.341]

~~**726.341** Installation of Circuit Conductors Extending Beyond One Building.~~

~~Where Class 4 circuit conductors 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, the requirements of the following shall also apply:~~

(0) ~~Sections 800.44, 800.53, 800.100, 805.50, 805.93, and 805.170(A) and (B) for other than coaxial conductors~~

(0) ~~Sections 820.44, 820.93, and 820.100 for coaxial conductors~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Oct 25 15:38:35 EDT 2021

Committee Statement

Committee Statement: The information in 726.341 is a duplication of what is covered in Article 722.
Response Message: SR-8303-NFPA 70-2021

Second Revision No. 8304-NFPA 70-2021 [Section No. 726.343]

~~**726.343** Support of Conductors.~~

~~Class 4 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. These conductors shall be permitted to be installed as permitted by 300.11(C)(2).~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Oct 25 15:39:41 EDT 2021

Committee Statement

Committee Statement: The information in 726.343 is a duplication of what is covered in Article 722.
Response Message: SR-8304-NFPA 70-2021

Second Revision No. 8305-NFPA 70-2021 [Section No. 726.379]

726.379 Listing and Marking of Class 4 Cables.

Cables for Class 4 power systems shall be Type CL4, Type CL4R, or Type CL4P and shall be listed for Class 4 distribution system use. CL4 cables installed as wiring methods within buildings shall be listed as resistant to the spread of fire and other criteria in accordance with 726.179(A) through (D), shall be constructed in accordance with 726.179(E), shall be marked in accordance with 726.179(F), and shall be permitted to be marked in accordance with 726.179(G).

Informational Note: See UL ###-2, *Standard for Class 4 Power Systems* , for information on determining applicable requirements for the listing of Class 4 power systems.

(A) Type CL4P.

Type CL4P plenum cable shall be marked as Type CL4P and shall be listed as suitable for use in ducts, plenums, and other spaces for environmental air and shall be listed as having adequate fire-resistant and low-smoke producing characteristics.

Informational Note: One method of defining a cable that is low-smoke producing and fire resistant is that the cable exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less when tested in accordance with NFPA 262-2019, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces* .

(B) Type CL4R.

Type CL4R riser cable shall be marked as Type CL4R and 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: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-2012, *Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts.*

(C) Type CL4.

Type CL4 cables shall be marked as Type CL4 and be listed as suitable for general-purpose use, with the exception of risers, ducts, plenums, and other spaces used for environmental air, and shall be listed as resistant to the spread of fire.

Informational Note No. 1: 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.

Informational Note No. 2: 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 for cables in cable trays, as described in CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables* .

(D) Type CL4TC.

Type CL4TC nonmetallic-sheathed tray cable shall be marked as Type CL4TC, shall be listed as being suitable for cable trays, and shall consist of a factory assembly of two or more insulated conductors under a nonmetallic jacket. The insulated conductors shall be at least 24 AWG copper (solid or stranded). Insulation on conductors shall be rated for 450 volts dc. The cable core shall be two or more parallel conductors, one or more group assemblies of twisted or parallel conductors, or a combination of both. A metallic shield or a metallized foil shield with drain wire(s) shall be permitted to be applied over the cable core, over groups of conductors, or both. The cable shall be listed as resistant to the spread of fire. The outer jacket shall be a sunlight- and moisture-resistant nonmetallic material. Type CL4TC cable used in a wet location shall be listed for use in wet locations or have a moisture-impervious metal sheath.

Exception: *Where a smooth metallic sheath, continuous corrugated metallic sheath, or nonmetallic jacket with interlocking tape armor is provided, an overall nonmetallic jacket shall not be required. On metallic-sheathed cable without an overall nonmetallic jacket, the information required in 310.8 shall be located on the nonmetallic jacket under the sheath.*

Informational Note No. 1: 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.

Informational Note No. 2: 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 tray flame test for cables in cable trays, as described in CSA C22.2 No. 0.3-M-2001, *Test Methods for Electrical Wires and Cables*.

(E) 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).

(5) Cabling.

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

Informational Note: Excessive cable lengths can result in higher capacitance which could affect the safety of the circuit. See UL ###-2, *Standard for Class 4 Power Systems*, for information on determining applicable requirements for the listing of Class 4 power systems.

~~**(F)** Marking.~~

~~All cables shall be marked to indicate the following information using the applicable method described in 310.8(B):~~

(0) ~~The cable type as described in 726.179 (A) through (D)~~

(0) ~~The manufacturer's name, trademark, or other distinctive marking by which the organization responsible for the product can be readily identified~~

(0) ~~The AWG size or circular mil area~~

(0) ~~Number of conductors, if more than two~~

(0) ~~The temperature rating of Class 4 cables that have a rating exceeding 60°C (140°F)~~

~~**(G)** Optional Markings.~~

~~Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials.~~

~~Informational Note No. 1: These markings include, but are not limited to, markings for 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 in accordance with UL 2556, *Wire and Cable Test Methods* ; "HF" to indicate halogen-free as described in UL 2885, *Outline of Investigation for Acid Gas, Acidity and Conductivity of Combusted Materials and Assessment of Halogens* ; and "LSHF" to indicate halogen-free and low-smoke characteristics in accordance with IEC 61034-2, *Measurement of smoke density of cables burning under defined conditions — Part 2: Test procedure and requirements* .~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 25 15:47:13 EDT 2021

Committee Statement

Committee Statement: Except for 726.379(D), the information in 726.379 is a duplication of what is covered in Article 722. Section 726.379(D) has been deleted and not included in 722 because there will not be a CL4 tray cable.

Response Message: SR-8305-NFPA 70-2021

Public Comment No. 1090-NFPA 70-2021 [Section No. 726.379(D)]

Second Revision No. 8488-NFPA 70-2021 [Section No. 760.1]

760.1 Scope.

This article covers the installation of wiring and equipment of fire alarm systems, including all circuits controlled and powered by the fire alarm system.

Informational Note No. 1: Fire alarm systems include fire detection and alarm notification, guard's tour, sprinkler waterflow, and sprinkler supervisory systems. Circuits controlled and powered by the fire alarm system include circuits for the control of building systems safety functions, elevator capture, elevator shutdown, door release, smoke doors and damper control, fire doors and damper control, and fan shutdown, but only where these circuits are powered by and controlled by the fire alarm system. ~~See *NFPA 72* -2019, *National Fire Alarm and Signaling Code* , for further information on the installation and monitoring for integrity requirements for fire alarm systems.~~

Informational Note No. 2: See *NFPA 72*-~~2019~~ , *National Fire Alarm and Signaling Code*, for further information on the installation and monitoring for integrity requirements for fire alarm systems.

~~Informational Note No. 2: Class 1, 2, and 3 circuits are defined in Articles 724 and 725 .~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 16:16:43 EDT 2021

Committee Statement

Committee Statement: Rearrange INF 1. Break into 1 and 2 Update reference to 2022. It is necessary to refer to the entire NFPA 72. There is no way to break down references to NFPA 72 referring to individual chapters and sections would create more confusion. Deleted Informational Note No. 2 as it is unnecessary.

Response Message: SR-8488-NFPA 70-2021

Public Comment No. 713-NFPA 70-2021 [Section No. 760.1]

Second Revision No. 8692-NFPA 70-2021 [New Section after 760.3]

760.12 Hazardous (Classified) Locations.

Cables and equipment installed in any hazardous (classified) location shall be installed in accordance with 500.1 , 505.1 , and 506.1 .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Nov 01 10:02:47 EDT 2021

Committee Statement

Committee Statement: Section 760.12 was developed by taking 760.3(C) and creating a new section to address hazardous locations aligning it with other Articles of the NEC. Hazardous locations in Articles 516 and 517 are appropriately covered in those Articles and are not required.

Response Message: SR-8692-NFPA 70-2021

Second Revision No. 8693-NFPA 70-2021 [Section No. 760.3]

760.3 Other Articles.

Circuits and equipment shall comply with 760.3(A) through (O). Only those sections of Article 300 referenced in this article shall apply to fire alarm systems.

(A) Spread of Fire or Products of Combustion.

Installation of fire alarm circuits shall comply with 300.21.

(B) Ducts, Plenums, and Other Air-Handling Spaces.

Power-limited and non-power-limited fire alarm cables installed in ducts, plenums, or other spaces used for environmental air shall comply with 300.22.

Exception No. 1: Power-limited fire alarm cables selected in accordance with Table 760.154 and installed in accordance with 722.135~~760.135(B)~~ and 300.22(B), Exception, shall be permitted to be installed in ducts specifically fabricated for environmental air.

Exception No. 2: Power-limited fire alarm cables selected in accordance with Table 760.154 and installed in accordance with ~~760.135(C)~~ 722.135 shall be permitted to be installed in other spaces used for environmental air (plenums).

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

~~Articles 500 through 516 and Article 517 , Part IV, where installed in hazardous (classified) locations.~~

(C) Corrosive, Damp, or Wet Locations.

Fire alarm circuits and equipment installed in corrosive, damp, or wet locations shall comply with 110.11, 300.5(B), 300.6, 300.9, and 310.10(F).

(D) Building Control Circuits.

~~Article 725 , where building control circuits~~ Building control systems (e.g., elevator capture, fan shutdown) ~~are~~ associated with the fire alarm system shall comply with Article 725 .

(E) Optical Fiber Cables.

Where optical fiber cables are utilized for fire alarm circuits, the cables shall be installed in accordance with Article 770.

(F) Installation of Conductors with Other Systems.

Installations shall comply with 300.8.

(G) Raceways or Sleeves Exposed to Different Temperatures.

Installations shall comply with 300.7(A).

(H) Vertical Support for Fire-Resistive Cables and Conductors.

Vertical installations of circuit integrity (CI) cables and conductors installed in a raceway or conductors and cables of fire-resistive cable systems shall be installed in accordance with 300.19.

(I) Installation of Cables and Conductors in Raceway.

The number and size of cables and conductors shall comply with 300.17.

(J) Bushing.

A bushing shall be installed where cables emerge from raceway used for mechanical support or protection in accordance with 300.15(C).

(K) Cable Routing Assemblies.

Power-limited fire alarm cables shall be permitted to be installed in plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with Table 800.154(c), listed in accordance with 800.182, and installed in accordance with 800.110(C) and 800.113.

(L) Communications Raceways.

Power-limited fire alarm cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with Table 800.154(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 apply.

(M) Temperature Limitations of Power-Limited and Non–Power-Limited Fire Alarm Cables.

The requirements of 310.14(A)(3) on the temperature limitation of conductors shall apply to power-limited fire alarm cables and non–power-limited fire alarms cables.

(N) Identification of Equipment Grounding Conductors.

Equipment grounding conductors shall be identified in accordance with 250.119.

Exception: Conductors with green insulation shall be permitted to be used as ungrounded signal conductors for Types FPLP, FPLR, FPL, and substitute cables installed in accordance with 760.154(A).

(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 Parts I and II of Article 722.

Supplemental Information

File Name	Description	Approved
NEC_CMP_3_SR8693_760.3.docx	For Staff Use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Nov 01 10:09:03 EDT 2021

Committee Statement

Committee Statement: For consistency with Articles 725 and 726 Hazardous locations has been removed from the list and relocated to its own section. As a result of the deletion of (C) the list has be re-alphabetized. Section 760.3(O) has been added to point to Article 722 and Part III of Article 760 for cable requirements.

Response Message: SR-8693-NFPA 70-2021

Second Revision No. 8594-NFPA 70-2021 [Section No. 760.24(A)]

(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 listed and identified~~ 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.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 16:27:19 EDT 2021

Committee Statement

Committee Statement: Reworded to clarify the requirement for listing applies to cable ties.

Response Message: SR-8594-NFPA 70-2021

Public Comment No. 1432-NFPA 70-2021 [Section No. 760.24(A)]

Public Comment No. 530-NFPA 70-2021 [Section No. 760.24(A)]

Second Revision No. 8595-NFPA 70-2021 [Section No. 760.124]

760.124 Circuit Marking.

The equipment supplying PLFA circuits shall be durably marked where plainly visible to indicate each circuit that is a power-limited fire alarm circuit.

~~Informational Note: See 760.130(A) , Exception No. 3, where a power-limited circuit is to be reclassified as a non–power-limited circuit.~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 16:36:00 EDT 2021

Committee Statement

Committee Statement: This Informational Note is no longer needed based on other changes made during the first revision regarding reclassifying circuits.

Response Message: SR-8595-NFPA 70-2021

Public Comment No. 48-NFPA 70-2021 [Section No. 760.124]

Second Revision No. 8695-NFPA 70-2021 [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 ~~(A) and (B)~~ . Parts I and II of Article 722 shall apply.

(A) NPLFA Wiring Methods and Materials.

~~The use of~~ NPLFA wiring methods shall be permitted when used in accordance with 760.46, 760.49, or 760.53 for PLFA circuits ~~shall be permitted~~ . 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 ~~760.179~~ 722.179 shall be installed as detailed in 722.135 and 760.130(B)(1)~~, (B)(2), or (B)(3) of this section and 300.7~~ 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 ~~in~~ such ~~a way~~ that maximum protection against physical damage is afforded by building construction such as baseboards, door frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

(2) Passing Through a Floor or Wall.

Cables shall be installed in metal 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) ~~In Hoistways~~ Nonconcealed Spaces .

Cables specified in Chapter 3 and meeting the requirements of 722.179(A)(15)(a) and (A)(15)(b) shall be permitted to be installed in ~~rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, or electrical metallic tubing~~ nonconcealed spaces where ~~installed in hoistways~~ the exposed length of cable does not exceed 3 m (10 ft) .

~~*Exception: As provided for in 620.21 for elevators and similar equipment.*~~

(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 .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Nov 01 10:27:11 EDT 2021

Committee Statement

Committee Statement:	References have been updated. Section 760.130(A) was revised to clearly provide permission or establish direction for the user. The existing 760.130(3) was deleted as it is covered by Article 722. The new 760.130(3) and 760.130(4) were added to Article 760 as they are specific to power-limited fire alarm circuits.
Response Message:	SR-8695-NFPA 70-2021

Public Comment No. 702-NFPA 70-2021 [Section No. 760.130(A)]

Second Revision No. 8491-NFPA 70-2021 [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 Parts I and II of Article 722 and ~~760.135~~ 760.136 through 760.143.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 17:09:15 EDT 2021

Committee Statement

Committee Statement: References have been revised to point to Article 722 and update the 760 reference.

Response Message: SR-8491-NFPA 70-2021

Second Revision No. 8492-NFPA 70-2021 [Section No. 760.135]

760.135 Installation of PLFA Cables in Buildings.

Installation of power-limited fire alarm cables in buildings shall comply with 760.135(A) through (J).

(A) Listing.

PLFA cables installed in buildings shall be listed.

(B) Ducts Specifically Fabricated for Environmental Air.

The following cables shall be permitted in ducts specifically fabricated for environmental air as described in 300.22(B) if they are directly associated with the air distribution system:

(0) Type FPLP and Type FPLP-CI cables in lengths as short as practicable to perform the required function

(0) Type FPLP, Type FPLP-CI, Type FPLR, Type FPLR-CI, Type FPL, and Type FPL-CI cables installed in raceways that are installed in compliance with 300.22(B)

Informational Note: See NFPA 90A-2021, *Standard for the Installation of Air-Conditioning and Ventilating Systems* , 4.3.4.1 for information on fire protection of wiring installed in fabricated ducts.

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

The following cables shall be permitted in other spaces used for environmental air as described in 300.22(C) :

(0) Type FPLP cables

(0) Type FPLP cables installed in plenum communications raceways

(0) Type FPLP cables installed in plenum routing assemblies

(0) Type FPLP and Type FPLP-CI cables supported by open metallic cable trays or cable tray systems

(0) Type FPLP, Type FPLR, and Type FPL cables installed in raceways that are installed in compliance with 300.22(C)

(0) Type FPLP, Type FPLR, and Type FPL cables supported by solid bottom metal cable trays with solid metal covers in other spaces used for environmental air (plenums) as described in 300.22(C)

(0) Type FPLP, Type FPLR, and Type FPL cables installed in plenum communications raceways, riser communications raceways, or 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)

Informational Note: See 4.3.11.3.3 of 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 (plenums).

(D) Risers — Cables in Vertical Runs.

The following cables shall be permitted in vertical runs penetrating one or more floors and in vertical runs in a shaft:

(0) Types FPLP and FPLR cables

(0) Types FPLP and FPLR cables installed in the following:

0. Plenum communications raceways
0. Plenum cable routing assemblies
0. Riser communications raceways
0. Riser cable routing assemblies

Informational Note: See 300.21 for firestop requirements for floor penetrations.

(E) Risers — Cables in Metal Raceways.

The following cables shall be permitted in metal raceways in a riser having firestops at each floor:

(0) Types FPLP, FPLR, and FPL cables

(0) Types FPLP, FPLR, and FPL cables installed in the following:

0. Plenum communications raceways
0. Riser communications raceways
0. General-purpose communications raceways

Informational Note: See 300.21 for firestop requirements for floor penetrations.

(F) Risers — Cables in Fireproof Shafts.

The following cables shall be permitted to be installed in fireproof riser shafts having firestops at each floor:

(0) Types FPLP, FPLR, and FPL cables

(0) Types FPLP, FPLR, and FPL cables installed in the following:

0. Plenum communications raceways
0. Plenum cable routing assemblies
0. Riser communications raceways
0. Riser cable routing assemblies
0. General-purpose communications raceways
0. General-purpose cable routing assemblies

Informational Note: See 300.21 for firestop requirements for floor penetrations.

~~**(G)** Risers — One- and Two-Family Dwellings.~~

~~The following cables shall be permitted in one- and two-family dwellings:~~

(0) ~~Types FPLP, FPLR, and FPL cables~~

(0) ~~Types FPLP, FPLR, and FPL cables installed in the following:~~

0. ~~Plenum communications raceways~~
0. ~~Plenum cable routing assemblies~~
0. ~~Riser communications raceways~~
0. ~~Riser cable routing assemblies~~
0. ~~General-purpose communications raceways~~
0. ~~General-purpose cable routing assemblies~~

~~**(H)** Other Building Locations.~~

~~The following cables shall be permitted to be installed in building locations other than the locations covered in 770.113(B) through (H):~~

(0) ~~Types FPLP, FPLR, and FPL cables~~

(0) ~~Types FPLP, FPLR, and FPL cables installed in the following:~~

0. ~~Plenum communications raceways~~
0. ~~Plenum cable routing assemblies~~
0. ~~Riser communications raceways~~
0. ~~Riser cable routing assemblies~~
0. ~~General-purpose communications raceways~~
0. ~~General-purpose cable routing assemblies~~

(0) ~~Types FPLP, FPLR, and FPL cables installed in a raceway of a type recognized in Chapter 3~~

~~**(I)** Nonconcealed Spaces.~~

~~Cables specified in Chapter 3 and meeting the requirements of 760.179(A) and (B) shall be permitted to be installed in nonconcealed spaces where the exposed length of cable does not exceed 3 m (10 ft).~~

~~**(J)** Portable Fire Alarm System.~~

~~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 530.22 .~~

Submitter Information Verification

Committee: NEC-P03
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Committee Statement

Committee Statement: Deleting this information removes the redundancy between Article 760 and Article 722.
Response Message: SR-8492-NFPA 70-2021

Second Revision No. 8596-NFPA 70-2021 [Section No. 760.139(E)]

(E) Audio System Circuits and PLFA Circuits.

Audio system circuits described in 640.9(C) and installed using Class 2 or Class 3 wiring methods in compliance with ~~725.133 and 725.154~~ 722.135 shall not ~~be permitted to~~ be installed in the same cable, cable tray, raceway, or cable routing assembly with power-limited conductors or cables.

Submitter Information Verification

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Submittal Date: Thu Oct 28 16:40:36 EDT 2021

Committee Statement

Committee Statement: Section 760.139(E) was revised to simplify the text to read “shall not be” instead of “shall not be permitted to be.”

Response Message: SR-8596-NFPA 70-2021

Second Revision No. 8608-NFPA 70-2021 [Section No. 760.176]

760.176 Listing and Marking of NPLFA Cables.

Non-power-limited fire alarm cables installed as wiring within buildings shall be listed in accordance with 760.176(A) and (B), be listed ~~and~~ as ~~being~~ resistant to the spread of fire in accordance with 760.176(C) through (F), and ~~shall~~ be marked in accordance with 760.176(G). Cable used in a wet location shall be listed for use in wet locations or have a moisture-impervious metal sheath. Non-power-limited fire alarm cables shall have a temperature rating of not less than 60°C (140°F). Non-power-limited fire alarm cables shall be permitted to contain optical fibers.

Informational Note: See UL 1425, *Standard for Cables for Non-Power-Limited Fire-Alarm Circuits*, for information on non-power-limited fire alarm cables.

(A) NPLFA Conductor Materials.

Conductors shall be 18 AWG or larger solid or stranded copper.

(B) Insulated Conductors.

Insulation on conductors shall be rated for the system voltage and not less than 600 V. Insulated conductors 14 AWG and larger shall be one of the types listed in Table 310.4(1) or one that is identified for ~~this~~ such use. Insulated conductors 18 AWG and 16 AWG shall be in accordance with 760.49.

(C) Type NPLFP.

Type NPLFP non-power-limited fire alarm cable for use in other space used for environmental air shall be listed as being suitable for use in other space used for environmental air as described in 300.22(C) and shall also be listed as having adequate fire-resistant and low smoke–producing characteristics.

Informational Note: ~~One~~ See NFPA 262, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces* , for one method of defining a cable that is low-smoke producing ~~cable~~ and fire-resistant ~~cable is that~~ if the cable exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less when tested ~~in accordance with NFPA 262 -2019, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*~~ .

(D) Type NPLFR.

Type NPLFR non–power-limited fire alarm riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: ~~One~~ See UL 1666, *Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts* , for one method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor ~~is that the cables pass ANSI/UL 1666-2012, *Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts*~~ .

(E) Type NPLF.

Type NPLF non–power-limited fire alarm cable shall be listed as being suitable for general-purpose fire alarm use, with the exception of use in risers, ducts, plenums, and other space used for environmental air, and shall also be listed as being resistant to the spread of fire.

Informational Note: ~~One method of defining~~ See UL 2556, *Wire and Cable Test Methods* , for one method of defining *resistant to the spread of fire*. One method is to demonstrate that the cables do not spread fire to the top of the tray in the "UL Flame Exposure, Vertical Tray Flame Test." ~~in ANSI/UL 1685-2010, *Standard for Safety for 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~~ FT4 "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* .~~

(F) Fire Alarm Circuit Integrity (CI) Cable, Fire-Resistive Cable System, or Electrical Circuit Protective System.

Cables that are used for survivability of critical circuits under fire conditions shall be listed and meet the requirements of 760.176(F)(1), (F)(2), or (F)(3).

Informational Note: See ~~12.4.3 and 12.4.4 of~~ *NFPA 72*~~-2019~~ , *National Fire Alarm and Signaling Code*, 12.4.3 and 12.4.4, for additional information on fire alarm circuit integrity (CI) cable, fire-resistive cable systems, or electrical circuit protective systems ~~that might be~~ 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.

(1) Circuit Integrity (CI) Cables.

Circuit integrity (CI) cables specified in 760.176(C), (D), and (E) and used for survivability of critical circuits shall be marked for an additional classification using the suffix "-CI." In order to maintain its listed fire-resistive rating, CI cables shall only be installed in free air in accordance with 760.24(B). CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of an electrical circuit protective fire-resistive cable system as covered in 760.176(F)(2). CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of an electrical circuit protective system as covered in 760.176(F)(2).

Informational Note: ~~One method of defining CI cable is by establishing a rating when tested in accordance with~~ See UL 2196, *Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables*, ~~as specified in~~ and UL 1425, *Cables for Non-Power-Limited Fire-Alarm Circuits*~~.~~ , for information on establishing a rating for CI cable. ~~UL guide information for non-power-limited fire alarm circuits~~ The *UL Guide Information for Nonpower-limited Fire Alarm Circuits* (HNHT) contains information for identifying the cable and its installation limitations to maintain the fire-resistive rating.

(2) Fire-Resistive Cable Systems.

Cables specified in 760.176(C), (D), (E), and (F)(1) 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: ~~One method of defining a fire-resistive cable system is by establishing a rating when tested in accordance with~~ 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 . ~~UL guide information for electrical circuit integrity systems~~ The *UL Guide Information for Electrical Circuit Integrity Systems* (FHIT) contains information for identifying the system and its installation limitations to maintain a minimum fire-resistive rating.

(3) Electrical Circuit Protective System.

Protectants for cables specified in 760.176(C), (D), and (E) 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: ~~One method of defining an electrical circuit protective system is by establishing a rating when tested in accordance with~~ See UL 1724, *Fire Tests for Electrical Circuit Protective Systems*~~.~~ , for information on establishing a rating for an electrical circuit protective system. ~~UL guide information for electrical circuit integrity systems~~ The *UL Guide Information for Electrical Circuit Integrity Systems* (FHIT) contains information for identifying the system and its installation limitations to maintain the fire-resistive rating.

(G) NPLFA Cable Markings.

Multiconductor non–power-limited fire alarm cables shall be marked in accordance with Table 760.176(G). Non–power-limited fire alarm circuit cables shall be permitted to be marked with a maximum usage voltage rating of 150 volts. Cables that are listed for circuit integrity shall be identified with the suffix "-CI" as defined in 760.176(F). The temperature rating shall be marked on the jacket of NPLFA cables that have a temperature rating exceeding 60°C (140°F). The jacket of NPLFA cables shall be marked with the conductor size.

Informational Note: Cable types are listed in descending order of fire performance.

Table 760.176(G) NPLFA Cable Markings

Cable Marking	Type	Reference
NPLFP	Non–power-limited fire alarm circuit cable for use in ~~"~~ other space used for environmental air~~"~~	760.176(C) and (G)
NPLFR	Non–power-limited fire alarm circuit riser cable	760.176(D) and (G)
NPLF	Non–power-limited fire alarm circuit cable	760.176(E) and (G)

Notes :

1. Cables identified in 760.176(C), (D), and (E) and meeting the requirements for circuit integrity shall have the additional classification using the suffix "-CI" (for example, NPLFP-CI, NPLFR-CI, and NPLF-CI).

2. Cables containing optical fibers shall be provided with the suffix "-OF".

Submitter Information Verification

Committee: NEC-P03

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Committee Statement

Committee Statement: The informational notes have been revised to comply with 3.1.3 of the NEC Style Manual. In (E) the standard reference was updated.

A "Note 2" was added to the table for cables that incorporated optical fibers.

Response Message: SR-8608-NFPA 70-2021

Public Comment No. 703-NFPA 70-2021 [Section No. 760.176(F)]

Second Revision No. 8602-NFPA 70-2021 [Section No. 760.179]

760.179 Listing and Marking of ~~PLFA Cables and~~ Insulated Continuous Line-Type Fire Detectors.

~~PLFA cables installed as wiring within buildings shall be listed as being resistant to the spread of fire and other criteria in accordance with 760.179(A) through (I) and shall be marked in accordance with 760.179(J).~~ Insulated continuous line-type fire detectors shall be listed in accordance with 760.179(A) through (D) . Cable used in a wet location shall be listed for use in wet locations or have a moisture-impervious metal sheath.

~~Informational Note: See UL 1424, *Cables for Power-Limited Fire-Alarm Circuits* , for applicable requirements for listing of power-limited fire alarm cable.~~

(A) Listing.

The cable shall be listed as being resistant to the spread of fire in accordance with 722.179(A)(1) , (A)(2), and (A)(3).

(B) Voltage and Temperature Rating.

The cable shall have a voltage rating of not less than 300 volts. The cable shall have a temperature rating of not less than 60°C (140°F).

(C) Markings.

The cable shall be marked as fire resistance Type FPLP, Type FPLR, or Type FPL in accordance with 722.179(B). The voltage rating shall not be marked on the cable. The temperature rating shall be marked on the jacket of cables that have a temperature rating exceeding 60°C (140°F). The jacket of PLFA cables shall be marked with the conductor size.

Informational Note: Voltage ratings on cables might be misinterpreted to suggest that the cables could be suitable for Class 1, electric light, and power applications.

Exception: Voltage markings shall be permitted where the cable has multiple listings and voltage marking is required for one or more of the listings.

(D) Cable Jacket Compound.

The cable jacket compound shall have a high degree of abrasion resistance.

~~**(E)** Conductor Materials.~~

~~Conductors shall be solid or stranded copper.~~

~~**(F)** Conductor Size.~~

~~The size of conductors in a multiconductor cable shall not be smaller than 26 AWG. Single conductors shall not be smaller than 18 AWG.~~

~~**(G)** Voltage and Temperature Ratings.~~

~~The cable shall have a voltage rating of not less than 300 volts. The cable shall have a temperature rating of not less than 60°C (140°F).~~

(H) Type FPLP.

Type FPLP power-limited fire alarm plenum cable shall be listed as being suitable for use in ducts, plenums, and other space used for environmental air and shall also be listed as having adequate fire-resistant and low-smoke-producing characteristics.

Informational Note: One method of defining a cable that is low-smoke producing cable and fire-resistant cable is that the cable exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less when tested in accordance with NFPA 262-2019, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*.

(I) Type FPLR.

Type FPLR power-limited fire alarm riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: One method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor is that the cables pass the requirements of ANSI/UL 1666-2012, *Standard Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts*.

(J) Type FPL.

Type FPL power-limited fire alarm cable shall be listed as being suitable for general-purpose fire alarm use, with the exception of risers, ducts, plenums, and other spaces used for environmental air, and shall also be listed as being resistant to the spread of fire.

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 1685-2012, *Standard for Safety for 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*.

(K) Fire Alarm Circuit Integrity (CI) Cable, Fire-Resistive Cable System, or Electrical Circuit Protective System.

Cables that are used for survivability of critical circuits under fire conditions shall be listed and meet the requirements of 760.179(G)(1), (G)(2), or (G)(3).

Informational Note: See 12.4.3 and 12.4.4 of *NFPA 72*-2019, *National Fire Alarm and Signaling Code*, for fire alarm circuit integrity (CI) cable, fire-resistive cable systems, or electrical circuit protective systems that might be 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.

(1) Circuit Integrity (CI) Cables.

Circuit integrity (CI) cables specified in 760.179(D), (E), (F), and (H) and used for survivability of critical circuits shall have an additional classification using the suffix "-CI." CI cables shall only be permitted to be installed in a raceway where specifically listed and marked as part of a fire-resistive system as covered in 760.179(G)(2).

(2) Electrical Circuit Protective System.

Cables specified in 760.179(D), (E), (F), (H), and (G)(1) that are part of an electrical circuit protective system shall be identified with the protective system number and hourly rating printed on the outer jacket of the cable and installed in accordance with the listing of the protective system.

(L) Coaxial Cables.

Coaxial cables shall be permitted to use 30 percent conductivity copper-covered steel center conductor wire and shall be listed as Type FPLP, FPLR, or FPL cable.

(M) Cables Containing Optical Fibers.

Composite optical fiber cables shall be listed as electrical cables based on the type of electrical conductors.

(N) Cable Marking.

The cable shall be marked in accordance with Table 760.179(J). The voltage rating shall not be marked on the cable. Cables that are listed for circuit integrity shall be identified with the suffix "-CI" as defined in 760.179(G) . The temperature rating shall be marked on the jacket of PLFA cables that have a temperature rating exceeding 60°C (140°F). The jacket of PLFA cables shall be marked with the conductor size.

Informational Note No. 1: Voltage ratings on cables might be misinterpreted to suggest that the cables might be suitable for Class 1, electric light, and power applications.

Exception: Voltage markings shall be permitted where the cable has multiple listings and voltage marking is required for one or more of the listings.

Table 760.179(J) Cable Markings

Cable Marking	Type
FPLP	Power-limited fire alarm plenum cable
FPLR	Power-limited fire alarm riser cable
FPL	Power-limited fire alarm cable

Notes:

1. Cables identified in 760.179(D), (E), and (F) as meeting the requirements for circuit integrity shall have the additional classification using the suffix "-CI" (for example, FPLP-CI, FPLR-CI, and FPL-CI).

2. Cables containing optical fibers shall be provided with the suffix "-OF".

Informational Note No. 2: Cable types are listed in descending order of fire performance.

(O) Insulated Continuous Line-Type Fire Detectors.

Insulated continuous line-type fire detectors shall be rated in accordance with 760.179(C) , listed as being resistant to the spread of fire in accordance with 760.179(D) through (F), and marked in accordance with 760.179(J) , and the jacket compound shall have a high degree of abrasion resistance.

Supplemental Information

File Name	Description	Approved
NEC_CMP_3_SR8602_760.179.docx	For Staff Use	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Thu Oct 28 17:28:59 EDT 2021

Committee Statement

Committee The majority of 760.179 was deleted as it is now covered in Article 722. The

Statement:	requirements for Insulated Continuous Line-Type fire detectors were consolidated into 760.179(A)(B)(C)(D).
Response Message:	SR-8602-NFPA 70-2021

Second Revision No. 8461-NFPA 70-2021 [Part I.]

~~**Part I.** General.~~

Submitter Information Verification

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Committee Statement

Committee Statement: The heading “Part I. General” was deleted because Article 724 does not have any other Parts.
Response Message: SR-8461-NFPA 70-2021

Second Revision No. 8484-NFPA 70-2021 [Part I.]

~~**Part I.** General~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Wed Oct 27 15:35:46 EDT 2021

Committee Statement

Committee Statement: Part I – General, is removed since the requirements in Part II on Pull and Junction Boxes, Conduit Bodies, and Handhole Enclosures will remain in Article 314 and the requirements in Part III on Busways will remain in Article 368.

Response Message: SR-8484-NFPA 70-2021

Second Revision No. 8486-NFPA 70-2021 [Sections Part II., 305.20, 305.21, 305.22, Part III., 305.3...]

~~**Part II.** Pull and Junction Boxes, Conduit Bodies, and Handhole Enclosures~~

~~**305.20** General.~~

~~**(A)** Pull and Junction Boxes.~~

~~Where pull and junction boxes are used on systems over 1000 volts ac, 1500 volts dc, the installation shall comply with the requirements of Part II of this article and with the following general requirements of Article 314:~~

(0) ~~Part I, 314.2; 314.3; and 314.4~~

(0) ~~Part II, 314.15; 314.17; 314.20; 314.23(A), (B), or (G); 314.28(B); and 314.29~~

(0) ~~Part III, 314.40(A) and (C); and 314.41~~

~~**(B)** Conduit Bodies.~~

~~Where conduit bodies are used on systems over 1000 volts ac, 1500 volts dc, the installation shall comply with the requirements of Part II of this article and with the following general requirements of Article 314:~~

(0) ~~Part I, 314.4~~

(0) ~~Part II, 314.15; 314.17; 314.23(A), (E), or (G); 314.28(A)(3); and 314.29~~

(0) ~~Part III, 314.40(A) and 314.41~~

~~**(C)** Handhole Enclosures.~~

~~Where handhole enclosures are used on systems over 1000 volts ac, 1500 volts dc, the installation shall comply with the requirements of Part II of this article and with the following general requirements of Article 314:~~

(0) ~~Part I, 314.3 and 314.4~~

(0) ~~Part II, 314.15; 314.17; 314.23(G); 314.28(B); 314.29; and 314.30~~

~~**305.21** Size of Pull and Junction Boxes, Conduit Bodies, and Handhole Enclosures.~~

~~Pull and junction boxes and handhole enclosures shall provide approved space and dimensions for the installation of conductors and shall comply with the specific requirements of this section. Conduit bodies shall be permitted if they meet the dimensional requirements for boxes.~~

~~**(A)** For Straight Pulls.~~

~~The length of the box shall not be less than 48 times the outside diameter, over sheath, of the largest shielded or lead-covered conductor or cable entering the box. The length shall not be less than 32 times the outside diameter of the largest nonshielded conductor or cable.~~

~~**(B)** For Angle or U Pulls.~~

(1) Distance to Opposite Wall.

The distance between each cable or conductor entry inside the box and the opposite wall of the box shall not be less than 36 times the outside diameter, over sheath, of the largest cable or conductor. This distance shall be increased for additional entries by the amount of the sum of the outside diameters, over sheath, of all other cables or conductor entries through the same wall of the box.

Exception No. 1: *Where a conductor or cable entry is in the wall of a box opposite a removable cover, the distance from that wall to the cover shall be permitted to be not less than the bending radius for the conductors in accordance with 305.4.*

Exception No. 2: *Where cables are nonshielded and not lead covered, the distance of 36 times the outside diameter shall be permitted to be reduced to 24 times the outside diameter.*

(2) Distance Between Entry and Exit.

The distance between a cable or conductor entry and its exit from the box shall not be less than 36 times the outside diameter, over sheath, of that cable or conductor.

Exception: *Where cables are nonshielded and not lead covered, the distance of 36 times the outside diameter shall be permitted to be reduced to 24 times the outside diameter.*

(C) Removable Sides.

One or more sides of any pull box shall be removable.

305.22 Construction and Installation Requirements.

(A) Corrosion Protection.

Boxes shall be made of material inherently resistant to corrosion or shall be suitably protected, both internally and externally, by enameling, galvanizing, plating, or other means.

(B) Passing Through Partitions.

Suitable bushings, shields, or fittings having smooth, rounded edges shall be provided where conductors or cables pass through partitions and at other locations where necessary.

(C) Complete Enclosure.

Boxes shall provide a complete enclosure for the contained conductors or cables.

(D) Wiring is Accessible.

Boxes and conduit bodies shall be installed so that the conductors are accessible without removing any fixed part of the building or structure. Working space shall be provided in accordance with 110.34.

(E) Suitable Covers.

Boxes shall be closed by suitable covers securely fastened in place. Underground box covers that weigh over 45 kg (100 lb) shall be considered meeting this requirement. Covers for boxes shall be permanently marked with the following readily visible on the outside of the box cover in block type and at least 13 mm (½ in.) in height:

DANGER — HIGH VOLTAGE — KEEP OUT.

(F) Suitable for Expected Handling.

Boxes and their covers shall be capable of withstanding the handling to which they are likely to be subjected.

Part III. Busways

305.32 Adjacent and Supporting Structures.

Metal-enclosed busways shall be installed so that any temperature rise from induced circulating currents in adjacent ferrous metal parts will not be hazardous to personnel or constitute a fire hazard.

305.33 Barriers and Seals.

(A) Vapor Seals.

Busway runs that have sections located both inside and outside of buildings shall have a vapor seal at the building wall to prevent interchange of air between indoor and outdoor sections.

Exception: *Vapor seals shall not be required in forced-cooled bus.*

(B) Fire Barriers.

Fire barriers shall be provided where fire walls, floors, or ceilings are penetrated.

Informational Note: See 300.21 for information concerning the spread of fire or products of combustion.

305.34 Drain Facilities.

Drain plugs, filter drains, or similar methods shall be provided to remove condensed moisture from low points in busway runs.

305.35 Ventilated Bus Enclosures.

Ventilated busway enclosures shall be installed in accordance with Part III of Article 110 and 490.24.

305.36 Terminations and Connections.

Where bus enclosures terminate at machines cooled by flammable gas, seal-off bushings, baffles, or other means shall be provided to prevent accumulation of flammable gas in the busway enclosures.

All conductor termination and connection hardware shall be accessible for installation, connection, and maintenance.

305.37 Switches.

Switching devices or disconnecting links provided in the busway run shall have the same momentary rating as the busway. Disconnecting links shall be plainly marked to be removable only when the bus is de-energized. Switching devices that are not load-break shall be interlocked to prevent operation under load, and disconnecting link enclosures shall be interlocked to prevent access to energized parts.

305.38 Wiring 1000 Volts or Less, Nominal.

Secondary control devices and wiring that are provided as part of the metal-enclosed bus run shall be insulated by fire-retardant barriers from all primary circuit elements with the exception of short lengths of wire, such as at instrument transformer terminals.

305.39 Expansion Fittings.

Flexible or expansion connections shall be provided in long, straight runs of bus to allow for temperature expansion or contraction, or where the busway run crosses building vibration insulation joints.

305.40 Neutral Conductor.

Neutral bus, where required, shall be sized to carry all neutral load current, including harmonic currents, and shall have adequate momentary and short-circuit current ratings consistent with system requirements.

305.41 Grounding.

Metal-enclosed busways shall be grounded.

305.42 Marking.

Each busway run shall be provided with a permanent nameplate on which the following information is provided:

(0) Rated voltage.

(0) Rated continuous current. If the bus is forced-cooled, both the normal forced-cooled rating and the self-cooled (not forced-cooled) rating for the same temperature rise shall be given.

(0) Rated frequency.

(0) Rated impulse withstand voltage.

(0) Rated 60-Hz withstand voltage (dry).

(0) Rated momentary current.

(0) Manufacturer's name or trademark.

Informational Note: See IEEE C37.23-2015, *IEEE Standard for Metal-Enclosed Bus*, for construction and testing requirements for metal-enclosed bus assemblies.

Part IV. Outdoor Overhead Conductors

305.50 Uses Permitted.

Outdoor overhead conductors as covered in Part IV of this article shall be permitted only for systems rated over 1000 volts ac, 1500 volts dc, nominal, as follows:

(0) Outdoors in free air

(0) For service conductors, feeders, or branch circuits

Informational Note: See IEEE C2, *National Electrical Safety Code*, and ANSI/IEEE 3001.2, *Recommended Practice for Evaluating the Electrical Service Requirements of Industrial and Commercial Power Systems*, for additional information on outdoor overhead conductors covered by Part IV of this article.

305.51 Support.

(A) Conductors.

Documentation of the engineered design by a licensed professional engineer engaged primarily in the design of such systems and the spacing between conductors shall be available upon request of the authority having jurisdiction and shall include the following:

(0) Applied voltage

(0) Conductor size

(0) Distance between support structures

(0) Type of structure

(0) Wind/ice loading

(0) Surge protection

~~**(B)** Structures.~~

~~Structures of wood, metal, or concrete, or combinations of those materials shall be provided for support of overhead conductors. Documentation of the engineered design by a licensed professional engineer engaged primarily in the design of such systems and the installation of each support structure shall be available upon request of the authority having jurisdiction and shall include the following:~~

(0) ~~Soil conditions~~

(0) ~~Foundations and structure settings~~

(0) ~~Weight of all supported conductors and equipment~~

(0) ~~Weather loading and other conditions such as, but not limited to, ice, wind, temperature, and lightning~~

(0) ~~Angle where change of direction occurs~~

(0) ~~Spans between adjacent structures~~

(0) ~~Effect of dead-end structures~~

(0) ~~Strength of guy wires and guy anchors~~

(0) ~~Structure size and material(s)~~

(0) ~~Hardware~~

~~**(C)** Insulators.~~

~~Insulators used to support conductors shall be rated for all of the following:~~

(0) ~~Applied phase-to-phase voltage~~

(0) ~~Mechanical strength required for each individual installation~~

(0) ~~Impulse withstand BIL in accordance with Table 490.24~~

~~Informational Note: The lists in 305.51(A), (B), and (C) are not all-inclusive.~~

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Committee Statement

Committee Statement: Part II through Part IV have been deleted as the installation requirements are staying with their installation Articles and Article 305 will cover general requirements.

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Second Revision No. 8439-NFPA 70-2021 [Sections Part II., 722.140, 722.141, 722.142, 722.143, 722....]

Part II. Class 2 and Class 3 Cables

722.140 Wiring Methods and Materials on Load Side of the Class 2 or Class 3 Power Source.

Class 2 and Class 3 circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with 722.140(A), (B), or a combination of (A) and (B).

(A) Class 1 Wiring Methods and Materials.

It shall be permitted to use Class 1 wiring methods for Class 2 and Class 3 circuits. Separation from electric light, power, Class 1, non-power-limited fire alarm circuit conductors, and edium-power network-powered broadband communications cables shall comply with 722.141.

Exception: *The ampacity adjustment factors given in 310.15(C)(1) shall not apply.*

(B) Class 2 and Class 3 Wiring Methods and Materials.

Cables on the load side of the power source shall be insulated in accordance with 722.179 and shall be installed in accordance with 722.135.

Exception No. 1: *See 620.21 for wiring methods for elevators and similar equipment.*

Exception No. 2: *Other wiring methods and materials installed in accordance with 722.3 shall be permitted to extend or replace the conductors and cables described in 722.179 and permitted by 722.140(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.*

722.141 Separation from Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm Circuit Conductors, and Medium-Power Network-Powered Broadband Communications Cables.

(A) General.

Cables and conductors of Class 2 and Class 3 circuits shall not be placed in any cable, cable tray, compartment, enclosure, manhole, outlet box, device box, raceway, or similar fitting with conductors of electric light, power, Class 1, non-power-limited fire alarm circuits, and medium-power network-powered broadband communications circuits unless permitted by 722.141(B) through (I).

(B) Separated by Barriers.

Class 2 and Class 3 circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuits where they are separated by a barrier.

(C) Raceways Within Enclosures.

In enclosures, Class 2 and Class 3 circuits shall be permitted to be installed in a raceway to separate them from Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuits.

(D) Associated Systems Within Enclosures.

Class 2 and Class 3 circuit conductors in compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to Class 2 and Class 3 circuits, and where one of the following applies:

(0) The electric light, power, Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuit conductors are routed to maintain a minimum of 6 mm (0.25 in.) separation from the conductors and cables of Class 2 and Class 3 circuits.

(0) The circuit conductors operate at 150 volts or less to ground and comply with one of the following:

(0) The Class 2 and Class 3 circuits are installed using Type CL3, CL3R, or CL3P or permitted substitute cables, provided these Class 3 cable conductors extending beyond the jacket are separated by a minimum of 6 mm (0.25 in.) or by a nonconductive sleeve or nonconductive barrier from all other conductors.

(0) The Class 2 and Class 3 circuit conductors are installed as a Class 1 circuit in accordance with 725.41.

(E) Enclosures with Single Opening.

Class 2 and Class 3 circuit conductors entering compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to Class 2 and Class 3 circuits. Where Class 2 and Class 3 circuit conductors must enter an enclosure that is provided with a single opening, they shall be permitted to enter through a single fitting, such as a tee, provided the conductors are separated from the conductors of the other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing.

(F) Manholes.

Underground Class 2 and Class 3 circuit conductors in a manhole shall be permitted to be installed with Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuits where one of the following conditions is met:

(0) The electric light, power, Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuit conductors are in a metal-enclosed cable or Type UF cable.

(0) The Class 2 and Class 3 circuit conductors are permanently and effectively separated from the conductors of other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing, in addition to the insulation or covering on the wire.

(0) The Class 2 and Class 3 circuit conductors are permanently and effectively separated from conductors of the other circuits and securely fastened to racks, insulators, or other approved supports.

(G) Cable Trays.

Class 2 and Class 3 circuit conductors shall be permitted to be installed in cable trays, where the conductors of the electric light, Class 1, and non-power-limited fire alarm circuits are separated by a solid fixed barrier of a material compatible with the cable tray or where the Class 2 or Class 3 circuits are installed in Type MC cable.

(H) Where Protected.

Class 2 and Class 3 circuits shall be permitted to be installed together with the conductors of electric light, power, Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuits where they are installed using Class 1 wiring methods in accordance with 725.46 and where they are protected by an approved method.

(I) Other Applications.

For other applications, conductors of Class 2 and Class 3 circuits shall be separated by at least 50 mm (2 in.) from conductors of any electric light, power, Class 1 non-power-limited fire alarm or medium-power network-powered broadband communications circuits unless one of the following conditions is met:

(0) Either all of the electric light, power, Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuit conductors or all of the Class 2 and Class 3 circuit conductors are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, Type TC, or Type UF cables.

(0) All of the electric light, power, Class 1 non-power-limited fire alarm and medium-power network-powered broadband communications circuit conductors are permanently separated from all of the Class 2 and Class 3 circuit conductors by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the conductors.

722.142 Installation of Conductors of Different Circuits in the Same Cable, Enclosure, Cable Tray, Raceway, or Cable Routing Assembly.

(A) Two or More Class 2 Circuits.

Conductors of two or more Class 2 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly.

(B) Two or More Class 3 Circuits.

Conductors of two or more Class 3 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly.

(C) Class 2 Circuits with Class 3 Circuits.

Conductors of one or more Class 2 circuits shall be permitted within the same cable, enclosure, raceway, or cable routing assembly with conductors of Class 3 circuits, provided that the insulation of the Class 2 circuit conductors in the cable, enclosure, raceway, or cable routing assembly is at least that required for Class 3 circuits.

(D) Class 2 and Class 3 Circuits with Communications Circuits.

(1) Communications Cables.

Conductors of one or more Class 2 or Class 3 circuits shall be permitted in the same cable with conductors of communications circuits if the cable is a listed communications cable installed in accordance with Part V of Article 805. The cables shall be listed as communications cables.

(2) Composite Cables.

Cables constructed of individually listed Class 2, Class 3, and communications cables under a common jacket shall be permitted to be classified as communications cables. The fire resistance rating of the composite cable shall be determined by the performance of the composite cable.

(E) Class 2 or Class 3 Cables with Other Circuit Cables.

Jacketed cables of Class 2 or Class 3 circuits shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly with jacketed cables of any of the following:

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

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

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

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

(0) Low-power network-powered broadband communications in compliance with Parts I and IV of Article 830

(F) Class 2 or Class 3 Conductors or Cables and Audio System Circuits.

Audio system circuits described in 640.9(C) and installed using Class 2 or Class 3 wiring methods in compliance with 725.133 and 725.154 shall not be permitted to be installed in the same cable, raceway, or cable routing assembly with Class 2 or Class 3 conductors or cables.

722.143 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).

722.144 Bundling of 4-Pair Cables Transmitting Power and Data.

Section 725.144 shall apply to 4-pair cables that are used to transmit power and data to a powered device.

722.145 Installation of Circuit Conductors Extending Beyond One Building.

Where Class 2 or Class 3 circuit conductors extend beyond one building and are run so as to be 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, the requirements of the following shall also apply:

(0) Sections 800.44, 800.53, 800.100, 805.50, 805.93, 805.170(A), and 805.170(B) for other than coaxial conductors

(0) Sections 820.44, 820.93, and 820.100 for coaxial conductors

Part III. PLFA Cables

722.150 Wiring Methods and Materials on Load Side of the PLFA Power Source.

Fire alarm circuits on the load side of the power source shall be permitted to be installed using wiring methods and materials in accordance with 722.150(A), (B), or a combination of (A) and (B).

(A) NPLFA Wiring Methods and Materials.

It shall be permitted to use NPLFA wiring methods 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 given 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 722.150(B)(1), 722.150(B)(2), or 722.135. 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 in such a way that maximum protection against physical damage is afforded by building construction such as baseboards, door frames, ledges, and so forth. Where located within 2.1 m (7 ft) of the floor, cables shall be securely fastened in an approved manner at intervals of not more than 450 mm (18 in.).

(2) Passing Through a Floor or Wall.

Cables shall be installed in metal 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.

722.151 Separation from Electric Light, Power, Class 1, NPLFA, and Medium-Power Network-Powered Broadband Communications Circuit Conductors.

(A) General.

Power-limited fire alarm circuit cables and conductors shall not be placed in any cable, cable tray, compartment, enclosure, manhole, outlet box, device box, raceway, or similar fitting with conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits unless permitted by 760.151(B) through (G).

(B) Separated by Barriers.

Power-limited fire alarm circuit cables shall be permitted to be installed together with Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits where they are separated by a barrier.

(C) Raceways Within Enclosures.

In enclosures, power-limited fire alarm circuits shall be permitted to be installed in a raceway within the enclosure to separate them from Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits.

(D) Associated Systems Within Enclosures.

Power-limited fire alarm conductors in compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to power-limited fire alarm circuits and comply with either of the following conditions:

(0) The electric light, power, Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuit conductors are routed to maintain a minimum of 6 mm (0.25 in.) separation from the conductors and cables of power-limited fire alarm circuits.

(0) The circuit conductors operate at 150 volts or less to ground and comply with one of the following:

(0) The fire alarm power-limited circuits are installed using Type FPL, FPLR, FPLP, or permitted substitute cables, provided these power-limited cable conductors extending beyond the jacket are separated by a minimum of 6 mm (0.25 in.) or by a nonconductive sleeve or nonconductive barrier from all other conductors.

(0) The power-limited fire alarm circuit conductors are installed as non-power-limited circuits in accordance with 760.46.

(E) Enclosures with Single Opening.

Power-limited fire alarm circuit conductors entering compartments, enclosures, device boxes, outlet boxes, or similar fittings shall be permitted to be installed with electric light, power, Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuits where they are introduced solely to connect the equipment connected to power-limited fire alarm circuits or to other circuits controlled by the fire alarm system to which the other conductors in the enclosure are connected. Where power-limited fire alarm circuit conductors must enter an enclosure that is provided with a single opening, they shall be permitted to enter through a single fitting, such as a tee, provided the conductors are separated from the conductors of the other circuits by a continuous and firmly fixed nonconductor, such as flexible tubing.

(F) 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 installed using NPLFA wiring methods and materials in accordance with Part II of Article 760 and where they are protected by an approved method.

(G) Other Applications.

For other applications, power-limited fire alarm circuit conductors shall be separated by at least 50 mm (2 in.) from conductors of any electric light, power, Class 1, non-power-limited fire alarm or medium-power network-powered broadband communications circuits unless one of the following conditions is met:

(0) Either (a) all of the electric light, power, Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuit conductors or (b) all of the power-limited fire alarm circuit conductors are in a raceway or in metal-sheathed, metal-clad, nonmetallic-sheathed, or Type UF cables.

(0) All of the electric light, power, Class 1, non-power-limited fire alarm and medium-power network-powered broadband communications circuit conductors are permanently separated from all of the power-limited fire alarm circuit conductors by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the conductors.

722.152 Installation of Conductors of Different PLFA, Class 2, Class 3, and Communications Circuits in the Same Cable, Enclosure, Cable Tray, Raceway, or Cable Routing Assembly.

(A) Two or More PLFA Circuits.

Cable and conductors of two or more power-limited fire alarm circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly.

(B) Class 2 Circuits with PLFA Circuits.

Conductors of one or more Class 2 circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly with conductors of power-limited fire alarm circuits, provided that the insulation of the Class 2 circuit conductors in the cable, enclosure, raceway, or cable routing assembly is at least that required by the power-limited fire alarm circuits.

(C) Class 3 and Communication Circuits with PLFA Circuits.

Cable and conductors of Class 3 and communications circuits shall be permitted within the same cable, enclosure, cable tray, raceway, or cable routing assembly with cables and conductors of power-limited fire alarm circuits.

(D) Low-Power Network-Powered Broadband Communications Cables and PLFA Cables.

Low-power network-powered broadband communications circuits shall be permitted in the same enclosure, cable tray, raceway, or cable routing assembly with PLFA cables.

(E) Audio System Circuits and PLFA Circuits.

Audio system circuits described in 640.9(C) and installed using Class 2 or Class 3 wiring methods in compliance with 725.133 and 725.154 shall not be permitted to be installed in the same cable, cable tray, raceway, or cable routing assembly with power-limited conductors or cables.

722.153 Cables.

Cables shall comply with 722.153(A) through (D).

(A) Conductor Materials.

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) Conductor Size.

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) Voltage Ratings.

The cable shall have a voltage rating of not less than 300 volts.

(D) Temperature Ratings.

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

722.154 Installation of PLFA Cables in Buildings.

Installation of power-limited fire alarm cables in buildings shall be in accordance with 722.135 and 722.154 (A) and (B).

(A) Nonconcealed Spaces.

Cables specified in Chapter 3 and meeting the requirements of 760.179(A) and (B) shall be permitted to be installed in nonconcealed spaces where the exposed length of cable does not exceed 3 m (10 ft).

(B) Portable Fire Alarm System.

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.

722.155 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 Parts II, III, and IV of Article 805 and shall meet the installation requirements of Part I of Article 300.

Part IV. Optical Fiber Cables — Installation Methods Within Buildings

722.160 Raceways, Cable Routing Assemblies, and Cable Trays for Optical Fiber Cables.

(A) Types of Raceways.

Optical fiber cables shall be permitted to be installed in any raceway that complies with 722.160(A)(1), (A)(2), or (A)(3).

(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 the requirements of Chapter 3.

(2) Communications Raceways.

Optical fiber cables shall be permitted to be installed in listed communications raceways selected in accordance with Table 800.154(b).

(3) Innerduct for Optical Fiber Cables.

Listed plenum communications raceway, listed riser communications raceway, and listed general-purpose communications raceway selected in accordance with Table 800.154(b) shall be permitted to be installed as innerduct in any type of listed raceway permitted in Chapter 3.

(B) Raceway Fill for Optical Fiber Cables.

Raceway fill for optical fiber cables shall comply with either 722.160(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 800.154(c).

(D) Cable Trays.

Optical fiber cables shall be permitted to be installed in metal or listed nonmetallic cable tray systems.

722.161 Grounding.

Non-current-carrying conductive members of optical fiber cables shall be bonded to a grounded equipment rack or enclosure or grounded in accordance with the grounding methods specified by 770.100(B)(2).

722.162 Installation of Optical Fibers and Electrical Conductors.

(A) In Cable Trays and Raceways.

Conductive optical fiber cables contained in an armored or metal-clad-type sheath and nonconductive optical fiber cables shall be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits operating at 1000 volts or less. Conductive optical fiber cables without an armored or metal-clad-type sheath shall not be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits, unless all of the conductors of electric light, power, Class 1, non-power-limited fire alarm, and medium-power network-powered broadband communications circuits are separated from all of the optical fiber cables by a permanent barrier or listed divider.

~~**(B)** In Cabinets, Outlet Boxes, and Similar Enclosures.~~

~~Nonconductive optical fiber cables shall not be permitted to occupy the same cabinet, outlet box, panel, or similar enclosure housing the electrical terminations of an electric light, power, Class 1, non-power-limited fire alarm or medium-power network-powered broadband communications circuit unless one or more of the following conditions exist:~~

(0) ~~The nonconductive optical fiber cables are functionally associated with the electric light, power, Class 1, non-power-limited fire alarm or medium-power network-powered broadband communications circuit.~~

(0) ~~The conductors for electric light, power, Class 1, non-power-limited fire alarm, Type ITC, or medium-power network-powered broadband communications circuits operate at 1000 volts or less.~~

(0) ~~The nonconductive optical fiber cables and the electrical terminations of electric light, power, Class 1, non-power-limited fire alarm or medium-power network-powered broadband communications circuit are installed in factory- or field-assembled control centers.~~

(0) ~~The nonconductive optical fiber cables are installed in an industrial establishment where conditions of maintenance and supervision ensure that only qualified persons service the installation.~~

~~When optical fibers are within the same composite 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 composite 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 composite 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.~~

~~Optical fibers shall be permitted in the same cable, and conductive and nonconductive optical fiber cables shall be permitted in the same raceway, cable tray, box, enclosure, or cable routing assembly, with conductors of any of the following:~~

(0) ~~Class 2 and Class 3 remote-control, signaling, and power-limited circuits in compliance with Article 645 or Parts I and III of Article 725~~

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

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

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

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

Submitter Information Verification

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Committee Statement

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Part III. Listing Requirements

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~~**Part IV.** Installation~~

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Committee Statement: This editorial second revision is created by NFPA staff to delete the header for Part IV based on the action taken by CMP 3 in Second Revision 8356. That action deletes all of the requirements in Part IV of Article 726 because they are covered by the requirements of Article 722.

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Part II. Listing Requirements

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