



Public Input No. 1612-NFPA 70-2023 [Global Input]

NOTE: This public input originates from Tentative Interim Amendment No. 20-17 (Log 1616) issued by the Standards Council on April 12, 2022 and per the NFPA Regs., needs to be reconsidered by the Code-Making Panel for the next edition of the Document.

See attached TIA 20-17 (Log 1616) for revisions to Article 100 Part III to include Combustible Fibers/Flyings and Ignitable Fibers/Flyings, Section 500.5(D), Section 500.6, Sections 500.8(D)(2) and (D)(3), Section 503.1, Section 503.5, Section 503.6, Section 503.125 Exception, Section 503.145 Exception, Section 506.1, Section 506.5, Section 506.6, Sections 506.7(C) and (D), Sections 506.9(B) and (C)(1), Section 506.16, and Section 506.20.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
TIA_1616_70_20_17.pdf	NEC TIA 20-17 Log 1616	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 20-17 (Log 1616) issued by the Standards Council on April 12, 2022 and per the NFPA Regs., needs to be reconsidered by the Code-Making Panel for the next edition of the Document.

Substantiation: This TIA is being resubmitted to supersede TIA 1520. Additional changes were needed to align with NFPA 499 that were not previously included in TIA 1520. These changes are in reference to the work done by a multi-committee task group who, at the direction of the Standards Council, put together TIAs to correlate the dust standards with NFPA 70.

This TIA is necessary to define the terms “combustible fibers/flyings” and “ignitable fibers/flyings” and include them in the hazardous (classified) location descriptions to draw the connection to the combustible dust standards and hazardous location classification documents. This alignment will allow the combustible dust documents to remove any prescriptive limitation or prohibition for use of the Zone system for classification.

We have not yet and do not expect to completely agree on a definition for combustible dust because of the need to include process-specific atmospheres in NFPA 652 and the commodity standards. This proposal makes the functional usage of the term “combustible dust” equivalent between NFPA 70 and the various dust standards.

Emergency Nature: The NFPA Standard contains a conflict within the NFPA Standards or within another NFPA Standard.

Submitter Information Verification

Submitter Full Name: CMP on NEC-P14
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Submittal Date: Thu Jul 27 12:25:02 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel accepts the prior changes incorporated by TIA.



Tentative Interim Amendment

NFPA[®] 70[®]

National Electrical Code[®]

2020 Edition

Reference: Article 100, Part III, and various sections in Articles 500, 503, and 506

TIA 20-17

(SC 22-4-7 / TIA Log #1616)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards*, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA70[®], *National Electrical Code[®]*, 2020 edition. The TIA was processed by the NEC Panel 14, and the NEC Correlating Committee and was issued by the Standards Council on April 12, 2022, with an effective date of May 2, 2022.

1. *Revise Article 100, Part III to include Combustible Fibers/Flyings and Ignitable Fibers/Flyings to read as follows:*

Part III. Hazardous (Classified) Locations (CMP-14).

...

Combustible Fibers/Flyings. Fibers/flyings, where any dimension is greater than 500 µm in nominal size, which can form an explosible mixture when suspended in air at standard atmospheric pressure and temperature. [499:3.3.4.1]

Informational Note No.1: This definition and Informational Notes No. 2 and 3 have been extracted from NFPA 499-2021, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*. The NFPA 499 reference is in brackets. Only editorial changes were made to the extracted text to make it consistent with this Code.

Informational Note No. 2: Section 500.5(D) defines a Class III location. Combustible fibers/flyings can be similar in physical form to ignitable fibers/flyings and protected using the same electrical equipment installation methods. Examples of fibers/flyings include flat platelet-shaped particulate, such as metal flake, and fibrous particulate, such as particle board core material. If the smallest dimension of a combustible material is greater than 500 µm, it is unlikely that the material would be combustible fibers/flyings, as determined by test. Finely divided solids with lengths that are large compared to their diameter or thickness usually do not pass through a 500 µm sieve, yet when tested could potentially be determined to be explosible. [499:A.3.3.4.1]

Informational Note No. 3: See ASTM E1226-2012a, *Standard Test Method for Explosibility of Dust Clouds*, ISO 6184-1-1985 (2005), *Explosion protection systems — Part 1: Determination of explosion indices of combustible dusts in air*, or ISO/IEC/UL 80079-20-2-2016, *Explosive atmospheres — Part 20-2: Material characteristics — Combustible dusts test methods*, for procedures for determining the explosibility of dusts. A material that is found to not present an explosible mixture hazard could still be an ignitable fiber/flying, as defined in this article. Historically, the explosibility condition has been described as presenting a flash fire or explosion hazard. It could be understood that the potential hazard due to the formation of an explosible mixture when suspended in air at standard atmospheric pressure and temperature would include ignition. [499:A.3.3.4.1]

...

Ignitable Fibers/Flyings. Fibers/flyings where any dimension is greater than 500 µm in nominal size, which are not likely to be in suspension in quantities to produce an explosible mixture, but could produce an ignitable layer fire hazard. [499:3.3.4.2]

Informational Note No.1: This definition and Informational Note No. 2 have been extracted from NFPA 499-2021, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*. The NFPA 499 reference is in brackets. Only editorial changes were made to the extracted text to make it consistent with this Code.

Informational Note No. 2: Section 500.5 of this Code prescribes a Class III location as one where ignitable fibers/flyings are present, but not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. This description addresses fibers/flyings that do not present a flash-fire hazard or explosion hazard by test. This could be because those fibers/flyings are too large or too agglomerated to be suspended in air in sufficient concentration, or at all, under typical test conditions. Alternatively, this could be because they burn so slowly that, when suspended in air, they do not propagate combustion at any concentration. In this document the zone classification system includes ignitable fibers/flyings as a fire hazard in a layer, which is not addressed in the IEC zone system (see IEC 60079-10-2, *Explosive atmospheres — Part 10-2: Classification of areas — Explosive dust atmospheres*). Where these are present, the user could also consider installation in accordance with Article 503 of this Code. [499:A.3.3.4.2]

2. *Revise Section 500.5(D) to read as follows:*

500.5(D) Class III Locations. ~~Class III locations are those that are hazardous because of the presence of easily ignitable fibers or where materials producing combustible flyings are handled, manufactured, or used, but in which such fibers/flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations shall include those specified in 500.5(D)(1) and (D)(2). Class III locations shall be locations meeting the requirements of 500.5(D)(1) and (D)(2).~~

(1) Class III, Division 1. ~~A Class III, Division 1 location is a location in which easily ignitable fibers/flyings are handled, manufactured, or used. Class III, Division 1 locations shall include those locations specified in 500.5(D)(1)(a) and (D)(1)(b).~~

(a) *Combustible Fibers/Flyings.* Locations where nonmetal combustible fibers/flyings are in the air under normal operating conditions in quantities sufficient to produce explosible mixtures or where mechanical failure or abnormal operation of machinery or equipment might cause combustible fibers/flyings to be produced and might also provide a source of ignition through simultaneous failure of electrical equipment, through operation of protection devices, or from other causes shall be classified as Class III, Division 1. Locations where metal combustible fibers/flyings are present shall be classified as Class II, Division 1, Group E.

~~Informational Note No. 1: Such locations usually include some parts of rayon, cotton, and other textile mills; combustible fibers/flyings associated manufacturing and processing plants; cotton gins and cotton-seed mills; flax-processing plants; clothing manufacturing plants; woodworking plants; and establishments and industries involving similar hazardous processes or conditions.~~

Informational Note No. 2: Combustible fibers/flyings include flat platelet-shaped particulate such as metal flakes and fibrous board such as particle board.

(b) *Ignitable Fibers/Flyings.* Locations where ignitable fibers/flyings are handled, manufactured, or used shall be classified as Class III, Division 1.

~~Informational Note No. 1: Such locations usually include some parts of rayon, cotton, and other textile mills; combustible fibers/flyings associated manufacturing and processing plants; cotton gins and cotton-seed mills; flax-processing plants; clothing manufacturing plants; woodworking plants; and establishments and industries involving similar hazardous processes or conditions.~~

~~Informational Note No. 2: Easily ignitable fibers/flyings can include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, and other materials of similar nature.~~

(2) Class III, Division 2. A Class III, Division 2 location is a location in which easily ignitable fibers/flyings are stored or handled other than in the process of manufacture. Class III, Division 2 locations shall include those locations specified in 500.5(D)(2)(a) and (D)(2)(b).

(a) *Combustible Fibers/Flyings.* Locations where nonmetal combustible fibers/flyings might be present in the air in quantities sufficient to produce explosible mixtures due to abnormal operations or where accumulations of nonmetal combustible fibers/flyings accumulations are present but are insufficient to interfere with the normal operation of electrical equipment or other apparatus but could, as a result of infrequent malfunctioning of handling or processing equipment, become suspended in the air shall be classified as Class III, Division 2.

(b) *Ignitable Fibers/Flyings.* Locations where ignitable fibers/flyings are stored or handled, other than in the process of manufacture, shall be classified as Class III, Division 2.

3. *Revise Section 500.6 to read as follows:*

500.6 Materials, Groups. ~~For purposes of testing, approval, and area classification, various air mixtures (not oxygen-enriched) shall be grouped in accordance with 500.6(A) and (B).~~

~~Exception: Equipment identified for a specific gas, vapor, dust, or fiber/flying.~~

~~Informational Note: This grouping is based on the characteristics of the materials. Facilities are available for testing and identifying equipment for use in the various atmospheric groups.~~

(A) Class I Group Classifications. ...

(B) Class II Combustible Dust Group Classifications. ~~Class II groups shall be in accordance with 500.6(B)(1) through (B)(3). Combustible dust shall be grouped in accordance with 500.6(B)(1) through (B)(3).~~

(1) Group E. Atmospheres containing combustible metal dusts, including aluminum, magnesium, and their commercial alloys, or other combustible dusts whose particle size, abrasiveness, and conductivity present similar hazards in the use of electrical equipment. [499:3.3.4.1.1]

(2) Group F. Atmospheres containing combustible carbonaceous dusts that have more than 8 percent total entrapped volatiles (see ASTM D3175-2017, *Standard Test Method for Volatile Matter in the Analysis Sample of Coal and Coke, for coal and coke dusts*) or that have been sensitized by other materials so that they present an explosion hazard.

[499:3.3.4.2.3.8.1.2] ~~Coal, carbon black, charcoal, and coke dusts are examples of carbonaceous dusts.~~ [499:A.3.3.4.2]

Informational Note: Although coal, carbon black, charcoal, and coke dusts are examples of carbonaceous dusts, only those atmospheres containing combustible carbonaceous dusts that have more than 8 percent total entrapped volatiles are Class II, Group F. [499:A.3.3.8.1.2]

(3) Group G. Atmospheres containing combustible dusts not included in Group E or Group F, including flour, grain, wood, plastic, and chemicals. [499:3.3.4.3.3.8.1.3]

(C) Class III Combustible Fibers/Flyings. Combustible fibers/flyings shall not be further grouped.

(D) Class III Ignitable Fibers/Flyings. Ignitable fibers/flyings shall not be further grouped.

4. Revise Section 500.8(D)(2) and (D)(3) to read as follows:

500.8(D) Temperature.

(1) Class I Temperature. ...

(2) Class II Temperature. The temperature marking specified in 500.8(C) shall be less than the ignition temperature of the specific dust or metal fiber/flying to be encountered. For organic dusts that ~~may~~ might dehydrate or carbonize, the temperature marking shall not exceed the lower of either the ignition temperature or 165°C (329°F).

Informational Note: See NFPA 499-2017-2021, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, for minimum ignition temperatures of specific dusts.

(3) Class III Temperature. The temperature marking specified in 500.8(C) shall be less than the ignition temperature of the specific fiber/flying to be encountered, except as specified in 500.8(D)(3)(a) or (D)(3)(b).

(a) For nonmetal combustible fibers/flyings that might dehydrate or carbonize, the temperature marking shall not exceed the lower of either the ignition temperature or 165°C (329°F).

(b) When ignitable fibers/flyings are present, the maximum surface temperatures under operating conditions shall not exceed 165°C (329°F) for equipment that is not subject to overloading, and 120°C (248°F) for equipment (such as motors or power transformers) that might be overloaded.

5. Revise Section 503.1 to read as follows:

503.1 Scope. Article 503 covers the requirements for electrical and electronic equipment and wiring for all voltages in Class III, Division 1 and Division 2 locations where fire or explosion hazards ~~may~~ might exist due to nonmetal combustible fibers/flyings or ignitable fibers/flyings.

6. Revise Section 503.5 and 503.6 to read as follows:

503.5 General. Equipment installed in Class III locations shall be able to function at full rating without developing surface temperatures high enough to cause excessive dehydration or gradual carbonization of accumulated fibers/flyings. ~~Organic material that is carbonized or excessively dry is highly susceptible to spontaneous ignition. The maximum surface temperatures under operating conditions shall not exceed 165°C (329°F) for equipment that is not subject to overloading, and 120°C (248°F) for equipment (such as motors or power transformers) that may be overloaded.~~

Informational Note No. 1: For electric trucks, see NFPA 505-2018, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations*, for information on electric trucks.

Informational Note No. 2: Organic material that is carbonized or excessively dry is highly susceptible to spontaneous ignition.

503.6 Zone Equipment. Equipment listed and marked in accordance with 506.9(C)(2) for Zone 20 locations and with a temperature marking class of in accordance with 500.8(D)(3) not greater than T120°C (for equipment that may be overloaded) or not greater than T165°C (for equipment not subject to overloading) shall be permitted in Class III, Division 1 locations.

Equipment listed and marked in accordance with 506.9(C)(2) for Zone 20, Zone 21, or Zone 22 locations and with a temperature marking in accordance with 500.8(D)(3) class of not greater than T120°C (for equipment that may be overloaded) or not greater than T165°C (for equipment not subject to overloading) shall be permitted in Class III, Division 2 locations.

7. Revise Section 503.125 Exception to read as follows:

503.125 Motors and Generators — Class III, Divisions 1 and Division 2. In Class III, Divisions 1 and Division 2 locations, motors, generators, and other rotating machinery shall be totally enclosed nonventilated, totally enclosed pipe ventilated, or totally enclosed fan cooled.

Exception: In locations where, in the judgment of the authority having jurisdiction, only moderate accumulations of ~~high~~ ~~or~~ ignitable fibers/flyings are likely to collect on, in, or in the vicinity of a rotating electrical machine and where such machine is readily accessible for routine cleaning and maintenance, one of the following shall be permitted:

- (1) Self-cleaning textile motors of the squirrel-cage type
- (2) Standard open-type machines without sliding contacts, or centrifugal or other types of switching mechanisms, including motor overload devices
- (3) Standard open-type machines having such contacts, switching mechanisms, or resistance devices enclosed within tight housings without ventilating or other openings

8. Revise Section 503.145 Exception to read as follows:

503.145 Receptacles and Attachment Plugs — Class III, Divisions 1 and Division 2. Receptacles and attachment plugs shall be of the grounding type, shall be designed so as to minimize the accumulation or the entry of fibers/flyings, and shall prevent the escape of sparks or molten particles.

Exception: In locations where, in the judgment of the authority having jurisdiction, only moderate accumulations of ~~high~~ ~~or~~ ignitable fibers/flyings are likely to collect in the vicinity of a receptacle, and where such receptacle is readily accessible for routine cleaning, and mounted to minimize the entry of fibers/flyings, general-purpose grounding-type receptacles ~~mounted so as to minimize the entry of fibers/flyings~~ shall be permitted.

9. Revise Section 506.1 to read as follows:

506.1 Scope. This article covers the requirements for the zone classification system as an alternative to the division classification system covered in Article 500, Article 502, and Article 503 for electrical and electronic equipment and wiring for all voltages in Zone 20, Zone 21, and Zone 22 hazardous (classified) locations where fire and explosion hazards may exist due to combustible dusts, ~~or combustible fibers/flyings, or ignitable fibers/flyings~~.

This article does not cover area classification and general requirements for dusts for the division system as described in 500.1. This article does not address the unique risk and explosion hazards associated with explosives, pyrotechnics, and blasting agents.

Informational Note No. 1: ~~For the requirements for electrical and electronic equipment and wiring for all voltages in Class I, Division 1 or Division 2; Class II, Division 1 or Division 2; Class III, Division 1 or Division 2; Zone 0; Zone 1; or Zone 2 hazardous (classified) locations where fire or explosion hazards may exist due to flammable gases or vapors, flammable liquids, or combustible dusts or ignitable fibers/flyings, refer to Articles 500 through 505. See 505.20 or 505.22 for Zone 0, Zone 1, or Zone 2 hazardous (classified) locations where fire or explosion hazards may exist due to flammable gases or vapors or flammable liquids.~~

Informational Note No. 2: Zone 20, Zone 21, and Zone 22 area classifications are based on the modified IEC area classification system as defined in ANSI/ISA 60079-10-2 (12.10.05)- 2013, *Explosive Atmospheres — Part 10-2: Classification of Areas — Combustible Dust Atmospheres*.

Informational Note No. 3: ~~The unique hazards associated with explosives, pyrotechnics, and blasting agents are not addressed in this article.~~

Informational Note No. 34: NFPA 499-~~2017~~2021, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, provides additional information for classification of hazardous (classified) locations using zone methodology.

10. Revise Section 506.5 to read as follows:

506.5 Classification of Locations.

(A) Classifications of Locations. Locations shall be classified on the basis of the properties of the combustible dust, ~~or ignitable combustible fibers/flyings, or ignitable fibers/flyings~~ that may might be present, and the likelihood that a combustible or ignitable combustible concentration or quantity is present. Each room, section, or area shall be considered individually in determining its classification. Where pyrophoric materials are the only materials used or handled, these locations are outside of the scope of this article.

(B) Zone 20, Zone 21, and Zone 22 Locations. Zone 20, Zone 21, and Zone 22 locations are those in which combustible dust, ~~or ignitable combustible fibers/flyings, or ignitable fibers/flyings~~ are or may might be present in the air or in layers, in quantities sufficient to produce ~~explosive~~ explosive or ignitable mixtures. Zone 20, Zone 21, and Zone 22 locations shall include those specified in 506.5(B)(1), (B)(2), and (B)(3).

Informational Note: Through the exercise of ingenuity in the layout of electrical installations for hazardous (classified) locations, it is frequently possible to locate much of the equipment in a reduced level of classification and, thus, to reduce the amount of special equipment required.

(1) Zone 20. A Zone 20 location is a location ~~in which any of the following occur where one of the following apply:~~

(1) Ignitable concentrations of combustible dust, ~~or ignitable combustible fibers/flyings, or ignitable fibers/flyings~~ are present continuously ~~or for long periods of time.~~

(2) Ignitable concentrations of combustible dust ~~or ignitable fibers/flyings~~ are present for long periods of time

Informational Note No. 1: As a guide to classification of Zone 20 locations, refer to ANSI/ISA 60079-10-2 (12.10.05)-2013, *Explosive Atmospheres — Part 10-2: Classification of areas — Combustible dust atmospheres.*

Informational Note No. 2: Zone 20 classification includes locations inside dust containment systems; hoppers, silos, etc., cyclones and filters, dust transport systems, except some parts of belt and chain conveyors, etc.; blenders, mills, dryers, bagging equipment, etc.

~~(2)~~ Group IIIC combustible dusts are present in quantities sufficient to be hazardous continuously or for long periods of time.

(2) Zone 21. A Zone 21 location is a location where one of the following apply:

(1) Ignitable concentrations of combustible dust, ~~or ignitable combustible fibers/flyings, or ignitable fibers/flyings~~ are likely to exist occasionally under normal operating conditions, ~~or~~

(2) Ignitable concentrations of combustible dust, ~~or ignitable combustible fibers/flyings, or ignitable fibers/flyings~~ may might exist frequently because of repair or maintenance operations or because of leakage, ~~or~~

(3) Equipment is operated or processes are carried on, of such a nature that equipment breakdown or faulty operations could result in the release of ignitable concentrations of combustible dust, ~~or ignitable combustible fibers/flyings, or ignitable fibers/flyings~~ and also cause simultaneous failure of electrical equipment in a mode to cause the electrical equipment to become a source of ignition, ~~or~~

(4) The location is adjacent to a Zone 20 location from which ignitable concentrations of combustible dust, or ignitable combustible fibers/flyings, or ignitable fibers/flyings could be communicated.

Exception: When communication from an adjacent Zone 20 location is minimized by adequate positive pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

(5) Group IIIC combustible dusts are present in quantities sufficient to be hazardous occasionally; under normal or abnormal operating conditions; or frequently because of repair or maintenance operations or because of leakage.

Informational Note No. 1: As a guide to classification of Zone 21 locations, refer to ANSI/ISA 60079-10-2 (12.10.05)-2013, *Explosive Atmospheres — Part 10-2: Classification of areas — Combustible dust atmospheres.*

Informational Note No. 2: This classification usually includes locations outside dust containment and in the immediate vicinity of access doors subject to frequent removal or opening for operation purposes when internal combustible mixtures are present; locations outside dust containment in the proximity of filling and emptying points, feed belts, sampling points, truck dump stations, belt dump over points, etc., where no measures are employed to prevent the formation of combustible mixtures; locations outside dust containment where dust accumulates and where due to process operations the dust layer is likely to be disturbed and form combustible mixtures; locations inside dust containment where ~~explosive~~ explosible dust clouds are likely to occur (but neither continuously, nor for long periods, nor frequently) as, for example, silos (if filled and/or emptied only occasionally) and the dirty side of filters if large self-cleaning intervals are occurring.

(3) Zone 22. A Zone 22 location is a location where one of the following apply:

(1) Ignitable concentrations of combustible dust, ~~or ignitable combustible fibers/flyings, or ignitable fibers/flyings~~ are not likely to occur in normal operation and, if they do occur, will only persist for a short period, ~~or~~

(2) Combustible dust, ~~or ignitable combustible fibers/flyings, or ignitable fibers/flyings~~ are handled, processed, or used, but ~~in which~~ the dust or fibers/flyings are normally confined within closed containers of closed systems from which they can escape only as a result of the abnormal operation of the equipment with which the dust or fibers/flyings are handled, processed, or used; or

(3) The location is adjacent to a Zone 21 location, from which ignitable concentrations of combustible dust, or ignitable combustible fibers/flyings, or ignitable fibers/flyings could be communicated.

Exception No. 1: When communication from an adjacent Zone 21 location is minimized by adequate positive pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

Exception No. 2: For Group IIIC combustible dusts or metal combustible fibers/flyings, there shall ~~are~~ only be Zone 20 or 21 locations.

Informational Note No. 1: As a guide to classification of Zone 22 locations, refer to ANSI/ISA 60079-10-2 (12.10.05)-2013, *Explosive Atmospheres — Part 10-2: Classification of areas — Combustible dust atmospheres.*

Informational Note No. 2: Zone 22 locations usually include outlets from bag filter vents, because in the event

of a malfunction there can be emission of combustible mixtures; locations near equipment that has to be opened at infrequent intervals or equipment that from experience can easily form leaks where, due to pressure above atmospheric, dust will blow out; pneumatic equipment, flexible connections that can become damaged, etc.; storage locations for bags containing dusty product, since failure of bags can occur during handling, causing dust leakage; and locations where controllable dust layers are formed that are likely to be raised into ~~explosive~~ explosible dust-air mixtures. Only if the layer is removed by cleaning before hazardous dust-air mixtures can be formed is the area designated unclassified.

Informational Note No. 3: Locations that normally are classified as Zone 21 can fall into Zone 22 when measures are employed to prevent the formation of ~~explosive~~ explosible dust-air mixtures. Such measures include exhaust ventilation. The measures should be used in the vicinity of (bag) filling and emptying points, feed belts, sampling points, truck dumpstations, belt dump over points, etc.

11. *Revise Section 506.6 to read as follows:*

506.6 Material Groups. For the purposes of testing, approval, and area classification, various air mixtures (not oxygen enriched) shall be grouped as required in 506.6(A), (B), and (C).

(A) Group IIIC. Combustible metal dust, including combustible metal fibers/flyings. ~~Group IIIC shall be considered to be equivalent to Class H, Group E.~~ [499:3.3.8.2.1]

(B) Group IIIB. Combustible dust other than combustible metal dust. ~~Group IIIB shall be considered to be equivalent to Class H, Groups F and G.~~ [499:3.3.8.2.2]

Informational Note: Group IIIA materials are larger particle-size than Group IIIB materials and do not include metal dust or metal fibers/flyings. [499:A.3.3.8.2.3]

(C) Group IIIA. Solid particles, including fibers, greater than 500 µm in nominal size, which could be suspended in air and could settle out of the atmosphere under their own weight. ~~Group IIIA shall be considered to be equivalent to Class III.~~ Combustible fibers/flyings or ignitable fibers/flyings other than metal. [499:3.3.8.2.3]

Informational Note No. 1: Group IIIA materials are larger particle-size than Group IIIB materials and do not include metal dust or metal fibers/flyings. [499:A.3.3.8.2.3]

Informational Note No. 2: Examples of ignitable fibers/flyings include rayon, cotton (including cotton linters and cotton waste), sisal, jute, hemp, cocoa fiber, oakum, and baled waste kapok.

Informational Note No. 3: Combustible fibers/flyings include flat platelet-shaped particulates, such as metal flakes, and fibrous board, such as particle board.

12. *Revise Sections 506.7(C) and (D) to read as follows:*

506.7 Special Precaution.

...

(C) Reclassification Permitted. A Class II or Class III, Division 1 or Division 2 location shall be permitted to be reclassified as a Zone 20, Zone 21, or Zone 22 location, ~~provided that~~ if all of the space that is classified because of a single combustible dust, ~~or ignitable-combustible fiber/flying, or ignitable fiber/flying~~ source is reclassified under the requirements of this article.

(D) Simultaneous Presence of Flammable Gases and Combustible Dusts or Fibers/Flyings. Where flammable gases, combustible dusts, ~~or ignitable-combustible fibers/flyings, or ignitable fibers/flyings~~ are or ~~may~~ might be present at the same time, the simultaneous presence shall be considered during the selection and installation of the electrical equipment and the wiring methods, including the determination of the safe operating temperature of the electrical equipment.

13. *Revise Sections 506.9(B) and (C)(1) to read as follows:*

506.9 Equipment Requirements.

...

(B) Listing. Equipment that is listed for Zone 20 shall be permitted in a Zone 21 or Zone 22 location of the same ~~combustible dust, or ignitable-combustible fiber/flying, or ignitable fiber/flying.~~ Equipment that is listed for Zone 21 ~~may be used shall be permitted~~ in a Zone 22 location of the same combustible dust, or ignitable-combustible fiber/flying, or ignitable fiber/flying.

(C) Marking.

(1) Division Equipment. Equipment identified for Class II, Division 1, ~~or Class II, Division 2,~~ Class III, Division 1, or Class III, Division 2 shall, in addition to being marked in accordance with 500.8(C), be permitted to be marked with all of the following:

(1) Zone 20, 21, or 22 (as applicable)

(2) Material group in accordance with 506.6

(3) Maximum surface temperature in accordance with 506.9(D), marked as a temperature value in degrees C, preceded by "T" and followed by the symbol "°C"

14. Revise Section 506.16 to read as follows:

506.16 Sealing. Where necessary to protect ~~against~~ the ingress of combustible dust, ~~or ignitable-combustible fiber/flying, or ignitable fiber/flying,~~ or to maintain the type of protection, seals shall be provided. The seal shall be identified as capable of preventing the ingress of combustible, ~~or ignitable-combustible fiber/flying, or ignitable fiber/flying~~ and maintaining the type of protection but need not be explosionproof or flameproof.

15. Revise Section 506.20 to read as follows:

506.20 Equipment Installation.

(A) Zone 20. In Zone 20 locations, only equipment listed and marked as suitable for the location shall be permitted.

Exception No. 1: Equipment listed for use in Class II, Division 1 locations with a suitable temperature class shall be permitted.

Exception No. 2: For locations involving Group IIIA materials, equipment listed for use in Class III, Division 1 locations with a suitable temperature in accordance with 500.8(D)(3) shall be permitted.

(B) Zone 21. In Zone 21 locations, only equipment listed and marked as suitable for the location shall be permitted.

Exception No. 1: Apparatus listed for use in Class II, Division 1 locations with a suitable temperature class shall be permitted.

Exception No. 2: Pressurized equipment identified for Class II, Division 1 shall be permitted.

Exception No. 3: For locations involving Group IIIA materials, equipment listed for use in Class III, Division 1 locations with a suitable temperature in accordance with 500.8(D)(3) shall be permitted.

(C) Zone 22. In Zone 22 locations, only equipment listed and marked as suitable for the location shall be permitted.

Exception No. 1: Apparatus listed for use in Class II, Division 1 or Class II, Division 2 locations with a suitable temperature class shall be permitted.

Exception No. 2: Pressurized equipment identified for Class II, Division 1 or Division 2 shall be permitted.

Exception No. 3: For Group IIIA materials, equipment listed for use in Class III, Division 1 or Class III, Division 2 locations with a suitable temperature in accordance with 500.8(D)(3) shall be permitted.

...

(F) Temperature. The temperature marking specified in 506.9(C)(2)(5) shall comply with 506.20(F)(1) or (F)(2):

(1) ~~For e~~Combustible dusts, ~~or combustible fibers/flyings~~ shall be less than the lower of either the layer or cloud ignition temperature of the specific combustible dust ~~or combustible fiber/flying~~. For ~~nonmetal organic~~ dusts ~~or nonmetal combustible fibers/flyings~~ that ~~may~~ might dehydrate or carbonize, the temperature marking shall not exceed the lower of either the ignition temperature or 165°C (329°F).

(2) For ignitable fibers/flyings, less than 165°C (329°F) for equipment that is not subject to overloading, or 120°C (248°F) for equipment (such as motors or power transformers) that may be overloaded.

Informational Note: See NFPA 499-~~2017~~2021, ...

Issue Date: April 12, 2022

Effective Date: May 2, 2022

(Note: For further information on NFPA Codes and Standards, please see www.nfpa.org/docinfo)

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Public Input No. 1615-NFPA 70-2023 [Global Input]

NOTE: This public input originates from Tentative Interim Amendment No. 23-2 (Log 1617) issued by the Standards Council on April 12, 2022 and per the NFPA Regs., needs to be reconsidered by the Code-Making Panel for the next edition of the Document.

See attached TIA 23-2 (Log 1617) for revisions to Article 100 Ignitable Fibers/Flyings, Section 506.5 and Section 506.9(B).

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
TIA_1617_70_23_2.pdf	NEC TIA 23-3 Log 1617	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 23-2 (Log 1617) issued by the Standards Council on April 12, 2022 and per the NFPA Regs., needs to be reconsidered by the Code-Making Panel for the next edition of the Document.

Substantiation: This TIA is being submitted to align the proposed 2023 edition of the NEC with NFPA 499 and the combustible dust standards. CMP 14 accounted for most of the changes in the NEC 2020 TIA in the 2023 Second Draft stage, but these few additional changes need to be made for alignment. These changes are in reference to the work done by a multi-committee task group who, at the direction of the Standards Council, put together TIAs to correlate the dust standards with NFPA 70.

Emergency Nature: The NFPA Standard contains a conflict within the NFPA Standards or within another NFPA Standard.

Submitter Information Verification

Submitter Full Name: CMP on NEC-P14
Organization: Code-Making Panel 14
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 27 13:12:47 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel accepts the prior changes incorporated by TIA.



Tentative Interim Amendment

NFPA[®] 70[®]

National Electrical Code[®]

2023 Edition

Reference: Article 100 (Ignitable Fibers/Flyings), 506.5, and 506.9(B)

TIA 23-2

(SC 22-4-8 / TIA Log #1617)

Note: Text of the TIA was issued and approved for incorporation into the document prior to printing.

1. *Revise Article 100 Ignitable Fibers/Flyings to read as follows:*

Ignitable Fibers/Flyings. Fibers/flyings where any dimension is greater than 500 µm in nominal size, which are not likely to be in suspension in quantities to produce an explosible mixture, but could produce an ignitable layer fire hazard. [499:3.3.4.2]

Informational Note No.1: This definition and Informational Note No. 2 have been extracted from NFPA 499-2021, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*. The NFPA 499 reference is in brackets. Only editorial changes were made to the extracted text to make it consistent with this Code.

Informational Note No. 2: Section 500.5 of this Code prescribes a Class III location as one where ignitable fibers/flyings are present, but not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. This description addresses fibers/flyings that do not present a flash-fire hazard or explosion hazard by test. This could be because those fibers/flyings are too large or too agglomerated to be suspended in air in sufficient concentration, or at all, under typical test conditions. Alternatively, this could be because they burn so slowly that, when suspended in air, they do not propagate combustion at any concentration. In this document the zone classification system includes ignitable fibers/flyings as a fire hazard in a layer, which is not addressed in the IEC zone system (see IEC 60079-10-2, *Explosive atmospheres — Part 10-2: Classification of areas — Explosive dust atmospheres*). Where these are present, the user could also consider installation in accordance with Article 503 of this Code. [499:A.3.3.4.2]

2. *Revise Section 506.5 to read as follows:*

506.5 Classification of Locations.

(A) Classifications of Locations. ...

(B) Zone 20, Zone 21, and Zone 22 Locations. ...

(1) Zone 20. A Zone 20 location is a location where one of the following apply:

(1) Ignitable concentrations of combustible dust, ~~or~~ combustible fibers/flyings, or ignitable fibers/flyings are present continuously or for long periods of time.

...

(2) Zone 21. ...

(3) Zone 22. A Zone 22 location is a location where one of the following apply:

(1) ...

(2) Combustible dust, combustible fibers/flyings, or ignitable fibers/flyings are handled, processed, or used...

(3) ...

3. *Revise Section 506.9(B) to read as follows:*

506.9 Equipment Requirements.

...

(B) Listing. Equipment that is listed for Zone 20 shall be permitted in a Zone 21 or Zone 22 location of the same combustible dust, combustible fiber/flying, or ignitable fiber/flying. Equipment that is listed for Zone 21 ~~can be used~~ shall be permitted in a Zone 22 location of the same combustible dust, combustible fiber/flying, or ignitable fiber/flying.

Issue Date: April 12, 2022

Effective Date: May 2, 2022

(Note: For further information on NFPA Codes and Standards, please see www.nfpa.org/docinfo)

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Public Input No. 4484-NFPA 70-2023 [Global Input]

Change the term: "Hazardous (Classified) Locations" throughout the NEC to Hazardous Locations.

Statement of Problem and Substantiation for Public Input

This term first appeared in the 1975 code. The proposal was to replace "hazardous locations" with "classified locations." The ultimate decision was to use both terms together. The parenthetical (Classified) meant that you could refer to the location as a hazardous location or a classified location. I dug into this several years ago and learned that there was a constituency that didn't care to use the term "hazardous" because of the negative connotations of the term "hazardous." Schram noted that the term are considered interchangeable (Electrical Installations in Hazardous Locations, 1988, P.14).

All of the online references that I have looked at that use the term "hazardous (classified) location" use that term in a title or table of contents and then use the term hazardous locations. Many don't use the term classified at all. Some believe that the proper term is "hazardous classified locations."

I think that it is time to eliminate the term classified. It adds nothing to the understanding of the concept. I note that the Canadian Electrical Code, Part 1 only uses the term "hazardous locations". I also note that IEC has named its sub committee on area classification "Classification of hazardous areas and installation requirements." They don't use the term "Classified" in this title. The currently defined term "unclassified location" can continue to exist because its meaning is clear. It should be noted that the term itself makes no reference to it being nonhazardous.

Submitter Information Verification

Submitter Full Name: Mark Earley
Organization: Alumni Code Consulting
Affiliation: Self
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 16:18:06 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel acknowledges this term has been in use for decades but does not agree to arbitrarily change now to delete "(Classified)". The term distinguishes an area that has been classified by the process and distinguishes it from locations which are deemed hazardous for other reasons, like toxicity. There are numerous other standards and regulations that use the term hazardous (classified) locations.



Public Input No. 3228-NFPA 70-2023 [Definition: Dust-Ignitionproof.]

Dust-Ignitionproof.

Equipment enclosed in a manner that excludes dusts and does not permit arcs, sparks, or heat otherwise generated or liberated inside of the enclosure to cause ignition of exterior accumulations or atmospheric suspensions of a specified dust on or in the vicinity of the enclosure. (CMP-14)

Informational Note No. 1: See ANSI/UL 1203, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*, for additional information on dust-ignitionproof enclosures.

Informational Note No. 2: See NEMA 250, *Enclosures for Electrical Equipment (1000 Volts Maximum)*, for additional information on dust-ignitionproof enclosures that are sometimes ~~marked additionally marked Type~~ marked Type 9.

Statement of Problem and Substantiation for Public Input

No substantive change, merely fixing a typographical error in this informational note by deleting the second "marked"

Submitter Information Verification

Submitter Full Name: Rebekah Hren
Organization: IPPNC LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 30 14:09:25 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8771-NFPA 70-2024](#)

Statement: The definition informational notes were revised to add clarity and comply with the Style Manual.



Public Input No. 729-NFPA 70-2023 [Definition: Explosionproof Equipment.]

Explosionproof Explosion-Proof Equipment.

Equipment enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor that might occur within it, that is capable of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and that operates at such an external temperature that a surrounding flammable atmosphere will not be ignited. (CMP-14)

Informational Note No. 1: See ANSI/UL 1203, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*, for additional information.

Informational Note No. 2: See NEMA 250, *Enclosures for Electrical Equipment (1000 Volts Maximum)*, for additional information on ~~explosionproof~~ explosion-proof enclosures that are sometimes additionally marked Type 7.

Statement of Problem and Substantiation for Public Input

"Explosionproof" is not found in any American English dictionary (or any other English dictionary), so it is not a word in English.

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submission Date: Wed Apr 26 01:05:38 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel affirms that the terms explosionproof, nonsparking, nonincendive, dust-ignitionproof, and dusttight are defined in the NEC.

**Public Input No. 1059-NFPA 70-2023 [Definition: Nonsparking.]****Nonsparking.**

Constructed to minimize the risk of arcs or sparks capable of creating an ignition hazard during conditions of normal operation. (CMP-14)

Informational Note 1: The term nonsparking is also referred to as nonarcing.

Informational Note 2: See ANSI/UL 121201, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations*, for additional information.

Statement of Problem and Substantiation for Public Input

In ANSI/UL 121201, the term “nonarcing” is used in the same context as “non-sparking” is used in UL 60079-7.

Submitter Information Verification

Submitter Full Name: Paul Kelly
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Street Address:
City:
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Zip:
Submittal Date: Tue Jun 13 15:10:38 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8774-NFPA 70-2024](#)
Statement: The definition informational notes were revised to add clarity.



Public Input No. 734-NFPA 70-2023 [Definition: Nonsparking.]

Nonsparking Non-Sparking .

Constructed to minimize the risk of arcs or sparks capable of creating an ignition hazard during conditions of normal operation. (CMP-14)

Informational Note: See ANSI/UL 121201, ~~Nonincendive Electrical~~ Non-Incendiary Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, for additional information.

Statement of Problem and Substantiation for Public Input

"Nonsparking" is not found in any dictionary of any variety of English, so it is not a word in English.

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 26 01:35:57 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel affirms that the terms explosionproof, nonsparking, nonincendive, dust-ignitionproof, and dusttight are defined in the NEC.



Public Input No. 728-NFPA 70-2023 [Definitions (100): Dust-Igniti... to Dusttight....]

Definitions (100): Dust-Igniti... to Dusttight....

Dust-Ignitionproof Ignition-Proof .

Equipment enclosed in a manner that excludes dusts and does not permit arcs, sparks, or heat otherwise generated or liberated inside of the enclosure to cause ignition of exterior accumulations or atmospheric suspensions of a specified dust on or in the vicinity of the enclosure. (CMP-14)

Informational Note No. 1: See ANSI/UL 1203, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*, for additional information on ~~dust-ignitionproof enclosures~~ ignition-proof enclosures.

Informational Note No. 2: See NEMA 250, *Enclosures for Electrical Equipment (1000 Volts Maximum)*, for additional information on ~~dust-ignitionproof enclosures~~ ignition-proof enclosures that are sometimes marked additionally marked Type 9.

Dusttight Dust-Tight .

Enclosures constructed so that dust will not enter under specified test conditions. (CMP-14)

Informational Note No. 1: See ANSI/UL 121201, ~~Nonincendive~~ Non-Incendive *Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations*, for additional information.

Informational Note No. 2: See NEMA 250, *Enclosures for Electrical Equipment (1000 Volts Maximum)*, and ANSI/UL 50E, *Enclosures for Electrical Equipment, Environmental Considerations*, for additional information on enclosure Types 3, 3X, 3S, 3SX, 4, 4X, 5, 6, 6P, 12, 12K, and 13 that are considered ~~dusttight~~ dust-tight.

Statement of Problem and Substantiation for Public Input

"Ignitionproof", "dusttight", and "nonincendive" are not found in any American English dictionary (or any English dictionary for that matter), so it is not a word in English.

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 26 01:00:52 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel affirms that the terms explosionproof, nonsparking, nonincendive, dust-ignitionproof, and dusttight are defined in the NEC.



Public Input No. 733-NFPA 70-2023 [Definitions (100): Nonincendiv... to Nonincendiv...]

Definitions (100): Nonincendiv... to Nonincendiv...

~~Nonincendive~~ Non-Incendiary Circuit.

A circuit, other than field wiring, in which any arc or thermal effect produced under intended operating conditions of the equipment, is not capable, under specified test conditions, of igniting the flammable gas–air, vapor–air, or dust–air mixture. (CMP-14)

Informational Note: See ANSI/UL 121201, ~~Nonincendive Electrical~~ Non-Incendiary Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, for additional information.

~~Nonincendive~~ Non-Incendiary Component.

A component having contacts for making or breaking an ~~incendive circuit~~ incendiary circuit and the contacting mechanism is constructed so that the component is incapable of igniting the specified flammable gas–air or vapor–air mixture. The housing of such a component is not intended to exclude the flammable atmosphere or contain an explosion. (CMP-14)

Informational Note: See ANSI/UL 121201, ~~Nonincendive Electrical~~ Non-Incendiary Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, for additional information.

~~Nonincendive Equipment~~ Non-Incendiary Equipment.

Equipment having electrical/electronic circuitry that is incapable, under normal operating conditions, of causing ignition of a specified flammable gas–air, vapor–air, or dust–air mixture due to arcing or thermal means. (CMP-14)

Informational Note: See ANSI/UL 121201, ~~Nonincendive Electrical~~ Non-Incendiary Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, for additional information.

~~Nonincendive Field~~ Non-Incendiary Field Wiring.

Wiring that enters or leaves an equipment enclosure and, under normal operating conditions of the equipment, is not capable, due to arcing or thermal effects, of igniting the flammable gas–air, vapor–air, or dust–air mixture. Normal operation includes opening, shorting, or grounding the field wiring. (CMP-14)

Informational Note: See ANSI/UL 121201, ~~Nonincendive Electrical~~ Non-Incendiary Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, for additional information.

~~Nonincendive Field~~ Non-Incendiary Field Wiring Apparatus.

Apparatus intended to be connected to ~~nonincendive field~~ non-incendiary field wiring. (CMP-14)

Informational Note: See ANSI/UL 121201, ~~Nonincendive Electrical~~ Non-Incendiary Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, for additional information.

Statement of Problem and Substantiation for Public Input

"Nonincendive" is not found in any dictionary of any variant of English, so it is not a valid word. The same applies to "incendive" too. However, I see that "nonincendive" is a commonly used term within the electrical industry. So, it is the responsibility of the electrical industry to inform dictionary publishers that the word "nonincendive" exists, or else the spelling should be corrected to "non-incendiary".

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submission Date: Wed Apr 26 01:28:41 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel affirms that the terms explosionproof, nonsparking, nonincendive, dust-ignitionproof, and dusttight are defined in the NEC.



Public Input No. 1060-NFPA 70-2023 [New Definition after Definition: Array.]

Artificially Ventilated Room "v". A room volume protected by artificial ventilation and of sufficient size to permit the entry of a person who might occupy the room. (CMP-14)

Informational Note: see ANSI/UL 60079-13, *Explosive Atmospheres – Part 13: Equipment Protection by Pressurized Room "p" and Artificially Ventilated Room "v"*, for information on the requirements for rooms intended for human entry where artificial ventilation is used as a means of reducing the risk of explosion.

Statement of Problem and Substantiation for Public Input

This proposal is necessary to define a new Type of Protection "v" for artificially ventilated rooms under the Zone system in Article 100, and to reference this new Type of Protection in Article 505 and Table 13 of the 2023 NEC. These references acknowledge the use of this Type of Protection as a new means to mitigate the risk of explosion in hazardous (classified) locations. Type of Protection "v" is included in ANSI/UL 60079-13, and this ANSI standard is already included in the 2023 NEC for the new Type of Protection "p" for pressurized rooms. Type of Protection "v" was not initially included in the 2023 NEC due to changes that were underway, but not yet completed, to the requirements in ANSI/UL 60079-13 so as to improve the consistency of application of the requirements. These changes have now been successfully completed, and Type of Protection "v" can now be included in the 2026 NEC.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1061-NFPA 70-2023 [New Section after 505.8(P)]	Addresses Type of Protection, "v"
Public Input No. 1062-NFPA 70-2023 [Section No. 505.16(B)(3)]	Addresses Type of Protection, "v"
Public Input No. 1064-NFPA 70-2023 [Section No. 505.20(C)]	Addresses Type of Protection, "v"
Public Input No. 1417-NFPA 70-2023 [Section No. Table]	Addresses Type of Protection, "v"
Public Input No. 1061-NFPA 70-2023 [New Section after 505.8(P)]	
Public Input No. 1062-NFPA 70-2023 [Section No. 505.16(B)(3)]	
Public Input No. 1064-NFPA 70-2023 [Section No. 505.20(C)]	
Public Input No. 1417-NFPA 70-2023 [Section No. Table]	

Submitter Information Verification

Submitter Full Name: Paul Kelly
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 13 15:16:14 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8759-NFPA 70-2024](#)

Statement: This proposal is necessary to define a new Type of Protection "v" for artificially ventilated rooms under the Zone system in Article 100.



Public Input No. 881-NFPA 70-2023 [New Section after 500.1(B)]

Reconditioned Equipment

Equipment for protection techniques found in 500.7(A) through 500.7(U) shall not be reconditioned.

Statement of Problem and Substantiation for Public Input

Protection techniques provide for the safety of hazardous (classified) locations. Product testing for this equipment is strict and includes some requirements that would be almost impossible to repeat during a reconditioning process.

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 23 21:29:04 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: First revisions containing reconditioned equipment requirements have been made in Articles 501, 502, 505, and 506.



Public Input No. 3298-NFPA 70-2023 [Section No. 500.4]

500.4 Documentation.

Areas designated as hazardous (classified) locations or determined to be unclassified shall be documented on an area classification drawing and other associated documentation. This documentation shall be available to the authority having jurisdiction (AHJ) and those authorized to design, install, inspect, maintain, or operate electrical equipment at the location.

Informational Note No. 1: See the following standards for additional information on the classification of locations:

- (1) *NFPA 2, Hydrogen Technologies*
- (2) *NFPA 30, Flammable and Combustible Liquids Code*
- (3) *NFPA 32, Standard for Drycleaning Facilities*
- (4) *NFPA 33, Standard for Spray Application Using Flammable or Combustible Materials*
- (5) *NFPA 34, Standard for Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids*
- (6) *NFPA 35, Standard for the Manufacture of Organic Coatings*
- (7) *NFPA 36, Standard for Solvent Extraction Plants*
- (8) *NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals*
- (9) *NFPA 55, Compressed Gases and Cryogenic Fluids Code*
- (10) *NFPA 58, Liquefied Petroleum Gas Code*
- (11) *NFPA 59, Utility LP-Gas Plant Code*
- (12) *NFPA 497, Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*
- (13) *NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*
- (14) *NFPA 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities*
- (15) *ANSI/API RP 500, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2*
- (16) *ISA-12.10, Area Classification in Hazardous (Classified) Dust Locations*

Informational Note No. 2: See *NFPA 77, Recommended Practice on Static Electricity*; *NFPA 780, Standard for the Installation of Lightning Protection Systems*; and *API RP 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents*, for information on protection against static electricity and lightning hazards in hazardous (classified) locations.

Informational Note No. 3: See *NFPA 30, Flammable and Combustible Liquids Code*; and *ANSI/API RP 500, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2*, for information on ventilation.

Informational Note No. 4: See *ANSI/API RP 14F, Recommended Practice for Design, Installation, and Maintenance of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Division 1, and Division 2 Locations*, for information on electrical systems for hazardous (classified) locations on offshore oil- and gas-producing platforms, drilling rigs, and workover rigs.

Informational Note No. 5: See *ANSI/UL 121203, Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous (Classified) Locations*, for information on portable or transportable equipment having self-contained power supplies, such as battery-operated equipment, which could potentially become an ignition source in hazardous (classified) locations.

Informational Note No. 6: See *IEC/IEEE 60079-30-2, Explosive atmospheres — Part 30-2: Electrical resistance trace heating — Application guide for design, installation and maintenance*, for information on electrical resistance trace heating for hazardous (classified) locations.

Informational Note No. 7: See *IEEE 844.2/CSA C293.2, IEEE/CSA Standard for Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance*, for information on electric skin effect trace heating for hazardous (classified) locations.

Informational Note No. 8: See *IEEE 844.4/CSA C293.4, IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance*, for information on electric impedance heating for hazardous (classified) locations.

Statement of Problem and Substantiation for Public Input

This standard should be referenced here since Hydrogen related technologies are increasing in their occurrence.

Submitter Information Verification

Submitter Full Name: Glen Edwards
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Affiliation: International Society of Automation (ISA)
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 31 16:55:06 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8243-NFPA 70-2024](#)

Statement: CMP-14 agrees with the intent of both submitter's PIs. The addition of NFPA2 provides a standard reference to address hydrogen. The revised text is based on information from the scope of ANSI/UL RP 121203. The RP specifically addresses electronic equipment where it is not classified by a NRTL. The RP addresses personal and portable electronic equipment and not portable or transportable equipment. Revision made to comply with NEC Style Manual section 2.1.10.3 which is in regard to format.



Public Input No. 3299-NFPA 70-2023 [Section No. 500.4]

500.4 Documentation.

Areas designated as hazardous (classified) locations or determined to be unclassified shall be documented on an area classification drawing and other associated documentation. This documentation shall be available to the authority having jurisdiction (AHJ) and those authorized to design, install, inspect, maintain, or operate electrical equipment at the location.

Informational Note No. 1: See the following standards for additional information on the classification of locations:

- (1) NFPA 30, *Flammable and Combustible Liquids Code*
- (2) NFPA 32, *Standard for Drycleaning Facilities*
- (3) NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*
- (4) NFPA 34, *Standard for Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids*
- (5) NFPA 35, *Standard for the Manufacture of Organic Coatings*
- (6) NFPA 36, *Standard for Solvent Extraction Plants*
- (7) NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*
- (8) NFPA 55, *Compressed Gases and Cryogenic Fluids Code*
- (9) NFPA 58, *Liquefied Petroleum Gas Code*
- (10) NFPA 59, *Utility LP-Gas Plant Code*
- (11) NFPA 497, *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*
- (12) NFPA 499, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*
- (13) NFPA 820, *Standard for Fire Protection in Wastewater Treatment and Collection Facilities*
- (14) ANSI/API RP 500, *Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2*
- (15) ISA-12.10, *Area Classification in Hazardous (Classified) Dust Locations*

Informational Note No. 2: See NFPA 77, *Recommended Practice on Static Electricity*; NFPA 780, *Standard for the Installation of Lightning Protection Systems*; and API RP 2003, *Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents*, for information on protection against static electricity and lightning hazards in hazardous (classified) locations.

Informational Note No. 3: See NFPA 30, *Flammable and Combustible Liquids Code*; and ANSI/API RP 500, *Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2*, for information on ventilation.

Informational Note No. 4: See ANSI/API RP 14F, *Recommended Practice for Design, Installation, and Maintenance of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Division 1, and Division 2 Locations*, for information on electrical systems for hazardous (classified) locations on offshore oil- and gas-producing platforms, drilling rigs, and workover rigs.

Informational Note No. 5: See ANSI/UL ~~124203~~, UL RP 121203, *Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous (Classified) Locations*, for information on ~~portable or transportable equipment~~ personal or portable that is not available as listed equipment, having self-contained power supplies, such as battery-operated equipment, which could potentially become an ignition source in hazardous (classified) locations.

Informational Note No. 6: See IEC/IEEE 60079-30-2, *Explosive atmospheres — Part 30-2: Electrical resistance trace heating — Application guide for design, installation and maintenance*, for information on electrical resistance trace heating for hazardous (classified) locations.

Informational Note No. 7: See IEEE 844.2/CSA C293.2, *IEEE/CSA Standard for Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance*, for information on electric skin effect trace heating for hazardous (classified) locations.

Informational Note No. 8: See IEEE 844.4/CSA C293.4, *IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance*, for information on electric impedance heating for hazardous (classified) locations.

Statement of Problem and Substantiation for Public Input

Clarification that the document is a recommended practice, and clarifying that it is for personal and portable equipment that is not available as listed equipment, in-line with the scope of the document.

Submitter Information Verification

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Submittal Date: Thu Aug 31 16:56:54 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8243-NFPA 70-2024](#)

Statement: CMP-14 agrees with the intent of both submitter's PIs. The addition of NFPA2 provides a standard reference to address hydrogen. The revised text is based on information from the scope of ANSI/UL RP 121203. The RP specifically addresses electronic equipment where it is not classified by a NRTL. The RP addresses personal and portable electronic equipment and not portable or transportable equipment. Revision made to comply with NEC Style Manual section 2.1.10.3 which is in regard to format.



Public Input No. 967-NFPA 70-2023 [Section No. 500.5(B)(2)]

(2) Class I, Division 2.

A Class I, Division 2 location is a location:

- (1) In which volatile flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors are handled, processed, or used, but in which the liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems or in case of abnormal operation of equipment, or
- (2) In which ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operation of the ventilating equipment, or
- (3) That is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors above their flash points might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air and effective safeguards against ventilation failure are provided.

Informational Note No.

~~1: This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used but that, in the judgment of the authority having jurisdiction, would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.~~ Informational Note No.

2: See NFPA 30, *Flammable and Combustible Liquids Code*, and NFPA 58, *Liquefied Petroleum Gas Code*. Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even if used for flammable liquids or gases. Depending on factors such as the quantity and size of the containers and ventilation, locations used for the storage of flammable liquids or liquefied or compressed gases in sealed containers might be considered either hazardous (classified) or unclassified locations.

Statement of Problem and Substantiation for Public Input

Section 2.1.10.2 of the 2023 NEC Style Manual prohibits making interpretations or recommendations. Informational note number 1 tells the reader that the AHJ's judgement can be used in determining if conditions warrant an area as being hazardous. There is nothing in 500.5(B)(2) that permits the AHJ to determine the classification of a Class I, Division 2 location under conditions not contained in the requirement. Additionally, in most cases area classification is determined by a design team that has access to all the information listed in the informational note and has the technical knowledge to determine the classification of an area. The AHJ's role, in most cases, is to review the area classification documents and either accept or reject them. This informational note is interpreting and/or making a recommendation.

Submitter Information Verification

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Submission Date: Wed Jun 07 14:09:58 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel notes that this text dates back many cycles, without change, and is a statement of fact, not an interpretation nor recommendation.

**Public Input No. 1051-NFPA 70-2023 [Section No. 500.5(C)(1)]****(1) Class II, Division 1.**

A Class II, Division 1 location is a location:

- (1) In which combustible dust is in the air under normal operating conditions in quantities sufficient to produce explosive or ignitable mixtures, or
- (2) Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electrical equipment, through operation of protection devices, or from other causes, or
- (3) In which Group E combustible dusts or metal combustible fibers/flyings may be present in quantities sufficient to be hazardous in normal or abnormal operating conditions.

Informational Note: Dusts containing magnesium or aluminum are particularly hazardous, and the use of extreme precaution is necessary to avoid ignition and explosion.

Statement of Problem and Substantiation for Public Input

Metal combustible fibers/flyings are classified as Class II, Division 1, Group E in 500.5(D)(1)(a) and should be included in 500.5(C)(1)(3) to eliminate any confusion or conflict. Section 500.5(C)(1) addresses Class II, Division 1 location and should list everything that is included in the classification. Section 500.5(D)(1)(a) is stating the group E metal combustible fibers/flyings belong in Class II, Division 1 but 500.5(C)(1)(3) hasn't accepted them. The information needs to be in both subdivisions for clarity.

Submitter Information Verification

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Submission Date: Mon Jun 12 19:56:07 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The intent of the changes for metal combustible fibers/flyings is to leave their requirements under Class III. Class III requires metal combustible fibers/flyings to be classified as Class II, Division 1, Group E.



Public Input No. 1362-NFPA 70-2023 [Section No. 500.5(D)(1)]

(1) Class III, Division 1.

Class III, Division 1 locations shall include those locations specified in 500.5(D)(1) and (D)(1)(b).

(a) *Combustible Fibers/Flyings.* Locations where nonmetal combustible fibers/flyings are in the air under normal operating conditions in quantities sufficient to produce explosible mixtures or where mechanical failure or abnormal operation of machinery or equipment might cause combustible fibers/flyings to be produced and might also provide a source of ignition through simultaneous failure of electrical equipment, through operation of protection devices, or from other causes shall be classified as Class III, Division 1. Locations where metal combustible fibers/flyings ~~are present~~ shall be may be present in quantities sufficient to be hazardous in normal or abnormal operating conditions shall be classified as Class II, Division 1, Group E.

Informational Note No. 1: Such locations usually include some parts of rayon, cotton, and other textile mills; associated manufacturing and processing plants; cotton gins and cotton-seed mills; flax-processing plants; clothing manufacturing plants; woodworking plants; and establishments and industries involving similar hazardous processes or conditions.

Informational Note No. 2: Combustible fibers/flyings include flat platelet-shaped particulates, such as metal flakes, and fibrous board, such as particle board.

(b) *Ignitable Fibers/Flyings.* Locations where ignitable fibers/flyings are handled, manufactured, or used shall be classified as Class III, Division 1.

Informational Note No. 1: Such locations usually include some parts of rayon, cotton, and other textile mills; associated manufacturing and processing plants; cotton gins and cotton-seed mills; flax-processing plants; clothing manufacturing plants; woodworking plants; and establishments and industries involving similar hazardous processes or conditions.

Informational Note No. 2: Ignitable fibers/flyings can include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, and other materials of similar nature.

Statement of Problem and Substantiation for Public Input

The change is to align the text with the definition of a Class II, Division 1 location in 500.5 (C) (1) (3) and to clarify that the metal flyings need to be present in sufficient quantity to be hazardous to classify the location.

Submitter Information Verification

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Submission Date: Tue Jul 11 05:42:34 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8248-NFPA 70-2024](#)

Statement: CMP14 agrees with the change of the language in PI 1362. The change makes it clear that the metal combustible fibers/flyings must be present in quantities that are hazardous.

**Public Input No. 1053-NFPA 70-2023 [Section No. 500.5(D)(2)]**

(2) Class III, Division 2.

Class III, Division 2 locations shall include those locations specified in 500.5(D)(2) and (D)(2)(b).

(a) *Nonmetal Combustible Fibers/Flyings*. Locations where nonmetal combustible fibers/flyings might be present in the air in quantities sufficient to produce explosible mixtures due to abnormal operations or where accumulations of nonmetal combustible fibers/flyings accumulations are present but are insufficient to interfere with the normal operation of electrical equipment or other apparatus but could, as a result of infrequent malfunctioning of handling or processing equipment, become suspended in the air shall be classified as Class III, Division 2.

(b) *Ignitable Fibers/Flyings*. Locations where ignitable fibers/flyings are stored or handled, other than in the process of manufacture, shall be classified as Class III, Division 2.

Statement of Problem and Substantiation for Public Input

The title of 500.5(D)(1)(a) should reflect what is being addressed in the subdivision. The requirement applies only to nonmetal fibers/flyings. The revision confirms that the requirement only applies to nonmetal fibers/flyings.

Submitter Information Verification

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Submittal Date: Mon Jun 12 20:14:21 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The intent of the changes for metal combustible fibers/flyings is to leave their requirements under Class III. Class III requires metal combustible fibers/flyings to be classified as Class II, Division 1, Group E.



Public Input No. 976-NFPA 70-2023 [Section No. 500.6(A) [Excluding any Sub-Sections]]

Class I groups shall be in accordance with 500.6(A)(1) through (A)(4).

Informational Note No. 1: The explosion characteristics of air mixtures of gases or vapors vary with the specific material involved. For Class I locations, Groups A, B, C, and D, the classification involves determinations of maximum explosion pressure and maximum safe clearance between parts of a clamped joint in an enclosure. ~~It is necessary, therefore, that equipment be identified not only for class but also for the specific group of the gas or vapor that will be present.~~

Informational Note No. 2: Certain chemical atmospheres may have characteristics that require safeguards beyond those required for any of the Class I groups. Carbon disulfide is one of these chemicals because of its low autoignition temperature (90°C) and the small joint clearance permitted to arrest its flame.

Statement of Problem and Substantiation for Public Input

The last sentence of the informational note is an interpretation which is not permitted by subdivision 2.1.10.2 of the 2023 NEC Style Manual. It also does not comply with subdivision 2.1.10.1 which requires an informational note to be directly under the requirement to which they apply. The sentence is addressing equipment which is addressed in 500.8. Additionally, the information in the sentence is required by 500.8(C) and doesn't need to be in an informational note.

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Submittal Date: Wed Jun 07 17:16:33 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8408-NFPA 70-2024](#)

Statement: The statement beginning with "It is necessary, therefore..." is deleted as this statement is already covered in the requirements as stated in 500.8(B) et. al. It is not necessary for this statement to be included in the informational note.

**Public Input No. 1363-NFPA 70-2023 [Section No. 500.6(B)(1)]****(1) Group E.**

Atmospheres containing combustible metal dusts, including aluminum, magnesium, and their commercial alloys, or other combustible dusts whose particle size, abrasiveness, and conductivity present similar hazards in the use of electrical equipment. [499:3.3.8.1.1]

Informational Note No.1 : Certain metal dusts may have characteristics that require safeguards beyond those required for atmospheres containing the dusts of aluminum, magnesium, and their commercial alloys. For example, zirconium, thorium, and uranium dusts have extremely low ignition temperatures [as low as 20°C (68°F)] and minimum ignition energies lower than any material classified in any of the Class I or Class II groups.

Informational Note No.2: According to 500.5(C)(1)(3), a location in which Group E combustible dusts may be present in quantities sufficient to be hazardous in either normal or abnormal operating conditions is always classified as Division 1.

Statement of Problem and Substantiation for Public Input

To clarify and reinforce that Group E dusts are always Division 1. i.e. Class I, Division 2, Group E is not permitted.

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Submittal Date: Tue Jul 11 06:01:31 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: The PI places language that constitutes an interpretation. The informational note which addresses area classification is located under a subdivision that addresses Group E. Both items are in violation of Section 2.1.10 of the 2023 NEC Style Manual.

**Public Input No. 3871-NFPA 70-2023 [Section No. 500.6(B)(1)]****(1) Group E.**

Atmospheres containing combustible metal dusts, including aluminum, magnesium, and their commercial alloys, or other combustible dusts whose particle size, abrasiveness, and conductivity present similar hazards in the use of electrical equipment. [499:3.3.8.1.1]

Informational Note: Certain metal dusts may have characteristics that require safeguards beyond those required for atmospheres containing the dusts of aluminum, magnesium, and their commercial alloys. For example, zirconium, thorium, and uranium dusts have extremely low ignition temperatures [as low as 20°C (68°F)] and minimum ignition energies lower than any material classified in any of the Class I or Class II groups.

Statement of Problem and Substantiation for Public Input

Number has changed.

Submitter Information Verification

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Submission Date: Wed Sep 06 07:25:39 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8255-NFPA 70-2024](#)

Statement: The section information for the extracted text is revised to correlate with the latest revision to NFPA 499.

**Public Input No. 3872-NFPA 70-2023 [Section No. 500.6(B)(2)]****(2) Group F.**

Atmospheres containing combustible carbonaceous dusts that have more than 8 percent total entrapped volatiles (see ASTM D3175-2017, *Standard Test Method for Volatile Matter in the Analysis Sample of Coal and Coke*, for coal and coke dusts) or that have been sensitized by other materials so that they present an explosion hazard. [499:3.3.8.1.2] Coal, carbon black, charcoal, and coke dusts are examples of carbonaceous dusts. [499:A.3.3.8.9.1.2]

Informational Note: Testing of specific dust samples, following established ASTM testing procedures, is a method used to identify the combustibility of a specific dust and the need to classify those locations containing that material as Group F.

Statement of Problem and Substantiation for Public Input

Numbering has changed.

Submitter Information Verification

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Submission Date: Wed Sep 06 07:27:02 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8256-NFPA 70-2024](#)

Statement: The section information for the extracted text is revised to correlate with the latest revision to NFPA 499.

**Public Input No. 3873-NFPA 70-2023 [Section No. 500.6(B)(3)]****(3) Group G.**

Atmospheres containing combustible dusts not included in Group E or Group F, including flour, grain, wood, plastic, and chemicals. [499:3.3.8.9.1.3]

Informational Note No. 1: See NFPA 499, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, for information on group classification of Class II materials.

Informational Note No. 2: The explosion characteristics of air mixtures of dust vary with the materials involved. For Class II locations, Groups E, F, and G, the classification involves the tightness of the joints of assembly and shaft openings to prevent the entrance of dust in the dust-ignitionproof enclosure, the blanketing effect of layers of dust on the equipment that may cause overheating, and the ignition temperature of the dust. It is necessary, therefore, that equipment be identified not only for the class but also for the specific group of dust that will be present.

Informational Note No. 3: See ANSI/IEEE C2, *National Electrical Safety Code*, Section 127A, Coal Handling Areas. Certain dusts might require additional precautions due to chemical phenomena that can result in the generation of ignitable gases.

Statement of Problem and Substantiation for Public Input

Number has changed.

Submitter Information Verification

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Submission Date: Wed Sep 06 07:28:03 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8258-NFPA 70-2024](#)

Statement: The section information for the extracted text is revised to correlate with the latest revision to NFPA 499.

**Public Input No. 2913-NFPA 70-2023 [Section No. 500.6(C)]**

(C) Class III Combustible Fibers/Flyings.

~~Combustible- Nonmetal combustible~~ fibers/flyings shall not be further grouped. Metal combustible fibers/flyings shall be grouped as Class II, Division 1, Group E.

Statement of Problem and Substantiation for Public Input

The current text stating that combustible fibers/flyings are not further grouped is incorrect. The 2023 revision group metal combustible fibers/flyings in Class II, Division 1, Group E. The current text conflicts with the 2023 revision. Metal combustible fibers/flyings should also be added to in 500.6(B)(1).

Submitter Information Verification

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Submittal Date: Sun Aug 27 12:53:46 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The intent of the changes for metal combustible fibers/flyings is to leave their requirements under Class III. Class III requires metal combustible fibers/flyings to be classified as Class II, Division 1, Group E.



Public Input No. 1055-NFPA 70-2023 [Section No. 500.7(K)(2)]

(2) Inadequate Ventilation.

A location, enclosed space, or building ~~that is~~ classified as a Class I, Division 1 location due to inadequate ~~ventilation~~ ~~and is provided with a detection system for flammable gases shall~~ ventilation shall be permitted to use Class I, Division 2 electrical equipment, installation methods, and wiring practices ~~suitable for Class I, Division 2 installations.~~ ~~Sensing a gas concentration of not more than 40 percent of~~ ~~if it is provided with a detection system for flammable gases.~~ The detection system shall activate an alarm if it senses a gas concentration that reaches 40 percent of the lower flammable limit or a gas detector system malfunction shall activate an alarm (audible or if the detection system malfunctions. The alarm shall be permitted to be audio, visual, or both, as whichever is most appropriate for the area}.

Statement of Problem and Substantiation for Public Input

The text of the subdivision is revised to produce clear and unambiguous language as required by Section 3.5 and improving sentence structure in accordance with subdivision 3.5,.1,1 of the 2023 NEC Style Manual.

Submitter Information Verification

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Submittal Date: Mon Jun 12 20:53:26 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: FR-8409-NFPA 70-2024

Statement: The panel has rewritten the requirement for usability, and clarity, without changing the intent of the current published text.

**Public Input No. 3300-NFPA 70-2023 [Section No. 500.7(K)(4)]****(4) Interior of a Control Panel.**

Inside the interior of a control panel containing instrumentation or other equipment using or measuring flammable liquids, gases, or vapors which is provided with a detection system for flammable gases shall be permitted to use electrical equipment, installation methods, and wiring practices suitable for Class I, Division 2 installations.

An alarm (audible or visual, or both) shall be sounded at not more than 40 percent of the lower flammable limit.

When the equipment is protected by pressurization, use of a gas detection system does not eliminate the need for the purge cycle.

Statement of Problem and Substantiation for Public Input

In UL 60079-2, gas detection is not permitted to bypass the need for a proper purge cycle, due to the nature of the complexity within the equipment. The ability of the gas detection system to monitor all locations within the equipment assure there are no areas of hazardous material in all possible locations was determined to impractical, and therefore it was prohibited. Since equipment with a flammable material within the enclosure is often protected with pressurization, this is an important addition.

Submitter Information Verification

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Submission Date: Thu Aug 31 16:59:55 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: Section 500.7 and its subsections currently cover each protection method when used individually, but no mention of how an individual would use multiple protection methods or portions thereof. If a statement were to be included in the Code, it seems it would be more appropriate as a general statement in the charging language of 500.7. UL 60079-2 aligns to Zone protected equipment and NFPA 496 would be a better reference in the justification for a public comment. In addition, similar proposals would need to be considered for Article 505 to give corresponding permission in Zone locations.



Public Input No. 880-NFPA 70-2023 [Section No. 500.7 [Excluding any Sub-Sections]]

Electrical and electronic equipment in hazardous (classified) locations shall be protected by one or more of the techniques in 500.7(A) through (P U). Suitability of the protection techniques for specific hazardous locations is shown in Chapter 9, Table 13.

Statement of Problem and Substantiation for Public Input

Section 500.7 was revised in 2020 to have 21 protection techniques ending with 500.7(U). The 2023 list still ends with 500.7(P) which is 16 protection techniques. Based on the charging text of 500.7 we have 5 protection techniques that are not permitted to be used.

Submitter Information Verification

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Submittal Date: Tue May 23 21:09:13 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8262-NFPA 70-2024](#)

Statement: The charging text for 500.7 is editorially revised to include all the subdivisions. The current language includes (A) through (P) where it should have included (A) through (U).



Public Input No. 2719-NFPA 70-2023 [Section No. 500.8]

500.8 Equipment.

Explosionproof or dust-ignitionproof equipment shall not be permitted for use at temperatures lower than -25°C (-13°F) unless they are identified for low-temperature service.

Informational Note: At low ambient temperatures, flammable concentrations of vapors might not exist in a location classified as Class I, Division 1 at normal ambient temperature.

(A) Suitability.

Suitability of identified equipment shall be determined by one of the following:

- (1) Equipment listing or labeling
- (2) Evidence of equipment evaluation from a qualified testing laboratory or inspection agency concerned with product evaluation
- (3) Evidence acceptable to the authority having jurisdiction such as a manufacturer's self-evaluation or an owner's engineering judgment

Informational Note: Additional documentation for equipment might include certificates demonstrating compliance with applicable equipment standards, indicating special conditions of use, and providing other pertinent information.

(B) Approval for Class and Properties.

(1) Equipment Identification.

Equipment shall be identified not only for the class of location but also for the explosive, combustible, or ignitable properties of the specific gas, vapor, dust, or fibers/flyings that will be present. In addition, Class I equipment shall not have any exposed surface that operates at a temperature in excess of the autoignition temperature of the specific gas or vapor. Class II equipment shall not have an external temperature higher than that specified in 500.8(D)(2). Class III equipment shall not exceed the maximum surface temperatures specified in 503.5.

Exception No. 1: Group D equipment shall be permitted to be used for atmospheres containing butadiene if all conduit runs into explosionproof equipment are provided with explosionproof seals installed within 450 mm (18 in.) of the enclosure.

Exception No. 2: Group C equipment shall be permitted to be used for atmospheres containing allyl glycidyl ether, n-butyl glycidyl ether, ethylene oxide, propylene oxide, and acrolein if all conduit runs into explosionproof equipment are provided with explosionproof seals installed within 450 mm (18 in.) of the enclosure.

Informational Note: See 500.8(C)(6)(a) regarding general-purpose equipment. Luminaires and other heat-producing apparatus, switches, circuit breakers, and plugs and receptacles are potential sources of ignition and are investigated for suitability in classified locations. Such types of equipment, as well as cable terminations for entry into explosionproof enclosures, are available as listed for Class I, Division 2 locations. Fixed wiring, however, might use wiring methods that are not evaluated with respect to classified locations. Therefore, wiring products such as cable, raceways, boxes, and fittings are not marked as being suitable for Class I, Division 2 locations.

(2) Equipment Application.

Equipment identified for a Division 1 location shall be permitted in a Division 2 location of the same class, group, and temperature class and shall comply with the requirements of 500.8(B)(2)(a) or (B)(2)(b) as applicable.

(a) Intrinsically safe apparatus having a control drawing requiring the installation of associated apparatus for a Division 1 installation shall be permitted to be installed in a Division 2 location if the same associated apparatus is used for the Division 2 installation.

(b) Equipment required to be explosionproof shall incorporate seals in accordance with 501.15(A) or (D) when the wiring methods of 501.10(B) are employed.

(3) General-Purpose Equipment.

Where specifically permitted in ~~Part III of~~ Articles 501, 502, and 503, ~~Part III,~~ general-purpose equipment or equipment in general-purpose enclosures shall be permitted to be installed in Division 2 locations if the equipment does not constitute a source of ignition under normal operating conditions.

(4) Process Seals.

Equipment that depends on a single compression seal, diaphragm, or tube to prevent flammable or combustible fluids from entering the equipment shall be identified for a Class I, Division 2 location even if installed in an unclassified location. Equipment installed in a Class I, Division 1 location shall be identified for the Class I, Division 1 location.

Informational Note: Equipment used for flow measurement is an example of equipment having a single compression seal, diaphragm, or tube.

(5) Motors.

Unless otherwise specified, normal operating conditions for motors shall be assumed to be rated full-load steady conditions.

(6) Simultaneous Classifications.

Where flammable gases, flammable liquid–produced vapors, or combustible liquid–produced vapors and combustible dusts are or might be present at the same time, the simultaneous presence of the specific materials shall be considered when determining the safe operating temperature of the electrical equipment.

(C) Marking.

Equipment shall be marked to show the environment for which it has been evaluated. Unless otherwise specified or allowed in 500.8(C)(6), the marking shall include the information specified in 500.8(C)(1) through (C)(5).

(1) Class.

The marking shall specify the class(es) for which the equipment is suitable.

(2) Division.

The marking shall specify the division if the equipment is suitable for Division 2 only. Equipment suitable for Division 1 shall be permitted to omit the division marking.

Informational Note: See 500.8(B)(2). Equipment not marked to indicate a division, or marked “Division 1” or “Div. 1,” is suitable for both Division 1 and Division 2 locations. Equipment marked “Division 2” or “Div. 2” is suitable for Division 2 locations only.

(3) Material Classification Group.

The marking shall specify the applicable material classification group(s) or specific gas, vapor, dust, or fiber/flying in accordance with 500.6.

Exception: Fixed luminaires marked for use only in Class I, Division 2 or Class II, Division 2 locations shall not be required to indicate the group.

Informational Note: A specific gas, vapor, dust, or fiber/flying is typically identified by the generic name, chemical formula, CAS number, or combination thereof.

(4) Equipment Temperature.

The marking shall specify the temperature class or operating temperature at a 40°C ambient temperature, or at the higher ambient temperature if the equipment is rated and marked for an ambient temperature of greater than 40°C. For equipment installed in a Class II, Division 1 location, the temperature class or operating temperature shall be based on operation of the equipment when blanketed with the maximum amount of dust that can accumulate on the equipment. The temperature class, if provided, shall be indicated using the temperature class (T codes) shown in Table 500.8(C)(4). Equipment for Class I and Class II shall be marked with the maximum safe operating temperature, as determined by simultaneous exposure to the combinations of Class I and Class II conditions.

Table 500.8(C)(4) Classification of Maximum Surface Temperature

Maximum Temperature		Temperature Class
°C	°F	(T Code)
450	842	T1
300	572	T2
280	536	T2A
260	500	T2B
230	446	T2C
215	419	T2D
200	392	T3
180	356	T3A
165	329	T3B
160	320	T3C
135	275	T4
120	248	T4A
100	212	T5
85	185	T6

Exception: Equipment of the non–heat-producing type, such as junction boxes, conduit, and fittings, and equipment of the heat-producing type having a maximum temperature not more than 100°C shall not be required to have a marked operating temperature or temperature class.

Informational Note: More than one marked temperature class or operating temperature, for gases and vapors, dusts, and different ambient temperatures, may appear.

(5) Ambient Temperature Range.

Electrical equipment designed for use in the ambient temperature range between -25°C to $+40^{\circ}\text{C}$ shall require no ambient temperature marking. For equipment rated for a temperature range other than -25°C to $+40^{\circ}\text{C}$, the marking shall specify the special range of ambient temperatures in degrees Celsius. The marking shall include either the symbol "Ta" or "Tamb."

Informational Note: As an example, such a marking might be " $-30^{\circ}\text{C} \leq \text{Ta} \leq +40^{\circ}\text{C}$."

(6) Special Allowances.

(a) *General-Purpose Equipment.* Fixed general-purpose equipment in Class I locations, other than fixed luminaires, that is acceptable for use in Class I, Division 2 locations shall not be required to be marked with the class, division, group, temperature class, or ambient temperature range.

(b) *Dusttight Equipment.* Fixed dusttight equipment, other than fixed luminaires, that is acceptable for use in Class II, Division 2 and Class III locations shall not be required to be marked with the class, division, group, temperature class, or ambient temperature range.

(c) *Associated Apparatus.* Associated intrinsically safe apparatus and associated nonincendive field wiring apparatus that are not protected by an alternative type of protection shall not be marked with the class, division, group, or temperature class. Associated intrinsically safe apparatus and associated nonincendive field wiring apparatus shall be marked with the class, division, and group of the apparatus to which it is to be connected.

(d) *Simple Apparatus.* "Simple apparatus" as defined in Article 100 Part III, shall not be required to be marked with class, division, group, temperature class, or ambient temperature range.

(D) Temperature.**(1) Class I Temperature.**

The temperature marking specified in 500.8(C) shall not exceed the autoignition temperature of the specific gas or vapor to be encountered.

Informational Note: See NFPA 497, *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, for information on autoignition temperatures of gases and vapors.

(2) Class II Temperature.

The temperature marking specified in 500.8(C) shall be less than the ignition temperature of the specific dust or metal fiber/flying to be encountered. For organic dusts that might dehydrate or carbonize, the temperature marking shall not exceed the lower of either the ignition temperature or 165°C (329°F).

Informational Note: See NFPA 499, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, for minimum ignition temperatures of specific dusts.

(3) Class III Temperature.

The temperature marking specified in 500.8(C) shall be less than the ignition temperature of the specific fiber/flying to be encountered, except as specified in 500.8(D)(3)(a) or (D)(3)(b).

(a) For nonmetal combustible fibers/flyings that might dehydrate or carbonize, the temperature marking shall not exceed the lower of either the ignition temperature or 165°C (329°F).

(b) When ignitable fibers/flyings are present, the maximum surface temperatures under operating conditions shall not exceed 165°C (329°F) for equipment that is not subject to overloading, and 120°C (248°F) for equipment (such as motors or power transformers) that might be overloaded.

(E) Threading.

The supply connection entry thread form shall be NPT or metric. Conduit and fittings shall be made wrenchtight to prevent sparking when fault current flows through the conduit system, and to ensure the explosionproof integrity of the conduit system where applicable. Equipment provided with threaded entries for field wiring connections shall be installed in accordance with 500.8(E)(1) or (E)(2) and with (E)(3).

(1) Equipment Provided with Threaded Entries for NPT-Threaded Conduit or Fittings.

For equipment provided with threaded entries for NPT-threaded conduit or fittings, listed conduit, listed conduit fittings, or listed cable fittings shall be used. All NPT-threaded conduit and fittings shall be threaded with a National (American) Standard Pipe Taper (NPT) thread.

NPT-threaded entries into explosionproof equipment shall be made up with at least five threads fully engaged.

Exception: For listed explosionproof equipment, joints with factory-threaded NPT entries shall be made up with at least four and one-half threads fully engaged.

Informational Note No. 1: See ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*, for thread specifications for male NPT threads.

Informational Note No. 2: See ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*, and ANSI/UL 1203, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*, for information on female NPT-threaded entries using modified National Standard Pipe Taper (NPT) threads.

(2) Equipment Provided with Threaded Entries for Metric-Threaded Fittings.

For equipment with metric-threaded entries, listed conduit fittings or listed cable fittings shall be used. Such entries shall be identified as being metric, or listed adapters to permit connection to conduit or NPT-threaded fittings shall be provided with the equipment and shall be used for connection to conduit or NPT-threaded fittings.

Metric-threaded fittings installed into explosionproof equipment shall have a class of fit of at least 6g/6H and shall be made up with at least five threads fully engaged.

Informational Note: See ISO 965-1, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data*, and ISO 965-3, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads*, for threading specifications for metric-threaded entries.

(3) Unused Openings.

All unused openings shall be closed with blanking elements or close-up plugs that are listed for the location. The thread engagement shall comply with the requirements of 500.8(E)(1) or (E)(2).

(F) Optical Fiber Cables.

An optical fiber cable, with or without current-carrying conductors (hybrid optical fiber cable), shall be installed to address the associated fire hazard and sealed to address the associated explosion hazard in accordance with ~~Part II~~ of Articles 501, 502, or 503, ~~Part II~~, as applicable.

(G) Equipment Involving Optical Radiation.

The risk of ignition from optical radiation shall be evaluated for laser equipment, optical fiber equipment, and any other convergent light sources or beams where light is focused in one single point within a hazardous area with a wavelength range of 380 nm to 10 µm. This requirement shall include optical equipment that is located outside the explosive atmosphere, but whose emitted optical radiation enters such atmospheres.

Informational Note: See ANSI/UL 60079-28, *Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation*, for information on types of protection that can be applied to minimize the risk of ignition in explosive atmospheres from optical radiation.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 24 19:13:21 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8807-NFPA 70-2024](#)

Statement: The panel has rewritten the section to comply with the NEC® Style Manual, pointing the user to the article before the specific part of the article. In addition, the pointer to "Article 100, Part III" was revised to "Article 100", as the parts were removed in the 2023 code cycle. 500.8(C)(5) is rewritten for clarity and usability, but the intent of the existing code requirement remains unchanged.



Public Input No. 879-NFPA 70-2023 [Section No. 500.8(B)(1)]

(1) Equipment Identification.

Equipment shall be identified not only for the class of location but also for the explosive, combustible, or ignitable properties of the specific gas, vapor, dust, or fibers/flyings that will be present. In addition, Class I equipment shall not have any exposed surface that operates at a temperature ~~in excess of~~ higher than the autoignition temperature of the specific gas or vapor. Class II equipment shall not have an external temperature higher than that specified in 500.8(D) (2). Class III equipment shall not exceed the maximum surface temperatures specified in 503.5.

Exception No. 1: Group D equipment shall be permitted to be used for atmospheres containing butadiene if all conduit runs into explosionproof equipment are provided with explosionproof seals installed within 450 mm (18 in.) of the enclosure.

Exception No. 2: Group C equipment shall be permitted to be used for atmospheres containing allyl glycidyl ether, n-butyl glycidyl ether, ethylene oxide, propylene oxide, and acrolein if all conduit runs into explosionproof equipment are provided with explosionproof seals installed within 450 mm (18 in.) of the enclosure.

Informational Note No. 1: See 500.8(C)(6)(a) regarding general-purpose equipment. Luminaires and other heat-producing apparatus, switches, circuit breakers, and plugs and receptacles are potential sources of ignition and are investigated for suitability in classified locations. Such types of equipment, as well as cable terminations for entry into explosionproof enclosures, are available as listed for Class I, Division 2 locations. Fixed wiring, however, might use wiring methods that are not evaluated with respect to classified locations. Therefore, wiring products such as cable, raceways, boxes, and fittings are not marked as being suitable for Class I, Division 2 locations.

Informational Note No. 2: The explosion characteristics of air mixtures of gases and vapors vary with the specific material involved. For Class I locations, Groups A, B, C, and D the classification involves determinations of maximum explosion pressure and maximum safe clearance between parts of a clamped joint in an enclosure.

Statement of Problem and Substantiation for Public Input

The phrase "higher than" is more appropriate to use than "in excess of" when we are referring to temperatures. Additionally, the first sentence of Informational Note No. 1 under 500.6(A) has been relocated as Informational Note No. 2 under 500.8(B)(1). The second sentence of Informational Note No. 1 under 500.6(A) was deleted because the requirement is found in this section.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 878-NFPA 70-2023 [Section No. 500.6(A) [Excluding any Sub-Sections]]	New Informational Note No. 2 contains the relocated text from deleted Informational Note No. 1 under 500.6(A).

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submission Date: Tue May 23 20:15:42 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: CMP14 did not find the current language in conflict with the 2023 NEC Style Manual. The relocation of Informational Note 2 does not add clarity.



Public Input No. 3301-NFPA 70-2023 [Section No. 500.8(B)(2)]

(2) Equipment Application.

Equipment identified for a Division 1 location shall be permitted in a Division 2 location of the same class, group, and temperature class and shall comply with the requirements of 500.8(B)(2)(a) or (B)(2)(b) as applicable.

(a) Intrinsically safe apparatus having a control drawing requiring the installation of associated apparatus for a Division 1 installation shall be permitted to be installed in a Division 2 location if the same associated apparatus is used for the Division 2 installation. It is permitted to use an intrinsically safe associated apparatus listed for Division 1 installations for installations of nonincendive field wiring apparatus using NIFW.

(b) Equipment required to be explosionproof shall incorporate seals in accordance with 501.15(A) or (D) when the wiring methods of 501.10(B) are employed.

Statement of Problem and Substantiation for Public Input

Additional text to clarify that IS apparatus and associated apparatus can be used as part of NIFW circuits and installation even if not specifically stated on a control drawing.

Submitter Information Verification

Submitter Full Name: Glen Edwards
Organization: Detector Electronics Corporati
Affiliation: International Society of Automation (ISA)
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 31 17:02:30 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The scope of 500.8(B)(2) is limited to permission to install Division 1 intrinsic safety equipment in a Division 2 location. The PI proposes that there is a permission in (a) to install Division 2 NIFW equipment in a Division 2 location when powered by an intrinsic safety associated apparatus. Additionally, the substantiation infers that the installer does not have to adhere to the requirements found in the control drawing(s) for the NIFW equipment which conflicts with several other parts of the NEC including 501.10(B)(3), 502.10(B)(3) and 503.10(B)(4). Sections 501.10(B)(3), 502.10(B)(3) and 503.10(B)(4) would be more appropriate location for the changes requested in the PI. The proposed revision also does not adhere to the definition of Control Drawing: that details the allowed interconnections between intrinsically safe and associated apparatus or between the nonincendive field wiring apparatus or associated nonincendive field wiring apparatus.

**Public Input No. 882-NFPA 70-2023 [Section No. 500.8(C)(5)]****(5) Ambient Temperature Range.**

Electrical equipment designed for use in the ambient temperature range between -25°C to $+40^{\circ}\text{C}$ shall not require ~~no~~ an ambient temperature marking. For equipment rated for a temperature range other than -25°C to $+40^{\circ}\text{C}$, the marking shall specify the special range of ambient temperatures in degrees Celsius. The marking shall include either the symbol "Ta" or "Tamb."

Informational Note: As an example, such a marking might be " $-30^{\circ}\text{C} \leq \text{Ta} \leq +40^{\circ}\text{C}$."

Statement of Problem and Substantiation for Public Input

The text is revised to comply with Section 3.1.1 of the 2020 NEC Style Manual.

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 23 22:00:38 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8806-NFPA 70-2024](#)

Statement: The panel has rewritten the section to comply with the NEC® Style Manual, pointing the user to the article before the specific part of the article. In addition, the pointer to "Article 100, Part III" was revised to "Article 100", as the parts were removed in the 2023 code cycle. 500.8(C)(5) is rewritten for clarity and usability, but the intent of the existing code requirement remains unchanged.



Public Input No. 1481-NFPA 70-2023 [Section No. 500.8(C)(6)]

(6) Special Allowances.

(a) *General-Purpose Equipment.* Fixed general-purpose equipment in Class I locations, other than fixed luminaires, that is acceptable for use in Class I, Division 2 locations shall not be required to be marked with the class, division, group, temperature class, or ambient temperature range.

(b) *Dusttight Equipment.* Fixed dusttight equipment, other than fixed luminaires, that is acceptable for use in Class II, Division 2 and Class III locations shall not be required to be marked with the class, division, group, temperature class, or ambient temperature range.

(c) *Associated Apparatus.* Associated intrinsically safe apparatus and associated nonincendive field wiring apparatus that are not protected by an alternative type of protection shall not be marked with the class, division, group, or temperature class. Associated intrinsically safe apparatus and associated nonincendive field wiring apparatus shall be marked with the class, division, and group of the apparatus to which it is to be connected.

(d) *Simple Apparatus.* "Simple apparatus" as defined in Article 100- ~~Part III~~, shall not be required to be marked with class, division, group, temperature class, or ambient temperature range.

Statement of Problem and Substantiation for Public Input

The statement contains a reference to Part III of Article 100 which no longer exists and therefore should be deleted.

Submitter Information Verification

Submitter Full Name: Roger Zieg
Organization: NTT
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 20 18:37:47 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8805-NFPA 70-2024](#)

Statement: The panel has rewritten the section to comply with the NEC® Style Manual, pointing the user to the article before the specific part of the article. In addition, the pointer to "Article 100, Part III" was revised to "Article 100", as the parts were removed in the 2023 code cycle. 500.8(C)(5) is rewritten for clarity and usability, but the intent of the existing code requirement remains unchanged.



Public Input No. 870-NFPA 70-2023 [Section No. 500.8(C)(6)]

(6) Special Allowances.

(a) General-Purpose Equipment.

~~Fixed~~

~~In Class I locations fixed general-purpose~~

~~equipment in Class I locations, other than fixed luminaires, that is acceptable equipment acceptable for use in Class I, Division 2 locations other than fixed luminaires, shall not be required to be marked with the class, division, group, temperature class, or ambient temperature range.~~

(b) Dusttight Equipment. Fixed dusttight

~~equipment, other than fixed luminaires, that~~

~~equipment that is acceptable for use in Class II, Division 2 and Class III locations other than fixed luminaires shall not be required to be marked with the class, division, group, temperature class, or ambient temperature range.~~

(c) Associated Apparatus. Associated intrinsically safe apparatus and associated nonincendive field wiring apparatus that are not protected by an alternative type of protection shall not be marked with the class, division, group, or temperature class. Associated intrinsically safe apparatus and associated nonincendive field wiring apparatus shall be marked with the class, division, and group of the apparatus to which it is to be connected.

(d) Simple Apparatus.

~~“Simple apparatus” as defined in Article 100 Part III, shall~~

~~Simple apparatus shall not be required to be marked with class, division, group, temperature class, or ambient temperature range.~~

Statement of Problem and Substantiation for Public Input

The Parts in Article 100 were removed in the 2023 revision cycle and removing the Part from the reference creates a conflict with Section 4.1.4 of the 2020 NEC Style Manual. Removal of the reference does not create adds consistency to the section since there are no references to Article 100 for definitions of associated apparatus, intrinsically safe apparatus, and associated nonincendive field wiring apparatus. The remaining changes are made to comply with Section 3.3.1.2 of the 2020 NEC Style Manual. Commas and dependent clauses were removed.

Submitter Information Verification

Submitter Full Name: John Simmons

Organization: Florida East Coast JATC

Affiliation: IBEW

Street Address:

City:

State:

Zip:

Submittal Date: Mon May 22 11:30:55 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: CMP14 affirms that the language as currently written is clear and does not agree to change the requirements as proposed. The Parts in Article 100 were removed in the 2023 revision cycle and removing the Part from the reference creates a conflict with Section 4.1.4 of the NEC Style Manual.



Public Input No. 885-NFPA 70-2023 [Section No. 500.8(E)(1)]

(1) Equipment Provided with Threaded Entries for NPT-Threaded Conduit or Fittings.

~~For equipment provided—Conduit, conduit fittings, and cable fittings shall be listed where they are used for equipment with threaded entries for NPT-threaded conduit or fittings, listed conduit, listed conduit fittings, or listed cable fittings shall be used. All~~ All NPT-threaded conduit and fittings shall be threaded with a National (American) Standard Pipe Taper (NPT) thread. ~~NPT~~ NPT -threaded entries into explosionproof equipment shall be made up with at least five threads fully engaged.

Exception: For listed explosionproof equipment, joints with factory-threaded NPT entries shall be made up with at least four and one-half threads fully engaged.

Informational Note No. 1: See ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*, for thread specifications for male NPT threads.

Informational Note No. 2: See ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*, and ANSI/UL 1203, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*, for information on female NPT-threaded entries using modified National Standard Pipe Taper (NPT) threads.

Statement of Problem and Substantiation for Public Input

The first sentence is revised to add clarity and improve readability. The main intent of the first sentence is to require listed conduit, conduit fittings, and cable fittings. The revised text expresses the requirement more clearly.

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 24 13:15:08 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: This section addresses equipment and does not address raceway and fittings. The proposed revision of the section created additional confusion.



Public Input No. 886-NFPA 70-2023 [Section No. 500.8(E)(2)]

(2) Equipment Provided with Threaded Entries for Metric-Threaded Fittings.

~~For equipment with metric-threaded entries, listed~~ Listed conduit fittings ~~or listed and listed~~ cable fittings shall be used ~~for equipment with metric-threaded entries. Such~~ entries shall be identified as being metric, or listed adapters shall be provided with the equipment to permit connection to conduit or NPT-threaded fittings. The adapters shall be ~~provided with the equipment and shall be~~ used for connection to conduit or NPT-threaded fittings.

Metric-threaded fittings installed into explosionproof equipment shall have a class of fit of at least 6g/6H and shall be made up with at least five threads fully engaged.

Informational Note: See ISO 965-1, ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data, and ISO 965-3, ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads, for threading specifications for metric-threaded entries.

Statement of Problem and Substantiation for Public Input

The first sentence is revised to add clarity and improve readability. The main intent of the first sentence is to require listed conduit, conduit fittings, and cable fittings. The revised text expresses the requirement more clearly and conforms to Section 3.3 of the NEC Style Manual.

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 24 13:57:51 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: CMP17 affirms that the language as currently written is clear and does not agree to change the requirements as proposed. See related first revision on this section.



Public Input No. 661-NFPA 70-2023 [Section No. 500.8(E)(3)]

(3) Unused Openings.

All unused openings of explosionproof equipment shall be closed with blanking elements or close-up plugs that are listed for the location. The thread engagement shall comply with the requirements of 500.8(E)(1) or (E)(2).

Statement of Problem and Substantiation for Public Input

Apparently, this Section has recently been applied to closing unused raceways. This is basically a reflection of Section 408.7 which clearly reflects using closures for switching equipment rather than raceways. Closing unused raceways is still valuable, of course, but simple listed endcaps should be sufficient.

Submitter Information Verification

Submitter Full Name: Robert Alexander
Organization: Robert B Alexander
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 19 16:52:16 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: Section 500.8 applies to equipment in all Class I, Class II, and Class III locations. Subdivision 500.8(E)(3) applies to all of the equipment in these locations that is provided with threaded entries and is not limited to explosionproof enclosures. Nothing in the current wording of the subdivision requires unused raceways to be closed.

**Public Input No. 887-NFPA 70-2023 [Section No. 500.8(F)]**

(F) Optical Fiber Cables.

~~An Hybrid~~ optical fiber cable, with or without current-carrying ~~conductors (hybrid optical fiber cable)~~, shall ~~conductors shall~~ be installed to address the associated fire hazard and sealed to address the associated explosion hazard in accordance with Part II of Articles 501, 502, or 503, as applicable.

Statement of Problem and Substantiation for Public Input

There is no need to begin the subdivision with "An optical fiber cable" when what we are addressing is hybrid optical fiber cable which is defined in Article 100. Additionally, Section 3.3.1.2 of the 2020 NEC Style Manual warns that parenthetical expressions often create confusion and misunderstanding. Section 3.3.1.5 states: "If possible, avoid using dependent clauses, parenthetical phrases, and unclear inverted word order."

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 24 14:14:16 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8277-NFPA 70-2024](#)

Statement: CMP14 agreed that the language of 500.8(F) was confusing. The proposed change is revised to delete the phrase "hybrid optical fiber cable" in parentheses. The remaining text will make it clear that the requirement applies to optical fiber cable whether or not it contains current carrying conductors. CMP14 has rewritten the section to comply with the NEC® Style Manual, pointing the user to the article before the specific part of the article.



Public Input No. 1879-NFPA 70-2023 [New Section after 500.8(G)]

500.30 Bonding in Hazardous (Classified) Locations.

Regardless of the voltage of the electrical system, wiring systems and equipment in Class I, Division 1, Class I, Division 2, Class II, Division 1, Class II, Division 2, Class III, Division 1, and Class III, Division 2 locations shall comply with the specific bonding requirements in 500.30(A) and (B) in addition to the general bonding requirements in Chapter 2 of this Code .

(A) Specific Bonding Means.

(1) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between Class I locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(2) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

(B) Specific Bonding for Flexible Metal Conduit and Liquidtight Flexible Metal Conduit.

Flexible metal conduit and liquidtight flexible metal conduit shall comply with 500.30(B)(1) and (B)(2).

(1) Flexible metal conduit and liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

(2) In Class I, Division 2 locations, the bonding jumper shall not be required where all of the following conditions are met:

(a) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.

(b) Overcurrent protection in the circuit is limited to 10 amperes or less.

(c) The load is part of a meter, instrument, or relay circuit.

..

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
500.30_New_JS.docx	New revised bonding section.	

Statement of Problem and Substantiation for Public Input

The grounding and bonding requirements for Articles 501, 502, and 503, as modified in this PI should be in Article 500. The scope of Article 500 states that the article covers the general requirements for the class/division system. The bonding requirements in the revised section are the same for the three articles. They modify requirements in Article 250 which according to 90.3 apply in general to all electrical installations. Adding the bonding to Article 500 the bonding section and deleting the grounding and bonding requirements from Articles 501, 502, and 503 will add clarity to the hazardous location articles by eliminating repeated text. The revision to the dot 30 section limits the grounding requirements to Article 250 to Part I and Part VI and limits bonding to Article 250 Part I and Part V plus the special bonding requirements. The requirement for each one is saying that these parts are the only ones that apply to hazardous(classified) locations. While 90.3 does state that Chapters 1 through 4 apply in general to all installations it also says that Chapters 5 through 7 supplement or modify Chapters 1 through 4. It can be argued that the current "dot 30" sections in Articles 501, 502, 503, 505, and 506 limit (modify) the grounding and bonding in hazardous locations to Parts I, IV, and V. Regardless of the answer the section is not clear and needs to be revised. There are bonding and grounding requirements in each of the ten parts of Article 250 that might apply to an installation in a hazardous (classified) location at one time or another. With the restriction in the 2023 NEC Style Manual that prohibits using references to complete articles in the current language of 501.30 cannot be easily fixed. Removing grounding from the section eliminates that part of the problem and in truth the section does not modify or supplement grounding, so it doesn't belong. As for bonding, the revised language should correct the problem. Removing the reference to two parts of Article 250 removes any idea that the other parts are not valid and making the reference to the general bonding requirements of Chapter 2 of this Code leads to Article 250 indirectly without violating the Style Manual. Separate PIs are submitted to delete the dot 30 sections from Articles

501, 502, and 503. Separate PIs are also submitted to revise the text of 505.30 and 5065.30 to be parallel with text revised text in this PI.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1882-NFPA 70-2023 [Section No. 503.30]	Parallel Construction.
Public Input No. 1881-NFPA 70-2023 [Section No. 502.30]	Parallel Construction.
Public Input No. 1880-NFPA 70-2023 [Section No. 501.30]	Parallel Construction.
Public Input No. 1665-NFPA 70-2023 [Section No. 506.30]	Parallel Construction.
Public Input No. 1664-NFPA 70-2023 [Section No. 505.30]	Parallel Construction.
Public Input No. 1664-NFPA 70-2023 [Section No. 505.30]	
Public Input No. 1665-NFPA 70-2023 [Section No. 506.30]	
Public Input No. 1880-NFPA 70-2023 [Section No. 501.30]	
Public Input No. 1881-NFPA 70-2023 [Section No. 502.30]	
Public Input No. 1882-NFPA 70-2023 [Section No. 503.30]	

Submitter Information Verification

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Submittal Date: Sun Aug 06 20:04:21 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8284-NFPA 70-2024](#)

Statement: The grounding requirements and bonding requirements for hazardous (classified) locations have been revised. The grounding requirement in the dot 30 sections referenced Parts I and VI of Article 250. The reference to two of the parts could be construed to mean that the other Parts did not apply to hazardous (classified) locations. Additionally, based on 90.3 Chapters 5-7 can only supplement or modify Chapters 1-4. The grounding requirements did not belong in the dot 30 sections. The specific bonding requirements have not changed other than removing the reference to Parts I and V. The parent text is revised to require compliance with the bonding and grounding requirements in Chapter 2.

500.30 Bonding in Hazardous (Classified) Locations.

Regardless of the voltage of the electrical system, wiring systems and equipment in Class I, Division 1, Class I, Division 2, Class II, Division 1, Class II, Division 2, Class III, Division 1, and Class III, Division 2 locations shall comply with the specific bonding requirements in 500.30(A) and (B) in addition to the general bonding requirements in Chapter 2 of this *Code*.

(A) Specific Bonding Means.

(1) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between Class I locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(2) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

(B) Specific Bonding for Flexible Metal Conduit and Liquidtight Flexible Metal Conduit.

Flexible metal conduit and liquidtight flexible metal conduit shall comply with 500.30(B)(1) and (B)(2).

(1) Flexible metal conduit and liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

(2) In Class I, Division 2 locations, the bonding jumper shall not be required where all of the following conditions are met:

(a) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.

(b) Overcurrent protection in the circuit is limited to 10 amperes or less.

(c) The load is part of a meter, instrument, or relay circuit.



Public Input No. 888-NFPA 70-2023 [Section No. 500.8(G)]

(G) Equipment Involving Optical Radiation.

The risk of ignition from optical radiation shall be evaluated for laser equipment, optical fiber equipment, and any other convergent light sources or beams where light in a wavelength range of 380nm to 10 μm is focused in one single point within a hazardous area- ~~with a wavelength range of 380 nm to 10 μm~~. This requirement shall include optical equipment that is located outside the explosive ~~atmosphere, but whose emitted atmosphere but where its emitted~~ optical radiation enters such atmospheres.

Informational Note: See ANSI/UL 60079-28, *Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation*, for information on types of protection that can be applied to minimize the risk of ignition in explosive atmospheres from optical radiation.

Statement of Problem and Substantiation for Public Input

The first sentence is revised for clarity and readability.

Submitter Information Verification

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Submission Date: Wed May 24 14:46:34 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8288-NFPA 70-2024](#)

Statement: CMP-14 agrees that the language of 500.8(G) is broken but doesn't believe the proposed revision completely fixes the problem. The new proposed text adds readability and it makes it clear that the section requirements apply to the equipment addressed in the section if it is in a hazardous location or if it is outside of a hazardous location and emitting optical radiation into the hazardous location.



Public Input No. 1975-NFPA 70-2023 [New Section after 501.1]

501.3 Reconditioned Equipment

501.3(A) Permitted to be Installed.

Reconditioned equipment shall be permitted to be installed in hazardous (classified) locations if the reconditioning is conducted in accordance with the manufacturer's instructions or, if no instructions are provided, nationally recognized standards.

(1) Reconditioned Motors or Generators.

Reconditioning of a Class I, Division 1, explosionproof motor, or a Class I, Division 1 explosionproof generator listed for use in hazardous (classified) locations shall be listed as reconditioned when installed (or reinstalled) in a hazardous (classified) location. Reconditioning of a Class I, Division 1 explosionproof motor, or a Class I, Division 1 explosionproof generator identified for use in hazardous (classified) locations shall be identified as reconditioned when installed (or reinstalled) in a hazardous (classified) location, in accordance with 500.8(A). Reconditioning of a motor or generator with explosionproof construction features is considered to take place when the motor or generator is removed from service for repairs, including replacement of a failed bearing. The explosionproof features of any reconditioned, explosionproof, motor or generator are verified as a part of the reconditioning or refurbishing process.

Informational Note 1: See UL 674, *Electric Motors and Generators for Use in Hazardous (Classified) Locations* for construction and test requirements for explosionproof motors and generators.

Informational Note 2: See ANSI/EASA AR100, *Recommended Practice for the Repair of Rotating Electrical Apparatus*, for information on the rewinding and repair of motors.

501.3(B) Not Permitted to be Installed

(1) Intrinsically Safe Systems.

Reconditioned intrinsically safe systems are not permitted to be installed. Replacement of intrinsically safe, replaceable printed circuit board assemblies or modules, is permitted with like for like components, provided by the original manufacturer.

..

Statement of Problem and Substantiation for Public Input

An informal task group of CMP14 members (Rich Holub, Don Ankele, Dave Burns, Bill Lawrence, Mark Goodman, and Evans Massey) met to address the inclusion of a paragraph in the 2023 Edition of the NEC® in 430.2 which addressed listing of reconditioned motors in hazardous (classified) locations. The task group concluded that this language was out of scope for Article 430 and must reside in the Chapter 5 articles which cover hazardous (classified) location requirements. Current language in 501.125 and 502.125 allow motors to be identified for the location and doesn't specifically require them to be listed. Motors which were listed when constructed could be listed as reconditioned, but those just identified at the time of construction would then need to be identified in accordance with 500.8. Insertion of a listing requirement for reconditioned motors is contradictory to existing requirements because a motor which was never listed when first built could not be listed as reconditioned. As such, the CMP14 task group has proposed language stating reconditioned motors shall be identified as reconditioned, mirroring current requirements for the motors as stated in the relevant equipment sections. The task group concluded that reconditioning of intrinsically safe systems was not appropriate because no accepted practices to approve such reconditioning exists in the industry. Replacement, in kind, of intrinsically safe circuit board assemblies or modules is not considered reconditioning as it is compliant with the original manufacturer's listing and labeling.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1979-NFPA 70-2023 [Section No. 430.2]	

Submitter Information Verification

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Submittal Date: Wed Aug 09 07:09:06 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8293-NFPA 70-2024](#)

Statement: New section 501.3 places the requirements for reconditioned equipment in Article 501. Equipment must be reconditioned according to the manufacturer's instructions. Where there are none reconditioning must be according to nationally recognized standards. Specific reconditioning requirements are provided for motors and generators. Intrinsically safe systems are not permitted to be reconditioned. However printed circuit board assemblies or modules are permitted to be replaced with like for like components from the original manufacturer.

**Public Input No. 4214-NFPA 70-2023 [Section No. 501.10(A)]****(A) Class I, Division 1. (SEE WORD DOC.)****(1) General.**

In Class I, Division 1 locations, the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC), including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) PVC conduit, RTRC conduit, or HDPE conduit, where encased in a concrete envelope a minimum of 50 mm (2 in.) thick and provided with not less than 600 mm (24 in.) of cover measured from the top of the conduit to grade. The concrete encasement shall be permitted to be omitted where it is in accordance with 514.8(C) or 515.8(A). RMC or IMC conduit shall be used for the last 600 mm (24 in.) of the underground run to emergence or to the point of connection to the aboveground raceway. An equipment grounding conductor shall be included to provide for electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.
- (3) Type MI cable terminated with fittings listed for the location. Type MI cable shall be installed and supported to avoid tensile stress at the termination fittings.
- (4) In restricted industrial establishments, Type MC-HL cable listed for use in Class I, Zone 1 or Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, and a separate equipment grounding conductor(s) in accordance with 250.122, and terminated with fittings listed for the application. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type MC-HL cable shall be installed in accordance with Part II of Article 330.
- (5) In restricted industrial establishments, Type ITC-HL cable listed for use in Class I, Division 1 or Zone 1 locations, with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material, terminated with fittings listed for the application, and installed in accordance with 335.4.
- (6) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in raceways in accordance with 501.10(A). These optical fiber cables shall be sealed in accordance with 501.15.
- (7) In restricted industrial establishments for applications limited to 600 volts nominal or less, and where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type TC-ER-HL cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (8) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket, terminated with fittings listed for the location, and installed in accordance with Part II of Article 337. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22.

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable.

(2) Flexible Connections.

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one of the following shall be permitted:

- (1) Flexible fittings listed for the location.
- (2) Flexible cord in accordance with 501.140, terminated with cord connectors listed for the location.
- (3) In restricted industrial establishments, for applications limited to 600 volts nominal or less where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. The cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (4) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket where the cable is terminated with fittings listed for the location and installed in accordance with Part II of Article 337.

Informational Note No. 2: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable fittings.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

(3) Boxes and Fittings.

All boxes and fittings shall be identified for Class I, Division 1.

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables, explosionproof cable fittings, and explosionproof cord connectors for entry into enclosures required to be explosionproof.

Informational Note No. 2: See ANSI/UL 1203, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of explosionproof conduit fittings for entry into enclosures required to be explosionproof.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Article_501_PI_2023.docx	Revise 501.10(A)	

Statement of Problem and Substantiation for Public Input

The revised text to subdivision 501.10(A)(1) in this PI addresses text that does not comply with the following subdivisions of the 2023 NEC style Manual.

4.1.1 In the National Electrical Code (NFPA 70). General requirements contained in Chapters 1 through 4 shall not be repeated in other articles of the document. Committees shall always be mindful of the structure of the document as specified in 90.3 when contemplating the inclusion of a reference to another requirement. The use of redundant references shall be avoided. Only references to other requirements within the document shall be included.

3.5.1.1 Sentence Structure. Short, simple declarative sentences shall be used. Writing rules in long sentences full of commas, dependent clauses, and parenthetical expressions creates confusion and misunderstanding and shall be avoided. Requirements shall be written in multiple sentences or expressed using a list or table, or both to provide clarity.

3.5.1.2 Multiple Requirements. Multiple requirements within a single subdivision shall be avoided. Additional subdivisions or lists shall be used to express independent requirements.

2.1.8.2 Format. List items shall be single words, phrases, or sentences. Items in a list shall not contain titles. All items in a list shall have parallel construction. (See 3.5.5, Parallel Construction.)

(A)(1)(2) - The list item has four requirements, three indicated by the use of "shall" and the fourth is provided by the charging text. The revised subdivision corrects the use of the multiple requirements in a subdivision (Style Manual 3.5.1.2 and 2.1.6.3).

(A)(1)(4) – Editorial: The phrase "Class I, Zone 1 or Division 1" is corrected to say, "Class I, Division 1 or Zone 1". The requirement for MC-HL cable to be installed in accordance with Part II of Article 330 is deleted. The use and installation of MC-HL cable must meet all the requirements of Article 330 and not just Part II. Having this reference in 501.10(A)(1)(2) can cause confusion. Section 90.3 provides the arrangement of the NEC. Chapters 1 through 4 apply generally to all installations.

Chapters 5 through 7 supplement or modify Chapters 1 through 4. The reference to Part II of Article 330 neither supplements Article 330 nor does it modify the article. It merely says to look in Part II of Article 330 for those who are unfamiliar with the NEC. There may be some users who read this reference and think that it is the only portion of Article 330 that must be followed. Any person who is designing or installing electrical systems should not have to be reminded that any time he/she uses MC cable the installation must comply with Article 330. The designer/installer should also know about Article 250 and a few other articles if the installation is meant to be safe. Section 90.3 lets us know how the NEC is meant to be used. "The purpose of this Code is the practical safeguarding of persons and property from hazards arising from the use of electricity. This Code is not intended as a design specification or an instruction manual for untrained persons." This proposal also removes the Code references from (A)(5), (A)(7), and (A)(8).

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Submittal Date: Wed Sep 06 23:00:22 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: CMP14 affirms that the language as currently written is clear and does not agree to change the requirements as proposed.

501.10(A) Class I, Division 1.

(1) General.

~~In Raceway and cable wiring methods for Class I, Division 1 locations the following wiring methods shall be permitted in accordance with 501.10(A)(1) through 501.10(A)(8).~~

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment* [as applied to hazardous (classified) locations].

1. Threaded rigid metal conduit (RMC), ~~or~~ threaded intermediate metal conduit (IMC), ~~including~~. RMC conduit systems with supplemental corrosion protection coatings, or IMC conduit systems shall be permitted to have with supplemental corrosion protection coatings shall be permitted.
2. PVC conduit, RTRC conduit, or HDPE conduit shall be permitted where it is installed in accordance with the following.
 - (a). ~~The~~ conduit shall be encased in a concrete envelope with a minimum thickness of 50 mm (2 in.) and have not less than 600 mm (24 in.) of cover measured from the top of the concrete to grade.
 - (b). The concrete encasement shall not be required where the conduit is installed in accordance with 514.8(C) or 515.8(A) and RMC or IMC conduit ~~shall be~~ is used for the last 600 mm (24 in.) of the underground run to the point where it emerges from underground or to the point of connection to the aboveground raceway.
 - (c). The conduit run shall have an equipment grounding conductor.
3. Type MI cable shall be permitted where the cable is terminated with fittings listed for the location and ~~the~~ cable ~~shall be~~ is installed and supported to avoid tensile stress at the termination fittings.
4. Type MC-HL cable listed for use in Class I, ~~Zone 1 or~~ Division 1 or Zone 1 locations shall be permitted to be ~~used~~ installed in restricted industrial establishments in accordance with all the following.
 - (a) The cable shall have a gas/vaportight continuous corrugated metallic sheath with an overall jacket of suitable polymeric material.
 - (b) ~~The~~ cable shall have a separate equipment grounding conductor(s) in accordance with 250.122. ~~and~~
 - (c) The cable shall be terminated with fittings listed for the application.
 - (d) ~~The~~ cable shall be installed in accordance with 392.22 where it is installed in a ladder cable tray, ventilated trough cable tray, or ventilated channel cable tray. it shall be installed in accordance with 392.22.
~~Type MC-HL cable shall be installed in accordance with Part II of Article 330.~~
5. Type ITC-HL cable listed for use in Class I, Division 1 or Zone 1 locations shall ~~only~~ be permitted to be used in restricted industrial establishments in accordance with all the following.
 - (a) The cable shall have a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material.
 - (b) ~~The~~ cable shall be terminated with fittings listed for the application ~~and~~.
~~The cable shall be installed in accordance with 335.4.~~
6. Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC shall be permitted where it is installed in a raceways in accordance with 501.10(A) and ~~Optical fiber cables shall be sealed in accordance with 501.15.~~

7. Type TC-ER-HL cable shall be permitted for use in restricted industrial establishments for applications limited to 600 volts nominal or less where it is installed in accordance with all of the following.
- (a). The cable shall be terminated with fittings listed for the location and shall have protection against physical damage.
 - (b). The cable shall be installed in accordance with 392.22 where it is installed in a ladder cable tray, ventilated trough cable tray, or ventilated channel cable tray. ~~it shall be installed in accordance with 392.22.~~
 - (c). Type TC-ER-HL cable shall be listed for use in Class I, Division 1 or Zone 1 locations. ~~and shall be installed in accordance with 336.10.~~

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

8. Listed Type P cable shall be permitted in restricted industrial Establishments where it is installed in accordance with all the following.
- (a). The cable shall have metal braid armor and an overall jacket.
 - (b). The cable shall be terminated with fittings listed for the location. ~~and installed in accordance with Part II of Article 337.~~
 - (c). The cable shall be installed in accordance with 392.22 where it is installed in a ladder cable tray, ventilated trough cable tray, or ventilated channel cable tray. ~~it shall be installed in accordance with 392.22.~~

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable.



Public Input No. 2720-NFPA 70-2023 [Section No. 501.10(A)(1)]

(1) General.

In Class I, Division 1 locations, the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC), including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) PVC conduit, RTRC conduit, or HDPE conduit, where encased in a concrete envelope a minimum of 50 mm (2 in.) thick and provided with not less than 600 mm (24 in.) of cover measured from the top of the conduit to grade. The concrete encasement shall be permitted to be omitted where it is in accordance with 514.8(C) or 515.8(A). RMC or IMC conduit shall be used for the last 600 mm (24 in.) of the underground run to emergence or to the point of connection to the aboveground raceway. An equipment grounding conductor shall be included to provide for electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.
- (3) Type MI cable terminated with fittings listed for the location. Type MI cable shall be installed and supported to avoid tensile stress at the termination fittings.
- (4) In restricted industrial establishments, Type MC-HL cable listed for use in Class I, Zone 1 or Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, and a separate equipment grounding conductor(s) in accordance with 250.122, and terminated with fittings listed for the application. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type MC-HL cable shall be installed in accordance with ~~Part II of Article 330~~, Part II.
- (5) In restricted industrial establishments, Type ITC-HL cable listed for use in Class I, Division 1 or Zone 1 locations, with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material, terminated with fittings listed for the application, and installed in accordance with 335.4.
- (6) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in raceways in accordance with 501.10(A). These optical fiber cables shall be sealed in accordance with 501.15.
- (7) In restricted industrial establishments for applications limited to 600 volts nominal or less, and where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type TC-ER-HL cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (8) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket, terminated with fittings listed for the location, and installed in accordance with ~~Part II of Article 337~~, Part II. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22.

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

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State:**Zip:****Submittal Date:** Thu Aug 24 19:16:27 EDT 2023**Committee:** NEC-P14**Committee Statement****Resolution:** [FR-8305-NFPA 70-2024](#)**Statement:** This revised text adds fittings which are addressed in ANSI/UL 2225 to the requirement. CMP14 renumbered the informational notes in 501.10(A)(1) to comply with Section 2.1.10.4 of the 2023 NEC Style Manual. The committee updated the articles to relocate the listing requirements to the 501.2 section in accordance with Section 2.2 of the NEC® Style Manual.



Public Input No. 3302-NFPA 70-2023 [Section No. 501.10(A)(1)]

(1) General.

In Class I, Division 1 locations, the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC), including RMC or IMC conduit systems with supplemental corrosion protection coatings. For RMC or IMC that is PVC-Coated, factory elbows and associated fittings are required.
- (2) PVC conduit, RTRC conduit, or HDPE conduit, ~~where~~ with associated fittings and factory elbows where encased in a concrete envelope a minimum of 50 mm (2 in.) thick and provided with not less than 600 mm (24 in.) of cover measured from the top of the conduit to grade. The concrete encasement shall be permitted to be omitted where it is in accordance with 514.8(C) or 515.8(A). RMC or IMC conduit shall be used for the last 600 mm (24 in.) of the underground run to emergence or to the point of connection to the aboveground raceway. An equipment grounding conductor shall be included to provide for electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.
- (3) Type MI cable terminated with fittings listed for the location. Type MI cable shall be installed and supported to avoid tensile stress at the termination fittings.
- (4) In restricted industrial establishments, Type MC-HL cable listed for use in Class I, Zone 1 or Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, and a separate equipment grounding conductor(s) in accordance with 250.122, and terminated with fittings listed for the application. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type MC-HL cable shall be installed in accordance with Part II of Article 330.
- (5) In restricted industrial establishments, Type ITC-HL cable listed for use in Class I, Division 1 or Zone 1 locations, with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material, terminated with fittings listed for the application, and installed in accordance with 335.4.
- (6) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in raceways in accordance with 501.10(A). These optical fiber cables shall be sealed in accordance with 501.15.
- (7) In restricted industrial establishments for applications limited to 600 volts nominal or less, and where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type TC-ER-HL cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (8) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket, terminated with fittings listed for the location, and installed in accordance with Part II of Article 337. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22.

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable.

Statement of Problem and Substantiation for Public Input

We are clear in 501.10(B) for Div 2 that RMC and IMC can be coated with PVC to help with corrosion resistance, but it requires factory elbows and associated fittings. Likewise, We call for associated fittings and "factory elbows" in non-metallic conduit systems in div 2 in 501.10 (B)(1), but not in div 1. These should align or if different on purpose, some clarification notes would be helpful.

Submitter Information Verification

Submitter Full Name: Glen Edwards

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Affiliation: International Society of Automation (ISA)

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City:

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Zip:

Submittal Date: Thu Aug 31 17:06:11 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: CMP14 does not agree that the text needs to be added. PVC-coated RMC or IMC would require coated elbows and associated fittings to maintain the corrosion protection. There is no substantiation to show that the added text for PVC, RTRC, and HDPE is needed. Addition of the text in list item 2 would prevent field bending with hot boxes and other approved means.



Public Input No. 4318-NFPA 70-2023 [Section No. 501.10(A)(1)]

(1) General.

In Class I, Division 1 locations, the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC), including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) PVC conduit, RTRC conduit, or HDPE conduit, where encased in a concrete envelope a minimum of 50 mm (2 in.) thick and provided with not less than 600 mm (24 in.) of cover measured from the top of the conduit to grade. The concrete encasement shall be permitted to be omitted where it is in accordance with 514.8(C) or 515.8(A). RMC or IMC conduit shall be used for the last 600 mm (24 in.) of the underground run to emergence or to the point of connection to the aboveground raceway. An equipment grounding conductor shall be included to provide for electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.
- (3) Type MI cable terminated with fittings listed for the location. Type MI cable shall be installed and supported to avoid tensile stress at the termination fittings.
- (4) In restricted industrial establishments, Type MC-HL cable listed for use in Class I, Zone 1 or Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, and a separate equipment grounding conductor(s) in accordance with 250.122, and terminated with fittings listed for the application. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type MC-HL cable shall be installed in accordance with Part II of Article 330.
- (5) In restricted industrial establishments, Type ITC-HL cable listed for use in Class I, Division 1 or Zone 1 locations, with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material, terminated with fittings listed for the application, and installed in accordance with 335.4.
- (6) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in raceways in accordance with 501.10(A). These optical fiber cables shall be sealed in accordance with 501.15.
- (7) In restricted industrial establishments for applications limited to 600 volts nominal or less, and where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type TC-ER-HL cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (8) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket, terminated with fittings listed for the location, and installed in accordance with Part II of Article 337. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22.

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

To align text of informational note 3 with other similar notes relating to Type P cable (e.g. 501.10 B (1) (9) info note 3. I.e. add missing word "fittings".

Submitter Information Verification

Submitter Full Name: Andrew Wood
Organization: Land Instruments International
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 11:14:25 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8305-NFPA 70-2024](#)

Statement: This revised text adds fittings which are addressed in ANSI/UL 2225 to the requirement. CMP14 renumbered the informational notes in 501.10(A)(1) to comply with Section 2.1.10.4 of the 2023 NEC Style Manual. The committee updated the articles to relocate the listing requirements to the 501.2 section in accordance with Section 2.2 of the NEC® Style Manual.



Public Input No. 4409-NFPA 70-2023 [Section No. 501.10(A)(1)]

(1) General.

In Class I, Division 1 locations, the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC), including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) PVC conduit, RTRC conduit, or HDPE conduit, where encased in a concrete envelope a minimum of 50 mm (2 in.) thick and provided with not less than 600 mm (24 in.) of cover measured from the top of the conduit to grade. The concrete encasement shall be permitted to be omitted where it is in accordance with 514.8(C) or 515.8(A). RMC or IMC conduit shall be used for the last 600 mm (24 in.) of the underground run to emergence or to the point of connection to the aboveground raceway. An equipment grounding conductor shall be included to provide for electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.
- (3) Type MI cable terminated with fittings listed for the location. Type MI cable shall be installed and supported to avoid tensile stress at the termination fittings.
- (4) In restricted industrial establishments, Type MC-HL cable listed for use in Class I, Zone 1 or Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, and a separate equipment grounding conductor(s) in accordance with 250.122, and terminated with fittings listed for the application. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type MC-HL cable shall be installed in accordance with Part II of Article 330.
- (5) In restricted industrial establishments, Type ITC-HL cable listed for use in Class I, Division 1 or Zone 1 locations, with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material, terminated with fittings listed for the application, and installed in accordance with 335.4 10.
- (6) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in raceways in accordance with 501.10(A). These optical fiber cables shall be sealed in accordance with 501.15.
- (7) In restricted industrial establishments for applications limited to 600 volts nominal or less, and where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type TC-ER-HL cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (8) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket, terminated with fittings listed for the location, and installed in accordance with Part II of Article 337. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22.

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable.

Statement of Problem and Substantiation for Public Input

To correlate with the renumbering in Article 335

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4236-NFPA 70-2023 [Article 335]	referenced section

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
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City:

State:

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Submittal Date: Thu Sep 07 14:36:41 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 762-NFPA 70-2023 [Section No. 501.10(A)(1)]

(1) General.

In Class I, Division 1 locations, only the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC), including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) ~~PVC conduit, RTRC conduit, or HDPE conduit, where encased in a concrete envelope a minimum of 50 mm (2 in.) thick and provided with not less than 600 mm (24 in.) of cover measured from the top of the conduit to grade. The concrete encasement shall be permitted to be omitted where it is in accordance with 514.8(C) or 515.8(A). RMC or IMC conduit shall be used for the last 600 mm (24 in.) of the underground run to emergence or to the point of connection to the aboveground raceway. An equipment grounding conductor shall be included to provide for electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.~~
- (3) Type MI cable terminated with fittings listed for the location. Type MI cable shall be installed and supported to avoid tensile stress at the termination fittings.
- (4) In restricted industrial establishments, Type MC-HL cable listed for use in Class I, Zone 1 or Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, and a separate equipment grounding conductor(s) in accordance with 250.122, and terminated with fittings listed for the application. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type MC-HL cable shall be installed in accordance with Part II of Article 330.
- (5) In restricted industrial establishments, Type ITC-HL cable listed for use in Class I, Division 1 or Zone 1 locations, with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material, terminated with fittings listed for the application, and installed in accordance with 335.4.
- (6) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in raceways in accordance with 501.10(A). These optical fiber cables shall be sealed in accordance with 501.15.
- (7) In restricted industrial establishments for applications limited to 600 volts nominal or less, and where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22. Type TC-ER-HL cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (8) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket, terminated with fittings listed for the location, and installed in accordance with Part II of Article 337. If installed in a ladder, ventilated trough, or ventilated channel cable tray, the cable shall be installed in accordance with 392.22.

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable.

Statement of Problem and Substantiation for Public Input

The charging language of 501.10(A)(1) needs to be revised to include the word "only" so it becomes mandatory. As currently written, the text is permissive.

The allowance of 501.10(A)(1)(2) should be deleted because it is nonsensical. How will an ignitable mixture exist inside 2" of concrete that is also buried 24" in the ground?

Submitter Information Verification

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Affiliation: Steel Tube Institute
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City:
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Submittal Date: Tue May 02 14:28:23 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: The word “only” is not needed in the charging language of 501.10(A)(1). The language states: “In Class I, Division 1 locations the following wiring methods shall be permitted.” If a wiring method is not in the list, it is not permitted. There is no substantiation for deleting list item 2 other than “it is nonsensical”. The concrete is not being used to keep ignitable mixtures out of the conduit, it is used to protect the conduit from being broken.



Public Input No. 2721-NFPA 70-2023 [Section No. 501.10(A)(2)]

(2) Flexible Connections.

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one of the following shall be permitted:

- (1) Flexible fittings listed for the location.
- (2) Flexible cord in accordance with 501.140, terminated with cord connectors listed for the location.
- (3) In restricted industrial establishments, for applications limited to 600 volts nominal or less where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. The cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (4) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket where the cable is terminated with fittings listed for the location and installed in accordance with ~~Part II of~~ Article 337, Part II.

Informational Note No. 2: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable fittings.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
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City:
State:
Zip:
Submission Date: Thu Aug 24 19:18:57 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8308-NFPA 70-2024](#)

Statement: The editorial correction to separate two words with a space as proposed in PI 4321 is included in the FR. CMP14 agrees with the submitter of PI 4326 and deleted the phrase "one of" which could add confusion. The parent text permits any of the wiring methods in the four list items. If a wiring method is not included in one of the list items, it cannot be used. CMP14 also revised the numbering of the informational notes in 501.10(A)(2) to comply with Section 2.1.10.4 of the NEC Style Manual.



Public Input No. 4321-NFPA 70-2023 [Section No. 501.10(A)(2)]

(2) Flexible Connections.

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one of the following shall be permitted:

- (1) Flexible fittings listed for the location.
- (2) Flexible cord in accordance with 501.140, terminated with cord connectors listed for the location.
- (3) In restricted industrial establishments, for applications limited to 600 volts nominal or less where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. The cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (4) In restricted industrial establishments, listed Type P cable with metal braid ~~armor and armor and~~ an overall jacket where the cable is terminated with fittings listed for the location and installed in accordance with Part II of Article 337.

Informational Note No. 2: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable fittings.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

Correct typo error.

Submitter Information Verification

Submitter Full Name: Andrew Wood
Organization: Land Instruments International
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 11:18:33 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8308-NFPA 70-2024](#)

Statement: The editorial correction to separate two words with a space as proposed in PI 4321 is included in the FR. CMP14 agrees with the submitter of PI 4326 and deleted the phrase "one of" which could add confusion. The parent text permits any of the wiring methods in the four list items. If a wiring method is not included in one of the list items, it cannot be used. CMP14 also revised the numbering of the informational notes in 501.10(A)(2) to comply with Section 2.1.10.4 of the NEC Style Manual.

**Public Input No. 4326-NFPA 70-2023 [Section No. 501.10(A)(2)]****(2) Flexible Connections.**

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one or more of the following shall be permitted:

- (1) Flexible fittings listed for the location.
- (2) Flexible cord in accordance with 501.140, terminated with cord connectors listed for the location.
- (3) In restricted industrial establishments, for applications limited to 600 volts nominal or less where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. The cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (4) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket where the cable is terminated with fittings listed for the location and installed in accordance with Part II of Article 337.

Informational Note No. 2: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable fittings.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

To align text with the equivalent clause for Div 2.

Submitter Information Verification

Submitter Full Name: Andrew Wood
Organization: Land Instruments International
Street Address:
City:
State:
Zip:
Submission Date: Thu Sep 07 11:38:18 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8308-NFPA 70-2024](#)

Statement: The editorial correction to separate two words with a space as proposed in PI 4321 is included in the FR. CMP14 agrees with the submitter of PI 4326 and deleted the phrase "one of" which could add confusion. The parent text permits any of the wiring methods in the four list items. If a wiring method is not included in one of the list items, it cannot be used. CMP14 also revised the numbering of the informational notes in 501.10(A)(2) to comply with Section 2.1.10.4 of the NEC Style Manual.



Public Input No. 4390-NFPA 70-2023 [Section No. 501.10(A)(2)]

(2) Flexible Connections. (See Word Doc).

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one of the following shall be permitted:

- (1) Flexible fittings listed for the location.
- (2) Flexible cord in accordance with 501.140, terminated with cord connectors listed for the location.
- (3) In restricted industrial establishments, for applications limited to 600 volts nominal or less where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. The cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (4) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket where the cable is terminated with fittings listed for the location and installed in accordance with Part II of Article 337.

Informational Note No. 2: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable fittings.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
501.10_A_2_PI_2023.docx	501.2(A)(2)	

Statement of Problem and Substantiation for Public Input

Subdivision 501.10(A)(2) is revised for clarity and compliance with the 2023 NEC Style Manual. (A)(2)(3) is subdivided to limit the requirements in a subdivision to one. (3.5.1.2 Multiple Requirements. Multiple requirements within a single subdivision shall be avoided. Additional subdivisions or lists shall be used to express independent requirements.) The Informational Notes are renumbered and numbers removed to comply with the 2023 Style Manual. References to Chapters 1, 2, 3, or 4 are deleted. Section 90.3 provides the arrangement of the NEC. Chapters 1 through 4 apply generally to all installations. Chapters 5 through 7 supplement or modify Chapters 1 through 4. For example, the reference to Part II of Article 337 neither supplements the Article 337 nor does it modify the article. It merely says to look in Part II of Article 337 for those who are unfamiliar with the NEC. There may be some users who read this reference and think that it is the only portion of Article 337 that must be followed. Any person who is designing or installing electrical systems should not have to be reminded that any time he/she uses MC cable the installation must comply with Article 337. The designer/installer should also know about Article 250 and a few other articles if the installation is meant to be safe. Section 90.3 lets us know how the NEC is meant to be used. "The purpose of this Code is the practical safeguarding of persons and property from hazards arising from the use of electricity. This Code is not intended as a design specification or an instruction manual for untrained persons."

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
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Zip:
Submittal Date: Thu Sep 07 13:49:02 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel affirms that the language as currently written is clear and does not agree to change the requirement as proposed.

501.10(A)(2) Flexible Connections.

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, ~~one of the following~~ flexible connections shall be permitted in accordance with 501.10(A)(2)(1) through 501.10(A)(2)(3).

(1) Flexible fittings listed for the location shall be permitted.

(2) Flexible cord in accordance with [501.140](#), shall be permitted where it is terminated with cord connectors listed for the location.

(3) Type TC-ER-HL cable listed for use in Class I, Division 1 or Zone 1 locations shall be permitted for applications limited to 600 volts or less in restricted industrial establishments where it is in accordance with the following.

(a). The cable shall be protected against physical damage.

(b). The cable shall be terminated with fittings listed for the location.

~~for applications limited to 600 volts nominal or less where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. The cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with [336.10](#).~~

~~Informational Note No. 4:~~

~~See ANSI/UL 2225, Cables and Cable-Fittings for Use in Hazardous (Classified) Locations, for information on construction, testing, and marking of cables and cable fittings.~~

~~(4) In restricted industrial establishments, Listed Type P cable with metal braid armor and an overall jacket in restricted industrial establishments where the cable is terminated with fittings listed for the location. and installed in accordance with Part II of Article [337](#).~~

~~Informational Note No. 2:~~

~~See UL 1309A, Outline of Investigation for Cable for Use in Mobile Installations, for information on construction, testing, and marking of Type P cable fittings.~~

~~Informational Note No. 3:~~

~~See ANSI/UL 2225, Cables and Cable-Fittings for Use in Hazardous (Classified) Locations, for information on construction, testing, and marking of cable fittings.~~

(3) Boxes and Fittings.

All boxes and fittings shall be identified for Class I, Division 1.

Informational Note No. 1:

See ANSI/UL 2225, Cables and Cable-Fittings for Use in Hazardous (Classified) Locations, for information on construction, testing, and marking of cables, explosionproof cable fittings, and explosionproof cord connectors for entry into enclosures required to be explosionproof.

Informational Note No. 2:

See ANSI/UL 1203, Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations, for information on construction, testing, and marking of explosionproof conduit fittings for entry into enclosures required to be explosionproof.



Public Input No. 3315-NFPA 70-2023 [Section No. 501.10(B)]

(B) Class I, Division 2.

(1) General.

In Class I, Division 2 locations, all wiring methods in accordance with 501.10(A) and the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) Enclosed gasketed busways and enclosed gasketed wireways.
- (3) ~~Type PLTC cable or Type PLTC-ER cable used for Class 2 and Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.~~
- (4) ~~Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.~~
- (5) ~~Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. All cable types shall be terminated with listed fittings.~~
- (6) Where metal conduit will not provide the corrosion resistance needed for the installation environment, any of the following shall be permitted:
 - (7) Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW
 - (8) PVC-coated RMC, factory elbows, and associated fittings
 - (9) PVC-coated IMC, factory elbows, and associated fittings
 - (10) In restricted industrial establishments, Schedule 80 PVC conduit, factory elbows, and associated fittings
- (11) ~~Optical fiber cable Type OFNP, Type OFGP, Type OFNR, Type OFGR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any other raceway in accordance with 501.10(B). Optical fiber cables shall be sealed in accordance with 501.15.~~
- (12) ~~Cablebus.~~
- (13) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, and terminated with fittings listed for the location when entering explosionproof, flameproof, or pressurized equipment. The cable shall be installed in accordance with Part II of Article 337.

Informational Note No. 2: See ANSI/UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

(

~~2) Flexible Connections:~~

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one or more of the following shall be permitted:

- (1) ~~Listed flexible metal fittings~~
- (2) ~~Flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)~~
- (3) ~~Interlocked armor Type MC cable with listed fittings~~
- (4) ~~Liquidtight flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)~~
- (5) ~~Liquidtight flexible nonmetallic conduit with listed fittings~~
- (6) ~~Flexible cord listed for extra-hard usage and terminated with listed fittings, with a conductor for use as an equipment-grounding conductor~~
- (7) ~~For elevator use, an identified elevator cable of Type EO, Type ETP, or Type ETT, shown under the "use" column in Table 400.4 for "hazardous (classified) locations" and terminated with listed fittings~~
- (8) ~~In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, terminated with listed fittings and installed in accordance with Part II of Article 337~~

~~(3) Nonincendive Field Wiring:~~

~~Nonincendive field wiring shall be permitted using any of the wiring methods permitted for unclassified locations. Nonincendive field wiring systems shall be installed in accordance with the control drawing(s). Simple apparatus, not shown on the control drawing, shall be permitted in a nonincendive field wiring circuit if the simple apparatus does not interconnect the nonincendive field wiring circuit to any other circuit.~~

~~Informational Note: See Article 100 for the definition of simple apparatus.~~

~~Separate nonincendive field wiring circuits shall be installed in accordance with one of the following:~~

- (1) ~~In separate cables~~
- (2) ~~In multiconductor cables where the conductors of each circuit are within a grounded metal shield~~
- (3) ~~In multiconductor cables or in raceways, where the conductors of each circuit have insulation with a minimum thickness of 0.25 mm (0.01 in.)~~

~~(4) Boxes and Fittings.~~

~~Boxes and fittings shall be explosionproof if required by 501.105(B)(2), 501.115(B)(1), or 501.150(B)(1).~~

~~Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable for entry into enclosures required to be explosionproof.~~

~~Informational Note No. 2: See ANSI/UL 1203, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of explosionproof conduit fittings for entry into enclosures required to be explosionproof.~~

Statement of Problem and Substantiation for Public Input

During the previous two code cycles panel 14 has stated that EMT should not be allowed in Class 1 Division 2 locations because it is not robust enough to be used in these locations. I have gone through and deleted all wiring methods that are not as robust as Electrical Metallic Tubing. Article 358 of this same code allows EMT to be used where subject to physical damage while the wiring methods that have been deleted are not allowed to be used in areas of physical damage per their respective articles. There was also a question of the fittings being able to hold up to this location and fittings used for EMT go through extensive physical and electrical testing in 514B. Fittings for EMT have to pass a pull out test after having weight put directly on it hanging free and the EMT/fitting turned 360 degrees. Trade size 1/2 - 1 1/2 then go through a pull out test of 300lbf to 800lbf and any fitting trade size 2 and above have to pass a pull out test of a 1000lbf.

I am also submitting a companion proposal to allow the use of EMT in Class 1 Division 2 as one of these two should happen. Either the wiring methods in this article are acceptable to be used in Class 1 Division 2 areas and therefore by default EMT is more than adequate. Or the panel has to remove wiring methods that do not offer the protection that EMT provides which is 3/4's of the current wiring methods.

I represent a company that makes several of the wiring methods in this section and removed several products my company makes because EMT does provide more physical protection than the other products.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 3321-NFPA 70-2023 [Section No. 501.10(B)]	

Submitter Information Verification

Submitter Full Name: Raymond Horner

Organization: Atkore

Affiliation: Atkore

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 31 17:32:54 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: The PI does not provide substantiation, including testing data to prove that EMT is as robust as the wiring methods currently in subdivision. The omission of EMT from the list of approved wiring methods is not substantiation for deleting all the wiring methods from the section.

**Public Input No. 3321-NFPA 70-2023 [Section No. 501.10(B)]****(B) Class I, Division 2.****(1) General.**

In Class I, Division 2 locations, all wiring methods in accordance with 501.10(A) and the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) Electrical Metallic Tubing (EMT) with listed threadless fittings
- (3) Enclosed gasketed busways and enclosed gasketed wireways.
- (4) Type PLTC cable or Type PLTC-ER cable used for Class 2 and Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (5) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (6) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. All cable types shall be terminated with listed fittings.
- (7) Where metal conduit will not provide the corrosion resistance needed for the installation environment, any of the following shall be permitted:
 - (8) Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW
 - (9) PVC-coated RMC, factory elbows, and associated fittings
 - (10) PVC-coated IMC, factory elbows, and associated fittings
 - (11) In restricted industrial establishments, Schedule 80 PVC conduit, factory elbows, and associated fittings
- (12) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any other raceway in accordance with 501.10(B). Optical fiber cables shall be sealed in accordance with 501.15.
- (13) Cablebus.
- (14) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, and terminated with fittings listed for the location when entering explosionproof, flameproof, or pressurized equipment. The cable shall be installed in accordance with Part II of Article 337.

Informational Note No. 2: See ANSI/UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

(2) Flexible Connections.

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one or more of the following shall be permitted:

- (1) Listed flexible metal fittings
- (2) Flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)
- (3) Interlocked armor Type MC cable with listed fittings
- (4) Liquidtight flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)
- (5) Liquidtight flexible nonmetallic conduit with listed fittings
- (6) Flexible cord listed for extra-hard usage and terminated with listed fittings, with a conductor for use as an equipment grounding conductor
- (7) For elevator use, an identified elevator cable of Type EO, Type ETP, or Type ETT, shown under the "use" column in Table 400.4 for "hazardous (classified) locations" and terminated with listed fittings
- (8) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, terminated with listed fittings and installed in accordance with Part II of Article 337

(3) Nonincendive Field Wiring.

Nonincendive field wiring shall be permitted using any of the wiring methods permitted for unclassified locations. Nonincendive field wiring systems shall be installed in accordance with the control drawing(s). Simple apparatus, not shown on the control drawing, shall be permitted in a nonincendive field wiring circuit if the simple apparatus does not interconnect the nonincendive field wiring circuit to any other circuit.

Informational Note: See Article 100 for the definition of *simple apparatus*.

Separate nonincendive field wiring circuits shall be installed in accordance with one of the following:

- (1) In separate cables
- (2) In multiconductor cables where the conductors of each circuit are within a grounded metal shield
- (3) In multiconductor cables or in raceways, where the conductors of each circuit have insulation with a minimum thickness of 0.25 mm (0.01 in.)

(4) Boxes and Fittings.

Boxes and fittings shall be explosionproof if required by 501.105(B)(2), 501.115(B)(1), or 501.150(B)(1).

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable for entry into enclosures required to be explosionproof.

Informational Note No. 2: See ANSI/UL 1203, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of explosionproof conduit fittings for entry into enclosures required to be explosionproof.

Statement of Problem and Substantiation for Public Input

Electrical Metallic Tubing (EMT) is a more robust wiring method than most of those listed from 3 down in the list. Only Rigid Metal Conduit and Intermediate metal conduit offer more protection. Other wiring methods may be equal but most are not equal to EMT physical protection. The threadless fittings that are allowed in (1) of this section for RMC & IMC are listed to the same standard and the same requirements as the EMT fittings (UL 514B). Those fittings and EMT fittings have the exact same pull out tests as well as other tests .

So if you look and see that EMT offers more protection than most other wiring methods in this section and combine that with the fact that the fittings for EMT are already basically allowed for Rigid and IMC there is no substantiated reason to not allow EMT in these applications.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 3315-NFPA 70-2023 [Section No. 501.10(B)]	

Submitter Information Verification

Submitter Full Name: Raymond Horner
Organization: Atkore
Affiliation: Atkore
Street Address:
City:
State:
Zip:

Submittal Date: Thu Aug 31 22:58:36 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: The PI does not provide substantiation, including testing data to prove that EMT is as robust as the wiring methods currently in subdivision particularly with respect to sealing and support.


Public Input No. 4405-NFPA 70-2023 [Section No. 501.10(B)]
(B) Class I, Division 2. (See Word Doc)
(1) General.

In Class I, Division 2 locations, all wiring methods in accordance with 501.10(A) and the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) Enclosed gasketed busways and enclosed gasketed wireways.
- (3) Type PLTC cable or Type PLTC-ER cable used for Class 2 and Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (4) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (5) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. All cable types shall be terminated with listed fittings.
- (6) Where metal conduit will not provide the corrosion resistance needed for the installation environment, any of the following shall be permitted:
 - (7) Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW
 - (8) PVC-coated RMC, factory elbows, and associated fittings
 - (9) PVC-coated IMC, factory elbows, and associated fittings
 - (10) In restricted industrial establishments, Schedule 80 PVC conduit, factory elbows, and associated fittings
- (11) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any other raceway in accordance with 501.10(B). Optical fiber cables shall be sealed in accordance with 501.15.
- (12) Cablebus.
- (13) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, and terminated with fittings listed for the location when entering explosionproof, flameproof, or pressurized equipment. The cable shall be installed in accordance with Part II of Article 337.

Informational Note No. 2: See ANSI/UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

(2) Flexible Connections.

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one or more of the following shall be permitted:

- (1) Listed flexible metal fittings
- (2) Flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)
- (3) Interlocked armor Type MC cable with listed fittings
- (4) Liquidtight flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)
- (5) Liquidtight flexible nonmetallic conduit with listed fittings
- (6) Flexible cord listed for extra-hard usage and terminated with listed fittings, with a conductor for use as an equipment grounding conductor
- (7) For elevator use, an identified elevator cable of Type EO, Type ETP, or Type ETT, shown under the "use" column in Table 400.4 for "hazardous (classified) locations" and terminated with listed fittings
- (8) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, terminated with listed fittings and installed in accordance with Part II of Article 337

(3) Nonincendive Field Wiring.

Nonincendive field wiring shall be permitted using any of the wiring methods permitted for unclassified locations. Nonincendive field wiring systems shall be installed in accordance with the control drawing(s). Simple apparatus, not shown on the control drawing, shall be permitted in a nonincendive field wiring circuit if the simple apparatus does not interconnect the nonincendive field wiring circuit to any other circuit.

Informational Note: See Article 100 for the definition of *simple apparatus*.

Separate nonincendive field wiring circuits shall be installed in accordance with one of the following:

- (1) In separate cables
- (2) In multiconductor cables where the conductors of each circuit are within a grounded metal shield
- (3) In multiconductor cables or in raceways, where the conductors of each circuit have insulation with a minimum thickness of 0.25 mm (0.01 in.)

(4) Boxes and Fittings.

Boxes and fittings shall be explosionproof if required by 501.105(B)(2), 501.115(B)(1), or 501.150(B)(1).

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable for entry into enclosures required to be explosionproof.

Informational Note No. 2: See ANSI/UL 1203, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of explosionproof conduit fittings for entry into enclosures required to be explosionproof.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
501.10_B_PI_2023.docx	501.10(B)	

Statement of Problem and Substantiation for Public Input

The revisions made to 501.10(B) add clarity and address 2023 NEC Style Manual issues. Informational note numbering is revised to comply with 2.1.10.4 Numbering. "If there are two or more informational notes in a definition, section, or subdivision, consecutive numbering of the informational notes shall only occur in that definition, section, or subdivision.

Example: 430.31 General. Part III specifies overload devices intended to protect motors, motor-control apparatus, and motor branch-circuit conductors against excessive heating due to motor overloads and failure to start. Informational Note No. 1: See Informative Annex D, Example D8. Informational Note No. 2: See Article 100 for the definition of Overload.

(A) Where Hazard Exists. These provisions shall not require overload protection where a power loss would cause a hazard, such as in the case of fire pumps. Informational Note: See 695.7 for protection of fire pump supply conductors." The requirement that permits the wiring methods in 501.10(A) to be used for Class I, Division 2 is included with the list items. (B)(1) (4), (5), and (6) is revised to limit the number of requirements in a subdivision to one in accordance with 3.5.1.2 of the style manual. . References to Chapters 1, 2, 3, or 4 are deleted. Section 90.3 provides the arrangement of the NEC. Chapters 1 through 4 apply generally to all installations. Chapters 5 through 7 supplement or modify Chapters 1 through 4. For example, the reference to Part II of Article 337 neither supplements Article 337 nor does it modify the article. It merely says to look in Part II of Article 337 for those who are unfamiliar with the NEC. There may be some users who read this reference and think that it is the only portion of Article 337 that must be followed. Any person who is designing or installing electrical systems should not have to be reminded that any time he/she uses MC cable the installation must comply with Article 337. The designer/installer should also know about Article 250 and a few other articles if the installation is meant to be safe. Section 90.3 lets us know how the NEC is meant to be used. "The purpose of this Code is the practical safeguarding of persons and property from hazards arising from the use of electricity. This Code is not intended as a design specification or an instruction manual for untrained persons."

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 14:28:21 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel affirms that the language as currently written is clear and does not agree to change the requirements as proposed.

(B) Class I, Division 2.

(1) General.

Wiring methods permitted in Class I, Division 2 locations, all wiring methods shall be in accordance with 501.10(A) and the following wiring methods shall be permitted: 501.10(B)(1)(1) through 501.10(B)(1)(10).

Informational Note No. 4:

See Article 100 for the definition of restricted industrial establishment [as applied to hazardous (classified) locations].

- (1) All the wiring methods in 501.10(A) shall be permitted.
- (2) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including RMC or IMC conduit systems with supplemental corrosion protection coatings shall be permitted.
- (3) Enclosed gasketed busways and enclosed gasketed wireways shall be permitted.
- (4) Type PLTC cable or Type PLTC-ER cable used for Class 2 and Class 3 circuits shall be permitted in accordance with the following, including installation
 - (a). The cables shall be permitted to be installed in cable tray systems.
 - (b). The cables shall be terminated with listed fittings.
 - (c). Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (5) Type ITC cable or Type ITC-ER cable ~~as permitted in 335.4 and~~ shall be permitted in accordance with the following.
 - (a). Type ITC cable shall be ~~that is~~ terminated with listed fittings.
 - (b). Type ITC-ER cable shall be terminated with listed fittings and include an equipment grounding conductor in addition to a drain wire.
- (6) Type MC, Type MV, Type TC, or Type TC-ER cable terminated with listed fittings shall be permitted in accordance with the following.
 - (a). Type MC, Type MV, Type TC, and Type TC-ER cables shall be permitted to be installed in cable tray systems.
 - (b). Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.

~~including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. All cable types shall be terminated with listed fittings.~~
- (7) Where metal conduit will not provide the corrosion resistance needed for the installation environment, any of the following shall be permitted.
 - (a). Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW
 - (b). PVC-coated RMC, factory elbows, and associated fittings
 - (c). PVC-coated IMC, factory elbows, and associated fittings
 - (d). In restricted industrial establishments, Schedule 80 PVC conduit, factory elbows, and associated fittings
- (8) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC shall be permitted where installed in cable trays or other raceways in accordance with 501.10(B) and ~~Optical fiber cables shall be sealed in accordance with 501.15.~~
- (9) Cablebus shall be permitted.

~~(10) In restricted industrial establishments, Listed Type P cable with or without metal braid armor with and an overall jacket shall be permitted in restricted industrial establishments where and it is terminated with fittings listed for the location when entering explosionproof, flameproof, or pressurized equipment. The cable shall be installed in accordance with Part II of Article 337.~~

Informational Note No. 1 2:

See ANSI/UL 1309A, Outline of Investigation for Cable for Use in Mobile Installations, for information on construction, testing, and marking of Type P cable.

Informational Note No. 2 3:

See ANSI/UL 2225, Cables and Cable-Fittings for Use in Hazardous (Classified) Locations, for information on construction, testing, and marking of cable fittings.

(2) Flexible Connections.

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one or more of the following shall be permitted:

(1) Listed flexible metal fittings

(2) Flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)

(3) Interlocked armor Type MC cable with listed fittings

(4) Liquidtight flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)

(5) Liquidtight flexible nonmetallic conduit with listed fittings

~~(6) Flexible cord with an equipment grounding conductor where the cord is listed for extra-hard usage and terminated with listed fittings, with a conductor for use as an equipment grounding conductor and is terminated with listed fittings~~

~~(7) For elevator use, an identified elevator cable of Type EO, Type ETP, or Type ETT, shown under the "use" column in Table 400.4 for "hazardous (classified) locations" and is permitted for elevator use where it is terminated with listed fittings,~~

~~(8) In restricted industrial establishments, Listed Type P cable with or without metal braid armor with and an overall jacket, terminated with listed fittings and installed in accordance with Part II of Article 337 is permitted in restricted industrial establishments.~~

(3) Nonincendive Field Wiring.

Nonincendive field wiring shall be permitted using any of the wiring methods permitted for unclassified locations. Nonincendive field wiring systems shall be installed in accordance with the control drawing(s). Simple apparatus, not shown on the control drawing, shall be permitted in a nonincendive field wiring circuit if the simple apparatus does not interconnect the nonincendive field wiring circuit to any other circuit.

Informational Note:

See Article 100 for the definition of simple apparatus.

Separate nonincendive field wiring circuits shall be installed in accordance with one of the following:

(1) In separate cables

(2) In multiconductor cables where the conductors of each circuit are within a grounded metal shield

(3) In multiconductor cables or in raceways, where the conductors of each circuit have insulation with a minimum thickness of 0.25 mm (0.01 in.)

(4) Boxes and Fittings.

Boxes and fittings shall be explosionproof if required by 501.105(B)(2), 501.115(B)(1), or 501.150(B)(1).

Informational Note No. 1:

See ANSI/UL 2225, Cables and Cable-Fittings for Use in Hazardous (Classified) Locations, for information on construction, testing, and marking of cable for entry into enclosures required to be explosionproof.

Informational Note No. 2:

See ANSI/UL 1203, Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations, for information on construction, testing, and marking of explosionproof conduit fittings for entry into enclosures required to be explosionproof.



Public Input No. 2722-NFPA 70-2023 [Section No. 501.10(B)(1)]

(1) General.

In Class I, Division 2 locations, all wiring methods in accordance with 501.10(A) and the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) Enclosed gasketed busways and enclosed gasketed wireways.
- (3) Type PLTC cable or Type PLTC-ER cable used for Class 2 and Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (4) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (5) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. All cable types shall be terminated with listed fittings.
- (6) Where metal conduit will not provide the corrosion resistance needed for the installation environment, any of the following shall be permitted:
 - (7) Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW
 - (8) PVC-coated RMC, factory elbows, and associated fittings
 - (9) PVC-coated IMC, factory elbows, and associated fittings
 - (10) In restricted industrial establishments, Schedule 80 PVC conduit, factory elbows, and associated fittings
- (11) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any other raceway in accordance with 501.10(B). Optical fiber cables shall be sealed in accordance with 501.15.
- (12) Cablebus.
- (13) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, and terminated with fittings listed for the location when entering explosionproof, flameproof, or pressurized equipment. The cable shall be installed in accordance with ~~Part II of~~ Article 337, Part II.

Informational Note No. 2: See ANSI/UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
Street Address:
City:
State:

Zip:
Submittal Date: Thu Aug 24 19:19:55 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [ER-8431-NEPA 70-2024](#)

Statement: The panel has rewritten the section to comply with the NEC® Style Manual, pointing the user to the article before the specific part of the article.



Public Input No. 4337-NFPA 70-2023 [Section No. 501.10(B)(1)]

(1) General.

In Class I, Division 2 locations, all wiring methods in accordance with 501.10(A) and the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) Enclosed gasketed busways and enclosed gasketed wireways.
- (3) Type PLTC cable or Type PLTC-ER cable used for Class 2, ~~Class 3,~~ and ~~Class 3~~ Class 4 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (4) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (5) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. All cable types shall be terminated with listed fittings.
- (6) Where metal conduit will not provide the corrosion resistance needed for the installation environment, any of the following shall be permitted:
 - (7) Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW
 - (8) PVC-coated RMC, factory elbows, and associated fittings
 - (9) PVC-coated IMC, factory elbows, and associated fittings
 - (10) In restricted industrial establishments, Schedule 80 PVC conduit, factory elbows, and associated fittings
- (11) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any other raceway in accordance with 501.10(B). Optical fiber cables shall be sealed in accordance with 501.15.
- (12) Cablebus.
- (13) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, and terminated with fittings listed for the location when entering explosionproof, flameproof, or pressurized equipment. The cable shall be installed in accordance with Part II of Article 337.

Informational Note No. 2: See ANSI/UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

Adding Class 4 to the list. Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.

Submitter Information Verification

Submitter Full Name: Chad Jones
Organization: Cisco Systems
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 12:08:07 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The PI does not provide substantiation to prove that Class 4 systems are appropriate for use in Class I, Division 2 locations. Additionally, PLTC cable is rated at 300 volts while Class 4 systems are rated for up to 450 volts making the addition of Class 4 systems to PLTC cable incorrect.



Public Input No. 4411-NFPA 70-2023 [Section No. 501.10(B)(1)]

(1) General.

In Class I, Division 2 locations, all wiring methods in accordance with 501.10(A) and the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) Enclosed gasketed busways and enclosed gasketed wireways.
- (3) Type PLTC cable or Type PLTC-ER cable used for Class 2 and Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (4) Type ITC cable or Type ITC-ER cable as permitted in 335.4 ~~and 10~~ and 10 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (5) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. All cable types shall be terminated with listed fittings.
- (6) Where metal conduit will not provide the corrosion resistance needed for the installation environment, any of the following shall be permitted:
 - (7) Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW
 - (8) PVC-coated RMC, factory elbows, and associated fittings
 - (9) PVC-coated IMC, factory elbows, and associated fittings
 - (10) In restricted industrial establishments, Schedule 80 PVC conduit, factory elbows, and associated fittings
- (11) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any other raceway in accordance with 501.10(B). Optical fiber cables shall be sealed in accordance with 501.15.
- (12) Cablebus.
- (13) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, and terminated with fittings listed for the location when entering explosionproof, flameproof, or pressurized equipment. The cable shall be installed in accordance with Part II of Article 337.

Informational Note No. 2: See ANSI/UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
Street Address:
City:
State:

Zip:
Submittal Date: Thu Sep 07 14:40:42 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 708-NFPA 70-2023 [Section No. 501.10(B)(1)]

(1) General.

In Class I, Division 2 locations, all wiring methods in accordance with 501.10(A) and the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) Enclosed gasketed busways and enclosed gasketed wireways.
- (3) Type PLTC cable or Type PLTC-ER cable used for Class 2 and Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (4) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (5) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. All cable types shall be terminated with listed fittings.
- (6) Where metal conduit will not provide the corrosion resistance needed for the installation environment, any of the following shall be permitted:
 - (7) Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW
 - (8) PVC-coated RMC, factory elbows, and associated fittings
 - (9) PVC-coated IMC, factory elbows, and associated fittings
 - (10) In restricted industrial establishments, Schedule 80 PVC conduit, factory elbows, and associated fittings
- (11) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any other raceway in accordance with 501.10(B). Optical fiber cables shall be sealed in accordance with 501.15.
- (12) Cablebus.
- (13) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, and terminated with fittings listed for the location when entering explosionproof, flameproof, or pressurized equipment. The cable shall be installed in accordance with Part II of Article 337.

Informational Note No. 2: See ANSI/UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

(10) Electrical Metallic Tubing

Statement of Problem and Substantiation for Public Input

This PI seeks only to add a new item 10, although Terraview has made this rather difficult to easily see. There is underlined text in the existing language that I do not intend to change.

Electrical Metallic Tubing should be permitted in a Class I, Division 2 location because it is superior to other wiring methods already permitted in these locations. Previous attempts (see 2017 PI 2875) to add this allowance were rejected with the Code-making Panel expressing concerns that I would like to address.

Panel statement: "The assertion that EMT provides greater protection than other wiring methods is unsubstantiated. The wiring method "EMT" is not equivalent to any existing approved wiring methods for use in Class I, Division 2 locations. There is no adequate substantiations provided with this proposal. The physical properties of EMT and the requirements for support are inadequate for installation in Classified areas."

Rebuttal: It almost goes without saying that EMT provides far greater protection than MC cable. If MC cable is permitted, which it is, the argument of physical protection is moot. There is not a person in the entire industry that can say that MC cable is as strong as EMT and keep a straight face while saying it.

Panel statement: "The installation of a seal fitting with EMT may not comply with the requirements of Article 358.12. The

physical properties of this conduit is not sufficient to be installed in hazardous location. The wall thickness of EMT is typically less than half on (sic) the other wiring methods identified in this section."

Rebuttal: There are several instances where sealing is not required in Class I, Division 2 locations. Luminaires do not require sealing in such a location, and currently the NEC allows MC cable to be installed between typical dry-location outlet boxes (aka "four square," aka "1900" boxes) with no seals installed. Why would EMT not be permitted where MC is? This is certainly not an issue of sealing, nor is it an issue of the physical strength of the wiring method. Regarding the CMP's statement that the wall thickness is "less than half of the thickness of other wiring methods," I would invite them to compare the thickness of EMT to the thickness of MC cable or TC cable. The CMP statement is simply not accurate.

Panel statement: " EMT conduit installed in Division 2 public areas such as garages, gas stations, hangers, etc. could be subject to physical damage and result in an open ignition source in a hazardous location"

Rebuttal: The issue of physical damage is addressed in 110.27 and the uses permitted/uses not permitted sections of the applicable wiring methods (3xx.10 and 3xx.12). I would ask that the CMP compare the permitted uses of EMT and MC cable and note that EMT is specifically permitted to be used where subject to physical damage [358.10(E)]. There is no such allowance for MC cable, and there likely never will be. That is because the physical properties of EMT and MC are as different as night and day.

The concerns of the Code-Making Panel indicated in PI 2875-2017 are all addressed and should be considered satisfied.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Affiliation: Steel Tube Institute
Street Address:
City:
State:
Zip:
Submittal Date: Mon Apr 24 11:38:12 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The PI does not provide substantiation, including testing data to prove that EMT is as robust as the wiring methods currently in subdivision particularly with respect to sealing and support.



Public Input No. 763-NFPA 70-2023 [Section No. 501.10(B)(1)]

(1) General.

In Class I, Division 2 locations, ~~all~~ only the wiring methods specified in ~~accordance with~~ 501.10(A) and the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (2) Enclosed gasketed busways and enclosed gasketed wireways.
- (3) Type PLTC cable or Type PLTC-ER cable used for Class 2 and Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (4) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (5) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. All cable types shall be terminated with listed fittings.
- (6) Where metal conduit will not provide the corrosion resistance needed for the installation environment, any of the following shall be permitted:
 - (7) Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW
 - (8) PVC-coated RMC, factory elbows, and associated fittings
 - (9) PVC-coated IMC, factory elbows, and associated fittings
 - (10) In restricted industrial establishments, Schedule 80 PVC conduit, factory elbows, and associated fittings
- (11) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any other raceway in accordance with 501.10(B). Optical fiber cables shall be sealed in accordance with 501.15.
- (12) Cablebus.
- (13) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, and terminated with fittings listed for the location when entering explosionproof, flameproof, or pressurized equipment. The cable shall be installed in accordance with Part II of Article 337.

Informational Note No. 2: See ANSI/UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

The charging language of 501.10(B)(1) needs the mandatory text of "only" in order to be enforceable. As written, the language is permissive and not restrictive.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Affiliation: Steel Tube Institute
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 02 15:00:41 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The addition of "only the" is not needed, the current text makes it clear that the wiring methods in 501.10(A) and the thirteen methods in the list items can be used in Class I, Division 2 locations. If a wiring method is not in 501.10(A) or one of the thirteen list items, it is not permitted. The use of the phrase "in accordance with" is required by Section 4.1.3 of the 2023 NEC Style Manual when requirements are being referenced. Adding the word "only" would conflict with 90.4(C).



Public Input No. 2553-NFPA 70-2023 [New Section after 501.10(B)(2)]

TITLE OF NEW CONTENT

(9) In restricted industrial establishments, for prime movers, for applications restricted to 600V nominal or less, where the harness is protected from physical damage, cable harness assemblies, whose purpose is to connect equipment together and which is listed as part of the equipment certification for the hazardous location.

Informational Note: Cable or Wiring harness assemblies normally include wire/cable, fittings, connectors, protective sleeves, heat shrink, and/or other components, and are evaluated and listed as complete harness or equipment assemblies.

Statement of Problem and Substantiation for Public Input

Wiring Engines and Turbines in Classified areas is factory wiring and is normally accomplished through a NRTL as considerations for Vibration, Temperature, chemical compatibility is more specific to the engine than the building.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 2554-NFPA 70-2023 [New Section after 505.15(C)(2)]	

Submitter Information Verification

Submitter Full Name: Max Bernhardt
Organization: Woodward Inc
Street Address:
City:
State:
Zip:
Submission Date: Mon Aug 21 13:38:13 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: Requirements for installing components that are a part of a listed assembly are required to be install in accordance with the listing, labeling, or identification. If the prime mover is installed in a Class I, Division 2 location it should be listed for the location. In this case, the instructions should provide information on protecting and installing the harness assembly. Additionally, the submitter did not provide information to justify the revision. Cable harness assemblies of a listed assembly are not considered to be wiring methods for Class I, Division 2 locations. The recommendation conflicts with 90.7.



Public Input No. 2723-NFPA 70-2023 [Section No. 501.10(B)(2)]

(2) Flexible Connections.

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one or more of the following shall be permitted:

- (1) Listed flexible metal fittings
- (2) Flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)
- (3) Interlocked armor Type MC cable with listed fittings
- (4) Liquidtight flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)
- (5) Liquidtight flexible nonmetallic conduit with listed fittings
- (6) Flexible cord listed for extra-hard usage and terminated with listed fittings, with a conductor for use as an equipment grounding conductor
- (7) For elevator use, an identified elevator cable of Type EO, Type ETP, or Type ETT, shown under the "use" column in Table 400.4 for "hazardous (classified) locations" and terminated with listed fittings
- (8) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, terminated with listed fittings and installed in accordance with ~~Part II of Article 337~~ , Part II

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 24 19:20:51 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8435-NFPA 70-2024](#)

Statement: The panel has rewritten the section to comply with the NEC® Style Manual, pointing the user to the article before the specific part of the article.

**Public Input No. 4325-NFPA 70-2023 [Section No. 501.10(B)(2)]****(2) Flexible Connections.**

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, all wiring methods in accordance with 501.10(A)(2) and one or more of the following shall be permitted:

- (1) Listed flexible metal fittings
- (2) Flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)
- (3) Interlocked armor Type MC cable with listed fittings
- (4) Liquidtight flexible metal conduit with listed fittings and bonded in accordance with 501.30(B)
- (5) Liquidtight flexible nonmetallic conduit with listed fittings
- (6) Flexible cord listed for extra-hard usage and terminated with listed fittings, with a conductor for use as an equipment grounding conductor
- (7) For elevator use, an identified elevator cable of Type EO, Type ETP, or Type ETT, shown under the "use" column in Table 400.4 for "hazardous (classified) locations" and terminated with listed fittings
- (8) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, terminated with listed fittings and installed in accordance with Part II of Article 337

Statement of Problem and Substantiation for Public Input

To permit wiring allowed in Div1 locations to be used in Div 2 locations. For example TC-ER-HL permitted by 501.10(A) (2) (3)

Submitter Information Verification

Submitter Full Name: Andrew Wood
Organization: Land Instruments International
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 11:31:21 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: Subdivision 501.10(B)(1) which addresses general wiring methods for Class I, Division 2 locations already permits all the wiring methods in 500.10(A). This would include the flexible wiring methods in 500.10(A)(2). The permission to use them is not needed in both subdivisions.



Public Input No. 764-NFPA 70-2023 [Section No. 501.15(A)(4)]

(4) Class I, Division 1 Boundary.

A conduit seal shall be required in each conduit run leaving a Division 1 location. The sealing fitting shall be permitted to be installed on either side of the boundary within 3.05 m (10 ft) of the boundary, and it shall be designed and installed to minimize the amount of gas or vapor within the portion of the conduit installed in the Division 1 location that can be communicated beyond the seal. The conduit run between the conduit seal and the point at which the conduit leaves the Division 1 location shall contain no union, coupling, box, or other fitting except for a listed explosionproof reducer installed at the conduit seal.

~~Where~~ If the seal is located on the unclassified or Division 2 side of the boundary, the Division 1 wiring method shall extend into the unclassified or Division 2 area to the seal.

Exception No. 1: Metal conduit that contains no unions, couplings, boxes, or fittings, that passes completely through a Division 1 location with no fittings installed within 300 mm (12 in.) of either side of the boundary, shall not require a conduit seal if the termination points of the unbroken conduit are located in unclassified locations.

Exception No. 2: For underground conduit installed in accordance with 300.5 where the boundary is below grade, the sealing fitting shall be permitted to be installed after the conduit emerges from below grade, but there shall be no union, coupling, box, or fitting, other than listed explosionproof reducers at the sealing fitting, in the conduit between the sealing fitting and the point at which the conduit emerges from below grade.

Statement of Problem and Substantiation for Public Input

There is not always a Division 2 area adjacent to a Division 1 area. In many instances an exterior wall creates the boundary between a Class I, Division 1 location and an unclassified location. The requirement to extend the Division 1 wiring method must apply to these areas as well.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Affiliation: Steel Tube Institute
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 02 16:04:18 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The language in this requirement is specific to the general case where a Division 1 location does not abut an unclassified location. For instances where a room is classified and there is no Division 2 location, outside the Division 1 location, a change like this would be better covered as an exception to avoid confusing the user of the code.



Public Input No. 659-NFPA 70-2023 [Section No. 501.15(C)(2)]

(2) Compound.

The compound shall provide a seal to minimize the passage of gas and/or vapors through the sealing fitting **to 200 cm³ /hr (0.007 ft³ /hr) of air at a pressure of 1500 pascals (6 in. of water)** and shall not be affected by the surrounding atmosphere or liquids. The melting point of the compound shall not be less than 93°C (200°F).

Statement of Problem and Substantiation for Public Input

This is where the proposed text belongs - not in a Section for Cables That Do Not Transmit Gases or Vapors []] - especially since such cables do not currently exist and haven't since the Section was originally proposed. A companion PI will suggest removing the text from 501.15(E)(2)

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 660-NFPA 70-2023 [Section No. 501.15(E)(2)]</u>	

Submitter Information Verification

Submitter Full Name: Robert Alexander
Organization: Robert B Alexander
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 19 16:38:40 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The addition of this text is not needed because it is already in the certification of the sealing fitting.



Public Input No. 2365-NFPA 70-2023 [Section No. 501.15(D)(1)]

(1) At Terminations.

Cables shall be sealed at all terminations with sealing fittings. The seals at all terminations shall be in accordance with 501.15(C) and shall be installed within 450 mm (18 in.) of the enclosure or as required by the enclosure marking. Only threaded couplings or explosionproof fittings such as unions, reducers, elbows, and capped elbows not larger than the trade size of the conduit shall be permitted between the sealing fitting and the enclosure.

Type MC-HL cable ~~with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material.~~ Type ITC-HL, Type TC-ER-HL cable, and Type P cable shall be sealed with a listed fitting after the jacket and any other covering have been removed so that the sealing compound can surround each individual insulated conductor to minimize the passage of gases and vapors.

Shielded cables and twisted pair cables that have their conductors sealed in accordance with the instructions provided with their listed fitting to minimize the entrance of gases or vapors and prevent propagation of flame into the cable core shall not be required to have the shielding material removed or the twisted pairs separated.

Statement of Problem and Substantiation for Public Input

The construction of the sheath is required in 501.10(A) and is confusing here. Additionally, Type ITC-HL cable is missing from this list of permitted Div. 1 cables requiring sealing.

Submitter Information Verification

Submitter Full Name: Donald Ankele
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 16 14:54:37 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8316-NFPA 70-2024](#)

Statement: The deleted words are unnecessary since all MC-HL cable is constructed with a gas/vaportight continuous corrugated sheath and an overall jacket suitable polymeric material. Type ITCHL cable was inadvertently omitted from the list of permitted wiring methods in the 2023 revisions.



Public Input No. 660-NFPA 70-2023 [Section No. 501.15(E)(2)]

(2) Cables That Do Not Transmit Gases or Vapors.

Cables that have a gas/vaportight continuous sheath and do not transmit gases or vapors through the cable core in excess of the quantity permitted for seal fittings shall not be required to be sealed except as required in 501.15(E)(1). The minimum length of such a cable run shall not be less than the length needed to limit gas or vapor flow through the cable core, excluding the interstices of the conductor strands, to the rate permitted for seal fittings- ~~[200 cm³ /hr~~ (0.007 ft³ /hr) of air at a pressure of 1500 pascals (6 in. of water)].

Statement of Problem and Substantiation for Public Input

The deleted text belongs in Section 501.15(C)(2). A companion PI has been submitted.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 659-NFPA 70-2023 [Section No. 501.15(C)(2)]	Relocates text between these Sections.

Submitter Information Verification

Submitter Full Name: Robert Alexander
Organization: Robert B Alexander
Street Address:
City:
State:
Zip:
Submission Date: Wed Apr 19 16:46:56 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: Removing the values shown for the rate permitted for seal fittings does not change the requirement applied to gas blocked cable.



Public Input No. 1464-NFPA 70-2023 [Section No. 501.17]

501.17 Process Sealing.

Process-connected equipment, including, but not limited to, canned pumps, submersible pumps, and flow, pressure, temperature, or analysis measurement instruments, shall be sealed with process seals. A process seal shall be a device that prevents the migration of process fluids from the designed containment into the external electrical system. Process-connected electrical equipment that incorporates a single process seal, such as a single compression seal, diaphragm, or tube to prevent flammable or combustible fluids from entering a conduit or cable system capable of transmitting fluids, shall be provided with an additional means to mitigate a single process seal failure. The following additional means ~~might include, but are not limited to, the following shall be permitted~~ :

- (1) A suitable barrier meeting the process temperature and pressure conditions that the barrier will be subjected to upon failure of the single process seal. There shall be a vent or drain between the single process seal and the suitable barrier. Indication of the single process seal failure shall be provided by visible leakage, an audible whistle, or other means of monitoring.
- (2) A listed Type MI cable assembly, rated at not less than 125 percent of the process pressure and not less than 125 percent of the maximum process temperature (in degrees Celsius), installed between the cable or conduit and the single process seal.
- (3) A drain or vent located between the single process seal and a conduit or cable seal. The drain or vent shall be sufficiently sized to prevent overpressuring the conduit or cable seal above 6 in. water column (1493 Pa). Indication of the single process seal failure shall be provided by visible leakage, an audible whistle, or other means of monitoring.
- (4) An add-on secondary seal marked "secondary seal" and rated for the pressure and temperature conditions to which it will be subjected upon failure of the single process seal.

Process-connected electrical equipment that does not rely on a single process seal or is listed and marked "single seal", "dual seal", or "dual seal without annunciation" shall not be required to be provided with an additional means of sealing.

Process-connected electrical equipment marked "single seal — install conduit or cable seal" shall be sealed in accordance with 501.15.

Informational Note: See ANSI/UL 122701, *Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids*, for construction and testing requirements for process sealing of listed and marked single seal, dual seal, or secondary seal equipment.

Statement of Problem and Substantiation for Public Input

The current text using the word "might include" is not permitted to be mandatory or permissive language by Section 3.1 of the 2023 NEC Style Manual. If the four additional methods are to remain in the requirement, either mandatory or permissive text must be used. The other alternative would be to place the four list items into an informational note where the word "might" is appropriate. The other concern is that the four methods provided do provide viable methods for providing an addition method and if it is part of a requirement or permission the four methods can be easily added to the design, construction, and inspection of a project without question of the method being rejected. If the four methods are in an informational note, there is a possibility that they may not be approved by the AHJ.

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submission Date: Tue Jul 18 14:47:33 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel affirms that the language as currently written is clear and does not agree to change the requirements as proposed.



Public Input No. 1880-NFPA 70-2023 [Section No. 501.30]

~~501.30~~ Grounding and Bonding:

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with ~~501.30(A) and (B):~~

~~(A)~~ Grounding:

Wiring systems and equipment shall be grounded in accordance with Part I and Part VI of Article 250, as applicable.

~~(B)~~ Bonding:

Bonding shall comply with Part I and Part V of Article 250, as applicable, and ~~501.30(B)(1) and (B)(2):~~

~~(1)~~ Specific Bonding Means:

Bonding shall comply with ~~501.30(B)(1) (a) and (B)(1)(b):~~

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between Class I locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in ~~335.4 (5); 336.10(7) (c); or 722.135(C)~~ shall be bonded in accordance with ~~250.102~~ :

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in ~~250.32(B)~~ :

~~(2)~~ Flexible Metal Conduit and Liquidtight Flexible Metal Conduit:

Flexible metal conduit and liquidtight flexible metal conduit shall comply with ~~501.30(B)(2) (a) and (B)(2)(b):~~

(a) Flexible metal conduit and liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with ~~250.102~~ :

(b) In Class I, Division 2 locations, the bonding jumper shall not be required where all of the following conditions are met:

- (3) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.
- (4) Overcurrent protection in the circuit is limited to 10 amperes or less.
- (5) The load is part of a meter, instrument, or relay circuit.

Statement of Problem and Substantiation for Public Input

The grounding and bonding requirements for Articles 501, 502, and 503, as modified in PI 1879 should be in Article 500. The scope of Article 500 states that the article covers the general requirements for the class/division system. The bonding requirements in the revised section are the same for the three articles. They modify requirements in Article 250 which according to 90.3 apply generally to all electrical installations. Adding the bonding to Article 500 the bonding section and deleting the grounding and bonding requirements from Articles 501, 502, and 503 will add clarity to the hazardous location articles by eliminating repeated text. If this PI is rejected the revised text in PIs for Articles 500.30, 505.30, and PI 506.30 should be used. The revision to the dot 30 section limits the grounding requirements to Article 250 to Part I and Part VI and limits bonding to Article 250 Part I and Part V plus the special bonding requirements. The requirement for each one is saying that these parts are the only ones that apply to hazardous(classified) locations. While 90.3 does state that Chapters 1 through 4 apply generally to all installations it also says that Chapters 5 through 7 supplement or modify Chapters 1 through 4. It can be argued that the current "dot 30" sections in Articles 501, 502, 503, 505, and 506 limit (modify) the grounding and bonding in hazardous locations to Parts I, IV, and V. Regardless of the answer the section is not clear and needs to be revised. In reality there are bonding and grounding requirements in each of the ten parts of Article 250 that might apply to an installation in a hazardous (classified) location at one time or another. With the restriction in the 2023 NEC Style Manual that prohibits using references to complete articles the current language of 501.30 cannot be easily fixed. Removing grounding from the section eliminates that part of the problem and in truth the section does not modify or supplement grounding, so it doesn't belong. As for bonding, the revised language should correct the problem. Removing the reference to two parts of Article 250 removes any idea that the other parts are not valid and making the reference to the general bonding requirements of Chapter 2 of this Code leads to Article 250 indirectly without violating the Style Manual. Separate PIs are submitted to delete the dot 30 sections from Articles 501, 502, and 503. Separate PIs are also submitted to revise the text of 505.30 and 506.30 to be parallel with text revised text in this PI.

Related Public Inputs for This Document

Related Input

[Public Input No. 1882-NFPA 70-2023 \[Section No. 503.30\]](#)
[Public Input No. 1881-NFPA 70-2023 \[Section No. 502.30\]](#)
[Public Input No. 1879-NFPA 70-2023 \[New Section after 500.8\(G\)\]](#)
[Public Input No. 1665-NFPA 70-2023 \[Section No. 506.30\]](#)
[Public Input No. 1664-NFPA 70-2023 \[Section No. 505.30\]](#)
[Public Input No. 1664-NFPA 70-2023 \[Section No. 505.30\]](#)
[Public Input No. 1665-NFPA 70-2023 \[Section No. 506.30\]](#)
[Public Input No. 1879-NFPA 70-2023 \[New Section after 500.8\(G\)\]](#)
[Public Input No. 1881-NFPA 70-2023 \[Section No. 502.30\]](#)
[Public Input No. 1882-NFPA 70-2023 \[Section No. 503.30\]](#)

Relationship

Parallel Construction.
 Parallel Construction.
 New Parallel Construction.
 Parallel Construction.
 Parallel Construction.

Submitter Information Verification

Submitter Full Name: John Simmons
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Affiliation: IBEW
Street Address:
City:
State:
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Submittal Date: Sun Aug 06 20:54:54 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8808-NFPA 70-2024](#)
Statement: The grounding and bonding requirements of 501.30 are deleted to correlate with PI 1879 which moves them to new 500.30. See related first revision.



Public Input No. 2724-NFPA 70-2023 [Section No. 501.30]

501.30 Grounding and Bonding.

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with 501.30(A) and (B).

(A) Grounding.

Wiring systems and equipment shall be grounded in accordance with Article 250, Part I and Part VI ~~of Article 250~~, as applicable.

(B) Bonding.

Bonding shall comply with Article 250, Part I and Part V ~~of Article 250~~, as applicable, and 501.30(B)(1) and (B)(2).

(1) Specific Bonding Means.

Bonding shall comply with 501.30(B)(1)(a) and (B)(1)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between Class I locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

(2) Flexible Metal Conduit and Liquidtight Flexible Metal Conduit.

Flexible metal conduit and liquidtight flexible metal conduit shall comply with 501.30(B)(2)(a) and (B)(2)(b).

(a) Flexible metal conduit and liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

(b) In Class I, Division 2 locations, the bonding jumper shall not be required where all of the following conditions are met:

- (3) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.
- (4) Overcurrent protection in the circuit is limited to 10 amperes or less.
- (5) The load is part of a meter, instrument, or relay circuit.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
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City:
State:
Zip:
Submission Date: Thu Aug 24 19:22:03 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: FR-8284-NFPA 70-2024

Statement: The grounding requirements and bonding requirements for hazardous (classified) locations have been revised. The grounding requirement in the dot 30 sections referenced Parts I and VI of Article 250. The reference to two of the parts could be construed to mean that the other Parts did not apply to hazardous (classified) locations. Additionally, based on 90.3 Chapters 5-7 can only supplement or modify Chapters 1-4. The grounding requirements did not belong in the dot 30 sections. The specific bonding requirements have not changed other than removing the reference to Parts I and V. The parent text is revised to require compliance with the bonding and grounding requirements in Chapter 2.



Public Input No. 4414-NFPA 70-2023 [Section No. 501.30(B)(1)]

(1) Specific Bonding Means.

Bonding shall comply with 501.30(B)(1)(a) and (B)(1)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between Class I locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4 10 (5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 14:45:36 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 1871-NFPA 70-2023 [Section No. 501.100(B)]

(B) Class I, Division 2.

In Class I, Division 2 locations, dry type transformers shall comply with 450.24 through 20 through 450.27, ~~and capacitors~~ . Capacitors shall comply with ~~460.3 through 460~~ with 460.3 through 460 .28 .

Statement of Problem and Substantiation for Public Input

The language currently used does not adequately address the issues with exposed hot spot temperatures with ventilated transformers nor the surface temperatures of encapsulated dry-type transformers. Also, separating the subject matter into two sentences make it clear transformers and capacitors do not have related requirements.

This proposal would align new section 450.20 (PI-1526) with these proposed changes.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 1526-NFPA 70-2023 [New Part after II.]</u>	Dry type xfms in HazLocs

Submitter Information Verification

Submitter Full Name: Paul Guidry
Organization: Fluor Enterprises, Inc.
Affiliation: Associated Builders and Contractors
Street Address:
City:
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Zip:
Submittal Date: Sun Aug 06 17:50:28 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: This PI refers to a section 450.20 which is being proposed by PI 1526. The proposed section contains requirements for dry-type transformers in Hazardous (Classified) Locations. All requirements for Hazardous (Classified) Locations are located in Articles 500 through 516. PI 1526 should be resolved. Subdivision 500.8(B)(1) requires equipment to be identified for the class of location. Temperature requirements are also addressed in the subdivision. The subdivision is merely meant to refer to the Article 450 requirements for the transformers. The specific requirements for transformers in Hazardous (Classified) Locations are found in Articles 500 through 516 where they should be located.

**Public Input No. 3304-NFPA 70-2023 [Section No. 501.105(A)]**

(A) Class I, Division 1.

~~In Class I, Division 1 locations, meters, Meters,~~ instruments, and relays, including kilowatt-hour meters, instrument transformers, resistors, rectifiers, and thermionic tubes, shall ~~be provided with enclosures identified~~ be identified for Class I, Division 1 locations or installed in an enclosure that is identified for Class I, Division 1. Enclosures for Class I, Division 1 locations include explosionproof enclosures and purged and pressurized enclosures.

Informational Note: See NFPA 496, *Standard for Purged and Pressurized Enclosures for Electrical Equipment*.

Statement of Problem and Substantiation for Public Input

Original text read as if a meter or instrument could not be protected by IS. The wording here could be changed to clarify

Submitter Information Verification

Submitter Full Name: Glen Edwards
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City:
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Submittal Date: Thu Aug 31 17:09:13 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8324-NFPA 70-2024](#)

Statement: CMP-14 agrees that the revised text will add clarity to the requirement. The revision does not change the requirement. The informational note is revised to comply with Section 2.1.10.3 of the NEC Style Manual.



Public Input No. 3305-NFPA 70-2023 [Section No. 501.105(B) [Excluding any Sub-Sections]]

In Class I, Division 2 locations, meters, instruments, and relays shall comply with 501.105(B)(2-1) through (B)(6).

Statement of Problem and Substantiation for Public Input

Text should include (B)(1).

Submitter Information Verification

Submitter Full Name: Glen Edwards
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State:
Zip:
Submittal Date: Thu Aug 31 17:13:52 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8326-NFPA 70-2024](#)
Statement: CMP-14 agrees with the submitter that subsection 501.105(B)(1) should be included in the list of requirements.

**Public Input No. 3306-NFPA 70-2023 [Section No. 501.120(B)(3)]****(3) Resistors.**

Resistors shall be provided with enclosures; and the assembly shall be identified for Class I, Division 1 locations, unless the resistance is nonvariable and the maximum operating temperature, in degrees Celsius, will not exceed 80 percent of the autoignition temperature of the gas or vapor involved or the resistor has been tested and found incapable of igniting the gas or vapor.

Statement of Problem and Substantiation for Public Input

If the temperature could be too high, or there could be contacts for variability, then this would need protection for these ignition sources. Class I would need to include Div 1.

Submitter Information Verification

Submitter Full Name: Glen Edwards
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Affiliation: International Society of Automation (ISA)
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City:
State:
Zip:
Submittal Date: Thu Aug 31 17:15:06 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8327-NFPA 70-2024](#)

Statement: The revised wording makes it clear that resistor/enclosure assemblies must be identified for Class I, Division 1 locations unless the resistance is variable and the maximum operating temperature is not capable of exceeding 80% of the autoignition temperature of the gas or vapor involved.



Public Input No. 3307-NFPA 70-2023 [Section No. 501.125(A)]

(A) Class I, Division 1.

In Class I, Division 1 locations, motors, generators, and other rotating electrical machinery shall be one of the following:

- (1) Identified for Class I, Division 1 locations
- (2) Of the totally enclosed type supplied with positive-pressure ventilation from a source of clean air with discharge to a safe area, so arranged to prevent energizing of the machine until ventilation has been established and the enclosure has been purged with at least 10 volumes of air, and so arranged to automatically de-energize the equipment when the air supply fails

Informational Note - See NFPA 496 for further guidance

- (3) Of the totally enclosed inert gas-filled type supplied with a suitable reliable source of inert gas for pressurizing the enclosure, with devices provided to ensure a positive pressure in the enclosure and arranged to automatically de-energize the equipment when the gas supply fails

Informational Note - See NFPA 496 for further guidance

- (4) For machines that are for use only in restricted industrial establishments, the machine is permitted to be of a type designed to be submerged in a liquid that is flammable only when vaporized and mixed with air, or in a gas or vapor at a pressure greater than atmospheric and that is flammable only when mixed with air; and the machine is so arranged to prevent energizing it until it has been purged with the liquid or gas to exclude air, and so arranged to automatically de-energize the equipment when the supply of liquid or gas or vapor fails or the pressure is reduced to atmospheric

Totally enclosed motors of the types specified in 501.125(A)(2) or (A)(3) shall have no external surface with an operating temperature in degrees Celsius in excess of 80 percent of the autoignition temperature of the gas or vapor involved. Appropriate devices shall be provided to detect and automatically de-energize the motor or provide an adequate alarm if there is any increase in temperature of the motor beyond designed limits. Auxiliary equipment shall be of a type identified for the location in which it is installed.

Statement of Problem and Substantiation for Public Input

These items describe aspects of pressurization protection concept with no reference to a standard for further guidance.

Submitter Information Verification

Submitter Full Name: Glen Edwards
Organization: Detector Electronics Corporati
Affiliation: Informational Note - See NFPA 496 for further guidance
Street Address:
City:
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Zip:
Submittal Date: Thu Aug 31 17:16:27 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8329-NFPA 70-2024](#)

Statement: A reference to NFPA 496 has been added under list items 2 and 3 as requested in the PI. The text is revised to comply with the 2023 NEC Style Manual Section 2.1.10.3.

**Public Input No. 310-NFPA 70-2023 [Section No. 501.130]****501.130 Luminaires.**

Luminaires shall comply with 501.130(A) or (B). Retrofitted luminaires shall comply with 501.130(C).

(A) Class I, Division 1.

In Class I, Division 1 locations, luminaires shall comply with 501.130(A)(1) through (A)(4).

(1) Luminaires.

Each luminaire shall be identified as a complete assembly for the Class I, Division 1 location and shall be clearly marked to indicate the maximum wattage of lamps for which it is identified. Luminaires intended for portable use shall be specifically listed as a complete assembly for that use.

(2) Physical Damage.

Each luminaire shall be protected against physical damage by a suitable guard or by location.

(3) Pendant Luminaires.

Pendant luminaires shall be suspended by and supplied through threaded rigid metal conduit stems or threaded steel intermediate conduit stems, and threaded joints shall be provided with set-screws or other effective means to prevent loosening. For stems longer than 300 mm (12 in.), permanent and effective bracing against lateral displacement shall be provided at a level not more than 300 mm (12 in.) above the lower end of the stem, or flexibility in the form of a fitting or flexible connector identified for the Class I, Division 1 location shall be provided not more than 300 mm (12 in.) from the point of attachment to the supporting box or fitting.

(4) Supports.

Boxes, box assemblies, or fittings used for the support of luminaires shall be identified for Class I locations.

(B) Class I, Division 2.

In Class I, Division 2 locations, luminaires shall comply with 501.130(B)(1) through (B)(6).

(1) Luminaires.

Where lamps are of a size or type that may, under normal operating conditions, reach surface temperatures exceeding 80 percent of the autoignition temperature in degrees Celsius of the gas or vapor involved, luminaires shall comply with 501.130(A)(1) or shall be of a type that has been tested in order to determine the marked operating temperature or temperature class (T code).

(2) Physical Damage.

Luminaires shall be protected from physical damage by suitable guards or by location. Where there is danger that falling sparks or hot metal from lamps or luminaires might ignite localized concentrations of flammable vapors or gases, suitable enclosures or other effective protective means shall be provided.

(3) Pendant Luminaires.

Pendant luminaires shall be suspended by threaded rigid metal conduit stems, threaded steel intermediate metal conduit stems, or other approved means. For rigid stems longer than 300 mm (12 in.), permanent and effective bracing against lateral displacement shall be provided at a level not more than 300 mm (12 in.) above the lower end of the stem, or flexibility in the form of an identified fitting or flexible connector shall be provided not more than 300 mm (12 in.) from the point of attachment to the supporting box or fitting.

(4) Portable Lighting Equipment.

Portable lighting equipment shall comply with 501.130(B)(4)(a) or (B)(4)(b).

(a) Portable lighting equipment shall comply with 501.130(B)(1).

(b) Portable lighting equipment mounted on movable stands and connected by flexible cords in accordance with 501.140 shall be permitted to comply with 501.130(B)(1), where mounted in any position, if it is protected from physical damage in accordance with 501.130(B)(2).

(5) Switches.

Switches that are a part of a luminaire or of an individual lampholder shall comply with 501.115(B)(1).

(6) Starting Equipment.

Starting and control equipment for electric-discharge lamps shall comply with 501.120(B).

Exception: A thermal protector potted into a thermally protected fluorescent lamp ballast if the luminaire is identified for the location.

(C) Luminaire Retrofit Kits.

Retrofitted luminaires shall comply with 501.130(C)(1) through (C)(4).

(1) Modification of existing luminaires to change the lamp type, such as for light-emitting-diode (LED) lamp types, shall be permitted using retrofit kits listed for the location and suitable for field installation in luminaires in accordance with the instructions provided.

(2) The retrofit kit shall consist of light sources, installation instructions, subassemblies, luminaire marking labels, and assembly aids (where appropriate) to facilitate the replacement of the existing light source in complete luminaires. The retrofit installation might require modifications to the luminaire in accordance with the installation instructions provided with the retrofit kit.

(3) A luminaire that is modified so it can no longer accept the original lamp shall be relabeled with a label provided with the listed retrofit kit which is to be affixed to the luminaire where visible during relamping that indicates the luminaire has been modified and can no longer operate the originally intended lamp(s) and additionally identifies the replacement lamp type/model to be used, together with the manufacturer's name and ordering information. The label shall:

(a) Be affixed to the luminaire where visible during relamping.

(b) Indicate that the luminaire has been modified and can no longer operate the originally intended lamps, and

(c) Identify the replacement lamp type/model to be used, together with the manufacturer's name and ordering information.

(4) LED retrofit luminaire conversion kits using linear tubular LED lamp conversions shall be relabeled with a label provided with the listed retrofit kit which is to be affixed to the luminaire where visible during relamping that indicates in text or wiring diagram how the supply connections are made to the lamp holders.

Statement of Problem and Substantiation for Public Input

This proposal clarifies the need for luminaire retrofit kits to be listed for the classified location in which the luminaire is installed, and that the luminaire is to be modified in accordance with the instructions provided with the kit. The proposal also requires that new relamping information be marked on the retrofitted luminaire.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 311-NFPA 70-2023 [Section No. 502.130]	Related
Public Input No. 312-NFPA 70-2023 [Section No. 503.130]	Related
Public Input No. 313-NFPA 70-2023 [Section No. 505.9]	Related
Public Input No. 314-NFPA 70-2023 [Section No. 506.9]	Related
Public Input No. 311-NFPA 70-2023 [Section No. 502.130]	
Public Input No. 312-NFPA 70-2023 [Section No. 503.130]	
Public Input No. 313-NFPA 70-2023 [Section No. 505.9]	
Public Input No. 314-NFPA 70-2023 [Section No. 506.9]	

Submitter Information Verification

Submitter Full Name: Donald Ankele
Organization: UL LLC
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City:
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Zip:
Submittal Date: Thu Feb 09 09:37:30 EST 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8342-NFPA 70-2024](#)

Statement: The section is revised to provide for the new section (C) for retrofitted luminaires.



Public Input No. 2923-NFPA 70-2023 [Section No. 501.140]

~~501.140~~ Flexible Cords, Class 1, Divisions 1 and 2:

~~(A) Permitted Uses:~~

~~Flexible cord shall be permitted as follows:~~

- ~~(1) For connection between portable lighting equipment or other portable utilization equipment and the fixed portion of their supply circuit. The flexible cord shall be attached to the utilization equipment with a cord connector listed for the protection technique of the equipment wiring compartment. An attachment plug in accordance with 501.140(B)(4) shall be employed.~~
- ~~(2) For that portion of the circuit where the fixed wiring methods of 501.10(A) cannot provide the necessary degree of movement for fixed and mobile electrical utilization equipment, and the flexible cord is protected by location or by a suitable guard from damage and only in a restricted industrial establishment.~~
- ~~(3) For electric submersible pumps with means for removal without entering the wet-pit. The extension of the flexible cord within a suitable raceway between the wet-pit and the power source shall be permitted.~~
- ~~(4) For electric mixers intended for travel into and out of open-type mixing tanks or vats.~~
- ~~(5) For temporary portable assemblies consisting of receptacles, switches, and other devices that are not considered portable utilization equipment but are individually listed for the location.~~

~~(B) Installation:~~

~~Where flexible cords are used, the cords shall comply with all of the following:~~

- ~~(1) Be of a type listed for extra-hard usage~~
- ~~(2) Contain, in addition to the conductors of the circuit, an equipment grounding conductor complying with 400.23~~
- ~~(3) Be supported by clamps or by other suitable means in such a manner that there is no tension on the terminal connections~~
- ~~(4) In Division 1 locations or in Division 2 locations where the boxes, fittings, or enclosures are required to be explosionproof, the cord shall be terminated with a cord connector or attachment plug listed for the location or a listed cord connector installed with a seal listed for the location. In Division 2 locations where explosionproof equipment is not required, the cord shall be terminated with a listed cord connector or listed attachment plug.~~
- ~~(5) Be of continuous length. Where 501.140(A)(5) is applied, cords shall be of continuous length from the power source to the temporary portable assembly and from the temporary portable assembly to the utilization equipment.~~

~~Informational Note: See 501.20 for flexible cords exposed to liquids having a deleterious effect on the conductor insulation.~~

~~DELETE ENTIRE SECTION~~

Statement of Problem and Substantiation for Public Input

Extra hard service Portable Cord is not required to be FT4/IEEE 1202 rated and is not required to pass the Crushing, Impact and Cold Impact (-25C) mechanical abuse tests required for TC-ER-HL or MC-HL per UL 2225. Manufacturers are using this provision to get around complying with UL 2225 requirements for cables for hazardous locations. Flexible Cords should not be permitted in C1D1 areas. If this proposal is not acceptable, then you must specify that Flexible Cords used in C1D1 areas MUST comply with UL 2225. i.e. SOOW-HL

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 3286-NFPA 70-2023 [Section No. 501.140(B)]	

Submitter Information Verification

Submitter Full Name: Philip Laudicina
Organization: Marmon Industrial Energy & Infrastructure
Street Address:
City:

State:**Zip:****Submittal Date:** Mon Aug 28 11:58:00 EDT 2023**Committee:** NEC-P14**Committee Statement**

Resolution: Flexible cords are not permitted to be installed as permanent wiring in a cable tray. IEEE 1202 therefore shall not apply. No rationale given why SO cord requires crush and impact requirements of 2225. Typically, cord is used in short lengths to power luminaires at the ceiling, power equipment requiring motion, or for temporary use to power portable utilization equipment. No field complaints during many decades of use.



Public Input No. 3286-NFPA 70-2023 [Section No. 501.140(B)]

(B) Installation.

Where flexible cords are used, the cords shall comply with all of the following:

- (1) Be of a ~~type listed~~ Type Listed for extra-hard usage and bear the suffix "-HL"
- (2) Contain, in addition to the conductors of the circuit, an equipment grounding conductor complying with 400.23
- (3) Be supported by clamps or by other suitable means in such a manner that there is no tension on the terminal connections
- (4) In Division 1 locations or in Division 2 locations where the boxes, fittings, or enclosures are required to be explosionproof, the cord shall be terminated with a cord connector or attachment plug listed for the location or a listed cord connector installed with a seal listed for the location. In Division 2 locations where explosionproof equipment is not required, the cord shall be terminated with a listed cord connector or listed attachment plug.
- (5) Be of continuous length. Where 501.140(A)(5) is applied, cords shall be of continuous length from the power source to the temporary portable assembly and from the temporary portable assembly to the utilization equipment.

Informational Note: See 501.20 for flexible cords exposed to liquids having a deleterious effect on the conductor insulation.

Statement of Problem and Substantiation for Public Input

Extra hard Service Cords are NOT required to meet the flammability and mechanical tests per UL 2225 which are required for TC-ER-HL, MC-HL and ITC-HL. Portable cords are only required to be Horizontal Flame rated which is a Bunsen burner flame test. Cables for C1D1 areas such as MC-HL, TC-ER-HL and ITC-HL MUST pass IEEE 1202 which is a far more severe test (70,000 BTU of heat for 20 minutes vs a one minute Bunsen burner test). Portable Cords are not required to pass Crushing, Impact or Low Temperature Impact Tests as required for "-HL" cables per UL 2225. Let's put all cables used in C1D1 areas on equal footing with respect to mechanical and flammability characteristics.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 2923-NFPA 70-2023 [Section No. 501.140]	Provides more clarity

Submitter Information Verification

Submitter Full Name: Philip Laudicina
Organization: Marmon Industrial Energy & Infrastructure
Street Address:
City:
State:
Zip:
Submission Date: Thu Aug 31 14:34:42 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: There is no substantiation provided to require crush and impact requirements from UL 2225 for flexible cords.

**Public Input No. 2725-NFPA 70-2023 [Section No. 501.141(B)(1)]****(1) Cable Types.**

Listed Type P cables shall comply with 501.141(A)(1) and shall be installed as required in ~~Part II of Article 337~~, Part II. The associated cable assemblies shall comply with the requirements of 501.141(B)(2).

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 24 19:23:41 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: FR-8464-NFPA 70-2024

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

**Public Input No. 3874-NFPA 70-2023 [Section No. 501.150(B)(3)]**

(3) Protectors.

Enclosures shall be provided for lightning protective devices, arcing or non-arcing surge-protective devices, and surge arrestors, and for fuses. Such enclosures shall be permitted to be of the general-purpose type.

Statement of Problem and Substantiation for Public Input

Surge protective devices can be arcing and should be treated similar to lightning protective devices and fuses.

Submitter Information Verification

Submitter Full Name: Glen Edwards
Organization: Detector Electronics Corporation
Affiliation: International Society of Automation (ISA)
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 07:30:04 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The requirements for surge devices are found in 501.35. The requirements for enclosures in Class I, Division 1 and Division 2 are located there.



Public Input No. 1976-NFPA 70-2023 [New Section after 502.1]

502.3 Reconditioned Equipment

502.3(A) Permitted to be Installed

Reconditioned equipment shall be permitted to be installed in hazardous (classified) locations if the reconditioning is conducted in accordance with the manufacturer's instructions or, if no instructions are provided, nationally recognized standards.

(1) Reconditioned Motors or Generators.

Reconditioning of a Class II, Division 1, dust ignitionproof motor or a Class II, Division 1, dust ignitionproof generator listed for use in hazardous (classified) locations shall be listed as reconditioned when installed (or reinstalled) in a hazardous (classified) location. Reconditioning of a Class II, Division 1 dust ignitionproof motor or a Class II, Division 1 dust ignitionproof generator identified for use in hazardous (classified) locations shall be identified as reconditioned when installed in a hazardous (classified) location, in accordance with 500.8(A). Reconditioning of a motor or generator with dust ignitionproof construction features is considered to take place when a motor is removed from service for repairs, including replacement of a failed bearing. The dust ignitionproof features of any reconditioned, dust ignitionproof, motor or generator are verified as a part of the reconditioning or refurbishing process.

Informational Note 1: See UL 674, *Electric Motors and Generators for Use in Hazardous (Classified) Locations* for construction and test requirements for explosionproof motors and generators.

Informational Note 2: See ANSI/EASA AR100, *Recommended Practice for the Repair of Rotating Electrical Apparatus*, for information on the rewinding and repair of motors.

502.3(B) Not Permitted to be Installed

1. Intrinsically Safe Systems.

Reconditioning of intrinsically safe systems is not permitted. Replacement of intrinsically safe, replaceable printed circuit board assemblies or modules, is permitted with like for like components, provided by the original manufacturer.

Statement of Problem and Substantiation for Public Input

An informal task group of CMP14 members (Rich Holub, Don Ankele, Dave Burns, Bill Lawrence, Mark Goodman, and Evans Massey) met to address the inclusion of a paragraph in the 2023 Edition of the NEC® in 430.2 which addressed listing of reconditioned motors in hazardous (classified) locations. The task group concluded that this language was out of scope for Article 430 and must reside in the Chapter 5 articles which cover hazardous (classified) location requirements. Current language in 501.125 and 502.125 allow motors to be identified for the location and doesn't specifically require them to be listed. Motors which were listed when constructed could be listed as reconditioned, but those just identified at the time of construction would then need to be identified in accordance with 500.8. Insertion of a listing requirement for reconditioned motors is contradictory to existing requirements because a motor which was never listed when installed could not be listed as reconditioned. As such, the CMP14 task group has proposed language stating reconditioned motors shall be identified as reconditioned, mirroring current requirements for the motors as stated in the relevant equipment sections. The task group concluded that reconditioning of intrinsically safe systems was not appropriate because no accepted practices to approve such reconditioning exists in the industry. Replacement, in kind, of intrinsically safe circuit board assemblies or modules is not considered reconditioning as it is compliant with the original manufacturer's listing and labeling.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1979-NFPA 70-2023 [Section No. 430.2]	

Submitter Information Verification

Submitter Full Name: Richard Holub
Organization: The DuPont Company, Inc.
Street Address:
City:

State:**Zip:****Submittal Date:** Wed Aug 09 07:36:12 EDT 2023**Committee:** NEC-P14

Committee Statement

Resolution: [FR-8362-NFPA 70-2024](#)

Statement: New section 502.3 places the requirements for reconditioned equipment in Article 502. Equipment must be reconditioned according to the manufacturer's instructions. Where there are none, reconditioning must be according to nationally recognized standards. Specific reconditioning requirements are provided for motors and generators. Reconditioned intrinsically safe equipment is not permitted to be installed. However printed circuit board assemblies or modules are permitted to be replaced with like for like components from the original manufacturer.

**Public Input No. 1478-NFPA 70-2023 [Section No. 502.1]****502.1 Scope.**

This article covers the requirements for electrical and electronic equipment and wiring for all voltages in Class II, Division 1 and 2 locations where fire or explosion hazards may exist due to combustible dust or metal combustible fibers/flyings.

Statement of Problem and Substantiation for Public Input

Subdivision 500.5(D)(1)(a) classifies metal combustible fibers/flyings as Class II, Division 1, Group E materials. As such metal combustible fibers/flyings must comply with the requirements of Article 502 and should be included in the scope of Article 502. Subdivision 500.5(D)(1)(a) places meal combustible fibers/flyings in Article 502 but the scope of the article does not include them. The scope of Article 503 was revised to include only nonmetallic fibers/flyings in Article 503.

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Thu Jul 20 14:43:30 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The intent of the changes for metal combustible fibers/flyings is to leave their requirements under Class III. Class III requires metal combustible fibers/flyings to be classified as Class II, Division 1, Group E.



Public Input No. 2271-NFPA 70-2023 [Section No. 502.10(A)(1)]

(1) General.

In Class II, Division 1 locations, the following wiring methods shall be permitted:

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC), including conduit systems with supplemental corrosion protection coatings.
- (2) Type MI cable with termination fittings listed for the location. Type MI cable shall be installed and supported in a manner to avoid tensile stress at the termination fittings. When installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables unless otherwise protected against dust buildup resulting in increased heat, Type MI cable shall be installed in accordance with 332.10.
- (3) In restricted industrial establishments, Type MC-HL cable, listed for use in Class II, Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, a separate equipment grounding conductor(s) in accordance with 250.122, and provided with termination fittings listed for the location, shall be permitted. When installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables unless otherwise protected against dust buildup resulting in increased heat, Type MC-HL cable shall be installed in accordance with 330.10.
- (4) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC shall be permitted to be installed in raceways in accordance with 502.10(A). Optical fiber cables shall be sealed in accordance with 502.15.
- (5) In restricted industrial establishments, listed Type ITC-HL cable with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material, and terminated with fittings listed for the application, When installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables unless otherwise protected against dust buildup resulting in increased heat, and installed in accordance with 335.4.
- (6) In restricted industrial establishments, for applications limited to 600 volts nominal or less, where the cable is not subject to physical damage and is terminated with fittings listed for the location, listed Type TC-ER-HL cable. When installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables unless otherwise protected against dust buildup resulting in increased heat, Type TC-ER-HL cable shall be installed in accordance with 336.10.

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for construction, testing, and marking of cables and cable fittings.

- (7) In restricted industrial establishments, listed Type P cable with metal braid armor, with an overall jacket, that is terminated with fittings listed for the location and installed in accordance with 337.10. When installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables, unless otherwise protected against dust buildup resulting in increased heat.

Informational Note No. 2: See ANSI/UL 1309, *Marine Shipboard Cable*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

MI, MC-HL, and ITC-HL cable have not been required to have a space between adjacent cables to prevent the dust buildup and create extra heating effects. Type, TC-ER-HL and Type P cable require the spacing between cables, in a Class II, Division 1 location. The dust buildup for the Type(s) MI, MC-HL and ITC-HL cable would not be different than what would build up on the Type TC-ER-HL cable or Type P cable.

Submitter Information Verification

Submitter Full Name: IEC National
Organization: IEC
Affiliation: Lowell Reith IEC
Street Address:
City:
State:
Zip:

Submittal Date: Tue Aug 15 14:50:46 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: The PI did not provide sufficient substantiation to explain why cable fills would be different than already identified in the Code, whether the concern is over-heating of the cable due to dust layer, or whether the concern is dust ignition and how those temperature exposures create either cable damage or dust ignition.



Public Input No. 4416-NFPA 70-2023 [Section No. 502.10(A)(1)]

(1) General.

In Class II, Division 1 locations, the following wiring methods shall be permitted:

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC), including conduit systems with supplemental corrosion protection coatings.
- (2) Type MI cable with termination fittings listed for the location. Type MI cable shall be installed and supported in a manner to avoid tensile stress at the termination fittings.
- (3) In restricted industrial establishments, Type MC-HL cable, listed for use in Class II, Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, a separate equipment grounding conductor(s) in accordance with 250.122, and provided with termination fittings listed for the location, shall be permitted.
- (4) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC shall be permitted to be installed in raceways in accordance with 502.10(A). Optical fiber cables shall be sealed in accordance with 502.15.
- (5) In restricted industrial establishments, listed Type ITC-HL cable with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material, and terminated with fittings listed for the application, and installed in accordance with 335.4 10.
- (6) In restricted industrial establishments, for applications limited to 600 volts nominal or less, where the cable is not subject to physical damage and is terminated with fittings listed for the location, listed Type TC-ER-HL cable. When installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables unless otherwise protected against dust buildup resulting in increased heat, Type TC-ER-HL cable shall be installed in accordance with 336.10.

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for construction, testing, and marking of cables and cable fittings.

- (7) In restricted industrial establishments, listed Type P cable with metal braid armor, with an overall jacket, that is terminated with fittings listed for the location and installed in accordance with 337.10. When installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables, unless otherwise protected against dust buildup resulting in increased heat.

Informational Note No. 2: See ANSI/UL 1309, *Marine Shipboard Cable*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 14:50:08 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.

**Public Input No. 3175-NFPA 70-2023 [Section No. 502.10(A)(3)]****(3) Boxes and Fittings.**

Boxes and fittings shall be provided with threaded bosses for connection to conduit or cable terminations and shall be dusttight. Boxes and fittings in which taps, joints, or terminal connections are made, or that are used in Group E locations, shall be identified for Class II locations.

Informational Note No. 1 : See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables, dust-ignitionproof cable fittings, and dust-ignitionproof cord connectors for entry into enclosures required to be dust-ignitionproof.

Informational Note No. 2: For enclosures types that are considered dusttight, see Table 110.28.

Statement of Problem and Substantiation for Public Input

Adding Informational Note No 2 to help Code users understand what enclosure types would be suitable for dusttight.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 21:00:07 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The term dusttight does not appear in Table 110.28 except in informational notes 1 and 3. Table 110.28, Informational Note No. 1 reiterates Informational Note No. 2 found in the definition of dusttight. Table 110.28, Informational Note No. 3 refers to Section 502.10(A)(3). The inclusion of a second informational note in 502.10(A)(3) sending the user to Table 110.28 would only reiterate the definition of dusttight and would create a circular reference that does not benefit the user. The user would have the same benefit as referencing the definition of dusttight.



Public Input No. 4340-NFPA 70-2023 [Section No. 502.10(B)(1)]

(1) General.

In Class II, Division 2 locations, the following wiring methods shall be permitted:

- (1) All wiring methods permitted in 502.10(A).
- (2) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including conduit systems with supplemental corrosion protection coatings.
- (3) Dusttight wireways or electrical metallic tubing (EMT) with listed compression-type connectors or listed compression-type couplings.
- (4) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings.
- (5) Type PLTC cable or Type PLTC-ER cable used in Class 2- ~~or Class 3 circuits~~ , Class 3, or Class 4 circuits , including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (6) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (7) In restricted industrial establishments where wiring methods in 502.10(B)(1)(1)(2) will not provide the corrosion resistance required for the installation environment, either of the following:
 - (8) Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with suffix -XW
 - (9) Schedule 80 PVC conduit, factory elbows, and associated fittings
- (10) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC, installed in cable trays or any other raceway in accordance with 502.10(B). Optical fiber cables shall be sealed in accordance with 502.15.
- (11) Cablebus.
- (12) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, that is terminated with listed fittings and installed in accordance with 337.10.

Informational Note: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Statement of Problem and Substantiation for Public Input

Adding Class 4 to the list. Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.

Submitter Information Verification

Submitter Full Name: Chad Jones
Organization: Cisco Systems
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 12:10:11 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The PI does not provide substantiation to prove that Class 4 systems are appropriate for use in Class II, Division 2 locations. Additionally, PLTC cable is rated at 300 volts while Class 4 systems are rated for up to 450 volts making the addition of Class 4 systems to PLTC cable incorrect.



Public Input No. 4455-NFPA 70-2023 [Section No. 502.10(B)(1)]

(1) General.

In Class II, Division 2 locations, the following wiring methods shall be permitted:

- (1) All wiring methods permitted in 502.10(A).
- (2) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, including conduit systems with supplemental corrosion protection coatings.
- (3) Dusttight wireways or electrical metallic tubing (EMT) with listed compression-type connectors or listed compression-type couplings.
- (4) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings.
- (5) Type PLTC cable or Type PLTC-ER cable used in Class 2 or Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (6) Type ITC cable or Type ITC-ER cable as permitted in 335.4 ~~and 10~~ and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (7) In restricted industrial establishments where wiring methods in 502.10(B)(1)(1)(2) will not provide the corrosion resistance required for the installation environment, either of the following:
 - (8) Listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with suffix -XW
 - (9) Schedule 80 PVC conduit, factory elbows, and associated fittings
- (10) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC, installed in cable trays or any other raceway in accordance with 502.10(B). Optical fiber cables shall be sealed in accordance with 502.15.
- (11) Cablebus.
- (12) In restricted industrial establishments, listed Type P cable with or without metal braid armor, with an overall jacket, that is terminated with listed fittings and installed in accordance with 337.10.

Informational Note: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4236-NFPA 70-2023 [Article 335]	reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 15:43:08 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 1881-NFPA 70-2023 [Section No. 502.30]

~~502.30~~ Grounding and Bonding:

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with ~~502.30 (A) and (B):~~

~~(A)~~ Grounding:

Wiring systems and equipment shall be grounded in accordance with Part I and Part VI of Article 250, as applicable.

~~(B)~~ Bonding:

Bonding shall comply with Part I and Part V of Article 250, as applicable, and ~~502.30(B) (1) and (B)(2):~~

~~(1)~~ Specific Bonding Means:

Bonding shall comply with ~~502.30(B) (1)(a) and (B)(1)(b):~~

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in ~~335.4 (5), 336.10(7) (c), or 722.135(C)~~ shall be bonded in accordance with ~~250.102~~.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in ~~250.32(B)~~:

~~(2)~~ Liquidtight Flexible Metal Conduit:

Liquidtight flexible metal conduit shall comply with ~~502.30(B) (2)(a) and (B)(2)(b):~~

- ~~(1) Liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.~~
- ~~(2) In Class II, Division 2 locations, the bonding jumper shall not be required where all of the following conditions are met:~~
 - ~~(3) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.~~
 - ~~(4) Overcurrent protection in the circuit is limited to 10 amperes or less.~~
 - ~~(5) The load is part of a meter, instrument, or relay circuit.~~

Statement of Problem and Substantiation for Public Input

The grounding and bonding requirements for Articles 501, 502, and 503, as modified in this PI 1879 should be in Article 500. The scope of Article 500 states that the article covers the general requirements for the class/division system. The bonding requirements in the revised section are the same for the three articles. They modify requirements in Article 250 which according to 90.3 apply in general to all electrical installations. Adding the bonding to Article 500 the bonding section and deleting the grounding and bonding requirements from Articles 501, 502, and 503 will add clarity to the hazardous location articles by eliminating repeated text. If this PI is rejected the revised text in PIs for Articles 500.30, 505.30, and PI 506.30 should be used. The revision to the dot 30 section limits the grounding requirements to Article 250 to Part I and Part VI and limits bonding to Article 250 Part I and Part V plus the special bonding requirements. The requirement for each one is saying that these parts are the only ones that apply to hazardous(classified) locations. While 90.3 does state that Chapters 1 through 4 apply in general to all installations it also says that Chapters 5 through 7 supplement or modify Chapters 1 through 4. It can be argued that the current "dot 30" sections in Articles 501, 502, 503, 505, and 506 limit (modify) the grounding and bonding in hazardous locations to Parts I, IV, and V. Regardless of the answer the section is not clear and needs to be revised. There are bonding and grounding requirements in each of the ten parts of Article 250 that might apply to an installation in a hazardous (classified) location at one time or another. With the restriction in the 2023 NEC Style Manual that prohibits using references to complete articles in the current language of 501.30 cannot be easily fixed. Removing grounding from the section eliminates that part of the problem and in truth the section does not modify or supplement grounding, so it doesn't belong. As for bonding, the revised language should correct the problem. Removing the reference to two parts of Article 250 removes any idea that the other parts are not valid and making the reference to the general bonding requirements of Chapter 2 of this Code leads to Article 250 indirectly without violating the Style Manual. Separate PIs are submitted to delete the "dot 30" sections from Articles 501, 502, and 503. Separate PIs are also submitted to revise the text of 505.30 and 5065.30 to be parallel with text revised text in this PI.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1882-NFPA 70-2023 [Section No. 503.30]	Parallel Construction.
Public Input No. 1880-NFPA 70-2023 [Section No. 501.30]	Parallel Construction.
Public Input No. 1879-NFPA 70-2023 [New Section after 500.8(G)]	New Parallel Construction.
Public Input No. 1665-NFPA 70-2023 [Section No. 506.30]	Parallel Construction.
Public Input No. 1664-NFPA 70-2023 [Section No. 505.30]	Parallel Construction.
Public Input No. 1664-NFPA 70-2023 [Section No. 505.30]	
Public Input No. 1665-NFPA 70-2023 [Section No. 506.30]	
Public Input No. 1879-NFPA 70-2023 [New Section after 500.8(G)]	
Public Input No. 1880-NFPA 70-2023 [Section No. 501.30]	
Public Input No. 1882-NFPA 70-2023 [Section No. 503.30]	

Submitter Information Verification

Submitter Full Name: John Simmons
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Affiliation: IBEW
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City:
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Submittal Date: Sun Aug 06 21:06:57 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8558-NFPA 70-2024](#)
Statement: The grounding and bonding requirements of 502.30 are deleted to correlate with PI 1879 which moves them to new 500.30. See related first revision.



Public Input No. 2726-NFPA 70-2023 [Section No. 502.30]

502.30 Grounding and Bonding.

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with 502.30(A) and (B).

(A) Grounding.

Wiring systems and equipment shall be grounded in accordance with Article 250, Part I and Part VI ~~of Article 250~~, as applicable.

(B) Bonding.

Bonding shall comply with Article 250, Part I and Part V ~~of Article 250~~, as applicable, and 502.30(B)(1) and (B)(2).

(1) Specific Bonding Means.

Bonding shall comply with 502.30(B)(1)(a) and (B)(1)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

(2) Liquidtight Flexible Metal Conduit.

Liquidtight flexible metal conduit shall comply with 502.30(B)(2)(a) and (B)(2)(b).

(a) Liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

(b) In Class II, Division 2 locations, the bonding jumper shall not be required where all of the following conditions are met:

- (3) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.
- (4) Overcurrent protection in the circuit is limited to 10 amperes or less.
- (5) The load is part of a meter, instrument, or relay circuit.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

Street Address:

City:

State:

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Submittal Date: Thu Aug 24 19:24:41 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8558-NFPA 70-2024](#)

Statement: The grounding and bonding requirements of 502.30 are deleted to correlate with PI 1879 which moves them to new 500.30. See related first revision.



Public Input No. 4417-NFPA 70-2023 [Section No. 502.30(B)(1)]

(1) Specific Bonding Means.

Bonding shall comply with 502.30(B)(1)(a) and (B)(1)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4 ~~10~~ (5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
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Submittal Date: Thu Sep 07 14:52:25 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 1591-NFPA 70-2023 [Section No. 502.128 [Excluding any Sub-Sections]]

Ventilating pipes for motors, generators, or other rotating electrical machinery, or for enclosures for electrical equipment, shall be of metal not less than 0.53 mm (0.021 in.) in thickness or ~~of equally substantial noncombustible material and another combustible material that provides protection equal to that of the metal pipe.~~ The ventilating pipes shall comply with all of the following:

- (1) Lead directly to a source of clean air outside of buildings
- (2) Be screened at the outer ends to prevent the entrance of small animals or birds
- (3) Be protected against physical damage and against rusting or other corrosive influences

Ventilating pipes shall also comply with 502.128(A) and (B).

Statement of Problem and Substantiation for Public Input

The word "substantial(ly)" is included Table 3.2.1 of the 2023 NEC Style Manual a possibly vague and unenforceable term. The revised text makes it clear that the other noncombustible material is required to provide protection equal to the metal pipe included in the section. The requirement is broken down into two sentences for clarity.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1590-NFPA 70-2023 [Section No. 503.128]	The requirements of the two sections are identical.
Public Input No. 1590-NFPA 70-2023 [Section No. 503.128]	

Submitter Information Verification

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Submittal Date: Wed Jul 26 16:32:23 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel does not want to change the language in this section for fear of unintended consequences. The AHJ can evaluate alternate materials of construction and approve as needed with the current language, however metal duct construction is the default material they'd be comparing against.

**Public Input No. 311-NFPA 70-2023 [Section No. 502.130]****502.130 Luminaires.**

Luminaires shall comply with 502.130 (A) or (B). Retrofitted luminaires shall comply with 502.130(C).

(A) Class II, Division 1.

In Class II, Division 1 locations, luminaires for fixed and portable lighting shall comply with 502.130(A)(1) through (A)(4).

(1) Marking.

Each luminaire shall be identified for the location and shall be clearly marked to indicate the type and maximum wattage of the lamp for which it is designed.

(2) Physical Damage.

Each luminaire shall be protected against physical damage by a suitable guard or by location.

(3) Pendant Luminaires.

Pendant luminaires shall be suspended by threaded rigid metal conduit stems, by threaded steel intermediate metal conduit stems, by chains with approved fittings, or by other approved means. For rigid stems longer than 300 mm (12 in.), permanent and effective bracing against lateral displacement shall be provided at a level not more than 300 mm (12 in.) above the lower end of the stem, or flexibility in the form of a fitting or a flexible connector listed for the location shall be provided not more than 300 mm (12 in.) from the point of attachment to the supporting box or fitting. Threaded joints shall be provided with set screws or other effective means to prevent loosening. Where wiring between an outlet box or fitting and a pendant luminaire is not enclosed in conduit, flexible cord listed for hard usage shall be permitted to be used in accordance with 502.10(A)(2)(5). Flexible cord shall not serve as the supporting means for a luminaire.

(4) Supports.

Boxes, box assemblies, or fittings used for the support of luminaires shall be identified for Class II locations.

(B) Class II, Division 2.

In Class II, Division 2 locations, luminaires shall comply with 502.130(B)(1) through (B)(5).

(1) Portable Lighting Equipment.

Portable lighting equipment shall be identified for the location. They shall be clearly marked to indicate the maximum wattage of lamps for which they are designed.

(2) Fixed Lighting.

Luminaires for fixed lighting shall be provided with enclosures that are dusttight or otherwise identified for the location. Each luminaire shall be clearly marked to indicate the maximum wattage of the lamp that shall be permitted without exceeding an exposed surface temperature in accordance with 500.8(D)(2) under normal conditions of use.

(3) Physical Damage.

Luminaires for fixed lighting shall be protected from physical damage by suitable guards or by location.

(4) Pendant Luminaires.

Pendant luminaires shall be suspended by threaded rigid metal conduit stems, by threaded steel intermediate metal conduit stems, by chains with approved fittings, or by other approved means. For rigid stems longer than 300 mm (12 in.), permanent and effective bracing against lateral displacement shall be provided at a level not more than 300 mm (12 in.) above the lower end of the stem, or flexibility in the form of an identified fitting or a flexible connector shall be provided not more than 300 mm (12 in.) from the point of attachment to the supporting box or fitting. Where wiring between an outlet box or fitting and a pendant luminaire is not enclosed in conduit, flexible cord listed for hard usage shall be permitted if terminated with a listed cord connector that maintains the protection technique. Flexible cord shall not serve as the supporting means for a luminaire.

(5) Electric-Discharge Lamps.

Starting and control equipment for electric-discharge lamps shall comply with the requirements of 502.120(B).

(C) Luminaire Retrofit Kits.

Retrofit luminaire kits shall comply with 502.130(C)(1) through (C)(4).

(1) Modification of existing luminaires to change the lamp type, such as for light-emitting-diode (LED) lamp types, shall be permitted using retrofit kits listed for the location and suitable for field installation in luminaires in accordance with the instructions provided.

(2) The retrofit kit shall consist of light sources, installation instructions, subassemblies, luminaire marking labels, and assembly aids (where appropriate) to facilitate the replacement of the existing light source in complete luminaires. The retrofit installation might require modifications to the luminaire in accordance with the installation instructions provided with the retrofit kit.

(3) A luminaire that is modified so it can no longer accept the original lamp shall be relabeled with a label provided with the listed retrofit kit which is to be affixed to the luminaire where visible during relamping that indicates the luminaire has been modified and can no longer operate the originally intended lamp(s) and additionally identifies the replacement lamp type/model to be used, together with the manufacturer's name and ordering information. The label shall:

(a) Be affixed to the luminaire where visible during relamping.

(b) Indicate that the luminaire has been modified and can no longer operate the originally intended lamps, and

(c) Identify the replacement lamp type/model to be used, together with the manufacturer's name and ordering information.

(4) LED retrofit luminaire conversion kits using linear tubular LED lamp conversions shall be relabeled with a label provided with the listed retrofit kit which is to be affixed to the luminaire where visible during relamping that indicates in text or wiring diagram how the supply connections are made to the lamp holders.

Statement of Problem and Substantiation for Public Input

This proposal clarifies the need for luminaire retrofit kits to be listed for the classified location in which the luminaire is installed, and that the luminaire is to be modified in accordance with the instructions provided with the kit. The proposal also requires that new relamping information be marked on the retrofitted luminaire.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 310-NFPA 70-2023 [Section No. 501.130]	Related
Public Input No. 312-NFPA 70-2023 [Section No. 503.130]	Related
Public Input No. 313-NFPA 70-2023 [Section No. 505.9]	Related
Public Input No. 314-NFPA 70-2023 [Section No. 506.9]	Related
Public Input No. 310-NFPA 70-2023 [Section No. 501.130]	
Public Input No. 312-NFPA 70-2023 [Section No. 503.130]	
Public Input No. 313-NFPA 70-2023 [Section No. 505.9]	
Public Input No. 314-NFPA 70-2023 [Section No. 506.9]	

Submitter Information Verification

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Submittal Date: Thu Feb 09 09:43:17 EST 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8567-NFPA 70-2024](#)

Statement: This first revision adds the requirements for luminaire retrofit kits. The equipment has existed but was not explicitly specified in the NEC. Retrofit kits require certification to be listed and labeled for hazardous (classified) locations. The retrofit will not alter the area classification in which the equipment is installed, and it will not alter the hazardous location marking for the equipment currently installed. The retrofit kits are evaluated and certified for use with the installed luminaire, rather than being an aftermarket product for use with any luminaire. All submittals are required to be in compliance with UL 844, which includes requirements for ordinary locations. Only when a portion of the luminaire that carries the original certification mark is replaced does that certification mark go away.

If not, the original certification mark will remain and the retrofit certification mark will indicate the updated markings.

**Public Input No. 1493-NFPA 70-2023 [Section No. 502.150(B) [Excluding any Sub-Sections]]**

In Class II, Division 2 locations, signaling, alarm, remote-control, and communications systems; and meters, instruments, and relays shall comply with 502.150(B)(1) through (B)(~~4~~ 5).

Statement of Problem and Substantiation for Public Input

This is an editorial change. There are five list items under 502.150(B) and not just the four items shown in the charging language in the subdivision.

Submitter Information Verification

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Submittal Date: Fri Jul 21 17:00:46 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8809-NFPA 70-2024](#)

Statement: Article 502.150(B) includes five list items, however, the charging language of the article only requires the first four list items. Updating the charging language to include the fifth list item.



Public Input No. 2727-NFPA 70-2023 [Section No. 503.10(A)(1)]

(1) General.

In Class III, Division 1 locations, the following wiring methods shall be permitted:

- (1) Rigid metal conduit (RMC), PVC conduit, RTRC conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT), dusttight wireways, or Type MC or Type MI cable with listed termination fittings.
- (2) Type PLTC cable or Type PLTC-ER cable used in Class 2 and Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (3) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (4) Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings.
- (5) Cablebus.
- (6) In restricted industrial establishments, listed Type P cable with metal braid armor, with an overall jacket, that is terminated with fittings listed for the location, and installed in accordance with ~~Part II of Article 337~~, Part II. If installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables unless otherwise protected against dust buildup resulting in increased heat.

Informational Note No. 1: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

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Submission Date: Thu Aug 24 19:26:04 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8843-NFPA 70-2024](#)

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.



Public Input No. 4341-NFPA 70-2023 [Section No. 503.10(A)(1)]

(1) General.

In Class III, Division 1 locations, the following wiring methods shall be permitted:

- (1) Rigid metal conduit (RMC), PVC conduit, RTRC conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT), dusttight wireways, or Type MC or Type MI cable with listed termination fittings.
- (2) Type PLTC cable or Type PLTC-ER cable used in Class 2- ~~and Class 3 circuits~~ , Class 3, and Class 4 circuits , including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (3) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (4) Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings.
- (5) Cablebus.
- (6) In restricted industrial establishments, listed Type P cable with metal braid armor, with an overall jacket, that is terminated with fittings listed for the location, and installed in accordance with Part II of Article 337. If installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables unless otherwise protected against dust buildup resulting in increased heat.

Informational Note No. 1: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

Adding Class 4 to the list. Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.

Submitter Information Verification

Submitter Full Name: Chad Jones
Organization: Cisco Systems
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Zip:
Submittal Date: Thu Sep 07 12:11:09 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The PI does not provide substantiation to prove that Class 4 systems are appropriate for use in Class I, Division 2 locations. Additionally, PLTC cable is rated at 300 volts while Class 4 systems are rated for up to 450 volts making the addition of Class IV systems to PLTC cable incorrect.



Public Input No. 4419-NFPA 70-2023 [Section No. 503.10(A)(1)]

(1) General.

In Class III, Division 1 locations, the following wiring methods shall be permitted:

- (1) Rigid metal conduit (RMC), PVC conduit, RTRC conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT), dusttight wireways, or Type MC or Type MI cable with listed termination fittings.
- (2) Type PLTC cable or Type PLTC-ER cable used in Class 2 and Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (3) Type ITC cable or Type ITC-ER cable as permitted in 335.4 ~~and 10~~ and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (4) Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings.
- (5) Cablebus.
- (6) In restricted industrial establishments, listed Type P cable with metal braid armor, with an overall jacket, that is terminated with fittings listed for the location, and installed in accordance with Part II of Article 337. If installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables unless otherwise protected against dust buildup resulting in increased heat.

Informational Note No. 1: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
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Street Address:
City:
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Zip:
Submission Date: Thu Sep 07 14:54:24 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 774-NFPA 70-2023 [Section No. 503.10(A)(1)]

(1) General.

In Class III, Division 1 locations, only the following wiring methods shall be permitted:

- (1) Rigid metal conduit (RMC), PVC conduit, RTRC conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT), dusttight wireways, or Type MC or Type MI cable with listed termination fittings.
- (2) Type PLTC cable or Type PLTC-ER cable used in Class 2 and Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (3) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (4) Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings.
- (5) Cablebus.
- (6) In restricted industrial establishments, listed Type P cable with metal braid armor, with an overall jacket, that is terminated with fittings listed for the location, and installed in accordance with Part II of Article 337. If installed in ladder, ventilated trough, or ventilated channel cable trays, cables shall be installed in a single layer, with a space not less than the larger cable diameter between the two adjacent cables unless otherwise protected against dust buildup resulting in increased heat.

Informational Note No. 1: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

The section does not contain an enforceable requirement.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
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Affiliation: Steel Tube Institute
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City:
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Zip:
Submission Date: Thu May 04 14:21:05 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The text as written lists the permissible wiring methods for Class III, Division 1 locations. Adding the word “only” would conflict with 90.4(C).



Public Input No. 2728-NFPA 70-2023 [Section No. 503.10(A)(3)]

(3) Flexible Connections.

Where flexible connections are necessary, one or more of the following shall be permitted:

- (1) Dusttight flexible connectors
- (2) Liquidtight flexible metal conduit (LFMC) with listed fittings
- (3) Liquidtight flexible nonmetallic conduit (LFNC) with listed fittings and bonded in accordance with 503.30(B)
- (4) Interlocked armor Type MC cable having an overall jacket of suitable polymeric material and installed with listed dusttight termination fittings
- (5) Flexible cord in accordance with 503.140
- (6) For elevator use, an identified elevator cable of Type EO, Type ETP, or Type ETT, shown under the "use" column in Table 400.4 for "hazardous (classified) locations" and terminated with listed dusttight fittings
- (7) In restricted industrial establishments, listed Type P cable with metal braid armor, with an overall jacket, that is terminated with fittings listed for the location and installed in accordance with ~~Part H of Article 337~~, Part II

Informational Note: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
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Submittal Date: Thu Aug 24 19:26:56 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8846-NFPA 70-2024](#)

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.



Public Input No. 2729-NFPA 70-2023 [Section No. 503.10(B)]

(B) Class III, Division 2.

Wiring methods in Class III, Division 2 locations shall be in accordance with the following:

- (1) The wiring shall comply with 503.10(A).
- (2) In sections, compartments, or areas that do not contain machinery and are used solely for storage, open wiring on insulators shall be permitted where installed in accordance with ~~Part H of Article 398.298~~ , Part II, including the condition required by 398.15(C) that protection be provided where conductors are not run in roof spaces and are well out of reach of sources of physical damage.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

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Submittal Date: Thu Aug 24 19:28:06 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8848-NFPA 70-2024](#)

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4 regarding the use of Parts.



Public Input No. 1882-NFPA 70-2023 [Section No. 503.30]

~~503.30~~ Grounding and Bonding:

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with ~~503.30(A) and (B):~~

~~(A)~~ Grounding:

Wiring systems and equipment shall be grounded in accordance with Part I and Part VI of Article 250, as applicable.

~~(B)~~ Bonding:

Bonding shall comply with Part I and Part V of Article 250, as applicable, and ~~503.30(B) (1) and (B)(2):~~

~~(1)~~ Specific Bonding Means:

Bonding shall comply with ~~503.30(B) (1)(a) and (B)(2)(b):~~

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in ~~335.4 (5), 336.10(7) (c), or 722.135(C)~~ shall be bonded in accordance with ~~250.102~~.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in ~~250.32(B)~~:

~~(2)~~ Liquidtight Flexible Metal Conduit:

Liquidtight flexible metal conduit shall comply with ~~503.30(B) (2)(a) and (B)(2)(b):~~

- ~~(1) Liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.~~
- ~~(2) In Class III locations, the bonding jumper shall not be required where all of the following conditions are met:~~
 - ~~(3) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.~~
 - ~~(4) Overcurrent protection in the circuit is limited to 10 amperes or less.~~
 - ~~(5) The load is part of a meter, instrument, or relay circuit.~~

Statement of Problem and Substantiation for Public Input

The grounding and bonding requirements for Articles 501, 502, and 503, as modified in this PI 1879 should be in Article 500. The scope of Article 500 basically states that the article covers the general requirements for the class/division system. The bonding requirements in the revised section are the same for the three articles. They modify requirements in Article 250 which according to 90.3 apply in general to all electrical installations. Adding the bonding to Article 500 the bonding section and deleting the grounding and bonding requirements from Articles 501, 502, and 503 will add clarity to the hazardous location articles by eliminating repeated text. If this PI is rejected the revised text in PIs for Articles 500.30, 505.30, and PI 506.30 should be used. The revision to the dot 30 section limits the grounding requirements to Article 250 to Part I and Part VI and limits bonding to Article 250 Part I and Part V plus the special bonding requirements. The requirement for each one is saying that these parts are the only ones that apply to hazardous(classified) locations. While 90.3 does state that Chapters 1 through 4 apply in general to all installations it also says that Chapters 5 through 7 supplement or modify Chapters 1 through 4. It can be argued that the current "dot 30" sections in Articles 501, 502, 503, 505, and 506 limit (modify) the grounding and bonding in hazardous locations to Parts I, IV, and V. Regardless of the answer the section is not clear and needs to be revised. There are bonding and grounding requirements in each of the ten parts of Article 250 that might apply to an installation in a hazardous (classified) location at one time or another. With the restriction in the 2023 NEC Style Manual that prohibits using references to complete articles, the current language of 501.30 cannot be easily fixed. Removing grounding from the section eliminates that part of the problem and in truth the section does not modify or supplement grounding, so it doesn't belong. As for bonding, the revised language should correct the problem. Removing the reference to two parts of Article 250 removes any idea that the other parts are not valid and making the reference to the general bonding requirements of Chapter 2 of this Code leads to Article 250 indirectly without violating the Style Manual. Separate PIs are submitted to delete the "dot 30" sections from Articles 501, 502, and 503. Separate PIs are also submitted to revise the text of 505.30 and 506.30 to be parallel with text revised text in this PI.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1881-NFPA 70-2023 [Section No. 502.30]	Parallel Construction.
Public Input No. 1880-NFPA 70-2023 [Section No. 501.30]	Parallel Construction.
Public Input No. 1879-NFPA 70-2023 [New Section after 500.8(G)]	New Parallel Construction.
Public Input No. 1665-NFPA 70-2023 [Section No. 506.30]	Parallel Construction.
Public Input No. 1664-NFPA 70-2023 [Section No. 505.30]	Parallel Construction.
Public Input No. 1664-NFPA 70-2023 [Section No. 505.30]	
Public Input No. 1665-NFPA 70-2023 [Section No. 506.30]	
Public Input No. 1879-NFPA 70-2023 [New Section after 500.8(G)]	
Public Input No. 1880-NFPA 70-2023 [Section No. 501.30]	
Public Input No. 1881-NFPA 70-2023 [Section No. 502.30]	

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
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Submittal Date: Sun Aug 06 21:16:53 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8620-NFPA 70-2024](#)
Statement: Revision made to remove Section 503.30 text as the concept of grounding and bonding was added to 500.30.



Public Input No. 2730-NFPA 70-2023 [Section No. 503.30]

503.30 Grounding and Bonding.

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with 503.30(A) and (B).

(A) Grounding.

Wiring systems and equipment shall be grounded in accordance with Article 250, Part I and Part VI ~~of Article 250~~, as applicable.

(B) Bonding.

Bonding shall comply with Article 250, Part I and Part V ~~of Article 250~~, as applicable, and 503.30(B)(1) and (B)(2).

(1) Specific Bonding Means.

Bonding shall comply with 503.30(B)(1)(a) and (B)(2)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

(2) Liquidtight Flexible Metal Conduit.

Liquidtight flexible metal conduit shall comply with 503.30(B)(2)(a) and (B)(2)(b).

(a) Liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

(b) In Class III locations, the bonding jumper shall not be required where all of the following conditions are met:

- (3) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.
- (4) Overcurrent protection in the circuit is limited to 10 amperes or less.
- (5) The load is part of a meter, instrument, or relay circuit.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
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Submission Date: Thu Aug 24 19:29:09 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8620-NFPA 70-2024](#)

Statement: Revision made to remove Section 503.30 text as the concept of grounding and bonding was added to 500.30.



Public Input No. 4420-NFPA 70-2023 [Section No. 503.30(B)(1)]

(1) Specific Bonding Means.

Bonding shall comply with 503.30(B)(1)(a) and (B)(2)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4 ~~10~~ (5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
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City:
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Submittal Date: Thu Sep 07 14:55:35 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 1590-NFPA 70-2023 [Section No. 503.128]

503.128 Ventilating Piping — Class III, Divisions 1 and 2.

Ventilating pipes for motors, generators, or other rotating electrical machinery, or for enclosures for electric equipment, shall be of metal not less than 0.53 mm (0.021 in.) in thickness, ~~or of equally substantial noncombustible material, and or another noncombustible material that provides protection equal to that of the metal pipe.~~ The ventilating pipes shall comply with the following:

- (1) Lead directly to a source of clean air outside of buildings
- (2) Be screened at the outer ends to prevent the entrance of small animals or birds
- (3) Be protected against physical damage and against rusting or other corrosive influences

Ventilating pipes shall be sufficiently tight, including their connections, to prevent the entrance of appreciable quantities of fibers/flyings into the ventilated equipment or enclosure and to prevent the escape of sparks, flame, or burning material that might ignite accumulations of fibers/flyings or combustible material in the vicinity. For metal pipes, lock seams and riveted or welded joints shall be permitted; and tight-fitting slip joints shall be permitted where some flexibility is necessary, as at connections to motors.

Statement of Problem and Substantiation for Public Input

The word "substantial(ly)" is included Table 3.2.1 of the 2023 NEC Style Manual a possibly vague and unenforceable term. The revised text makes it clear that the other noncombustible material is required to provide protection equal to the metal pipe included in the section. The requirement is broken down into two sentences for clarity.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1591-NFPA 70-2023 [Section No. 502.128 [Excluding any Sub-Sections]]	The requirements in the two sections are identical.
Public Input No. 1591-NFPA 70-2023 [Section No. 502.128 [Excluding any Sub-Sections]]	

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submission Date: Wed Jul 26 16:19:52 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The panel does not want to change the language in this section for fear of unintended consequences. The AHJ can evaluate alternate materials of construction and approve as needed with the current language, however metal duct construction is the default material they'd be comparing against.



Public Input No. 312-NFPA 70-2023 [Section No. 503.130]

503.130 Luminaires — Class III, Divisions 1 and 2.

Luminaires shall comply with 503.130 (A) through (D) as applicable. Retrofitted luminaires shall comply with 503.130(E).

(A) Fixed Lighting.

Luminaires for fixed lighting shall provide enclosures for lamps and lampholders that are designed to minimize entrance of fibers/flyings and to prevent the escape of sparks, burning material, or hot metal. Each luminaire shall be clearly marked to show the maximum wattage of the lamps that shall be permitted without exceeding an exposed surface temperature of 165°C (329°F) under normal conditions of use.

(B) Physical Damage.

A luminaire that may be exposed to physical damage shall be protected by a suitable guard.

(C) Pendant Luminaires.

Pendant luminaires shall be suspended by stems of threaded rigid metal conduit, threaded intermediate metal conduit, threaded metal tubing of equivalent thickness, or by chains with approved fittings. For stems longer than 300 mm (12 in.), permanent and effective bracing against lateral displacement shall be provided at a level not more than 300 mm (12 in.) above the lower end of the stem, or flexibility in the form of an identified fitting or a flexible connector shall be provided not more than 300 mm (12 in.) from the point of attachment to the supporting box or fitting.

(D) Portable Lighting Equipment.

Portable lighting equipment shall be equipped with handles and protected with substantial guards. Lampholders shall be of the unswitched type with no provision for receiving attachment plugs. There shall be no exposed current-carrying metal parts, and all exposed non-current-carrying metal parts shall be grounded. In all other respects, portable lighting equipment shall comply with 503.130(A).

(E) Luminaire Retrofit Kits.

Retrofitted luminaires shall comply with 503.130(E)(1) through (E)(4).

(1) Modification of existing luminaires to change the lamp type, such as for light-emitting-diode (LED) lamp types, shall be permitted using retrofit kits listed for the location and suitable for field installation in luminaires in accordance with the instructions provided.

(2) The retrofit kit shall consist of light sources, installation instructions, subassemblies, luminaire marking labels, and assembly aids (where appropriate) to facilitate the replacement of the existing light source in complete luminaires. The retrofit installation might require modifications to the luminaire in accordance with the installation instructions provided with the retrofit kit.

(3) A luminaire that is modified so it can no longer accept the original lamp shall be relabeled with a label provided with the listed retrofit kit which is to be affixed to the luminaire where visible during relamping that indicates the luminaire has been modified and can no longer operate the originally intended lamp(s) and additionally identifies the replacement lamp type/model to be used, together with the manufacturer's name and ordering information. The label shall:

(a) Be affixed to the luminaire where visible during relamping,

(b) Indicate that the luminaire has been modified and can no longer operate the originally intended lamps, and

(c) Identify the replacement lamp type/model to be used, together with the manufacturer's name and ordering information.

(4) LED retrofit luminaire conversion kits using linear tubular LED lamp conversions shall be relabeled with a label provided with the listed retrofit kit which is to be affixed to the luminaire where visible during relamping that indicates in text or wiring diagram how the supply connections are made to the lamp holders.

Statement of Problem and Substantiation for Public Input

This proposal clarifies the need for luminaire retrofit kits to be listed for the classified location in which the luminaire is installed, and that the luminaire is to be modified in accordance with the instructions provided with the kit. The proposal also requires that new relamping information be marked on the retrofitted luminaire.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 310-NFPA 70-2023 [Section No. 501.130]</u>	Related
<u>Public Input No. 311-NFPA 70-2023 [Section No. 502.130]</u>	Related
<u>Public Input No. 313-NFPA 70-2023 [Section No. 505.9]</u>	Related
<u>Public Input No. 314-NFPA 70-2023 [Section No. 506.9]</u>	Related

[Public Input No. 310-NFPA 70-2023 \[Section No. 501.130\]](#)

[Public Input No. 311-NFPA 70-2023 \[Section No. 502.130\]](#)

[Public Input No. 313-NFPA 70-2023 \[Section No. 505.9\]](#)

[Public Input No. 314-NFPA 70-2023 \[Section No. 506.9\]](#)

Submitter Information Verification

Submitter Full Name: Donald Ankele

Organization: UL LLC

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Submittal Date: Thu Feb 09 09:45:05 EST 2023

Committee: NEC-P14

Committee Statement

Resolution: At the direction of the committee, due to TERRA functional requirements and of existing FR's on Section 503.130, ballotable detail FR-8627 changes the charging statement of Section 503.130 to include 503.130(A) thru (D) and [new] Section 503.130(E) therefore, PI-312 is resolved.



Public Input No. 1594-NFPA 70-2023 [Section No. 503.130(D)]

(D) Portable Lighting Equipment.

Portable lighting equipment shall be equipped with handles and protected with substantial guards. Lampholders shall be of the unswitched type with no provision for receiving attachment plugs. ~~There shall be no exposed current-carrying metal parts, and all exposed non-current-carrying metal parts shall be grounded. In all other respects, portable lighting equipment shall comply with 503.130(A).~~ -

Statement of Problem and Substantiation for Public Input

The requirement for no exposed current-carrying metal parts is unnecessary. Section 503.25 addresses uninsulated exposed parts in Class III, Division 1 and Division 2 locations. Section 410.5 does not permit luminaires, including portable luminaires, to have exposed live parts. Section 4.1.1 of the 2023 NEC Style Manual: "General requirements contained in Chapters 1 through 4 shall not be repeated in other articles of the document." Section 410.5 is a general requirement. The requirement for grounding exposed non-current carrying metal parts is addressed for portable equipment in 250.138 and 250.190(A). Cord and plug connected equipment is addressed in 250.114. Section 503.30 says that grounding will be in accordance with Part I and Part Vi of Article 250. Section 4.1.1 of the NEC Style Manual applies here.

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 26 17:38:17 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8472-NFPA 70-2024](#)

Statement: The text "There shall be no exposed current-carrying metal parts, and all exposed non-current-carrying metal parts shall be grounded." is deleted as it is addressed by the revisions to 500.30.

**Public Input No. 2846-NFPA 70-2023 [Section No. 503.130(D)]****(D) Portable Lighting Equipment.**

Portable lighting equipment shall be equipped with handles and protected with substantial guards. Lampholders shall be of the unswitched type with no provision for receiving attachment plugs. There shall be no exposed current-carrying metal parts, and all exposed non-current-carrying metal parts shall be ~~grounded~~ connected to the equipment grounding conductor. In all other respects, portable lighting equipment shall comply with 503.130(A).

Statement of Problem and Substantiation for Public Input

Revised text to make it clear that the requirement is about the connection to the equipment grounding conductor, not ground. This proposed revision will add clarity for Code users.

Submitter Information Verification

Submitter Full Name: Mike Holt
Organization: Mike Holt Enterprises Inc
Street Address:
City:
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Zip:
Submission Date: Fri Aug 25 14:39:47 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8472-NFPA 70-2024](#)

Statement: The text "There shall be no exposed current-carrying metal parts, and all exposed non-current-carrying metal parts shall be grounded." is deleted as it is addressed by the revisions to 500.30.



Public Input No. 3311-NFPA 70-2023 [Section No. 504.1]

504.1 Scope.

This article covers the installation of intrinsically safe (I.S.) apparatus, wiring, and systems for hazardous (classified) locations.

Informational Note: See ANSI/ISA RP 12.06.01, *Recommended Practice for Wiring Methods for Hazardous (Classified) Locations Instrumentation — Part 1: Intrinsic Safety*, for additional information.

[Placeholder: Update reference to ANSI/ISA RP 12.06.01. The new version may be published with both an ISA and UL reference number due to the numerous historical references to ANSI/ISA RP 12.06.01.]

Statement of Problem and Substantiation for Public Input

The UL 60079 STP is working on a revision of ANSI/ISA RP12.06.01. This comment is intended to be a placeholder and will be revised when details are available regarding the new reference and publication date.

Submitter Information Verification

Submitter Full Name: Glen Edwards
Organization: Detector Electronics Corporati
Affiliation: International Society of Automation (ISA)
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 31 17:19:56 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The referenced document has not been published and cannot be included at this time.

**Public Input No. 3726-NFPA 70-2023 [Section No. 504.4]****~~504.4~~ Equipment 2 Listing Requirements .**

All intrinsically safe apparatus and associated apparatus shall be listed.

Exception: Simple apparatus, as described on the control drawing, shall not be required to be listed.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. A new section is added to comply with the NEC Style Manual Section 2.2.1 regarding Listing Requirements.

2.2.1 Parallel Numbering Required. Technical committees shall use the following section numbers for the same purposes within articles. This requirement shall not apply to Articles 90, 100, and 110. If the article does not contain listing or reconditioning requirements, the subdivisions shall not be included in the article.

Required Parallel Numbering Format

XXX.1 Scope.

XXX.2 Listing Requirements.

XXX.3 Reconditioned Equipment.

XXX.3(A) Permitted to be Installed.

XXX.3(B) Not Permitted to be Installed.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

Street Address:

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Zip:

Submission Date: Tue Sep 05 14:58:29 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8477-NFPA 70-2024](#)

Statement: The listing requirements are moved to 504.2 in accordance with 2.2.1 of the NEC® Style Manual. The title of 504.2 is changed in accordance with the Style Manual as well. Renumber 504.3 to 504.4.

**Public Input No. 3312-NFPA 70-2023 [Section No. 504.10(A)]****(A) Control Drawing.**

Intrinsically safe apparatus, associated apparatus, and other equipment shall be installed in accordance with the control drawing(s).

A simple apparatus, whether or not shown on the control drawing(s), shall be permitted to be installed provided the simple apparatus does not interconnect intrinsically safe circuits.

Informational Note No. 1: The control drawing identification is marked on the apparatus.

Informational Note No. 2: Associated apparatus with a marked U_m of less than 250 V may require additional overvoltage protection at the inputs to limit any possible fault voltages to less than the U_m marked on the product. Electrical Equipment with outputs that are identified as SELV (Safety Extra Low Voltage), PELV (Protected Extra Low Voltage), or Inherently limited Class 2 power source that have a voltage below the U_m are examples of how this can be addressed.

Statement of Problem and Substantiation for Public Input

Clarification how this may be achieved would be useful to add to the note.

Submitter Information Verification

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Affiliation: International Society of Automation (ISA)
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City:
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Submittal Date: Thu Aug 31 17:21:36 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The proposed text provides a recommendation in an informational note which is not permitted by 2.1.10.2 of the NEC Style Manual.



Public Input No. 3313-NFPA 70-2023 [Section No. 504.10(D)]

(D) Simple Apparatus.

(1) Class I, Division 1 and Class I, Zone 0 and 1 locations

Simple apparatus shall be permitted to be installed in any hazardous (classified) location in which the maximum surface temperature of the simple apparatus does not exceed the ignition temperature of the flammable gases or vapors, flammable liquids, combustible dusts, or ignitable fibers/flyings present. The maximum surface temperature can be determined from the values of the output power from the associated apparatus or apparatus to which it is connected to obtain the temperature class. The temperature class can be determined by:

- Reference to Table 504.10(D)
- Calculation using the following equation:

$$T = P_o R_{th} + T_{amb} \quad [504.10(D)]$$

where:

- T = surface temperature
- P_o = output power marked on the associated apparatus or intrinsically safe apparatus
- R_{th} = thermal resistance of the simple apparatus
- T_{amb} = ~~ambient local~~ ambient local temperature (normally 40°C) and reference Table 500.8(C)(4)

Informational Note - The local temperature is the temperature of the air surrounding the component (but not the component surface temperature), taking into account the heat from the component and other nearby components, and where relevant, external sources of heating, under normal operating conditions.

In addition, components with a surface area smaller than 10 cm² (excluding lead wires) may be classified as T5 if their surface temperature does not exceed 150°C.

Table 504.10(D) ~~Assessment 1 Assessment~~ Assessment 1 Assessment for T4 Classification According to Component Size and Temperature

<u>Requirement for T4</u>	
<u>Total Surface Area Excluding Lead Wires</u>	<u>Classification</u>
<20 mm ²	Surface temperature ≤275°C
≥20 mm ² ≤10 cm ²	Surface temperature ≤200°C
≥20 mm ²	Power not exceeding 1.3 W*

*Based on 40°C ~~ambient temperature~~ ambient temperature local temperature. Reduce to 1.2 W with an ~~ambient of~~ ambient of a local temperature of 60°C or 1.0 W with 80°C local temperature.

Terminal boxes and switches in intrinsically safe circuits can be considered to have a temperature rise of less than 40 K and can thus have a temperature classification of T6 at a local temperature not exceeding 40 °C, T5 at a local temperature not exceeding 55 °C or T4 at a local temperature not exceeding 80 °C.

(2) Class II and III, Division 1 and Zone 20 and 21 locations

Simple apparatus shall be permitted to be installed in any hazardous (classified) location in which the maximum surface temperature of the simple apparatus does not exceed the ignition temperature of the combustible dusts, or ignitable fibers/flyings present. The maximum surface temperature can be determined from the values of the output power from the associated apparatus or apparatus to which it is connected to obtain the temperature class.

For simple apparatus, which is installed in Class II, Division 1, Class III, Division 1, Zone 20 or Zone 21, if the continuous short circuit current is less than 250 mA and the maximum dissipated power from the associated apparatus or apparatus to which it is connected to is less than the values quoted in Table 504 (10) D2 then a T4 or T135°C temperature classification applies.

Table 504.10(D)2 Maximum permitted power dissipation within a component immersed in dust

<u>Maximum local temperature</u>	<u>°C</u>	<u>40</u>	<u>70</u>	<u>100</u>
<u>Permitted power</u>	<u>mW</u>	<u>750</u>	<u>650</u>	<u>550</u>

Informational Note No. 1: Local temperature and ambient temperature are considered equal for these low power situations .

(3) Class II and III, Division 2 and Zone 22 locations

Simple apparatus installed in Class II and III, Division 2 or Zone 22 locations can be considered to have a temperature rise of less than 40 K and can therefore have a temperature classification of T6 or T85°C at a local temperature not exceeding 40 °C, T5 or 100°C at a local temperature not exceeding 55 °C, or T4 or T135°C at a local temperature not exceeding 80 °C.

Statement of Problem and Substantiation for Public Input

The existing text addresses the issue for gases and vapours only. Additional research resulted in changes to the intrinsic safety standard (UL 60079-11 Ed 6) which demonstrated that the existing section 50410(D) should be modified to include the specific criteria for Class II and III (Divisions) and Group III (Zones).

A separate section is added for Class II and III, Division 2 and Zone 22 locations since these items are considered under normal operation and are not immersed in combustible dusts, or ignitable fibers/flyings.

Also change from 'ambient temperature' to 'local temperature' to align with 60079-0.

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Submittal Date: Thu Aug 31 17:25:50 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: The proposed text places a definition in an Informational Note. Which is not permitted by 2.10.1.1 of the NEC Style Manual. In addition, the NEC is an installation code, which precludes operating equipment before it is approved. Since the equipment cannot be operated, the local temperature cannot be known at the time of installation. Finally, technical substantiation has not been provided for proposed changes such as the temperature rise of terminals and the inclusion of Class II, Class III, Zone 20, Zone 21, and Zone 22 locations.

**Public Input No. 3316-NFPA 70-2023 [Section No. 504.50(A)]****(A) Intrinsically Safe Apparatus, Enclosures, and Raceways.**

Intrinsically safe apparatus, enclosures, and raceways, if of metal, shall be connected to the equipment grounding conductor.

Informational Note: See ANSI/ISA RP 12.06.01, *Recommended Practice for Wiring Methods for Hazardous (Classified) Locations Instrumentation — Part 1: Intrinsic Safety*. In addition to an equipment grounding conductor connection, a connection to a grounding electrode might be needed for some associated apparatus, such as zener diode barriers, if specified in the control drawing.

[Placeholder: Update reference to ANSI/ISA RP 12.06.01.]

Statement of Problem and Substantiation for Public Input

The UL 60079 STP is working on a revision of ANSI/ISA RP12.06.01. This comment is intended to be a placeholder and will be revised when details are available regarding the new reference and publication date.

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Committee: NEC-P14

Committee Statement

Resolution: The referenced document has not been published and cannot be included at this time.

**Public Input No. 3317-NFPA 70-2023 [Section No. 504.50(B)]****(B) Associated Apparatus and Cable Shields.**

Associated apparatus and cable shields shall be grounded in accordance with the required control drawing. See 504.10(A).

Informational Note: See ANSI/ISA RP 12.06.01, *Recommended Practice for Wiring Methods for Hazardous (Classified) Locations Instrumentation — Part 1: Intrinsic Safety*. In addition to an equipment grounding conductor connection, a connection to a grounding electrode might be needed for some associated apparatus, such as zener diode barriers, if specified in the control drawing.

[Placeholder: Update reference to ANSI/ISA RP 12.06.01.]

Statement of Problem and Substantiation for Public Input

The UL 60079 STP is working on a revision of ANSI/ISA RP12.06.01. This comment is intended to be a placeholder and will be revised when details are available regarding the new reference and publication date.

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Committee: NEC-P14

Committee Statement

Resolution: The referenced document has not been published and cannot be included at this time.



Public Input No. 1977-NFPA 70-2023 [New Section after 505.1(B)]

505.3 Reconditioned Equipment

505.3(A) Permitted to be Installed.

Reconditioned equipment shall be permitted to be installed in hazardous (classified) locations if the reconditioning is conducted in accordance with the manufacturer's instructions or, if no instructions are provided, nationally recognized standards.

(1) Reconditioned Motors or Generators.

Reconditioning of a Zone 1 flameproof or increased safety motor or generator, or explosionproof motor or generator, listed for use in hazardous (classified) locations shall be listed as reconditioned when installed in hazardous (classified) locations. Reconditioning of a type "p" motor or generator identified for use in hazardous (classified) locations, or Class I, Division 1 explosionproof motor or Class I, Division 1 explosionproof generator identified for use in hazardous (classified) location shall be identified as reconditioned when installed in a hazardous (classified) location, in accordance with 500.8(A). Reconditioning of a motor or generator with flameproof, explosionproof, or increased safety construction features is considered to take place when the motor or generator is removed from service for repairs, including replacement of a failed bearing. The flameproof, explosionproof, or increased safety features of any reconditioned motor or generator are verified as a part of the reconditioning or refurbishing process.

Informational Note 1: See UL 60079-1, *Explosive Atmospheres – Part 1: Equipment Protection by Flameproof Enclosures "d"* for construction and test requirements for flameproof motors and generators.

Informational Note 2: See UL 60079-7, *Explosive Atmospheres- Part 7: Equipment Protection by Increased Safety "e"* for construction and test requirements for increased safety motors and generators.

Informational Note 3: See ANSI/EASA AR100, *Recommended Practice for the Repair of Rotating Electrical Apparatus*, for information on the rewinding and repair of motors.

Informational Note 4: See IEC 60079-19, *Explosive Atmospheres – Part 19: Equipment Repair, Overhaul, and Reclamation*.

505.3(B) Not Permitted to be Installed

(1) Intrinsically Safe Systems.

Reconditioning of intrinsically safe systems is not permitted. Replacement of intrinsically safe, replaceable printed circuit board assemblies or modules, is permitted with like for like, provided by the original manufacturer.

Statement of Problem and Substantiation for Public Input

An informal task group of CMP14 members (Rich Holub, Don Ankele, Dave Burns, Bill Lawrence, Mark Goodman, and Evans Massey) met to address the inclusion of a paragraph in the 2023 Edition of the NEC® in 430.2 which addressed listing of reconditioned motors in hazardous (classified) locations. The task group concluded that this language was out of scope for Article 430 and must reside in the Chapter 5 articles which cover hazardous (classified) location requirements. Current language in 501.125 and 502.125 allow motors to be identified for the location and doesn't specifically require them to be listed. Motors which were listed when constructed could be listed as reconditioned, but those just identified at the time of construction would then need to be identified in accordance with 500.8. Insertion of a listing requirement for reconditioned motors is contradictory to existing requirements because a motor which was never listed when first built could not be listed as reconditioned. As such, the CMP14 task group has proposed language stating reconditioned motors shall be identified as reconditioned, mirroring current requirements for the motors as stated in the relevant equipment sections. The task group concluded that reconditioning of intrinsically safe systems was not appropriate because no accepted practices to approve such reconditioning exists in the industry. Replacement, in kind, of intrinsically safe circuit board assemblies or modules is not considered reconditioning as it is compliant with the original manufacturer's listing and labeling.

Related Public Inputs for This Document

Related Input**Relationship**

Public Input No. 1979-NFPA 70-2023 [Section No. 430.2]

Submitter Information Verification

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Committee: NEC-P14

Committee Statement

Resolution: FR-8348-NFPA 70-2024

Statement: New section 505.3 places the requirements for reconditioned equipment in Article 505. Equipment must be reconditioned according to the manufacturer's instructions. Where there are none, reconditioning must be according to nationally recognized standards. Specific reconditioning requirements are provided for motors and generators. Reconditioned intrinsically safe equipment is not permitted to be installed. However printed circuit board assemblies or modules are permitted to be replaced with like for like components from the original manufacturer.



Public Input No. 2208-NFPA 70-2023 [Section No. 505.4]

505.4 Documentation.

Areas designated as hazardous (classified) locations or as unclassified shall be documented on an area classification drawing and other associated documentation. This documentation shall be made available to the AHJ and those authorized to design, install, inspect, maintain, or operate electrical equipment at the location.

Informational Note No. 1: See ANSI/API RP 505, *Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2*; ANSI/ISA 60079-10-1 (12.24.01), *Explosive Atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres*; and EI 15, *Model Code of Safe Practice, Part 15: Area Classification for Installations Handling Flammable Fluids*, for examples of area classification drawings.

Informational Note No. 2: See 505.8(I)(2), (I)(3), or (I)(4) for information on where gas detection equipment is used as a means of protection. The documentation typically includes the type of detection equipment, its listing, the installation location(s), the alarm and shutdown criteria, and the calibration frequency.

Informational Note No. 3: See NFPA 497, *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*; ANSI/API RP 505, *Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2*; ANSI/ISA 60079-10-1 (12.24.01), *Explosive Atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres*; and EI 15, *Model Code of Safe Practice, Part 15: Area Classification for Installations Handling Flammable Fluids*, for information on the classification of locations.

Informational Note No. 4: See NFPA 77, *Recommended Practice on Static Electricity*; NFPA 780, *Standard for the Installation of Lightning Protection Systems*, and API RP 2003, *Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents*, for information on protection against static electricity and lightning hazards in hazardous (classified) locations.

Informational Note No. 5: See NFPA 30, *Flammable and Combustible Liquids Code*, and ANSI/API RP 505, *Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2*, for information on ventilation.

Informational Note No. 6: See ANSI/API RP 14FZ, *Recommended Practice for Design, Installation, and Maintenance of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Zone 0, Zone 1, and Zone 2 Locations*, for information on electrical systems for hazardous (classified) locations on offshore oil and gas producing platforms, drilling rigs, and workover rigs.

Informational Note No. 7: See UL 120101, *Definitions and Information Pertaining to Electrical Apparatus in Hazardous Locations*, and ANSI/UL 60079-0, *Explosive Atmospheres — Part 0: Equipment — General Requirements*, for further information on the general application of electrical equipment in hazardous (classified) locations.

Informational Note No. 8: See ANSI/UL 121203, *Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous (Classified) Locations*, for information on whether portable or transportable equipment having self-contained power supplies, such as battery-operated equipment, could potentially become an ignition source in hazardous (classified) locations.

Informational Note No. 9: See ANSI/UL 60079-28, *Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation*, for information concerning the installation of equipment utilizing optical emissions technology (such as laser equipment) that could potentially become an ignition source in hazardous (classified) locations.

Informational Note No. 10: See IEC/IEEE 60079-30-2, *Explosive Atmospheres — Part 30-2: Electrical Resistance Trace Heating — Application Guide for Design, Installation and Maintenance*, for information on electrical resistance trace heating for hazardous (classified) locations.

Informational Note No. 11: See IEEE 844.2/CSA C293.2, *IEEE/CSA Standard for Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance*, for information on electric skin effect trace heating for hazardous (classified) locations.

Informational Note No. 12: See IEEE 844.4/CSA C293.4, *IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance*, for information on electric impedance heating for hazardous (classified) locations.

Informational Note No. 13: See ANSI/UL RP 60079-46, *Recommended Practice for Explosive Atmospheres - Part 46: Equipment Assemblies*, for information on manufactured assemblies comprising multiple items of equipment that require additional assessment by the assembly manufacturer that is not covered by the equipment certificates. This additional assessment might include (but is not limited to) performance and documentation of a close or detailed inspection of the assembly by the manufacturer prior to commissioning by the user. See also 90.7.

Statement of Problem and Substantiation for Public Input

The first edition of UL RP 60079-46 was published as an ANSI document in 2022. While use of this document is not mandatory for the certification of assemblies (as such certification can be covered by using just the applicable UL 60079 series type of protection standards), use of this document can assist the user, such as by having a close or detailed inspection performed and documented by the manufacturer prior to commissioning by the user.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 2209-NFPA 70-2023 [Section No. 506.4]	Addresses new ANSI/UL RP 60079-46 documentation
Public Input No. 2209-NFPA 70-2023 [Section No. 506.4]	

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8363-NFPA 70-2024](#)

Statement: The first edition of UL RP 60079-46 was published as an ANSI document in 2022. While use of this document is not mandatory

for the certification of assemblies (as such certification can be covered by using just the applicable UL 60079 series type of

protection standards), use of this document can assist the user, such as by having a close or detailed inspection performed and

documented by the manufacturer prior to commissioning by the user.



Public Input No. 1048-NFPA 70-2023 [Section No. 505.5(A)(1)]

(1) Hazardous (Classified) Locations.

Locations in this Article shall be classified depending on the properties of the flammable gases, flammable liquid-produced vapors, ~~or combustible liquid-produced vapors, combustible dusts, or fibers/flyings that vapors that~~ could be present and the likelihood that a flammable or combustible concentration or quantity is present. Each room, section, or area shall be considered individually in determining its classification.

Informational Note No. 1: See 505.7 for restrictions on area classification.

Informational Note No. 2: Through the exercise of ingenuity in the layout of electrical installations for hazardous (classified) locations, it is frequently possible to locate much of the equipment in a reduced level of classification or in an unclassified location to reduce the amount of special equipment required.

Statement of Problem and Substantiation for Public Input

The existing text in this subdivision refers to combustible dusts and fibers/flying which are addressed in Article 506. Subdivision 505.1(B)(2) makes it clear that Zone 20, Zone 21, and Zone 22 are not covered in Article 505. The inclusion of combustible dusts and fibers/flyings should not be found in a requirement in Article 505. The revised text will eliminate confusion. It will also correlate with the requirement for classification found in 506.5(A)(1) which refers to combustible dusts and fibers/flyings and does not include gases and vapors. The addition of the phrase "in this Article" makes it clear that this is not a general requirement for area classification.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1049-NFPA 70-2023 [Section No. 506.5(A)]	The new language in both PIs make it clear that the requirement is limited to the Article it is located in.
Public Input No. 1049-NFPA 70-2023 [Section No. 506.5(A)]	

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8371-NFPA 70-2024](#)

Statement: The existing text in this subdivision refers to combustible dusts and fibers/flying which are addressed in Article 506. Subdivision

505.1(B)(2) makes it clear that Zone 20, Zone 21, and Zone 22 are not covered in Article 505. The inclusion of combustible dusts and fibers/flyings should not be found in a requirement in Article 505. The revised text will eliminate confusion. It will also correlate with the requirement for classification found in 506.5(A)(1) which refers to combustible dusts and fibers/flyings and does not include gases and vapors.



Public Input No. 1061-NFPA 70-2023 [New Section after 505.8(P)]

505.8(Q) Artificially Ventilated Room "v". This protection technique shall be permitted in a Zone 2 location for which it is identified.

Statement of Problem and Substantiation for Public Input

This proposal is necessary to define a new Type of Protection "v" for artificially ventilated rooms under the Zone system in Article 100, and to reference this new Type of Protection in Article 505 and Table 13 of the 2023 NEC. These references acknowledge the use of this Type of Protection as a new means to mitigate the risk of explosion in hazardous (classified) locations. Type of Protection "v" is included in ANSI/UL 60079-13, and this ANSI standard is already included in the 2023 NEC for the new Type of Protection "p" for pressurized rooms. Type of Protection "v" was not initially included in the 2023 NEC due to changes that were underway, but not yet completed, to the requirements in ANSI/UL 60079-13 so as to improve the consistency of application of the requirements. These changes have now been successfully completed, and Type of Protection "v" can now be included in the 2026 NEC.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1060-NFPA 70-2023 [New Definition after Definition: Array.]	Addresses Type of Protection, "v"
Public Input No. 1062-NFPA 70-2023 [Section No. 505.16(B)(3)]	Addresses Type of Protection, "v"
Public Input No. 1064-NFPA 70-2023 [Section No. 505.20(C)]	Addresses Type of Protection, "v"
Public Input No. 1417-NFPA 70-2023 [Section No. Table]	Addresses Type of Protection, "v"
Public Input No. 1060-NFPA 70-2023 [New Definition after Definition: Array.]	
Public Input No. 1062-NFPA 70-2023 [Section No. 505.16(B)(3)]	
Public Input No. 1064-NFPA 70-2023 [Section No. 505.20(C)]	
Public Input No. 1417-NFPA 70-2023 [Section No. Table]	

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8373-NFPA 70-2024](#)

Statement: This proposal is necessary to define a new Type of Protection "v" for artificially ventilated rooms under the Zone system in Article 100, and to reference this new Type of Protection in Article 505 and Table 13 of the 2023 NEC. These references acknowledge the use of this Type of Protection as a new means to mitigate the risk of explosion in hazardous (classified) locations. Type of protection "v" is included in ANSI/UL 60079-13, and this ANSI standard is already included in the 2023 NEC for the new Type of Protection "p" for pressurized rooms. Type of Protection "v" was not initially included in the 2023 NEC due to changes that were underway, but not yet completed, to the requirements in ANSI/UL 60079-13 so as to improve the consistency of application of the requirements. These changes have now been successfully completed, and Type of Protection "v" can now be included in the 2026 NEC.


Public Input No. 313-NFPA 70-2023 [Section No. 505.9]
505.9 Equipment.
(A) Suitability.

Suitability of identified equipment shall be determined by one of the following:

- (1) Equipment listing or labeling
- (2) Evidence of equipment evaluation from a qualified testing laboratory or inspection agency concerned with product evaluation
- (3) Evidence acceptable to the authority having jurisdiction such as a manufacturer's self-evaluation or an owner's engineering judgment

Informational Note: Additional documentation for equipment may include certificates demonstrating compliance with applicable equipment standards, indicating special conditions of use, and other pertinent information.

(B) Listing.

- (1) Equipment that is listed for a Zone 0 location shall be permitted in a Zone 1 or Zone 2 location of the same gas or vapor, provided that it is installed in accordance with the requirements for the marked type of protection. Equipment that is listed for a Zone 1 location shall be permitted in a Zone 2 location of the same gas or vapor, provided that it is installed in accordance with the requirements for the marked type of protection.
- (2) Equipment shall be permitted to be listed for a specific gas or vapor, specific mixtures of gases or vapors, or any specific combination of gases or vapors.

Informational Note: One common example is equipment marked for "IIB. + H2."

(C) Marking.

Equipment shall be marked in accordance with 505.9(C)(1) or (C)(2).

(1) Division Equipment.

Equipment identified for Class I, Division 1 or Class I, Division 2 shall, in addition to being marked in accordance with 500.8(C), be permitted to be marked with all of the following:

- (1) Class I, Zone 1 or Zone 1; Class I, Zone 2 or Zone 2 (as applicable)
- (2) Applicable gas classification group(s) in accordance with Table 505.9(C)(1)
- (3) Temperature classification in accordance with 505.9(D)

Table 505.9(C)(1) Material Groups

Material Group	Comment
IIC	See 505.6(A)
IIB	See 505.6(B)
IIA	See 505.6(C)

(2) Zone Equipment.

Equipment meeting one or more of the protection techniques described in 505.8 shall be marked with all of the following in the order shown:

- (1) Class I shall be an optional marking. If it is included in the equipment marking, the Class I marking shall precede the zone marking.
- (2) Zone in accordance with Chapter 9, Table 13.
- (3) Symbol "AEx".
- (4) Protection technique(s) in accordance with Chapter 9, Table 13.
- (5) Applicable material group in accordance with Table 505.9(C)(1) or a specific gas or vapor.
- (6) Temperature classification in accordance with 505.9(D).
- (7) Equipment protection level (EPL).

Exception No. 1: Associated apparatus NOT suitable for installation in a hazardous (classified) location shall be required to be marked only with 505.9(C)(2)(3), (C)(2)(4), and (C)(2)(5), but BOTH the symbol AEx (3) and the symbol for the type of protection (4) shall be enclosed within the same square brackets, for example, [AEx ia Ga] IIC.

Exception No. 2: Simple apparatus as defined in Article 100 shall not be required to have a marked operating temperature or temperature class.

Exception No. 3: Fittings for the termination of cables shall not be required to have a marked operating temperature or temperature class.

Informational Note No. 1: See Informational Note Figure 505.9(C)(2), for an explanation of the marking that is required. An example of the required marking for intrinsically safe apparatus for installation in Zone 0 is "Class I, Zone 0, AEx ia IIC T6 Ga" or "Zone 0, AEx, ia, IIC T6 Gb."

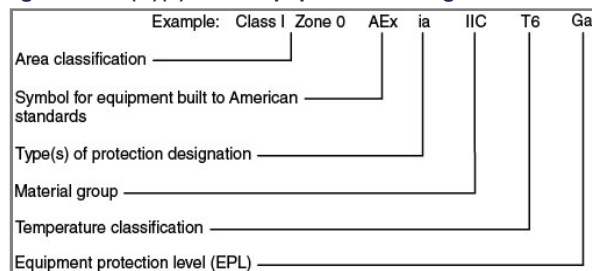
Informational Note No. 2: An example of the required marking for intrinsically safe associated apparatus mounted in a flameproof enclosure for installation in Zone 1 is "Class I, Zone 1 AEx db[ia] IIC T4 Gb" or "Zone 1, AEx, db[ia Ga] IIC T4 Gb."

Informational Note No. 3: An example of the required marking for intrinsically safe associated apparatus NOT for installation in a hazardous (classified) location is "[AEx ia Ga] IIC."

Informational Note No. 4: EPLs are designated as G for gas, or D for dust, and are then followed by a letter (a, b, or c) to give the user a better understanding as to whether the equipment provides (a) a "very high," (b) a "high," or (c) an "enhanced" level of protection against ignition of an explosive atmosphere. For example, a Zone 1, AEx db IIC T4 Gb motor (which is suitable by protection concept for application in Zone 1) is marked with an EPL of "Gb" to indicate that it was provided with a high level of protection.

Informational Note No. 5: See ANSI/UL 60079-26, *Explosive Atmospheres — Part 26: Equipment with Equipment Protection Level (EPL) Ga*, for additional information. Equipment installed outside a Zone 0 location and electrically connected to equipment located inside a Zone 0 location might be marked Zone 0/1. The "/" indicates that equipment contains a separation element and can be installed at the boundary between a Zone 0 and a Zone 1 location.

Figure Informational Note Figure 505.9(C)(2) Zone Equipment Marking.



(D) Temperature Classification Marking.

The temperature marking shall not exceed the autoignition temperature of the specific gas or vapor to be encountered.

Informational Note No. 1: See ANSI/UL 60079-26, *Explosive Atmospheres — Part 26: Equipment with Equipment Protection Level (EPL) Ga*, for more information. Equipment installed outside a Zone 0 location and electrically connected to equipment located inside a Zone 0 location might be marked Zone 0/1. The “/” indicates that equipment contains a separation element and can be installed at the boundary between a Zone 0 and a Zone 1 location.

Equipment shall be marked to show the operating temperature or temperature class referenced to a 40°C ambient, or at the higher ambient temperature if the equipment is rated and marked for an ambient temperature of greater than 40°C. The temperature class, if provided, shall be indicated using the temperature class (T code) shown in Table 505.9(D).

Table 505.9(D) Temperature Classification Marking of Maximum Surface Temperature for Group II Electrical Equipment

<u>Temperature Class</u> (T Code)	<u>Maximum Surface Temperature (°C)</u>
T1	≤450
T2	≤300
T3	≤200
T4	≤135
T5	≤100
T6	≤85

Electrical equipment designed for use in the ambient temperature range between -20°C and +40°C shall require no ambient temperature marking.

Electrical equipment that is designed for use in a range of ambient temperatures other than -20°C to +40°C is considered to be special; and the ambient temperature range shall then be marked on the equipment, including either the symbol “Ta” or “Tamb” together with the special range of ambient temperatures, in degrees Celsius.

Informational Note No. 2: For example, such a marking might be “-30°C to +40°C.”

Exception No. 1: Equipment of the non-heat-producing type, such as conduit fittings, and equipment of the heat-producing type having a maximum temperature of not more than 100°C (212°F) shall not be required to have a marked operating temperature or temperature class.

Exception No. 2: Equipment identified for Class I, Division 1 or Division 2 locations as permitted by 505.20(A), (B), and (C) shall be permitted to be marked in accordance with 505.8(C) and Table 500.8(C)(4).

(E) Threading.

The supply connection entry thread form shall be NPT or metric. Conduit and fittings shall be made wrenchtight to prevent sparking when fault current flows through the conduit system, and to ensure the explosionproof or flameproof integrity of the conduit system where applicable. Equipment provided with threaded entries for field wiring connections shall be installed in accordance with 505.9(E)(1) or (E)(2) and with (E)(3).

(1) Equipment Provided with Threaded Entries for NPT Threaded Conduit or Fittings.

For equipment provided with threaded entries for NPT threaded conduit or fittings, listed conduit, listed conduit fittings, or listed cable fittings shall be used.

All NPT threaded conduit and fittings shall be threaded with a National (American) Standard Pipe Taper (NPT) thread.

NPT threaded entries into explosionproof or flameproof equipment shall be made up with at least five threads fully engaged.

Exception: For listed explosionproof or flameproof equipment, factory-threaded NPT entries shall be made up with at least 4½ threads fully engaged.

Informational Note No. 1: See ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*, for thread specifications for male NPT threads.

Informational Note No. 2: See ANSI/UL 60079-1, *Explosive Atmospheres — Part 1: Equipment Protection by Flameproof Enclosures “d”*, and ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*, for information on female NPT threaded entries using modified National Standard Pipe Taper (NPT) thread.

(2) Equipment Provided with Threaded Entries for Metric Threaded Conduit or Fittings.

For equipment with metric threaded entries, listed conduit fittings or listed cable fittings shall be used. Such entries shall be identified as being metric, or listed adapters to permit connection to conduit or NPT threaded fittings shall be provided with the equipment and shall be used for connection to conduit or NPT threaded fittings.

Metric threaded fittings installed into explosionproof or flameproof equipment entries shall have a class of fit of at least 6g/6H and be made up with at least five threads fully engaged.

Informational Note: See ISO 965-1, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data*, and ISO 965-3, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads*, for threading specifications for metric threaded entries.

(3) Unused Openings.

All unused openings shall be closed with blanking elements or close-up plugs that are listed for the location and will maintain the type of protection. Thread engagement shall comply with 505.9(E)(1) or (E)(2).

(F) Optical Fiber Cables.

An optical fiber cable, with or without current-carrying conductors (hybrid optical fiber cable), shall be installed to address the associated fire hazard and sealed to address the associated explosion hazard in accordance with 505.15 and 505.16.

(G) Equipment Involving Optical Radiation.

For equipment involving sources of optical radiation (such as laser or LED sources) in the wavelength range from 380 nm to 10 µm, the risk of ignition from optical radiation shall be considered for all electrical parts and circuits that may be exposed to the radiation, both inside and outside the optical equipment. This includes optical equipment, which itself is located outside the explosive atmosphere, but its emitted optical radiation enters such atmospheres.

Informational Note: See ANSI/UL 60079-28, *Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation*, for information on types of protection to minimize the risk of ignition in explosive atmospheres from optical radiation.

Exception: All luminaires (fixed, portable, or transportable) and hand lights, intended to be supplied by mains (with or without galvanic isolation) or powered by batteries, with any continuous divergent light source, including LEDs, shall be excluded from this requirement.

(H) Luminaire Retrofit Kits

Retrofit kits shall comply with 505.9(H)(1) through (H)(4).

(1) Modification of existing luminaires to change the lamp type, such as for light-emitting-diode (LED) lamp types, shall be permitted using retrofit kits listed for the location and suitable for field installation in luminaires in accordance with the instructions provided.

(2) The retrofit kit shall consist of light sources, installation instructions, subassemblies, luminaire marking labels, and assembly aids (where appropriate) to facilitate the replacement of the existing light source in complete luminaires. The retrofit installation might require modifications to the luminaire in accordance with the installation instructions provided with the retrofit kit.

(3) A luminaire that is modified so it can no longer accept the original lamp shall be relabeled with a label provided with the listed retrofit kit which is to be affixed to the luminaire where visible during relamping that indicates the luminaire has been modified and can no longer operate the originally intended lamp(s) and additionally identifies the replacement lamp type/model to be used, together with the manufacturer's name and ordering information. The label shall:

(a) Be affixed to the luminaire where visible during relamping,

(b) Indicate that the luminaire has been modified and can no longer operate the originally intended lamps, and

(c) Identify the replacement lamp type/model to be used, together with the manufacturer's name and ordering information.

(4) LED retrofit luminaire conversion kits using linear tubular LED lamp conversions shall be relabeled with a label provided with the listed retrofit kit which is to be affixed to the luminaire where visible during relamping that indicates in text or wiring diagram how the supply connections are made to the lamp holders.

Statement of Problem and Substantiation for Public Input

This proposal clarifies the need for luminaire retrofit kits to be listed for the classified location in which the luminaire is installed, and that the luminaire is to be modified in accordance with the instructions provided with the kit. The proposal also requires that new relamping information be marked on the retrofitted luminaire.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 310-NFPA 70-2023 [Section No. 501.130]	Related
Public Input No. 311-NFPA 70-2023 [Section No. 502.130]	Related
Public Input No. 312-NFPA 70-2023 [Section No. 503.130]	Related
Public Input No. 314-NFPA 70-2023 [Section No. 506.9]	Related
Public Input No. 310-NFPA 70-2023 [Section No. 501.130]	
Public Input No. 311-NFPA 70-2023 [Section No. 502.130]	
Public Input No. 312-NFPA 70-2023 [Section No. 503.130]	
Public Input No. 314-NFPA 70-2023 [Section No. 506.9]	

Submitter Information Verification

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Submittal Date: Thu Feb 09 09:46:14 EST 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8381-NFPA 70-2024](#)

Statement: Statement: This first revision adds requirements for luminaire retrofit kits. The equipment has existed but was not explicitly specified in the NEC. Retrofit kits require certification to be listed and labeled for hazardous (classified) locations. The retrofit will not alter the area of classification in which the equipment is installed, and it will not alter the hazardous location marking for the equipment currently installed. The retrofit kits are evaluated and certified for use with the installed luminaire, rather than being an aftermarket product for use with any luminaire. All submittals are required to be in accordance with UL 60079 Series Standards, which includes requirements for ordinary locations. Only when a portion of the luminaire that carries the original certification mark is replaced does that certification mark go away. If not, the original certification mark will remain and the retrofit certification mark will indicate the updated markings.



Public Input No. 1136-NFPA 70-2023 [Section No. 505.9(C)(2)]

(2) Zone Equipment.

Equipment meeting one or more of the protection techniques described in 505.8 shall be marked with all of the following in the order shown:

- (1) Class I shall be an optional marking. If it is included in the equipment marking, the Class I marking shall precede the zone marking.
- (2) Zone in accordance with Chapter 9, Table 13.
- (3) Symbol "AEx".
- (4) Protection technique(s) in accordance with Chapter 9, Table 13.
- (5) Applicable material group in accordance with Table 505.9(C)(1) or a specific gas or vapor.
- (6) Temperature classification in accordance with 505.9(D).
- (7) Equipment protection level (EPL).

Equipment meeting one or more of the protection techniques described in 505.8 shall be marked with a certificate number in the following form: the name or mark of the certificate issuer followed by the last two figures of the year of the certificate followed by a "US" followed by a unique four character reference for the certificate in that year. Where equipment is listed with specific conditions of use, the symbol "X" shall be placed after the certificate number. A reference to a specific instruction document containing the detailed information may appear on the equipment as an alternative to the requirement for the "X" marking.

Exception No. 1: Associated apparatus NOT suitable for installation in a hazardous (classified) location shall be required to be marked only with 505.9(C)(2)(3), (C)(2)(4), and (C)(2)(5), but BOTH the symbol AEx (3) and the symbol for the type of protection (4) shall be enclosed within the same square brackets, for example, [AEx ia Ga] IIC.

Exception No. 2: Simple apparatus as defined in Article 100 shall not be required to have a marked operating temperature or temperature class.

Exception No. 3: Fittings for the termination of cables shall not be required to have a marked operating temperature or temperature class.

Informational Note No. 1: See Informational Note Figure 505.9(C)(2), for an explanation of the marking that is required. An example of the required marking for intrinsically safe apparatus for installation in Zone 0 is "Class I, Zone 0, AEx ia IIC T6 Ga" or "Zone 0, AEx, ia, IIC T6 Gb."

Informational Note No. 2: An example of the required marking for intrinsically safe associated apparatus mounted in a flameproof enclosure for installation in Zone 1 is "Class I, Zone 1 AEx db[ia] IIC T4 Gb" or "Zone 1, AEx, db[ia Ga] IIC T4 Gb."

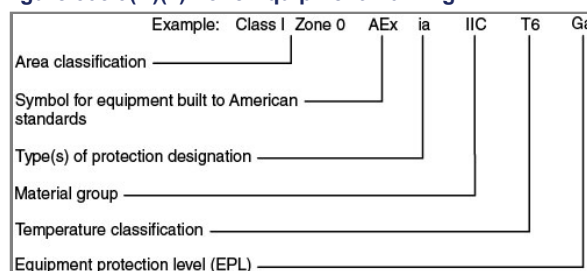
Informational Note No. 3: An example of the required marking for intrinsically safe associated apparatus NOT for installation in a hazardous (classified) location is "[AEx ia Ga] IIC."

Informational Note No. 4: EPLs are designated as G for gas, or D for dust, and are then followed by a letter (a, b, or c) to give the user a better understanding as to whether the equipment provides (a) a "very high," (b) a "high," or (c) an "enhanced" level of protection against ignition of an explosive atmosphere. For example, a Zone 1, AEx db IIC T4 Gb motor (which is suitable by protection concept for application in Zone 1) is marked with an EPL of "Gb" to indicate that it was provided with a high level of protection.

Informational Note No. 5: See ANSI/UL 60079-26, *Explosive Atmospheres — Part 26: Equipment with Equipment Protection Level (EPL) Ga*, for additional information. Equipment installed outside a Zone 0 location and electrically connected to equipment located inside a Zone 0 location might be marked Zone 0/1. The "/" indicates that equipment contains a separation element and can be installed at the boundary between a Zone 0 and a Zone 1 location.

Informational Note No. 6: Where the certificate number includes a "U" suffix, it indicates that the product is an "Ex Component", is incomplete and not suitable for installation without further evaluation or certification.

Figure Informational Note Figure 505.9(C)(2) Zone Equipment Marking.



Statement of Problem and Substantiation for Public Input

It is common practise for US certification bodies to provide a certificate for hazardous (classified) equipment but nowhere in the Code does it identify what this certificate number is or what it represents. Adding this to the Code would eliminate a National Deviation for the US adoptions of IEC standards and would permit equipment with Specific Conditions of Use to be identified by the 'X' following the certificate number.

Add an informational note to identify the difference between Ex Equipment and Ex Components.

This is consistent with the way Canada addresses the same situation.

Submitter Information Verification

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Submittal Date: Tue Jun 20 03:37:08 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: In the NEC, the installation is required to follow the installation instructions that are provided. The US differences to the IEC Standard 60079-0 for the adoption of the ANSI/UL 60079-0 replace conditions of safe use with installation instructions. No reason for variance from the rest of the Code. Other "X" conditions such as not testing the ordinary location requirements is not permitted in the US and this proposal makes the concept of the X-condition broader than the US accepted practice of installation instructions noted herein.



Public Input No. 3875-NFPA 70-2023 [Section No. 505.9(C)(2)]

(2) Zone Equipment.

Equipment meeting one or more of the protection techniques described in 505.8 shall be marked with all of the following in the order shown:

- (1) Class I shall be an optional marking. If it is included in the equipment marking, the Class I marking shall precede the zone marking.
- (2) Zone in accordance with Chapter 9, Table 13 shall be an optional marking . If optional marking of 505.9(C)(2)(1) is included, the Zone in accordance with Chapter 9, Table 13 shall also be included.
- (3) Symbol "AEx".
- (4) Protection technique(s) in accordance with Chapter 9, Table 13.
- (5) Applicable material group in accordance with Table 505.9(C)(1) or a specific gas or vapor.
- (6) Temperature classification in accordance with 505.9(D).
- (7) Equipment protection level (EPL).

Exception No. 1: Associated apparatus NOT suitable for installation in a hazardous (classified) location shall be required to be marked only with 505.9(C)(2)(3), (C)(2)(4), and (C)(2)(5), but BOTH the symbol AEx (3) and the symbol for the type of protection (4) shall be enclosed within the same square brackets, for example, [AEx ia Ga] IIC.

Exception No. 2: Simple apparatus as defined in Article 100 shall not be required to have a marked operating temperature or temperature class.

Exception No. 3: Fittings for the termination of cables shall not be required to have a marked operating temperature or temperature class.

Informational Note No. 1: See Informational Note Figure 505.9(C)(2), for an explanation of the marking that is required. An example of the required marking for intrinsically safe apparatus for installation in Zone 0 is "Class I, Zone 0, AEx ia IIC T6 Ga" or "Zone 0, AEx, ia, IIC T6 Gb."

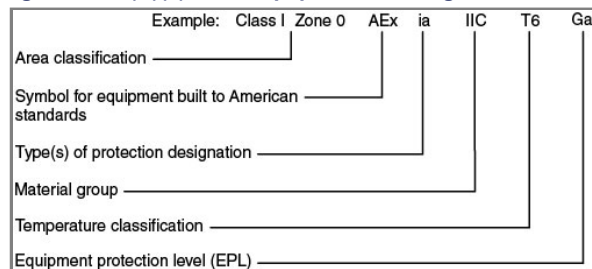
Informational Note No. 2: An example of the required marking for intrinsically safe associated apparatus mounted in a flameproof enclosure for installation in Zone 1 is "Class I, Zone 1 AEx db[ia] IIC T4 Gb" or "Zone 1, AEx, db[ia Ga] IIC T4 Gb."

Informational Note No. 3: An example of the required marking for intrinsically safe associated apparatus NOT for installation in a hazardous (classified) location is "[AEx ia Ga] IIC."

Informational Note No. 4: EPLs are designated as G for gas, or D for dust, and are then followed by a letter (a, b, or c) to give the user a better understanding as to whether the equipment provides (a) a "very high," (b) a "high," or (c) an "enhanced" level of protection against ignition of an explosive atmosphere. For example, a Zone 1, AEx db IIC T4 Gb motor (which is suitable by protection concept for application in Zone 1) is marked with an EPL of "Gb" to indicate that it was provided with a high level of protection.

Informational Note No. 5: See ANSI/UL 60079-26, *Explosive Atmospheres — Part 26: Equipment with Equipment Protection Level (EPL) Ga*, for additional information. Equipment installed outside a Zone 0 location and electrically connected to equipment located inside a Zone 0 location might be marked Zone 0/1. The "/" indicates that equipment contains a separation element and can be installed at the boundary between a Zone 0 and a Zone 1 location.

Figure Informational Note Figure 505.9(C)(2) Zone Equipment Marking.



Statement of Problem and Substantiation for Public Input

The Zone marking is redundant with required EPL marking on the equipment, which has proved effective in Canada and the rest of the world. Label space on equipment is typically at a premium, so eliminating mandatory redundant markings would be helpful.

Submitter Information Verification

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Submittal Date: Wed Sep 06 07:39:31 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The removal of the Zone marking does not benefit the reader. In fact, doing so will add confusion due to the current lack of familiarity regarding the EPLs only recently added to the Code.



Public Input No. 2731-NFPA 70-2023 [Section No. 505.15(B)]

(B) Zone 1.

(1) General.

In Zone 1 locations, the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) All wiring methods permitted by 505.15(A).
- (2) In restricted industrial establishments where the cable is not subject to physical damage, Type MC-HL cable listed for use in Zone 1 or Class I, Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, and a separate equipment grounding conductor(s) in accordance with 250.122. Type MC-HL cable shall be terminated with fittings listed for the application and installed in accordance with ~~Part II of Article 330~~, Part II.
- (3) In restricted industrial establishments where the cable is not subject to physical damage, Type ITC-HL cable listed for use in Zone 1 or Class I, Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material. Type ITC-HL cable shall be terminated with fittings listed for the application and installed in accordance with 335.4.
- (4) Type MI cable terminated with fittings listed for Zone 1 or Class I, Division 1 locations. Type MI cable shall be installed and supported in a manner to avoid tensile stress at the termination fittings.
- (5) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC), including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (6) Where encased in a concrete envelope a minimum of 50 mm (2 in.) thick and provided with not less than 600 mm (24 in.) of cover measured from the top of the conduit to grade, PVC or RTRC conduit. RMC or IMC conduit shall be used for the last 600 mm (24 in.) of the underground run to emergence or to the point of connection to the aboveground raceway. An equipment grounding conductor shall be included to provide for electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.
- (7) Intrinsic safety type of protection "ib" using the wiring methods in accordance with 504.20.
- (8) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in raceways in accordance with 505.15(B). Optical fiber cable shall be sealed in accordance with 505.16.
- (9) In restricted industrial establishments for applications limited to 600 volts nominal or less where the cable is not subject to physical damage, Type TC-ER-HL shall be terminated with fittings listed for the location and installed in accordance with 336.10.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (10) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket. Type P cable shall be terminated with fittings listed for the location and installed in accordance with ~~Part II of Article 337~~, Part II.

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

(2) Flexible Connections.

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one of the following shall be permitted:

- (1) Flexible fittings listed for the location.
- (2) Flexible cord in accordance with 505.17(A), terminated with cord connectors listed for the location.
- (3) In restricted industrial establishments for applications limited to 600 volts nominal or less, where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. Type TC-ER-HL cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (4) In restricted industrial establishments listed Type P cable with metal braid armor and an overall jacket. Type P cable shall be terminated with fittings listed for the location and installed in accordance with Part II of Article 337.

Informational Note No. 2: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8385-NFPA 70-2024](#)

Statement: This PI corrects an editorial error with two words not separated by a space in 505.15(B)(2)(4). The text is revised to comply with the NEC Style Manual 4.1.4 regarding the use of Parts.



Public Input No. 4422-NFPA 70-2023 [Section No. 505.15(B)(1)]

(1) General.

In Zone 1 locations, the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) All wiring methods permitted by 505.15(A).
- (2) In restricted industrial establishments where the cable is not subject to physical damage, Type MC-HL cable listed for use in Zone 1 or Class I, Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, and a separate equipment grounding conductor(s) in accordance with 250.122. Type MC-HL cable shall be terminated with fittings listed for the application and installed in accordance with Part II of Article 330.
- (3) In restricted industrial establishments where the cable is not subject to physical damage, Type ITC-HL cable listed for use in Zone 1 or Class I, Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material. Type ITC-HL cable shall be terminated with fittings listed for the application and installed in accordance with 335.4 ~~10~~
- (4) Type MI cable terminated with fittings listed for Zone 1 or Class I, Division 1 locations. Type MI cable shall be installed and supported in a manner to avoid tensile stress at the termination fittings.
- (5) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC), including RMC or IMC conduit systems with supplemental corrosion protection coatings.
- (6) Where encased in a concrete envelope a minimum of 50 mm (2 in.) thick and provided with not less than 600 mm (24 in.) of cover measured from the top of the conduit to grade, PVC or RTRC conduit. RMC or IMC conduit shall be used for the last 600 mm (24 in.) of the underground run to emergence or to the point of connection to the aboveground raceway. An equipment grounding conductor shall be included to provide for electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.
- (7) Intrinsic safety type of protection "ib" using the wiring methods in accordance with 504.20.
- (8) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in raceways in accordance with 505.15(B). Optical fiber cable shall be sealed in accordance with 505.16.
- (9) In restricted industrial establishments for applications limited to 600 volts nominal or less where the cable is not subject to physical damage, Type TC-ER-HL shall be terminated with fittings listed for the location and installed in accordance with 336.10.

Informational Note No. 2: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (10) In restricted industrial establishments, listed Type P cable with metal braid armor and an overall jacket. Type P cable shall be terminated with fittings listed for the location and installed in accordance with Part II of Article 337.

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

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Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 4327-NFPA 70-2023 [Section No. 505.15(B)(2)]

(2) Flexible Connections.

If flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one of the following shall be permitted:

- (1) Flexible fittings listed for the location.
- (2) Flexible cord in accordance with 505.17(A), terminated with cord connectors listed for the location.
- (3) In restricted industrial establishments for applications limited to 600 volts nominal or less, where the cable is not subject to physical damage and is terminated with fittings listed for the location, Type TC-ER-HL cable. Type TC-ER-HL cable shall be listed for use in Class I, Division 1 or Zone 1 locations and shall be installed in accordance with 336.10.

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables and cable fittings.

- (4) In restricted industrial establishments listed Type P cable with metal braid ~~armor and~~ armor and an overall jacket. Type P cable shall be terminated with fittings listed for the location and installed in accordance with Part II of Article 337.

Informational Note No. 2: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 3: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

Correct typo

Submitter Information Verification

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8385-NFPA 70-2024](#)

Statement: This PI corrects an editorial error with two words not separated by a space in 505.15(B)(2)(4). The text is revised to comply with the NEC Style Manual 4.1.4 regarding the use of Parts.



Public Input No. 4342-NFPA 70-2023 [Section No. 505.15(C)(1)]

(1) General.

In Zone 2 locations, the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) All wiring methods permitted by 505.15(B).
- (2) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER shall include a separate equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings. Single conductor Type MV cables shall be shielded or metallic-armored.
- (3) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER shall include a separate insulated equipment grounding conductor in addition to a drain wire.
- (4) Type PLTC cable or Type PLTC-ER cable used for ~~Class 2- or Class 3 circuits,~~ Class 3, or Class 4 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER shall include a separate insulated equipment grounding conductor in addition to a drain wire that might be present.
- (5) Enclosed gasketed busways or enclosed gasketed wireways.
- (6) In restricted industrial establishments and where metal conduit does not provide the corrosion resistance needed for the environment where it is installed, listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW, and Schedule 80 PVC conduit, factory elbows, and associated fittings. Where seals are required for boundary conditions as defined in 505.16(C)(1)(b), the Zone 1 wiring method shall extend into the Zone 2 area to the seal, which shall be located on the Zone 2 side of the Zone 1/Zone 2 boundary.
- (7) Intrinsic safety type of protection "ic" using any of the wiring methods permitted for unclassified locations. Intrinsic safety type of protection "ic" systems shall be installed in accordance with the control drawing(s). Simple apparatus, not shown on the control drawing, shall be permitted in an intrinsic safety type of protection "ic" circuit if the simple apparatus does not interconnect the intrinsic safety type of protection "ic" systems to any other circuit. Separate intrinsic safety type of protection "ic" systems shall be installed in accordance with one of the following:
 - (8) In separate cables
 - (9) In multiconductor cables where the conductors of each circuit are within a grounded metal shield
 - (10) In multiconductor cables where the conductors of each circuit have insulation with a minimum thickness of 0.25 mm (0.01 in.)

Informational Note No. 2: See Article 100 for the definition of *simple apparatus*.

- (11) Optical fiber cable of Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any other raceway in accordance with 505.15(C). Optical fiber cable shall be sealed in accordance with 505.16.
- (12) Cablebus.
- (13) In restricted industrial establishments, listed Type P cable with or without metal braid armor and an overall jacket. Type P cable shall be terminated with fittings listed for the location and installed in accordance with Part II of Article 337.

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

Adding Class 4 to the list. Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.

Submitter Information Verification

Submitter Full Name: Chad Jones
Organization: Cisco Systems
Street Address:

City:

State:

Zip:

Submittal Date: Thu Sep 07 12:12:18 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: No substantiation is provided to show that Class 4 systems are appropriate for use in Class I, Division 2 locations, Additionally, PLTC cable is rated at 300 volts while Class 4 systems are rated for up to 450 volts.



Public Input No. 4423-NFPA 70-2023 [Section No. 505.15(C)(1)]

(1) General.

In Zone 2 locations, the following wiring methods shall be permitted:

Informational Note No. 1: See Article 100 for the definition of *restricted industrial establishment [as applied to hazardous (classified) locations]*.

- (1) All wiring methods permitted by 505.15(B).
- (2) Type MC, Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER shall include a separate equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings. Single conductor Type MV cables shall be shielded or metallic-armored.
- (3) Type ITC cable or Type ITC-ER cable as permitted in 335.4 ~~and 10~~ and terminated with listed fittings. Type ITC-ER shall include a separate insulated equipment grounding conductor in addition to a drain wire.
- (4) Type PLTC cable or Type PLTC-ER cable used for Class 2 or Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER shall include a separate insulated equipment grounding conductor in addition to a drain wire that might be present.
- (5) Enclosed gasketed busways or enclosed gasketed wireways.
- (6) In restricted industrial establishments and where metal conduit does not provide the corrosion resistance needed for the environment where it is installed, listed reinforced thermosetting resin conduit (RTRC), factory elbows, and associated fittings, all marked with the suffix -XW, and Schedule 80 PVC conduit, factory elbows, and associated fittings. Where seals are required for boundary conditions as defined in 505.16(C)(1)(b), the Zone 1 wiring method shall extend into the Zone 2 area to the seal, which shall be located on the Zone 2 side of the Zone 1/Zone 2 boundary.
- (7) Intrinsic safety type of protection "ic" using any of the wiring methods permitted for unclassified locations. Intrinsic safety type of protection "ic" systems shall be installed in accordance with the control drawing(s). Simple apparatus, not shown on the control drawing, shall be permitted in an intrinsic safety type of protection "ic" circuit if the simple apparatus does not interconnect the intrinsic safety type of protection "ic" systems to any other circuit. Separate intrinsic safety type of protection "ic" systems shall be installed in accordance with one of the following:
 - (8) In separate cables
 - (9) In multiconductor cables where the conductors of each circuit are within a grounded metal shield
 - (10) In multiconductor cables where the conductors of each circuit have insulation with a minimum thickness of 0.25 mm (0.01 in.)

Informational Note No. 2: See Article 100 for the definition of *simple apparatus*.

- (11) Optical fiber cable of Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any other raceway in accordance with 505.15(C). Optical fiber cable shall be sealed in accordance with 505.16.
- (12) Cablebus.
- (13) In restricted industrial establishments, listed Type P cable with or without metal braid armor and an overall jacket. Type P cable shall be terminated with fittings listed for the location and installed in accordance with Part II of Article 337.

Informational Note No. 3: See UL 1309A, *Outline of Investigation for Cable for Use in Mobile Installations*, for information on construction, testing, and marking of Type P cable.

Informational Note No. 4: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cable fittings.

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 15:00:30 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 2554-NFPA 70-2023 [New Section after 505.15(C)(2)]

TITLE OF NEW CONTENT

505.15(C)(2).

(12) In restricted industrial establishments, for prime movers, for applications restricted to 600V nominal or less, where the harness is protected from physical damage, cable harness assemblies, whose purpose is to connect equipment together and which is listed as part of the equipment certification for the hazardous location.

Informational Note: Cable or Wiring harness assemblies normally include wire/cable, fittings, connectors, protective sleeves, heat shrink, and/or other components, and are evaluated and listed as complete harness or equipment assemblies.

Statement of Problem and Substantiation for Public Input

Wiring Engines and Turbines in Classified areas is factory wiring and is normally accomplished through a NRTL as considerations for Vibration, Temperature, chemical compatibility is more specific to the engine than the building.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 2553-NFPA 70-2023 [New Section after 501.10(B)(2)]	Div 2 vs Zone 2.

Submitter Information Verification

Submitter Full Name: Max Bernhardt
Organization: Woodward Inc
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 21 13:44:26 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: Requirements for installing components that are a part of a listed assembly are required to be installed in accordance with the listing, labeling, or identification. If the prime mover is installed in a Class I, Division 2 location it shall be identified for the location. In this case, the instructions should provide information on protecting and installing the harness assembly. Cable harness assemblies are not considered to be wiring methods for Class I, Division 2 locations.



Public Input No. 2370-NFPA 70-2023 [Section No. 505.15(C)(2)]

(2) Flexible Connections.

Where flexibility is necessary to minimize the transmission of vibration from equipment during operation or to allow for movement after installation during maintenance, one or more of the following wiring methods shall be permitted:

- (1) Listed flexible metal fittings
- (2) Flexible metal conduit with listed fittings
- (3) Interlocked armor Type MC cable with listed fittings
- (4) Type P cable
- (5) Type TC-ER or Type TC-ER-HL cable
- (6) Type ITC-ER or Type ITC-HL cable ER cable
- (7) Type PLTC-ER cable
- (8) Liquidtight flexible metal conduit with listed fittings
- (9) Liquidtight flexible nonmetallic conduit with listed fittings
- (10) Flexible cord in accordance with 505.17, terminated with a listed cord connector that maintains the type of protection of the terminal compartment
- (11) For elevator use, an identified elevator cable of Type EO, Type ETP, or Type ETT, shown under the "use" column in Table 400.4 for "hazardous (classified) locations" and terminated with listed fittings

If flexible conduit is used, it shall be grounded in accordance with 505.30(A) and bonded in accordance with 505.30(B).

Statement of Problem and Substantiation for Public Input

Type ITC-HL cable should not be a permitted as a flexible wiring method. The construction required by this Code and the construction requirements in UL 2225 for certification require a continuous corrugated metal sheath the same as is used for Type MC-HL cables. As such, neither Type MC-HL or Type ITC-HL cable has the ability to be flexed repeatedly without the high risk of breaking the sheath. As the sheath is a permitted ground path, a broken sheath would be a possible risk of shock.

Submitter Information Verification

Submitter Full Name: Donald Ankele
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 16 15:02:27 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: FR-8386-NFPA 70-2024

Statement: Type ITC-HL cable should not be permitted as a flexible wiring method. The construction required by this Code and the construction requirements in UL 2225 for certification require a continuous corrugated metal sheath the same as is used for Type MC-HL cables. As such, neither Type MC-HL or Type ITC-HL cable has the ability to be flexed repeatedly without the high risk of breaking the sheath. As the sheath is a permitted ground path, a broken sheath would be a possible risk of shock.



Public Input No. 1062-NFPA 70-2023 [Section No. 505.16(B)(3)]

(3) Pressurized Enclosures and Pressurized Rooms, and Artificially Ventilated Rooms.

~~Conduit For pressurized enclosures and pressurized rooms, conduit seals shall be provided in each conduit entry into a pressurized enclosure or pressurized room where the conduit is not pressurized as part of the protection system.~~
~~Conduit For artificially ventilated rooms, conduit seals shall be provided in each conduit entry. Conduit seals shall be installed within 450 mm (18 in.) from the pressurized enclosure or pressurized room, or artificially ventilated room .~~

Informational Note No. 1: Installing the seal as close as possible to the enclosure reduces problems with purging the dead airspace in the ~~pressurized~~ conduit.

Informational Note No. 2: See NFPA 496, *Standard for Purged and Pressurized Enclosures for Electrical Equipment*, for information on pressurized equipment.

Informational Note No. 3: See UL 60079-13, *Explosive Atmospheres — Part 13: Equipment Protection by Pressurized Room "p" and Artificially Ventilated Room "v"*, for additional information.

Statement of Problem and Substantiation for Public Input

This proposal is necessary to define a new Type of Protection "v" for artificially ventilated rooms under the Zone system in Article 100, and to reference this new Type of Protection in Article 505 and Table 13 of the 2023 NEC. These references acknowledge the use of this Type of Protection as a new means to mitigate the risk of explosion in hazardous (classified) locations. Type of Protection "v" is included in ANSI/UL 60079-13, and this ANSI standard is already included in the 2023 NEC for the new Type of Protection "p" for pressurized rooms. Type of Protection "v" was not initially included in the 2023 NEC due to changes that were underway, but not yet completed, to the requirements in ANSI/UL 60079-13 so as to improve the consistency of application of the requirements. These changes have now been successfully completed, and Type of Protection "v" can now be included in the 2026 NEC.

In addition, delete "pressureized" in Informational Note 1 as a sealed conduit is not pressurized as part of the protection system.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1060-NFPA 70-2023 [New Definition after Definition: Array.]	Addresses Type of Protection, "v"
Public Input No. 1061-NFPA 70-2023 [New Section after 505.8(P)]	Addresses Type of Protection, "v"
Public Input No. 1064-NFPA 70-2023 [Section No. 505.20(C)]	Addresses Type of Protection, "v"
Public Input No. 1417-NFPA 70-2023 [Section No. Table]	Addresses Type of Protection, "v"
Public Input No. 1060-NFPA 70-2023 [New Definition after Definition: Array.]	
Public Input No. 1061-NFPA 70-2023 [New Section after 505.8(P)]	
Public Input No. 1064-NFPA 70-2023 [Section No. 505.20(C)]	
Public Input No. 1417-NFPA 70-2023 [Section No. Table]	

Submitter Information Verification

Submitter Full Name: Paul Kelly
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submission Date: Tue Jun 13 15:28:30 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8387-NFPA 70-2024](#)

Statement: This revision is necessary to define a new Type of Protection "v" for artificially ventilated rooms under the Zone system in Article 100, and to reference this new Type of Protection in Article 505 and Table 13 of the 2023 NEC. These references acknowledge the use of this Type of Protection as a new means to mitigate the risk of explosion in hazardous (classified) locations. Type of Protection "v" is included in ANSI/UL 60079-13, and this ANSI standard is already included in the 2023 NEC for the new Type of Protection "p" for pressurized rooms. Type of Protection

“v” was not initially included in the 2023 NEC due to changes that were underway, but not yet completed, to the requirements in ANSI/UL 60079-13 so as to improve the consistency of application of the

requirements. These changes have now been successfully completed, and Type of Protection “v” can now be included in the

2026 NEC. In addition, “pressurized” is deleted in Informational Note 1 as a sealed conduit is not pressurized as part of the protection system.



Public Input No. 1050-NFPA 70-2023 [Section No. 505.16(C)(2)]

(2) Cable Seals.

Cable seals shall be installed in accordance with 505.16(C)(2)(a) through (C)(2)(e e).

(a) *Explosionproof and Flameproof Enclosures.* Cables entering enclosures required to be flameproof or explosionproof shall be sealed at the point of entrance. The seal shall comply with 505.16(D). Multiconductor or optical multifiber cables with a gas/vaportight continuous sheath capable of transmitting gases or vapors through the cable core shall be sealed in the Zone 2 location after removing the jacket and any other coverings so that the sealing compound surrounds each individual insulated conductor or optical fiber tube to minimize the passage of gases and vapors. Multiconductor or optical multifiber cables in conduit shall be sealed as described in 505.16(B)(4).

Exception No. 1: Cables passing from an enclosure or room that is unclassified as a result of Type Z pressurization into a Zone 2 location shall not require a seal at the boundary.

Exception No. 2: Shielded cables and twisted pair cables shall not require removal of the shielding material or separation of the twisted pairs if the termination is by an approved means to minimize the entrance of gases or vapors and prevent propagation of flame into the cable core.

(b) *Restricted Breathing Enclosures "nR".* Cables entering restricted breathing enclosures required to be restricted breathing shall be sealed at the point of entrance into the enclosure. These seals shall be installed in accordance with 505.16(D). Multiconductor cables or multifiber optical fiber cables with a gas/vaportight continuous sheath capable of transmitting gases or vapors through the cable core shall be sealed in the Zone 2 location. The jacket and any other coverings shall be removed to allow the sealing compound to surround each individual insulated conductor or optical fiber tube to minimize the passage of gases and vapors. Multiconductor cables or optical fiber cables in conduit shall be sealed as described in 505.16(C)(1)(b).

Exception No. 1: Cables passing from an enclosure or room that is unclassified as a result of Type Z pressurization into a Zone 2 location shall not require a seal at the boundary.

Exception No. 2: Shielded cables and twisted pair cables terminated with fittings listed for the location shall not require removal of the shielding material or separation of the twisted pairs.

(c) *Cables That Will Not Transmit Gases or Vapors.* Cables with a gas/vaportight continuous sheath that will not transmit gases or vapors through the cable core in excess of the quantity permitted for seal fittings shall not be required to be sealed except as required in 505.16(C)(2)(b). The minimum length of such cable run shall not be less than the length that limits gas or vapor flow through the cable core to the rate permitted for seal fittings [200 cm³/hr (0.007 ft³/hr) of air at a pressure of 1500 pascals (6 in. of water)].

Informational Note No. 1: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for further information on construction, testing, and marking of cables, cable fittings, and cord connectors.

Informational Note No. 2: The cable core does not include the interstices of the conductor strands.

(d) *Cables Capable of Transmitting Gases or Vapors.* Cables with a gas/vaportight continuous sheath capable of transmitting gases or vapors through the cable core shall not be required to be sealed except as required in 505.16(C)(2)(b), unless the cable is attached to process equipment or devices that might cause a pressure in excess of 1500 pascals (6 in. of water) to be exerted at a cable end, in which case a seal, barrier, or other means shall be provided to prevent migration of flammables into an unclassified area.

Exception: Cables with an unbroken gas/vaportight continuous sheath shall be permitted to pass through a Zone 2 location without seals.

(e) *Cables Without a Gas/Vaportight Continuous Sheath.* Cables that do not have a gas/vaportight continuous sheath shall be sealed at the boundary of the Zone 2 and unclassified location to minimize the passage of gases or vapors into an unclassified location.

Informational Note: The cable sheath can be either metal or a nonmetallic material.

Statement of Problem and Substantiation for Public Input

There are five list items and not three.

Submitter Information Verification

Submitter Full Name: John Simmons

Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 12 19:05:57 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8388-NFPA 70-2024](#)

Statement: This is an editorial revision. There are five list items and not three, (e) was added to reflect that. The committee has updated informational notes in this section to comply with the NEC® Style Manual, 2.1.10.



Public Input No. 1063-NFPA 70-2023 [New Section after 505.17(B)]

505.17(C) Flexible Cables, Zone 2.

Flexible cables installed in Zone 2 locations shall comply with 501.141, except as follows in 505.17(C)(1) through (C)(4):

- (1) Replace the references to "Class I, Division 2" with Zone 2";
- (2) Replace the references to "nonincendive field wiring applications" with "associated apparatus [ic] applications";
- (3) Replace the reference to " 501.10(B) (3)" with "505.15(C)(1)(7)"; and
- (4) Retain the reference to "501.105(B)(2)", but replace the references to "Class I, Division 1" in "501.105(B)(2)" with "Zone 1" .

Statement of Problem and Substantiation for Public Input

This proposal provides Zone 2 equivalent requirements to the existing Class I, Division 2 requirements detailed under 501.141.

Submitter Information Verification

Submitter Full Name: Paul Kelly
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 13 15:35:38 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8389-NFPA 70-2024](#)

Statement: This first revision provides Zone 2 equivalent requirements for flexible cables to the existing Class I, Division 2 requirements detailed under 501.141.

**Public Input No. 1971-NFPA 70-2023 [Section No. 505.20(B)]****(B) Zone 1.**

In Zone 1 locations, only equipment specifically listed and marked as suitable for the location shall be permitted.

Exception No. 1: Equipment identified for use in Class I, Division 1 or listed for use in Zone 0 locations for the same gas, or as permitted by 505.9(B)(2), and with a suitable temperature class shall be permitted.

Exception No. 2: Equipment identified for Zone 1 ~~or Zone 2~~ with type of protection "p" shall be permitted.

Statement of Problem and Substantiation for Public Input

Zone 2 equipment is not suitable for installation in a Zone 1 location. This appears to be a "cut & paste" error.

Submitter Information Verification

Submitter Full Name: William Lawrence

Organization:

Street Address:

City:

State:

Zip:

Submission Date: Wed Aug 09 05:09:34 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8390-NFPA 70-2024](#)

Statement: This revision corrects an error in including Zone 2 in Exception No. 2. Zone 2 equipment is not suitable for installation in a Zone 1 location.



Public Input No. 1064-NFPA 70-2023 [Section No. 505.20(C)]

(C) Zone 2.

In Zone 2 locations, only equipment specifically listed and marked as suitable for the location shall be permitted.

Exception No. 1: Equipment listed for use in Zone 0 or Zone 1 locations for the same gas, or as permitted by 505.9(B)(2), and with a suitable temperature class shall be permitted.

Exception No. 2: Equipment identified for Zone 1 or Zone 2 type of protection "~~p~~", or for Zone 2 type of protection "v", shall be permitted.

Exception No. 3: Equipment identified for use in Class I, Division 1 or Division 2 locations for the same gas, or as permitted by 505.9(B)(2), and with a suitable temperature class shall be permitted.

Exception No. 4: In Zone 2 locations, the installation of open or nonexplosionproof or nonflameproof enclosed motors such as squirrel-cage induction motors without brushes, switching mechanisms, or similar arc-producing devices that are not identified for use in a Zone 2 location shall be permitted.

Exception No. 5: The exposed surface of space heaters used to reduce condensation of moisture during shutdown periods shall not exceed 80 percent of the autoignition temperature in degrees Celsius of the gas or vapor involved when operated at rated voltage, and the maximum space heater surface temperature [based on a 40°C or higher marked ambient] shall be permanently marked on a visible nameplate mounted on the motor. Otherwise, space heaters shall be identified for Class I, Division 2 or Zone 2 locations.

Exception No. 6: A sliding contact shaft bonding device used for the purpose of maintaining the rotor at ground potential shall be permitted where the potential discharge energy is determined to be nonincendive for the application. The shaft bonding device shall be permitted to be installed on the inside or the outside of the motor.

Informational Note No. 1: It is important to consider the temperature of internal and external surfaces that might be exposed to the flammable atmosphere.

Informational Note No. 2: It is important to consider the risk of ignition due to currents arcing across discontinuities and overheating of parts in multisection enclosures of large motors and generators. Such motors and generators might need equipotential bonding jumpers across joints in the enclosure and from enclosure to ground. Where the presence of ignitable gases or vapors is suspected, clean air purging might be needed immediately prior to and during start-up periods.

Informational Note No. 3: See IEEE STD 1349, *IEEE Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations*, for information on the application of rotating electric machines including shaft bonding devices and potential discharge energy calculations.

Statement of Problem and Substantiation for Public Input

This proposal is necessary to define a new Type of Protection "v" for artificially ventilated rooms under the Zone system in Article 100, and to reference this new Type of Protection in Article 505 and Table 13 of the 2023 NEC. These references acknowledge the use of this Type of Protection as a new means to mitigate the risk of explosion in hazardous (classified) locations. Type of Protection "v" is included in ANSI/UL 60079-13, and this ANSI standard is already included in the 2023 NEC for the new Type of Protection "p" for pressurized rooms. Type of Protection "v" was not initially included in the 2023 NEC due to changes that were underway, but not yet completed, to the requirements in ANSI/UL 60079-13 so as to improve the consistency of application of the requirements. These changes have now been successfully completed, and Type of Protection "v" can now be included in the 2026 NEC.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1060-NFPA 70-2023 [New Definition after Definition: Array.]	Addresses Type of Protection, "v"
Public Input No. 1061-NFPA 70-2023 [New Section after 505.8(P)]	Addresses Type of Protection, "v"
Public Input No. 1062-NFPA 70-2023 [Section No. 505.16(B)(3)]	Addresses Type of Protection, "v"
Public Input No. 1417-NFPA 70-2023 [Section No. Table]	Addresses Type of Protection, "v"
Public Input No. 1060-NFPA 70-2023 [New Definition after Definition: Array.]	
Public Input No. 1061-NFPA 70-2023 [New Section after 505.8(P)]	
Public Input No. 1062-NFPA 70-2023 [Section No. 505.16(B)(3)]	
Public Input No. 1417-NFPA 70-2023 [Section No. Table]	

Submitter Information Verification

Submitter Full Name: Paul Kelly

Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 13 15:41:20 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8391-NFPA 70-2024](#)

Statement: This revision is necessary to define a new Type of Protection “v” for artificially ventilated rooms under the Zone system in Article 100, and to reference this new Type of Protection in Article 505 and Table 13 of the 2023 NEC. These references acknowledge the use of this Type of Protection as a new means to mitigate the risk of explosion in hazardous (classified) locations. Type of Protection “v” is included in ANSI/UL 60079-13, and this ANSI standard is already included in the 2023 NEC for the new Type of Protection “p” for pressurized rooms. Type of Protection “v” was not initially included in the 2023 NEC due to changes that were underway, but not yet completed, to the requirements in ANSI/UL 60079-13 so as to improve the consistency of application of the

requirements. These changes have now been successfully completed, and Type of Protection “v” can now be included in the 2026 NEC.

**Public Input No. 1637-NFPA 70-2023 [Section No. 505.20(E)]**

~~(E) Manufacturer's Instructions:~~

~~Electrical equipment installed in hazardous (classified) locations shall be installed in accordance with the instructions (if any) provided by the manufacturer.~~

Statement of Problem and Substantiation for Public Input

This language is redundant to 110.3(B) and therefore not needed as Chapter 5 is subject to the rules in Chapter 1 so this Section is not needed.

Submitter Information Verification

Submitter Full Name: Kyle Krueger

Organization: NECA

Affiliation: NECA

Street Address:

City:

State:

Zip:

Submittal Date: Thu Jul 27 15:28:43 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: The reference to the manufacturer's instruction is needed in this section.



Public Input No. 2732-NFPA 70-2023 [Section No. 505.22]

505.22 Increased Safety “e” Motors and Generators.

In Zone 1 locations, increased safety “e” motors and generators of all voltage ratings shall be listed for Zone 1 locations, and shall comply with all of the following:

- (1) Motors shall be marked with the current ratio, I_A/I_N , and time, t_E .
- (2) Motors shall have controllers marked with the model or identification number, output rating (horsepower or kilowatt), full-load amperes, starting current ratio (I_A/I_N), and time (t_E) of the motors that they are intended to protect; the controller marking shall also include the specific overload protection type (and setting, if applicable) that is listed with the motor or generator.
- (3) Connections shall be made with the specific terminals listed with the motor or generator.
- (4) Terminal housings shall be permitted to be of substantial, nonmetallic, nonburning material, provided an internal grounding means between the motor frame and the equipment grounding connection is incorporated within the housing.
- (5) The provisions of ~~Part III of Article 430 shall~~ Part III shall apply regardless of the voltage rating of the motor.
- (6) The motors shall be protected against overload by a separate overload device that is responsive to motor current. This device shall be selected to trip or shall be rated in accordance with the listing of the motor and its overload protection.
- (7) Sections 430.32(C) and 430.44 shall not apply to such motors.
- (8) The motor overload protection shall not be shunted or cut out during the starting period.

Informational Note: See ANSI/UL 122001, *General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations*, for information on ignition systems for reciprocating engines installed in Zone 2 hazardous (classified) locations. Reciprocating engine–driven generators, compressors, and other equipment installed in Zone 2 locations might present a risk of ignition of flammable materials associated with fuel, starting, and compression due to inadvertent release or equipment malfunction by the engine ignition system and controls.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 24 19:32:47 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8481-NFPA 70-2024](#)

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts and Section 2.2 regarding listing requirements.



Public Input No. 1664-NFPA 70-2023 [Section No. 505.30]

505.30 Grounding and Bonding.

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with 505.30(A) and (B).

(A) Grounding.

Wiring systems and equipment shall be grounded in accordance with Part I and Part VI of Article 250, as applicable.

(B) Bonding.

Wiring systems and equipment shall be bonded in accordance with Part I and Part V of Article 250, as applicable, and 505.30(B)(1) and (B)(2).

(1) Specific Bonding Means.

Bonding shall comply with 505.30(B)(1)(a) and (B)(1)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

(2) Flexible Metal Conduit and Liquidtight Flexible Metal Conduit.

Flexible metal conduit and liquidtight flexible metal conduit shall comply with 505.30(B)(2)(a) and (B)(2)(b).

(a) Flexible metal conduit and liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

(b) In Zone 2 locations, the bonding jumper shall not be required where all of the following conditions are met:

- (1) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.
- (2) Overcurrent protection in the circuit is limited to 10 amperes or less.
- (3) The load is part of a meter, instrument, or relay circuit.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
505.30_Revision.docx	Revise Section 505.30.	

Statement of Problem and Substantiation for Public Input

This section limits the grounding requirements to Article 250 to Part I and Part VI and limits bonding to Article 250 Part I and Part V plus the special bonding requirements. The requirement for each one is saying that these parts are the only ones that apply to hazardous(classified) locations. While 90.3 does state that Chapters 1 through 4 apply generally to all installations it also says that Chapters 5 through 7 supplement or modify Chapters 1 through 4. It can be argued that the current "dot 30" sections in Articles 501, 502, 503, 505, and 506 limit (modify) the grounding and bonding in hazardous locations to Parts I, IV, and V. Regardless of the answer the section is not clear and needs to be revised. In reality there are bonding and grounding requirements in each of the ten parts of Article 250 that might apply to an installation in a hazardous (classified) location at one time or another. With the restriction in the 2023 NEC Style Manual that prohibits using references to complete articles, the current language of 505.30 cannot be easily fixed. Removing grounding from the section eliminates that part of the problem and in truth the section does not modify or supplement grounding, so it doesn't belong. As for bonding, the revised language should correct the problem. Removing the reference to two parts of Article 250 removes any idea that the other parts are not valid and making the reference to the general bonding requirements of Chapter 2 of this Code leads to Article 250 indirectly without violating the Style Manual.

Related Public Inputs for This Document

Related Input

Relationship

[Public Input No. 1665-NFPA 70-2023 \[Section No. 506.30\]](#)

Parallel Construction.

[Public Input No. 1882-NFPA 70-2023 \[Section No. 503.30\]](#)

Parallel Construction.

[Public Input No. 1881-NFPA 70-2023 \[Section No. 502.30\]](#)

Parallel Construction.

[Public Input No. 1880-NFPA 70-2023 \[Section No. 501.30\]](#)

Parallel Construction.

[Public Input No. 1879-NFPA 70-2023 \[New Section after 500.8\(G\)\]](#)

New Parallel Construction.

[Public Input No. 1665-NFPA 70-2023 \[Section No. 506.30\]](#)

[Public Input No. 1879-NFPA 70-2023 \[New Section after 500.8\(G\)\]](#)

[Public Input No. 1880-NFPA 70-2023 \[Section No. 501.30\]](#)

[Public Input No. 1881-NFPA 70-2023 \[Section No. 502.30\]](#)

[Public Input No. 1882-NFPA 70-2023 \[Section No. 503.30\]](#)

Submitter Information Verification

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8392-NFPA 70-2024](#)

Statement: The language of 505.30 is revised to correlate with the text of 501.30 which was moved to 500.30.

505.30 ~~Grounding and Bonding in Hazardous (Classified) Locations.~~

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with ~~503.30(A) and (B)~~ the specific bonding requirements in 505.30(A) and (B) in addition to the general bonding requirements in Chapter 2 of this Code.

~~(A) Grounding.~~

~~Wiring systems and equipment shall be grounded in accordance with Part I and Part VI of Article 250, as applicable.~~

~~(B) Bonding.~~

~~Bonding shall comply with Part I and Part V of Article 250, as applicable, and 505.30(B)(1) and (B)(2).~~

~~(1A) Specific Bonding Means.~~

~~Bonding shall comply with 505.30(B)(1)(a) and (B)(1)(b).~~

~~(a1)~~ The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between Class I locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

~~(b2)~~ Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

~~(2B) Specific Bonding for Flexible Metal Conduit and Liquidtight Flexible Metal Conduit.~~

~~Flexible metal conduit and liquidtight flexible metal conduit shall comply with 505.30(B)(1a) and (B)(2)(b).~~

~~(a1)~~ Flexible metal conduit and liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

~~(b2)~~ In Class I, Division 2 locations, the bonding jumper shall not be required where all of the following conditions are met:

~~(1a)~~ Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.

~~(2b)~~ Overcurrent protection in the circuit is limited to 10 amperes or less.

(3c) The load is part of a meter, instrument, or relay circuit.



Public Input No. 2733-NFPA 70-2023 [Section No. 505.30]

505.30 Grounding and Bonding.

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with 505.30(A) and (B).

(A) Grounding.

Wiring systems and equipment shall be grounded in accordance with Article 250, Part I and Part VI ~~of Article 250~~, as applicable.

(B) Bonding.

Wiring systems and equipment shall be bonded in accordance with Article 250, Part I and Part V ~~of Article 250~~, as applicable, and 505.30(B)(1) and (B)(2).

(1) Specific Bonding Means.

Bonding shall comply with 505.30(B)(1)(a) and (B)(1)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

(2) Flexible Metal Conduit and Liquidtight Flexible Metal Conduit.

Flexible metal conduit and liquidtight flexible metal conduit shall comply with 505.30(B)(2)(a) and (B)(2)(b).

(a) Flexible metal conduit and liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

(b) In Zone 2 locations, the bonding jumper shall not be required where all of the following conditions are met:

- (3) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.
- (4) Overcurrent protection in the circuit is limited to 10 amperes or less.
- (5) The load is part of a meter, instrument, or relay circuit.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8392-NFPA 70-2024](#)

Statement: The language of 505.30 is revised to correlate with the text of 501.30 which was moved to 500.30.



Public Input No. 4425-NFPA 70-2023 [Section No. 505.30(B)(1)]

(1) Specific Bonding Means.

Bonding shall comply with 505.30(B)(1)(a) and (B)(1)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4 ~~10~~ (5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

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Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 1978-NFPA 70-2023 [New Section after 506.1(B)]

506.3 Reconditioned Equipment

506.3(A) Permitted to be Installed.

Reconditioned equipment shall be permitted to be installed in hazardous (classified) locations if the reconditioning is conducted in accordance with the manufacturer's instructions or, if no instructions are provided, nationally recognized standards.

(1) Reconditioned Motors or Generators.

Reconditioning of a Zone 21 dust ignition protected motor or generator or a dust ignitionproof motor or generator listed for use in hazardous (classified) locations shall be listed as reconditioned when installed in hazardous (classified) locations. Reconditioning of a type "p" motor or generator, or dust ignitionproof motor or dust ignitionproof generator, identified for use in hazardous (classified) locations shall be identified as reconditioned when installed in a hazardous (classified) location, in accordance with 500.8(A). Reconditioning of a motor or generator with dust ignition protected construction features is considered to take place when the motor or generator is removed from service for repairs, including replacement of a failed bearing. The dust ignition protected features of any reconditioned motor or generator are verified as a part of the reconditioning or refurbishing process.

Informational Note 1: See Explosive Atmospheres - Part 31: Equipment Dust Ignition Protection by Enclosure "t" for construction and test requirements for dust ignition protected motors and generators.

Informational Note 2: See ANSI/EASA AR100, Recommended Practice for the Repair of Rotating Electrical Apparatus, for information on the rewinding and repair of motors.

506.3(B) Not Permitted to be Installed

(1) Intrinsically Safe Systems.

Reconditioning of intrinsically safe systems is not permitted. Replacement of intrinsically safe, replaceable printed circuit board assemblies or modules, is permitted with like for like, provided by the original manufacturer.

Statement of Problem and Substantiation for Public Input

An informal task group of CMP14 members (Rich Holub, Don Ankele, Dave Burns, Bill Lawrence, Mark Goodman, and Evans Massey) met to address the inclusion of a paragraph in the 2023 Edition of the NEC® in 430.2 which addressed listing of reconditioned motors in hazardous (classified) locations. The task group concluded that this language was out of scope for Article 430 and must reside in the Chapter 5 articles which cover hazardous (classified) location requirements. Current language in 501.125 and 502.125 allow motors to be identified for the location and doesn't specifically require them to be listed. Motors which were listed when constructed could be listed as reconditioned, but those just identified at the time of construction would then need to be identified in accordance with 500.8. Insertion of a listing requirement for reconditioned motors is contradictory to existing requirements because a motor which was never listed when first built could not be listed as reconditioned. As such, the CMP14 task group has proposed language stating reconditioned motors shall be identified as reconditioned, mirroring current requirements for the motors as stated in the relevant equipment sections. The task group concluded that reconditioning of intrinsically safe systems was not appropriate because no accepted practices to approve such reconditioning exists in the industry. Replacement, in kind, of intrinsically safe circuit board assemblies or modules is not considered reconditioning as it is compliant with the original manufacturer's listing and labeling.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1979-NFPA 70-2023 [Section No. 430.2]	

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8360-NFPA 70-2024](#)

Statement: New section 506.3 places the requirements for reconditioned equipment in Article 506. Equipment must be reconditioned according to the manufacturer's instructions. Where there are none, reconditioning must be according to nationally recognized standards. Specific reconditioning requirements are provided for motors and generators. Reconditioned intrinsically safe equipment is not permitted to be installed. However printed circuit board assemblies or modules are permitted to be replaced with like for like components from the original manufacturer.



Public Input No. 2209-NFPA 70-2023 [Section No. 506.4]

506.4 Documentation.

Areas designated as hazardous (classified) or unclassified locations shall be documented on an area classification drawing and other associated documentation. This documentation shall be made available to the AHJ and to those authorized to design, install, inspect, maintain, or operate electrical equipment.

Informational Note No. 1: See ANSI/UL 60079-28, *Explosive Atmospheres — Part 28: Protection of equipment and transmission systems using optical radiation*, for information concerning the installation of equipment using optical emissions technology (such as laser equipment) that could potentially become an ignition source in hazardous (classified) locations.

Informational Note No. 2: See IEC/IEEE 60079-30-2, *Explosive atmospheres — Part 30-2: Electrical Resistance Trace Heating — Application Guide for Design, Installation and Maintenance*, for information on electrical resistance trace heating for hazardous (classified) locations.

Informational Note No. 3: See IEEE 844.2/CSA C293.2, *IEEE/CSA Standard for Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance*, for information on electric skin effect trace heating for hazardous (classified) locations.

Informational Note No. 4: See IEEE 844.4/CSA C293.4, *IEEE/CSA Standard for Impedance Heating of Pipelines and Equipment — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance*, for information on electric impedance heating for hazardous (classified) locations.

Informational Note No. 5: See ANSI/UL RP 60079-46, *Recommended Practice for Explosive Atmospheres - Part 46: Equipment Assemblies*, for information on manufactured assemblies comprising multiple items of equipment that require additional assessment by the assembly manufacturer that is not covered by equipment certificates. This additional assessment might include (but is not limited to) performance and documentation of a close or detailed inspection of the assembly by the manufacturer prior to commissioning by the user. See also 90.7.

Statement of Problem and Substantiation for Public Input

The first edition of UL RP 60079-46 was published as an ANSI document in 2022. While use of this document is not mandatory for the certification of assemblies (as such certification can be covered by using just the applicable UL 60079 series type of protection standards), use of this document can assist the user, such as by having a close or detailed inspection performed and documented by the manufacturer prior to commissioning by the user.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 2208-NFPA 70-2023 [Section No. 505.4]	Addresses new ANSI/UL RP 60079-46 documentation
Public Input No. 2208-NFPA 70-2023 [Section No. 505.4]	

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8569-NFPA 70-2024](#)

Statement: Adding informational note No. 5 to reference ANSI/UL RP 60079.46 and provide an explanation for the informational note.

This task group seeks input from the committee regarding keeping or deleting the second sentence of the informational note.



Public Input No. 1049-NFPA 70-2023 [Section No. 506.5(A)]

(A) Classifications of Locations.

Locations in this Article shall be classified on the basis of the properties of the combustible dust, combustible fibers/flyings, or ignitable fibers/flyings that might be present, and the likelihood that a combustible or ignitable concentration or quantity is present. Each room, section, or area shall be considered individually in determining its classification.

Statement of Problem and Substantiation for Public Input

The added text makes it clear that the requirement applies to Article 506 and no other articles. It also correlates with PI 1048 for Article 505,

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 1048-NFPA 70-2023</u> <u>[Section No. 505.5(A)(1)]</u>	The new language in both PIs make it clear that the requirement is limited to the Article it is located in.
<u>Public Input No. 1048-NFPA 70-2023</u> <u>[Section No. 505.5(A)(1)]</u>	

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Committee: NEC-P14

Committee Statement

Resolution: There is no reason a user should be reading Article 506 and assume that the requirements belong to any other Article.



Public Input No. 314-NFPA 70-2023 [Section No. 506.9]

506.9 Equipment Requirements.

(A) Suitability.

Suitability of identified equipment shall be determined by one of the following:

- (1) Equipment listing or labeling
- (2) Evidence of equipment evaluation from a qualified testing laboratory or inspection agency concerned with product evaluation
- (3) Evidence acceptable to the authority having jurisdiction such as a manufacturer's self-evaluation or an owner's engineering judgment

Informational Note: Additional documentation for equipment might include certificates demonstrating compliance with applicable equipment standards, indicating special conditions of use, and other pertinent information.

(B) Listing.

Equipment that is listed for Zone 20 shall be permitted in a Zone 21 or Zone 22 location of the same combustible dust, combustible fiber/flying, or ignitable fiber/flying. Equipment that is listed for Zone 21 shall be permitted in a Zone 22 location of the same combustible dust, combustible fiber/flyings, or ignitable fiber/flying.

(C) Marking.

(1) Division Equipment.

Equipment identified for Class II, Division 1, Class II, Division 2, Class III, Division 1, or Class III, Division 2 shall, in addition to being marked in accordance with 500.8(C), be permitted to be marked with all of the following:

- (1) Zone 20, 21, or 22 (as applicable)
- (2) Material group in accordance with 506.6
- (3) Maximum surface temperature in accordance with 506.9(D), marked as a temperature value in degrees C, preceded by "T" and followed by the symbol "°C"

(2) Zone Equipment.

Equipment meeting one or more of the protection techniques described in 506.8 shall be marked with the following in the order shown:

- (1) Zone in accordance with Chapter 9, Table 13
- (2) Symbol "AEx"
- (3) Protection technique(s) in accordance with Chapter 9, Table 13
- (4) Material group in accordance with 506.6
- (5) Maximum surface temperature in accordance with 506.9(D), marked as a temperature value in degrees Celsius, preceded by "T" and followed by the symbol "°C"
- (6) Ambient temperature marking in accordance with 506.9(D)
- (7) Equipment protection level (EPL)

Informational Note: EPLs are designated as G for gas, or D for dust, and are then followed by a letter (a, b, or c) to give the user a better understanding as to whether the equipment provides (a) a "very high," (b) a "high," or (c) an "enhanced" level of protection against ignition of an explosive atmosphere. For example, a Zone 21 AEx pb IIIB T165°C Db motor is marked with an EPL of "Db".

Exception: Associated apparatus NOT suitable for installation in a hazardous (classified) location shall be required to be marked only with 506.9(C)(2)(2) and (C)(2)(3), and where applicable (C)(2)(4), but BOTH the symbol AEx in 506.9(C)(2)(2) and the symbol for the type of protection in 506.9(C)(2)(3) shall be enclosed within the same square brackets; for example, [AEx ia] IIIC.

(D) Temperature Classifications.

Equipment shall be marked to show the maximum surface temperature referenced to a 40°C ambient, or at the higher marked ambient temperature if the equipment is rated and marked for an ambient temperature of greater than 40°C. For equipment installed in a Zone 20 or Zone 21 location, the operating temperature shall be based on operation of the equipment when blanketed with the maximum amount of dust (or with dust-simulating fibers/flyings) that can accumulate on the equipment. Electrical equipment designed for use in the ambient temperature range between -20°C and +40°C shall require no additional ambient temperature marking. Electrical equipment that is designed for use in a range of ambient temperatures other than -20°C and +40°C is considered to be special, and the ambient temperature range shall then be marked on the equipment, including either the symbol "Ta" or "Tamb" together with the special range of ambient temperatures.

Informational Note: As an example, such a marking might be "-30°C ≤ Ta ≤ +40°C."

Exception No. 1: Equipment of the non-heat-producing type, such as conduit fittings, shall not be required to have a marked operating temperature.

Exception No. 2: Equipment identified for Class II, Division 1 or Class II, Division 2 locations as permitted by 506.20(B) and (C) shall be permitted to be marked in accordance with 500.8(C) and Table 500.8(C)(4).

(E) Threading.

The supply connection entry thread form shall be NPT or metric. Conduit and fittings shall be made wrenchtight to prevent sparking when the fault current flows through the conduit system and to ensure the integrity of the conduit system. Equipment provided with threaded entries for field wiring connections shall be installed in accordance with 506.9(E)(1) or (E)(2) and with (E)(3).

(1) Equipment Provided with Threaded Entries for NPT-Threaded Conduit or Fittings.

For equipment provided with threaded entries for NPT-threaded conduit or fittings, listed conduit fittings or listed cable fittings shall be used. All NPT-threaded conduit and fittings shall be threaded with a National (American) Standard Pipe Taper (NPT) thread.

Informational Note: See ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*, for thread specifications for NPT threads.

(2) Equipment Provided with Threaded Entries for Metric-Threaded Fittings.

For equipment with metric-threaded entries, listed conduit fittings or listed cable fittings shall be used. Such entries shall be identified as being metric, or listed adapters to permit connection to conduit or NPT-threaded fittings shall be provided with the equipment and shall be used for connection to conduit or NPT-threaded fittings. Metric-threaded fittings installed into equipment entries shall be made up with at least five threads fully engaged.

(3) Unused Openings.

All unused openings shall be closed with blanking elements or close-up plugs that are listed for the location and will maintain the type of protection. Thread engagement shall comply with the requirements of 506.9(E)(1) or (E)(2).

(F) Optical Fiber Cables.

An optical fiber cable, with or without current-carrying conductors (hybrid optical fiber cable), shall be installed to address the associated fire hazard and sealed to address the associated explosion hazard in accordance with 506.15 and 506.16.

(G) Equipment Involving Optical Radiation.

For equipment involving sources of optical radiation (such as laser or LED sources) in the wavelength range from 380 nm to 10 µm, the risk of ignition from optical radiation shall be considered for all electrical parts and circuits that might be exposed to the radiation, both inside and outside the optical equipment. This includes optical equipment, which itself is located outside the explosive atmosphere but its emitted optical radiation enters such atmospheres.

Informational Note: See ANSI/UL 60079-28, *Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation*, for information on types of protection that can be applied to minimize the risk of ignition in explosive atmospheres from optical radiation.

Exception: All luminaires (fixed, portable, or transportable) and hand lights intended to be supplied by mains (with or without galvanic isolation) or powered by batteries, with any continuous divergent light source, including LEDs, shall be excluded from this requirement.

(H) Luminaire Retrofit Kits

Retrofit luminaire kits shall comply with 506.9(H)(1) through (H)(4).

(1) Modification of existing luminaires to change the lamp type, such as for light-emitting-diode (LED) lamp types, shall be permitted using retrofit kits listed for the location and suitable for field installation in luminaires in accordance with the instructions provided.

(2) The retrofit kit shall consist of light sources, installation instructions, subassemblies, luminaire marking labels, and assembly aids (where appropriate) to facilitate the replacement of the existing light source in complete luminaires. The retrofit installation might require modifications to the luminaire in accordance with the installation instructions provided with the retrofit kit.

(3) A luminaire that is modified so it can no longer accept the original lamp shall be relabeled with a label provided with the listed retrofit kit which is to be affixed to the luminaire where visible during relamping that indicates the luminaire has been modified and can no longer operate the originally intended lamp(s) and additionally identifies the replacement lamp type/model to be used, together with the manufacturer's name and ordering information. The label shall:

(a) Be affixed to the luminaire where visible during relamping.

(b) Indicate that the luminaire has been modified and can no longer operate the originally intended lamps, and

(c) Identify the replacement lamp type/model to be used, together with the manufacturer's name and ordering information.

(4) LED retrofit luminaire conversion kits using linear tubular LED lamp conversions shall be relabeled with a label provided with the listed retrofit kit which is to be affixed to the luminaire where visible during relamping that indicates in text or wiring diagram how the supply connections are made to the lamp holders.

Statement of Problem and Substantiation for Public Input

This proposal clarifies the need for luminaire retrofit kits to be listed for the classified location in which the luminaire is installed, and that the luminaire is to be modified in accordance with the instructions provided with the kit. The proposal also requires that new relamping information be marked on the retrofitted luminaire.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 310-NFPA 70-2023 [Section No. 501.130]	Related
Public Input No. 311-NFPA 70-2023 [Section No. 502.130]	Related
Public Input No. 312-NFPA 70-2023 [Section No. 503.130]	Related
Public Input No. 313-NFPA 70-2023 [Section No. 505.9]	Related
Public Input No. 310-NFPA 70-2023 [Section No. 501.130]	
Public Input No. 311-NFPA 70-2023 [Section No. 502.130]	
Public Input No. 312-NFPA 70-2023 [Section No. 503.130]	
Public Input No. 313-NFPA 70-2023 [Section No. 505.9]	

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8575-NFPA 70-2024](#)

Statement: This first revision adds the equipment for luminaire retrofit kits. The equipment has existed but was not explicitly specified in the NEC. Retrofit kits require certification to be listed and labeled for hazardous (classified) locations. The retrofit will not alter the area of classification in which the equipment is installed, and it will not alter the hazloc marking for the equipment currently installed. The retrofit kits are evaluated and certified for use with the installed luminaire, rather than being an aftermarket product for use with any luminaire. All submittals are required to be in compliance with UL 844, which includes requirements for ordinary locations. Only when a portion of the luminaire that carries the original certification mark is replaced does that certification mark go away. If not, the original certification mark will remain and the retrofit certification mark will indicate the updated markings.



Public Input No. 1137-NFPA 70-2023 [Section No. 506.9(C)(2)]

(2) Zone Equipment.

Equipment meeting one or more of the protection techniques described in 506.8 shall be marked with the following in the order shown:

- (1) Zone in accordance with Chapter 9, Table 13
- (2) Symbol "AEx"
- (3) Protection technique(s) in accordance with Chapter 9, Table 13
- (4) Material group in accordance with 506.6
- (5) Maximum surface temperature in accordance with 506.9(D), marked as a temperature value in degrees Celsius, preceded by "T" and followed by the symbol "C"
- (6) Ambient temperature marking in accordance with 506.9(D)
- (7) Equipment protection level (EPL)

Equipment meeting one or more of the protection techniques described in 506.8 shall be marked with a certificate number in the following form: the name or mark of the certificate issuer followed by the last two figures of the year of the certificate followed by a "US" followed by a unique four character reference for the certificate in that year. Where equipment is listed with specific conditions of use, the symbol "X" shall be placed after the certificate number. A reference to a specific instruction document containing the detailed information may appear on the equipment as an alternative to the requirement for the "X" marking .

Informational Note No 1 : EPLs are designated as G for gas, or D for dust, and are then followed by a letter (a, b, or c) to give the user a better understanding as to whether the equipment provides (a) a "very high," (b) a "high," or (c) an "enhanced" level of protection against ignition of an explosive atmosphere. For example, a Zone 21 AEx pb IIIB T165°C Db motor is marked with an EPL of "Db".

Informational Note No 2: Where the certificate number includes a "U" suffix, it indicates that the product is an "Ex Component", is incomplete and not suitable for installation without further evaluation or certification.

Exception: Associated apparatus NOT suitable for installation in a hazardous (classified) location shall be required to be marked only with 506.9(C)(2)(2) and (C)(2)(3), and where applicable (C)(2)(4), but BOTH the symbol AEx in 506.9(C)(2)(2) and the symbol for the type of protection in 506.9(C)(2)(3) shall be enclosed within the same square brackets; for example, [AEx ia] IIIC.

Statement of Problem and Substantiation for Public Input

It is common practise for US certification bodies to provide a certificate for hazardous (classified) equipment but nowhere in the Code does it identify what this certificate number is or what it represents. Adding this to the Code would eliminate a National Deviation for the US adoptions of IEC standards and would permit equipment with Specific Conditions of Use to be identified by the 'X' following the certificate number.

Add an informational note to identify the difference between Ex Equipment and Ex Components.

This is consistent with the way Canada addresses the same situation.

Submitter Information Verification

Submitter Full Name: Nicholas Ludlam
Organization: FM Approvals
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 20 03:45:24 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: In the NEC, the installation is required to follow the installation instructions that are provided. The US differences replace conditions of safe use with installation instructions. No reason for variance from the rest of the Code. Other "X" conditions such as not testing the ordinary location requirements is not permitted in the US and this proposal

makes the concept of the X-condition broader than the US accepted practice of installation instructions noted herein.



Public Input No. 3876-NFPA 70-2023 [Section No. 506.9(C)(2)]

(2) Zone Equipment.

Equipment meeting one or more of the protection techniques described in 506.8 shall be marked with the following in the order shown:

- (1) Zone in accordance with Chapter 9, Table 43 13 shall be an optional marking.
- (2) Symbol "AEx"
- (3) Protection technique(s) in accordance with Chapter 9, Table 13
- (4) Material group in accordance with 506.6
- (5) Maximum surface temperature in accordance with 506.9(D), marked as a temperature value in degrees Celsius, preceded by "T" and followed by the symbol "°C"
- (6) Ambient temperature marking in accordance with 506.9(D)
- (7) Equipment protection level (EPL)

Informational Note: EPLs are designated as G for gas, or D for dust, and are then followed by a letter (a, b, or c) to give the user a better understanding as to whether the equipment provides (a) a "very high," (b) a "high," or (c) an "enhanced" level of protection against ignition of an explosive atmosphere. For example, a Zone 21 AEx pb IIIB T165°C Db motor is marked with an EPL of "Db".

Exception: Associated apparatus NOT suitable for installation in a hazardous (classified) location shall be required to be marked only with 506.9(C)(2)(2) and (C)(2)(3), and where applicable (C)(2)(4), but BOTH the symbol AEx in 506.9(C)(2)(2) and the symbol for the type of protection in 506.9(C)(2)(3) shall be enclosed within the same square brackets; for example, [AEx ia] IIIC.

Statement of Problem and Substantiation for Public Input

The Zone marking is redundant with required EPL marking on the equipment. EPL marking has been proved effective in Canada and the rest of the world. Label space on equipment is typically at a premium, so eliminating mandatory redundant markings would be helpful.

Submitter Information Verification

Submitter Full Name: Glen Edwards
Organization: Detector Electronics Corporation
Affiliation: International Society of Automation (ISA)
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 07:46:04 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The removal of the Zone marking does not benefit the reader. In fact, doing so will add confusion due to the current lack of familiarity regarding the EPLs only recently added to the code.



Public Input No. 2734-NFPA 70-2023 [Section No. 506.15(A)]

(A) Zone 20.

In Zone 20 locations, the following wiring methods shall be permitted:

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC).
- (2) Type MI cable terminated with fittings listed for the location. Type MI cable shall be installed and supported in a manner to avoid tensile stress at the termination fittings.

Exception No. 1: Type MI cable and fittings listed for Class II, Division 1 locations shall be permitted to be used.

Exception No. 2: Equipment identified as intrinsically safe "ia" shall be permitted to be connected using the wiring methods identified in 504.20.
- (3) In restricted industrial establishments, Type MC-HL cable listed for use in Zone 20 locations, with a continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, and a separate equipment grounding conductor(s) in accordance with 250.122, and terminated with fittings listed for the application. Type MC-HL cable shall be installed in accordance with ~~Part II of Article 330~~, Part II.

Exception: Type MC-HL cable and fittings listed for Class II, Division 1 locations shall be permitted to be used.
- (4) In restricted industrial establishments, and where the cable is not subject to physical damage, Type ITC-HL cable listed for use in Zone 1 or Class I, Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material, and terminated with fittings listed for the application. Type ITC-HL cable shall be installed in accordance with 335.4.
- (5) Fittings and boxes shall be identified for use in Zone 20 locations.

Exception: Boxes and fittings listed for Class II, Division 1 locations shall be permitted to be used.
- (6) If flexible connections are necessary, liquidtight flexible metal conduit (LFMC) with listed fittings, liquidtight flexible nonmetallic conduit (LFNC) with listed fittings, or flexible cord listed for extra-hard usage and provided with listed fittings. Where flexible cords are used, they shall also comply with 506.17 and be terminated with a listed cord connector that maintains the type of protection of the terminal compartment. If flexible connections are subject to oil or other corrosive conditions, the insulation of the conductors shall be of a type listed for the condition or be protected by means of a suitable sheath.

Exception No. 1: Liquidtight flexible conduit (LFMC or LFNC), flexible conduit fittings, and cord fittings listed for Class II, Division 1 locations shall be permitted.

Exception No. 2: For elevator use, an identified elevator cable of Type EO, Type ETP, or Type ETT, shown under the "use" column in Table 400.4 for "hazardous (classified) locations," and terminated with listed connectors that maintain the type of protection of the terminal compartment shall be permitted.

Informational Note No. 1: See 506.30 for grounding requirements where flexible conduit is used.

Informational Note No. 2: See ANSI/UL 2225, Cables and Cable-Fittings for Use in Hazardous (Classified) Locations, for information on construction, testing, and marking of cables, cable fittings, and cord connectors.
- (7) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in raceways in accordance with 506.15(A). Optical fiber cables shall be sealed in accordance with 506.16.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
Street Address:
City:

State:

Zip:

Submittal Date: Thu Aug 24 19:36:14 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8500-NFPA 70-2024](#)

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use
of Parts.



Public Input No. 4426-NFPA 70-2023 [Section No. 506.15(A)]

(A) Zone 20.

In Zone 20 locations, the following wiring methods shall be permitted:

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC).
- (2) Type MI cable terminated with fittings listed for the location. Type MI cable shall be installed and supported in a manner to avoid tensile stress at the termination fittings.

Exception No. 1: Type MI cable and fittings listed for Class II, Division 1 locations shall be permitted to be used.

Exception No. 2: Equipment identified as intrinsically safe "ia" shall be permitted to be connected using the wiring methods identified in 504.20.
- (3) In restricted industrial establishments, Type MC-HL cable listed for use in Zone 20 locations, with a continuous corrugated metallic sheath, an overall jacket of suitable polymeric material, and a separate equipment grounding conductor(s) in accordance with 250.122, and terminated with fittings listed for the application. Type MC-HL cable shall be installed in accordance with Part II of Article 330.

Exception: Type MC-HL cable and fittings listed for Class II, Division 1 locations shall be permitted to be used.
- (4) In restricted industrial establishments, and where the cable is not subject to physical damage, Type ITC-HL cable listed for use in Zone 1 or Class I, Division 1 locations, with a gas/vaportight continuous corrugated metallic sheath and an overall jacket of suitable polymeric material, and terminated with fittings listed for the application. Type ITC-HL cable shall be installed in accordance with 335.4 10 .
- (5) Fittings and boxes shall be identified for use in Zone 20 locations.

Exception: Boxes and fittings listed for Class II, Division 1 locations shall be permitted to be used.
- (6) If flexible connections are necessary, liquidtight flexible metal conduit (LFMC) with listed fittings, liquidtight flexible nonmetallic conduit (LFNC) with listed fittings, or flexible cord listed for extra-hard usage and provided with listed fittings. Where flexible cords are used, they shall also comply with 506.17 and be terminated with a listed cord connector that maintains the type of protection of the terminal compartment. If flexible connections are subject to oil or other corrosive conditions, the insulation of the conductors shall be of a type listed for the condition or be protected by means of a suitable sheath.

Exception No. 1: Liquidtight flexible conduit (LFMC or LFNC), flexible conduit fittings, and cord fittings listed for Class II, Division 1 locations shall be permitted.

Exception No. 2: For elevator use, an identified elevator cable of Type EO, Type ETP, or Type ETT, shown under the "use" column in Table 400.4 for "hazardous (classified) locations," and terminated with listed connectors that maintain the type of protection of the terminal compartment shall be permitted.

Informational Note No. 1: See 506.30 for grounding requirements where flexible conduit is used.

Informational Note No. 2: See ANSI/UL 2225, Cables and Cable-Fittings for Use in Hazardous (Classified) Locations, for information on construction, testing, and marking of cables, cable fittings, and cord connectors.
- (7) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in raceways in accordance with 506.15(A). Optical fiber cables shall be sealed in accordance with 506.16.

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
Street Address:
City:
State:

Zip:
Submittal Date: Thu Sep 07 15:10:29 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 4330-NFPA 70-2023 [Section No. 506.15(B)]

(B) Zone 21.

In Zone 21 locations, the following wiring methods shall be permitted:

- (1) All wiring methods permitted in 506.15(A)
- (2) Fittings and boxes that are dusttight, that are provided with threaded bosses for connection to conduit, and in which taps, joints, or terminal connections are not made and are not used in locations where metal dust is present

Informational Note: See ANSI/UL 2225, *Cables and Cable-Fittings for Use in Hazardous (Classified) Locations*, for information on construction, testing, and marking of cables, cable fittings, and cord connectors.

Exception: Equipment identified as intrinsically safe "ib" shall be permitted to be connected using the wiring methods identified in 504.20.

(3) <<copy 502.10(A)(1)(6)>>

(4) <<copy 502.10(A)(1)(7)>>

Statement of Problem and Substantiation for Public Input

To permit TC-ER-HL and Type P cables which are permitted in Class II Div 1 but are omitted from Zone 21.

Note that these cables are also permitted for flexible applications in Class II Div 1 so should also be permitted for flexible applications in Zone 21.

Submitter Information Verification

Submitter Full Name: Andrew Wood
Organization: Land Instruments International
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 11:54:38 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8586-NFPA 70-2024](#)

Statement: To permit TC-ER-HL and Type P cables which are permitted in Class II Div 1 but are omitted from Zone 21.

Note that these cables are also permitted for flexible applications in Class II Div 1 so should also be permitted for flexible applications in Zone 21.



Public Input No. 4333-NFPA 70-2023 [Section No. 506.15(C)]

(C) Zone 22.

In Zone 22 locations, the following wiring methods shall be permitted:

- (1) All wiring methods permitted in 506.15(B).
- (2) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings.
- (3) Electrical metallic tubing (EMT) or dusttight wireways.
- (4) Type MC or Type MI cable with listed termination fittings.
- (5) Type PLTC cable or Type PLTC-ER cable used in Class 2 or Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (6) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (7) Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings.
- (8) Intrinsic safety type of protection "ic" using any of the wiring methods permitted for unclassified locations. Intrinsic safety type of protection "ic" systems shall be installed in accordance with the control drawing(s). Simple apparatus, not shown on the control drawing, shall be permitted in a circuit of intrinsic safety type of protection "ic", provided that the simple apparatus does not interconnect the intrinsic safety type of protection "ic" circuit to any other circuit. Separation of circuits of intrinsic safety type of protection "ic" shall be in accordance with one of the following:
 - (9) Be in separate cables
 - (10) Be in multiconductor cables where the conductors of each circuit are within a grounded metal shield
 - (11) Be in multiconductor cables where the conductors have insulation with a minimum thickness of 0.25 mm (0.01 in.)

Informational Note: See Article 100 for the definition of *simple apparatus*.

- (12) Boxes and fittings shall be dusttight.
- (13) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any raceway in accordance with 506.15(C). Optical fiber cables shall be sealed in accordance with 506.16.
- (14) Cablebus.
- (15) <<copy_text of 502.10(B)(1)(10)>>

Statement of Problem and Substantiation for Public Input

Add additional option of Type P cable without metal braid, as permitted in Zone 2 and Class II Division 2.

Submitter Information Verification

Submitter Full Name: Andrew Wood
Organization: Land Instruments International
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 12:01:47 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: FR-8612-NFPA 70-2024

Statement: This first revision adds the wiring method Type P for use in Zone 22 locations. This wiring method is currently

permitted in Division 2 locations.



Public Input No. 4344-NFPA 70-2023 [Section No. 506.15(C)]

(C) Zone 22.

In Zone 22 locations, the following wiring methods shall be permitted:

- (1) All wiring methods permitted in 506.15(B).
- (2) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings.
- (3) Electrical metallic tubing (EMT) or dusttight wireways.
- (4) Type MC or Type MI cable with listed termination fittings.
- (5) Type PLTC cable or Type PLTC-ER cable used in ~~Class 2- or Class 3 circuits~~, Class 3, or Class 4 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (6) Type ITC cable or Type ITC-ER cable as permitted in 335.4 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (7) Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings.
- (8) Intrinsic safety type of protection "ic" using any of the wiring methods permitted for unclassified locations. Intrinsic safety type of protection "ic" systems shall be installed in accordance with the control drawing(s). Simple apparatus, not shown on the control drawing, shall be permitted in a circuit of intrinsic safety type of protection "ic", provided that the simple apparatus does not interconnect the intrinsic safety type of protection "ic" circuit to any other circuit. Separation of circuits of intrinsic safety type of protection "ic" shall be in accordance with one of the following:
 - (9) Be in separate cables
 - (10) Be in multiconductor cables where the conductors of each circuit are within a grounded metal shield
 - (11) Be in multiconductor cables where the conductors have insulation with a minimum thickness of 0.25 mm (0.01 in.)

Informational Note: See Article 100 for the definition of *simple apparatus*.

- (12) Boxes and fittings shall be dusttight.
- (13) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any raceway in accordance with 506.15(C). Optical fiber cables shall be sealed in accordance with 506.16.
- (14) Cablebus.

Statement of Problem and Substantiation for Public Input

Adding Class 4 to the list. Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.

Submitter Information Verification

Submitter Full Name: Chad Jones
Organization: Cisco Systems
Street Address:
City:
State:
Zip:
Submission Date: Thu Sep 07 12:13:20 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The PI does not provide substantiation to prove that Class 4 systems are appropriate for use in Zone 22 locations. Additionally, PLTC cable is rated at 300 volts while Class 4 systems are rated for up to 450 volts making the

addition of Class 4 systems to PLTC cable incorrect.



Public Input No. 4429-NFPA 70-2023 [Section No. 506.15(C)]

(C) Zone 22.

In Zone 22 locations, the following wiring methods shall be permitted:

- (1) All wiring methods permitted in 506.15(B).
- (2) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings.
- (3) Electrical metallic tubing (EMT) or dusttight wireways.
- (4) Type MC or Type MI cable with listed termination fittings.
- (5) Type PLTC cable or Type PLTC-ER cable used in Class 2 or Class 3 circuits, including installation in cable tray systems. The cable shall be terminated with listed fittings. Type PLTC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present.
- (6) Type ITC cable or Type ITC-ER cable as permitted in 335.4 ~~and 10~~ and 10 terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor in addition to a drain wire.
- (7) Type MV, Type TC, or Type TC-ER cable, including installation in cable tray systems. Type TC-ER cable shall include an equipment grounding conductor in addition to a drain wire that might be present. The cable shall be terminated with listed fittings.
- (8) Intrinsic safety type of protection "ic" using any of the wiring methods permitted for unclassified locations. Intrinsic safety type of protection "ic" systems shall be installed in accordance with the control drawing(s). Simple apparatus, not shown on the control drawing, shall be permitted in a circuit of intrinsic safety type of protection "ic", provided that the simple apparatus does not interconnect the intrinsic safety type of protection "ic" circuit to any other circuit. Separation of circuits of intrinsic safety type of protection "ic" shall be in accordance with one of the following:
 - (9) Be in separate cables
 - (10) Be in multiconductor cables where the conductors of each circuit are within a grounded metal shield
 - (11) Be in multiconductor cables where the conductors have insulation with a minimum thickness of 0.25 mm (0.01 in.)

Informational Note: See Article 100 for the definition of *simple apparatus*.

- (12) Boxes and fittings shall be dusttight.
- (13) Optical fiber cable Type OFNP, Type OFCP, Type OFNR, Type OFCR, Type OFNG, Type OFCG, Type OFN, or Type OFC installed in cable trays or any raceway in accordance with 506.15(C). Optical fiber cables shall be sealed in accordance with 506.16.
- (14) Cablebus.

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
Street Address:
City:
State:
Zip:
Submission Date: Thu Sep 07 15:13:24 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.

**Public Input No. 1972-NFPA 70-2023 [Section No. 506.20(B)]**

(B) Zone 21.

In Zone 21 locations, only equipment listed and marked as suitable for the location shall be permitted.

Exception No. 1: ~~Apparatus~~ Equipment listed for use in Class II, Division 1 or Zone 20 locations with a suitable temperature class shall be permitted.

Exception No. 2: Pressurized equipment identified for Class II, Division 1 shall be permitted.

Exception No. 3: For locations involving Group IIIA materials, equipment listed for use in Class III, Division 1 locations with a suitable temperature in accordance with 500.8(D)(3) shall be permitted.

Statement of Problem and Substantiation for Public Input

The correct term is equipment. There should also be a permission for Zone 20 equipment, similar to the permission in 505.20(B)

Submitter Information Verification

Submitter Full Name: William Lawrence

Organization:

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 09 05:23:21 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8613-NFPA 70-2024](#)

Statement: The correct term is equipment, not apparatus. In addition, equipment listed for use in Zone 20 locations is permitted for use in Zone 21 locations. The Zone area classification is hierarchal, and equipment rated for use in Zone 20 is sufficiently rated to operate in Zone 21 or Zone 22 hazardous (classified) locations. A similar structure exists in 505.20 for Zones 0, 1, and 2. There should also be a permission for Zone 20 equipment, similar to the permission in 505.20(B).



Public Input No. 1973-NFPA 70-2023 [Section No. 506.20(C)]

(C) Zone 22.

In Zone 22 locations, only equipment listed and marked as suitable for the location shall be permitted.

~~Exception No. 1: Apparatus~~ Equipment listed for use in Zone 20 or Zone 21 with a suitable temperature class shall be permitted.

Exception No. 2: Equipment identified for use in Class II, Division 1 or Class II, Division 2 locations with a suitable temperature class shall be permitted.

~~Exception No. 3~~: Pressurized equipment identified for Class II, Division 1 or Division 2 shall be permitted.

~~Exception No. 4~~: For Group IIIA materials, equipment listed for use in Class III, Division 1 or Class III, Division 2 locations with a suitable temperature in accordance with 500.8(D)(3) shall be permitted.

Statement of Problem and Substantiation for Public Input

Equipment is the correct term. The permission for Zone 20 and Zone 21 equipment in a Zone 22 location was missing.

Submitter Information Verification

Submitter Full Name: William Lawrence

Organization:

Street Address:

City:

State:

Zip:

Submission Date: Wed Aug 09 05:29:08 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8614-NFPA 70-2024](#)

Statement: The correct term is equipment, not apparatus. In addition, equipment listed for use in Zone 20 or Zone 21 locations is permitted for use in Zone 22 locations. The Zone area classification is hierarchal, and equipment rated for use in Zone 20 is sufficiently rated to operate in Zone 21 or Zone 22 hazardous (classified) locations. A similar structure exists in 505.20 for Zones 0, 1, and 2. The permission for Zone 20 and Zone 21 equipment in a Zone 22 location was missing.

**Public Input No. 1638-NFPA 70-2023 [Section No. 506.20(E)]**

~~(E) Manufacturer's Instructions:~~

~~Electrical equipment installed in hazardous (classified) locations shall be installed in accordance with the manufacturer's instructions, if provided.~~

Statement of Problem and Substantiation for Public Input

This language is redundant to 110.3(B) as Chapter 5 is subject to the rules in Chapter 1, therefore this Section is not needed.

Submitter Information Verification

Submitter Full Name: Kyle Krueger

Organization: NECA

Affiliation: NECA

Street Address:

City:

State:

Zip:

Submittal Date: Thu Jul 27 15:30:50 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: Reference to the manufacturer's instruction is needed in this section. The language used is not redundant since it differs from the text in 110.3(B).



Public Input No. 1665-NFPA 70-2023 [Section No. 506.30]

506.30 Grounding and Bonding.

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with 506.30(A) and (B).

(A) Grounding.

Wiring systems and equipment shall be grounded in accordance with Part I and Part VI of Article 250, as applicable.

(B) Bonding.

Bonding shall comply with Part I and Part V of Article 250, as applicable, and 506.30(B)(1) and (B)(2).

(1) Specific Bonding Means.

Bonding shall comply with 506.30(B)(1)(a) and (B)(1)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

(2) Liquidtight Flexible Metal Conduit.

Liquidtight flexible metal conduit shall comply with 506.30(B)(2)(a) and (B)(2)(b).

(a) Liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

(b) In Zone 22 locations, the bonding jumper shall not be required where all of the following conditions are met:

- (1) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.
- (2) Overcurrent protection in the circuit is limited to 10 amperes or less.
- (3) The load is part of a meter, instrument, or relay circuit.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
506.30_Revision.docx	Revise Section 506.30.	

Statement of Problem and Substantiation for Public Input

This section limits the grounding requirements to Article 250 to Part I and Part VI and limits bonding to Article 250 Part I and Part V plus the special bonding requirements. The requirement for each one is saying that these parts are the only ones that apply to hazardous(classified) locations. While 90.3 does state that Chapters 1 through 4 apply generally to all installations it also says that Chapters 5 through 7 supplement or modify Chapters 1 through 4. It can be argued that the current "dot 30" sections in Articles 501, 502, 503, 505, and 506 limit (modify) the grounding and bonding in hazardous locations to Parts I, IV, and V. Regardless of the answer the section is not clear and needs to be revised. In reality there are bonding and grounding requirements in each of the ten parts of Article 250 that might apply to an installation in a hazardous (classified) location at one time or another. With the restriction in the 2023 NEC Style Manual that prohibits using references to complete articles the current language of 506.30 cannot be easily fixed. Removing grounding from the section eliminates that part of the problem and in truth the section does not modify or supplement grounding, so it doesn't belong. As for bonding, the revised language should correct the problem. Removing the reference to two parts of Article 250 removes any idea that the other parts are not valid and making the reference to the general bonding requirements of Chapter 2 of this Code leads to Article 250 indirectly without violating the Style Manual.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1664-NFPA 70-2023 [Section No. 505.30]	Parallel Construction.

[Public Input No. 1882-NFPA 70-2023 \[Section No. 503.30\]](#)
[Public Input No. 1881-NFPA 70-2023 \[Section No. 502.30\]](#)
[Public Input No. 1880-NFPA 70-2023 \[Section No. 501.30\]](#)
[Public Input No. 1879-NFPA 70-2023 \[New Section after 500.8\(G\)\]](#)
[Public Input No. 1664-NFPA 70-2023 \[Section No. 505.30\]](#)
[Public Input No. 1879-NFPA 70-2023 \[New Section after 500.8\(G\)\]](#)
[Public Input No. 1880-NFPA 70-2023 \[Section No. 501.30\]](#)
[Public Input No. 1881-NFPA 70-2023 \[Section No. 502.30\]](#)
[Public Input No. 1882-NFPA 70-2023 \[Section No. 503.30\]](#)

Parallel Construction.
 Parallel Construction.
 Parallel Construction.
 New Parallel Construction.

Submitter Information Verification

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Submittal Date: Thu Jul 27 20:29:26 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8616-NFPA 70-2024](#)
Statement: The language of 506.30 is revised to correlate the language with 505.30.

506.30 ~~Grounding and Bonding in Hazardous (Classified) Locations.~~

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with ~~503.30(A) and (B)~~ the specific bonding requirements in 506.30(A) and (B) in addition to the general bonding requirements in Chapter 2 of this Code.

~~(A) Grounding.~~

~~Wiring systems and equipment shall be grounded in accordance with Part I and Part VI of Article 250, as applicable.~~

~~(B) Bonding.~~

~~Bonding shall comply with Part I and Part V of Article 250, as applicable, and 506.30(B)(1) and (B)(2).~~

~~(1A) Specific Bonding Means.~~

~~Bonding shall comply with 506.30(B)(1)(a) and (B)(1)(b).~~

~~(a1)~~ The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between Class I locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

~~(b2)~~ Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

~~(2B) Specific Bonding for Flexible Metal Conduit and Liquidtight Flexible Metal Conduit.~~

~~Flexible metal conduit and liquidtight flexible metal conduit shall comply with 506.30(B)(1a) and (B)(2)(b).~~

~~(a1)~~ Flexible metal conduit and liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

~~(b2)~~ In Class I, Division 2 locations, the bonding jumper shall not be required where all of the following conditions are met:

~~(1a)~~ Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.

~~(2b)~~ Overcurrent protection in the circuit is limited to 10 amperes or less.

(3c) The load is part of a meter, instrument, or relay circuit.



Public Input No. 2735-NFPA 70-2023 [Section No. 506.30]

506.30 Grounding and Bonding.

Regardless of the voltage of the electrical system, wiring systems and equipment shall comply with 506.30(A) and (B).

(A) Grounding.

Wiring systems and equipment shall be grounded in accordance with Article 250, Part I and Part VI ~~of Article 250~~, as applicable.

(B) Bonding.

Bonding shall comply with Article 250, Part I and Part V ~~of Article 250~~, as applicable, and 506.30(B)(1) and (B)(2).

(1) Specific Bonding Means.

Bonding shall comply with 506.30(B)(1)(a) and (B)(1)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4(5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

(2) Liquidtight Flexible Metal Conduit.

Liquidtight flexible metal conduit shall comply with 506.30(B)(2)(a) and (B)(2)(b).

(a) Liquidtight flexible metal conduit shall include an equipment bonding jumper of the wire type in accordance with 250.102.

(b) In Zone 22 locations, the bonding jumper shall not be required where all of the following conditions are met:

- (3) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.
- (4) Overcurrent protection in the circuit is limited to 10 amperes or less.
- (5) The load is part of a meter, instrument, or relay circuit.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8616-NFPA 70-2024](#)

Statement: The language of 506.30 is revised to correlate the language with 505.30.



Public Input No. 4432-NFPA 70-2023 [Section No. 506.30(B)(1)]

(1) Specific Bonding Means.

Bonding shall comply with 506.30(B)(1)(a) and (B)(1)(b).

(a) The locknut-bushing and double-locknut types of contacts shall not be depended on for bonding purposes, but bonding jumpers with identified fittings or other approved means of bonding shall be used. These bonding means shall apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between hazardous (classified) locations and the point of grounding for service equipment or point of grounding for a separately derived system. Metal struts, angles, or channels provided for support and mechanical or physical protection as permitted in 335.4 ~~10~~ (5), 336.10(7)(c), or 722.135(C) shall be bonded in accordance with 250.102.

(b) Where the branch-circuit overcurrent protection is located on the load side of the disconnecting means, the specific bonding means shall be permitted to end at the nearest point where the grounded circuit conductor and the grounding electrode conductor are connected together on the line side of the building or structure disconnecting means as specified in 250.32(B).

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

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Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.



Public Input No. 2322-NFPA 70-2023 [Article 511]

~~Article 511 Commercial Garages, Repair~~ Article 511 Repair and Storage Garages

511.1 Scope.

These occupancies shall include locations used for service and repair operations in connection with self-propelled vehicles (including, but not limited to, passenger automobiles, buses, trucks, and tractors) in which volatile flammable liquids or flammable gases are used for fuel or power.

Informational Note: See NFPA 30A-2021, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, for extracted text that is followed by a reference in brackets. Only editorial changes were made to the extracted text to make it consistent with this *Code*.

511.2 Other Articles.

In addition to the requirements of this article, these occupancies shall comply with Table 511.2, as applicable, except as modified by this article.

Table 511.2 Other Articles

<u>Requirement</u>	<u>Division Classified Locations</u>	<u>Zone Classified Locations</u>
Area classification	500.5, 500.6	505.5, 505.6, 505.7
Equipment	Part III of 501, 500.7, 500.8, 501.5	505.8, 505.9, 505.20, 505.22
Wiring	Part II of 501	505.15, 505.16, 505.17, 505.18, 505.19, 505.26, 505.30

511.3 Area Classification, General.

Where Class I liquids or gaseous fuels are stored, handled, or transferred, electrical wiring and electrical utilization equipment shall be designed in accordance with the requirements for Class I, Division 1 or 2 hazardous (classified) locations as classified in accordance with 500.5 and 500.6, and this article. A Class I location shall not extend beyond an unpierced wall, roof, or other solid partition that has no openings. [30A:8.3.1, 8.3.3]

Where the term "Class I" is used with respect to Zone classifications within this article of the *Code*, it shall apply to Zone 0, Zone 1, and Zone 2 designations.

Informational Note: The term "Class I" was originally included as a prefix to Zone 0, Zone 1, and Zone 2 locations and references as an identifier for flammable gases, vapors, or liquids to differentiate from Class II and Class III locations. Zone 0, Zone 1, and Zone 2 only apply to flammable gases, vapors, or liquids so the "Class I" prefix is redundant and has been deleted, except for text that is extracted from other documents or to remain consistent throughout this article.

(A) Parking Garages.

Parking garages used for parking or storage shall be permitted to be unclassified.

Informational Note: See NFPA 88A, *Standard for Parking Structures*, and NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, for additional information.

(B) Repair Garages, with Dispensing.

Major and minor repair garages that dispense motor fuels into the fuel tanks of vehicles, including flammable liquids having a flash point below 38°C (100°F) such as gasoline, or gaseous fuels such as natural gas, hydrogen, or LPG, shall have the dispensing functions and components classified in accordance with Table 514.3(B)(1) in addition to any classification required by this section. Where Class I liquids, other than fuels, are dispensed, the area within 900 mm (3 ft) of any fill or dispensing point, extending in all directions, shall be a Class I, Division 2 location.

(C) Repair Garages, Major and Minor.

Where vehicles using Class I liquids or heavier-than-air gaseous fuels (such as LPG) are repaired, hazardous area classification shall be in accordance with Table 511.3(C).

Informational Note: See NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, Table 8.3.2, for additional information.

Table 511.3(C) Extent of Classified Locations for Major and Minor Repair Garages with Heavier-Than-Air Fuel

<u>Location</u>	<u>Class I</u>		<u>Extent of Classified Location</u>
	<u>Division</u> (Group D)	<u>Zone</u> (Group IIA)	
Repair garage, major	1	1	Entire space within any pit, belowgrade work area, or subfloor work area that is not ventilated
(where Class I liquids or gaseous fuels are transferred or dispensed*)	2	2	Entire space within any pit, belowgrade work area, or subfloor work area that is provided with ventilation of at least 0.3 m ³ /min/m ² (1 ft ³ /min/ft ²) of floor area, with suction taken from a point within 300 mm (12 in.) of floor level
-	-	2	2 Up to 450 mm (18 in.) above floor level of the room, except as noted below, for entire floor area
-	-	Unclassified	Unclassified Up to 450 mm (18 in.) above floor level of the room where room is provided with ventilation of at least 0.3 m ³ /min/m ² (1 ft ³ /min/ft ²) of floor area, with suction taken from a point within 300 mm (12 in.) of floor level
-	-	2	2 Within 0.9 m (3 ft) of any fill or dispensing point, extending in all directions
Specific areas adjacent to classified locations	Unclassified	Unclassified	Areas adjacent to classified locations where flammable vapors are not likely to be released, such as stock rooms, switchboard rooms, and other similar locations, where mechanically ventilated at a rate of four or more air changes per hour or designed with positive air pressure or where effectively separated by walls or partitions
Repair garage, minor	2	2	Entire space within any pit, belowgrade work area, or subfloor work area that is not ventilated
(where Class I liquids or gaseous fuels are not transferred or dispensed*)	2	2	Up to 450 mm (18 in.) above floor level, extending 0.9 m (3 ft) horizontally in all directions from opening to any pit, belowgrade work area, or subfloor work area that is not ventilated
-	-	Unclassified	Unclassified Entire space within any pit, belowgrade work area, or subfloor work area that is provided with ventilation of at least 0.3 m ³ /min/m ² (1 ft ³ /min/ft ²) of floor area, with suction taken from a point within 300 mm (12 in.) of floor level

<u>Location</u>	<u>Class I</u>		<u>Extent of Classified Location</u>
	<u>Division</u> (Group D)	<u>Zone</u> (Group IIA)	
Specific areas adjacent to classified locations	Unclassified	Unclassified	Areas adjacent to classified locations where flammable vapors are not likely to be released, such as stock rooms, switchboard rooms, and other similar locations, where mechanically ventilated at a rate of four or more air changes per hour or designed with positive air pressure or where effectively separated by walls or partitions

*Includes draining of Class I liquids from vehicles.

(D) Repair Garages, Major.

Where vehicles using lighter-than-air gaseous fuels (such as hydrogen and natural gas) are repaired or stored, hazardous area classification shall be in accordance with Table 511.3(D).

Informational Note: See NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, Table 8.3.2, for additional information.

Table 511.3(D) Extent of Classified Locations for Major Repair Garages with Lighter-than-Air Fuel

<u>Location</u>	<u>Class I</u>		<u>Extent of Classified Location</u>
	<u>Division²</u>	<u>Zone³</u>	
Repair garage, major	2	2	Within 450 mm (18 in.) of ceiling, except as noted below
(where lighter-than-air gaseous fueled ¹ vehicles are repaired or stored)	Unclassified	Unclassified	Within 450 mm (18 in.) of ceiling where ventilation of at least 0.3 m ³ /min/m ² (1 ft ³ /min/ft ²) of floor area is provided, with suction taken from a point within 450 mm (18 in.) of the highest point in the ceiling
Specific areas adjacent to classified locations	Unclassified	Unclassified	Areas adjacent to classified locations where flammable vapors are not likely to be released, such as stock rooms, switchboard rooms, and other similar locations, where mechanically ventilated at a rate of four or more air changes per hour, designed with positive air pressure, or effectively separated by walls or partitions

¹Includes fuels such as hydrogen and natural gas, but not LPG.

²For hydrogen (lighter than air) Group B, or natural gas Group D.

³For hydrogen (lighter than air) Group IIC or IIB+H2, or natural gas Group IIA.

(E) Modifications to Classification.

(1) Specific Areas Adjacent to Classified Locations.

Areas adjacent to classified locations in which flammable vapors are not likely to be released, such as stock rooms, switchboard rooms, and other similar locations, shall be unclassified where mechanically ventilated at a rate of four or more air changes per hour, designed with positive air pressure, or separated by an unpierced wall, roof, or other solid partition.

(2) Alcohol-Based Windshield Washer Fluid.

The area used for storage, handling, or dispensing into motor vehicles of alcohol-based windshield washer fluid in repair garages shall be unclassified unless otherwise classified by a provision of 511.3. [30A:8.3.1, Exception]

511.4 Wiring and Equipment in Class I Locations.

(A) Wiring Located in Class I Locations.

Wiring located within Class I locations as classified in 511.3 shall conform with the requirements of Part II of Article 501 or 504.20, as applicable.

(B) Equipment Located in Class I Locations.

Within Class I locations as defined in 511.3, equipment shall conform with the requirements of Part III of Article 501 or 504.10, as applicable.

(1) Fuel-Dispensing Units.

Where fuel-dispensing units (other than liquid petroleum gas, which is prohibited) are located within buildings, 514.1 shall apply.

Where mechanical ventilation is provided in the dispensing area, the control shall be interlocked so that the dispenser cannot operate without ventilation, in accordance with 500.5(B)(2).

(2) Portable Lighting Equipment.

Portable lighting equipment shall be equipped with a handle, lampholder, hook, and substantial guard attached to the lampholder or handle. All exterior surfaces that might come in contact with battery terminals, wiring terminals, or other objects shall be of nonconducting material or shall be effectively protected with insulation. Lampholders shall be of an unswitched type and shall not provide means for plug-in of attachment plugs. The outer shell shall be of molded composition or other suitable material. Unless the lamp and its cord are supported or arranged in such a manner that they cannot be used in the locations classified in 511.3, they shall be of a type identified for Class I, Division 1 locations.

511.7 Wiring and Equipment Installed Above Hazardous (Classified) Locations.**(A) Wiring in Spaces Above Hazardous (Classified) Locations.****(1) Fixed Wiring Above Hazardous (Classified) Locations.**

Fixed wiring above hazardous (classified) locations shall be permitted to be one or more of the following:

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, or electrical metallic conduit (EMT) with listed fittings.
- (2) Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or electrical nonmetallic tubing (ENT).
- (3) Flexible metal conduit (FMC), liquidtight flexible metal conduit (LFMC), or liquidtight flexible nonmetallic conduit (LFNC), with listed fittings.
- (4) Type MC cable, Type AC cable, Type TC cable, or Type TC-ER cable, including installation in cable trays. Type TC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire. All cable types shall have listed fittings.
- (5) Type MI cable terminated with listed fittings and supported in a manner to avoid tensile stress.
- (6) Manufactured wiring systems.
- (7) Type PLTC cable or Type PLTC-ER cable in Class I, Class 2, or Class 3 circuits. Type PLTC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (8) Type ITC cable or Type ITC-ER cable in accordance with 335.4 and 335.5, terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (9) Cellular metal floor raceways or cellular concrete floor raceways only for supplying ceiling outlets or extensions to the area below the floor. Such raceways shall have no connections leading into or through any Class I location above the floor.

(2) Pendant.

For pendants, flexible cord suitable for the type of service and listed for hard usage shall be used.

(B) Electrical Equipment Installed Above Hazardous (Classified) Locations.**(1) Fixed Electrical Equipment.**

Electrical equipment in a fixed position shall be located above the level of any defined hazardous (classified) location or shall be identified for the location.

- (1) *Arcing Equipment.* Equipment that is less than 3.7 m (12 ft) above the floor level and that might produce arcs, sparks, or particles of hot metal, such as cutouts, switches, charging panels, generators, motors, or other equipment (excluding receptacles, lamps, and lampholders) having make-and-break or sliding contacts, shall be of the totally enclosed type or constructed to prevent the escape of sparks or hot metal particles.
- (2) *Fixed Lighting.* Lamps and lampholders for fixed lighting that is located over lanes through which vehicles are commonly driven or that might otherwise be exposed to physical damage shall be located not less than 3.7 m (12 ft) above floor level, unless of the totally enclosed type or constructed to prevent escape of sparks or hot metal particles.

511.8 Underground Wiring Below Hazardous (Classified) Locations.

Underground wiring shall be installed in accordance with one of the following wiring methods:

- (1) Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC) with listed threaded fittings.
- (2) Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or high-density polyethylene conduit (HDPE) where buried under not less than 600 mm (2 ft) of cover. Where PVC conduit, RTRC conduit, or HDPE conduit is used, threaded rigid metal conduit or threaded intermediate metal conduit shall be used for the last 600 mm (2 ft) of the underground run to emergence or to the point of connection to the aboveground raceway, and an equipment grounding conductor shall be included to provide electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.

511.9 Sealing.

Seals complying with the requirements of 501.15 and 501.15(B)(2) shall be provided and shall apply to horizontal as well as vertical boundaries of the defined Class I locations.

511.10 Special Equipment.**(A)** Battery Charging Equipment.

Battery chargers and their control equipment, and batteries being charged, shall not be located within locations classified in 511.3 .

(B) Electric Vehicle Charging Equipment.**(1)** General.

All electrical equipment and wiring shall be installed in accordance with Part III of Article 625, except as required by 511.10(B)(2) and (B)(3). Flexible cords shall be of a type identified for extra-hard usage.

(2) Connector Location.

No connector shall be located within a Class I location as defined in 511.3 .

(3) Plug Connections to Vehicles.

Where the cord is suspended from overhead, it shall be arranged so that the lowest point of sag is at least 150 mm (6 in.) above the floor. Where an automatic arrangement is provided to pull both cord and plug beyond the range of physical damage, no additional connector shall be required in the cable or at the outlet.

511.12 Ground-Fault Circuit-Interrupter Protection for Personnel.

Ground-fault circuit-interrupter protection for personnel shall be provided as required in 210.8(B) .

511.16 Grounding and Bonding Requirements.**(A)** General Grounding Requirements.

All metal raceways, the metal armor or metallic sheath on cables, and all non-current-carrying metal parts of fixed or portable electrical equipment, regardless of voltage, shall be grounded.

(B) Supplying Circuits with Grounded and Grounding Conductors in Class I Locations.

Grounding in Class I locations shall comply with 501.30 .

(1) Circuits Supplying Portable Equipment or Pendants.

Where a circuit supplies portables or pendants and includes a grounded conductor in accordance with 200.3 , receptacles, attachment plugs, connectors, and similar devices shall be of the grounding type and the grounded conductor of the flexible cord shall be connected to the screw shell of any lampholder or to the grounded terminal of any utilization equipment supplied.

(2) Approved Means.

Approved means shall be provided for maintaining continuity of the equipment grounding conductor between the fixed wiring system and the non-current-carrying metal portions of pendant luminaires, portable luminaires, and portable utilization equipment.

Statement of Problem and Substantiation for Public Input

511 (revise the chapter name to "Repair and Storage Garages) – expand/clarify that Chapter 511 includes non-commercial repair and storage garages. Include garages that are not commercial yet repair and/or store self-propelled vehicles such as buses, police, fire, private industry motorpool fleets, etc. in which vehicles are repaired and/or stored often with inhouse staff.

The use of the word "commercial" implies a direct customer to service provider exchange. The title of the article should be revised to include non-commercial applications which are similar in scope as outlined in 511.1

Consider adding an exception which excludes dwelling unit garages and storage areas.

Submitter Information Verification

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Submittal Date: Wed Aug 16 12:23:39 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: The locations covered by this article are commercial garages, which include either repair or storage operations. Changing the title by removing the word "commercial" could be interpreted as applying to non-commercial garages that are used for storage only, that is not the intent.


Public Input No. 1873-NFPA 70-2023 [Section No. 511.3(D)]
(D) Repair Garages, Major.

Where vehicles using lighter-than-air gaseous fuels (such as hydrogen and natural gas) are repaired or stored, hazardous area classification shall be in accordance with Table 511.3(D).

Informational Note: See NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, Table 8.3.2, for additional information.

Table 511.3(D) Extent of Classified Locations for Major Repair Garages with Lighter-than-Air Fuel

<u>Location</u>	<u>Class I</u>		<u>Extent of Classified Location</u>
	<u>Division²</u>	<u>Zone³</u>	
Repair garage, major	2	2	Within 450 mm (18 in.) of ceiling, except as noted below
(where lighter-than-air gaseous fueled ¹ vehicles are repaired or stored)	Unclassified	Unclassified	Within 450 mm (18 in.) of ceiling where ventilation of at least 0.3 m ³ /min/m ² (1 ft ³ /min/ft ²) of floor area is provided, with suction taken from a point within 450 mm (18 in.) of the highest point in the ceiling
Specific areas adjacent to classified locations	Unclassified	Unclassified	Areas adjacent to classified locations where flammable vapors are not likely to be released, such as stock rooms, switchboard rooms, and other similar locations, where mechanically ventilated at a rate of four or more air changes per hour, designed with positive air pressure, or effectively separated by walls or partitions <u>separated by an unpierced wall, roof, or other solid partition.</u>

¹Includes fuels such as hydrogen and natural gas, but not LPG.

²For hydrogen (lighter than air) Group B, or natural gas Group D.

³For hydrogen (lighter than air) Group IIC or IIB+H2, or natural gas Group IIA.

Statement of Problem and Substantiation for Public Input

This provides clarity by changing walls to unpierced walls. A wall with penetrations or openings will not provide the required separation. It also is consistent with the language in 511.3(E)(1)

Submitter Information Verification

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Submittal Date: Sun Aug 06 18:13:02 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8631-NFPA 70-2024](#)

Statement: The text of Table 511.3(D) has been revised to align with that used in 511.3 and 511.3(E)(1).



Public Input No. 2736-NFPA 70-2023 [Section No. 511.4]

511.4 Wiring and Equipment in Class I Locations.

(A) Wiring Located in Class I Locations.

Wiring located within Class I locations as classified in 511.3 shall conform with the requirements of

Part II of

Article 501

or

, Part II or 504.20, as applicable.

(B) Equipment Located in Class I Locations.

Within Class I locations as defined in 511.3, equipment shall conform with the requirements of

Part III of

Article 501

or

, Part III or 504.10, as applicable.

(1) Fuel-Dispensing Units.

Where fuel-dispensing units (other than liquid petroleum gas, which is prohibited) are located within buildings, 514.1 shall apply.

Where mechanical ventilation is provided in the dispensing area, the control shall be interlocked so that the dispenser cannot operate without ventilation, in accordance with 500.5(B)(2).

(2) Portable Lighting Equipment.

Portable lighting equipment shall be equipped with a handle, lampholder, hook, and substantial guard attached to the lampholder or handle. All exterior surfaces that might come in contact with battery terminals, wiring terminals, or other objects shall be of nonconducting material or shall be effectively protected with insulation. Lampholders shall be of an unswitched type and shall not provide means for plug-in of attachment plugs. The outer shell shall be of molded composition or other suitable material. Unless the lamp and its cord are supported or arranged in such a manner that they cannot be used in the locations classified in 511.3, they shall be of a type identified for Class I, Division 1 locations.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 24 19:38:20 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8505-NFPA 70-2024](#)

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.



Public Input No. 2297-NFPA 70-2023 [Section No. 511.4(B)(2)]

(2) Portable ~~Lighting Equipment Handlamps~~ .

Portable ~~lighting equipment shall~~ handlamps shall be equipped with a ~~handle, lampholder, hook, and substantial guard attached to the lampholder or handle~~ substantial guard that prevents a hot lamp from contacting external surfaces . All exterior surfaces that might come in contact with battery terminals, wiring terminals, or other objects shall be of nonconducting material or shall be effectively protected with insulation. Lampholders shall be of an unswitched type and shall not provide means for plug-in of attachment plugs. The outer shell shall be of molded composition or other suitable material. Unless the ~~lamp~~ portable handlamp and its cord are supported or arranged in such a manner that they cannot be used in the locations classified in 511.3, they shall be of a type identified for Class I, Division 1 locations.

Statement of Problem and Substantiation for Public Input

The term "portable lighting equipment" used in 511.4(B)(2) describes a portable handlamp; these products are listed under UL 153, Standard for Portable Luminaires. A related PI is being submitted with a definition for "portable handlamp" that identifies it as including a handle and a hook; many do not use a conventional 'lampholder' and instead employ a fixed-in-place LED array. With the shift to LED technology, which produces far less heat and often uses impact-resistant polymer lamps, many portable handlamps can now be listed without a guard while maintaining similar (or better) safety performance than legacy incandescent (glass) bulb designs that always required a guard. The phrasing added to describe the role of a guard, in the context of an Article 511 application, provides guidance to the AHJ as to whether a particular portable handlamp must include a guard.

See related PI 2294 for Portable Handlamp (new, Article 100).

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 2294-NFPA 70-2023 [New Definition after Definition: Portable (as applied to eq...)]	
Public Input No. 2294-NFPA 70-2023 [New Definition after Definition: Portable (as applied to eq...)]	

Submitter Information Verification

Submitter Full Name: Michael Shulman
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 15 17:36:00 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The nexus to hazardous locations is not clear. The proposed changes are predicated on the acceptance of PI 2294.



Public Input No. 1938-NFPA 70-2023 [Section No. 511.7(A)(1)]

(1) Fixed Wiring Above Hazardous (Classified) Locations.

Fixed wiring above hazardous (classified) locations shall be permitted to be one or more of the following:

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, or electrical metallic conduit (EMT) with listed fittings.
- (2) Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or electrical nonmetallic tubing (ENT).
- (3) Flexible metal conduit (FMC), liquidtight flexible metal conduit (LFMC), or liquidtight flexible nonmetallic conduit (LFNC), with listed fittings.
- (4) Type MC cable, Type AC cable, Type TC cable, or Type TC-ER cable, including installation in cable trays. Type TC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire. All cable types shall have listed fittings.
- (5) Type MI cable terminated with listed fittings and supported in a manner to avoid tensile stress.
- (6) Manufactured wiring systems.
- (7) Type PLTC cable or Type PLTC-ER cable ~~in Class 1, Class 2, or in Class 2 or Class 3~~ circuits. Type PLTC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (8) Type ITC cable or Type ITC-ER cable in accordance with 335.4 and 335.5, terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (9) Cellular metal floor raceways or cellular concrete floor raceways only for supplying ceiling outlets or extensions to the area below the floor. Such raceways shall have no connections leading into or through any Class I location above the floor.

Statement of Problem and Substantiation for Public Input

Types PLTC and PLTC-ER cable are not approved for Class 1 wiring. Class 1 was removed throughout the hazardous (classified) location articles in 2023 and this one must have been missed.

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 07 17:14:00 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8632-NFPA 70-2024](#)

Statement: The reference to "Class I" has been deleted as it was incorrectly added in the 2023 edition of the NEC.



Public Input No. 4149-NFPA 70-2023 [Section No. 511.7(A)(1)]

(1) Fixed Wiring Above Hazardous (Classified) Locations.

Fixed wiring above hazardous (classified) locations shall be permitted to be one or more of the following:

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, or electrical metallic conduit (EMT) with listed fittings.
- (2) Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or electrical nonmetallic tubing (ENT).
- (3) Flexible metal conduit (FMC), liquidtight flexible metal conduit (LFMC), or liquidtight flexible nonmetallic conduit (LFNC), with listed fittings.
- (4) Type MC cable, Type AC cable, Type TC cable, or Type TC-ER cable, including installation in cable trays. Type TC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire. All cable types shall have listed fittings.
- (5) Type MI cable terminated with listed fittings and supported in a manner to avoid tensile stress.
- (6) Manufactured wiring systems.
- (7) Type PLTC cable or Type PLTC-ER cable in ~~Class 1~~ Class 1, Class 2, Class 3, or ~~Class 3~~ Class 4 circuits. Type PLTC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (8) Type ITC cable or Type ITC-ER cable in accordance with 335.4 and 335.5, terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (9) Cellular metal floor raceways or cellular concrete floor raceways only for supplying ceiling outlets or extensions to the area below the floor. Such raceways shall have no connections leading into or through any Class I location above the floor.

Statement of Problem and Substantiation for Public Input

First, the text incorrectly said "Class I" instead of Class 1. Second, adding Class 4 to the list. Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.

Submitter Information Verification

Submitter Full Name: Chad Jones
Organization: Cisco Systems
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 18:50:33 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: Substantiation was not provided that PLTC and PLTC-ER cable are permitted, or suitable, for Class 4 wiring in hazardous locations.



Public Input No. 4436-NFPA 70-2023 [Section No. 511.7(A)(1)]

(1) Fixed Wiring Above Hazardous (Classified) Locations.

Fixed wiring above hazardous (classified) locations shall be permitted to be one or more of the following:

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, or electrical metallic conduit (EMT) with listed fittings.
- (2) Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or electrical nonmetallic tubing (ENT).
- (3) Flexible metal conduit (FMC), liquidtight flexible metal conduit (LFMC), or liquidtight flexible nonmetallic conduit (LFNC), with listed fittings.
- (4) Type MC cable, Type AC cable, Type TC cable, or Type TC-ER cable, including installation in cable trays. Type TC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire. All cable types shall have listed fittings.
- (5) Type MI cable terminated with listed fittings and supported in a manner to avoid tensile stress.
- (6) Manufactured wiring systems.
- (7) Type PLTC cable or Type PLTC-ER cable in Class I, Class 2, or Class 3 circuits. Type PLTC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (8) Type ITC cable or Type ITC-ER cable in accordance with 335.4 ~~and 10~~ and 335.5 ~~12~~, terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (9) Cellular metal floor raceways or cellular concrete floor raceways only for supplying ceiling outlets or extensions to the area below the floor. Such raceways shall have no connections leading into or through any Class I location above the floor.

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 15:19:49 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.

**Public Input No. 2324-NFPA 70-2023 [Section No. 511.7(B)(1)]****(1) Fixed Electrical Equipment.**

Electrical equipment in a fixed position shall be located above the level of any defined hazardous (classified) location or shall be identified for the location.

(a) *Arcing Equipment.* ~~Equipment.~~ The lowest part of equipment that is less than 3.7 m (12 ft) above the floor level and that might produce arcs, sparks, or particles of hot metal, such as cutouts, switches, charging panels, generators, motors, or other equipment (excluding receptacles, lamps, and lampholders) having make-and-break or sliding contacts, shall be of the totally enclosed type or constructed to prevent the escape of sparks or hot metal particles.

(b) *Fixed Lighting.* Lamps and lampholders for fixed lighting that is located over lanes through which vehicles are commonly driven or that might otherwise be exposed to physical damage shall be located not less than 3.7 m (12 ft) above floor level, unless of the totally enclosed type or constructed to prevent escape of sparks or hot metal particles.

Statement of Problem and Substantiation for Public Input

511.7 (B) (1) (a) – clarify that the 12-foot measurement is from the lowest portion of the equipment above the floor and not just 12 feet from the portion of the equipment that may produce arcs, sparks, etc. Clarity and elimination of ambiguity work to strengthen the NEC.

Submitter Information Verification

Submitter Full Name: Gary Hein
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 16 12:28:26 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: As written, the text applies to any part of equipment less than 12 feet above the floor, including “the lowest part”. No substantiation has been provided for the proposed change.

**Public Input No. 2326-NFPA 70-2023 [Section No. 511.7(B)(1)]****(1) Fixed Electrical Equipment.**

Electrical equipment in a fixed position shall be located above the level of any defined hazardous (classified) location or shall be identified for the location.

(a) *Arcing Equipment.* Equipment that is less than 3.7 m (12 ft) above the floor level and that might produce arcs, sparks, or particles of hot metal, such as cutouts, switches, charging panels, generators, motors, or other equipment (excluding receptacles, lamps, and lampholders) having make-and-break or sliding contacts, shall be of the totally enclosed type or constructed to prevent the escape of sparks or hot metal particles.

(b) *Fixed Lighting.- Lamps.* ~~The lowest part of lamps~~ and lampholders for fixed lighting that is located over lanes through which vehicles are commonly driven or that might otherwise be exposed to physical damage shall be located not less than 3.7 m (12 ft) above floor level, unless of the totally enclosed type or constructed to prevent escape of sparks or hot metal particles.

Statement of Problem and Substantiation for Public Input

511.7 (B) (1) (b) – clarify that the 12-foot measurement s from the lowest portion of the lamp and lamp holder and its associated source of illumination (LED, halogen, incandescent bulb etc.). Clarity and elimination of ambiguity work to strengthen the NEC.

Submitter Information Verification

Submitter Full Name: Gary Hein
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 16 12:33:27 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The existing language is correct. The intent is to protect against damage to lamps and lampholders, not to the entire assembly, that could extend below the specified height.



Public Input No. 1883-NFPA 70-2023 [Section No. 511.10(B)]

(B) ~~Electric Vehicle Charging Equipment~~ Power Transfer Systems .

(1) General.

All electrical equipment and wiring shall be installed in accordance with Part III of Article 625, except as required by 511.10(B)(2) and (B)(3). Flexible cords shall be of a type identified for extra-hard usage.

(2) ~~Electric Vehicle~~ Connector Location.

No electric vehicle connector shall be located within a Class I location as defined in 511.3.

(3) ~~Plug~~ Connections to Electric Vehicles.

~~Where the cord is~~ The output cable to the electric vehicle shall be of the extra hard usage type or it shall be suspended from overhead ~~it shall be arranged so that~~ such that the lowest point of sag is at least 150 mm (6 in.) above the floor. ~~Where~~ The means of suspension shall be permitted to be an automatic arrangement ~~is~~ provided to pull ~~both cord and plug~~ the output cable to the electric vehicle upwards beyond the range of physical damage, ~~no additional connector shall be required in the cable or at the outlet~~ . Suspension means shall be permitted for use with extra hard usage cables .

Statement of Problem and Substantiation for Public Input

Paragraph 511.10(B)(2) requires a terminology change. The defined term in Article 100 is “electric vehicle connector” and this is clearer than the previous term “connector.” Paragraph 511.10(B)(3) requires revision in order to correct terminology and to clarify the requirements. First, the term “cord” could be understood to mean power supply cord, but it intended to refer to the “output cable to the electric vehicle” which is a defined term in Article 100. Second, the requirement states that the overhead suspension means can be provided. It does not specify that it is required. If it was an option, then maintaining the 150 mm clearance from the floor would not make sense as an output cable to the electric vehicle without overhead suspension could technically reside on the floor. It is assumed that the intent is to require the overhead suspension when the cable provided is not extra hard usage. This is clarified in the revision.

Submitter Information Verification

Submitter Full Name: Joseph Bablo
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 07 05:51:53 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8636-NFPA 70-2024](#)

Statement: The text has been modified as proposed to use the defined terms from Article 100 and Article 625. Additionally, 511.10(B)(3) has been re-worded for clarity. This PI will be referred to CMP12 for information or comment.

**Public Input No. 2737-NFPA 70-2023 [Section No. 511.10(B)(1)]****(1) General.**

All electrical equipment and wiring shall be installed in accordance with ~~Part III of Article 625~~, Part III, except as required by 511.10(B)(2) and (B)(3). Flexible cords shall be of a type identified for extra-hard usage.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 24 19:39:40 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8636-NFPA 70-2024](#)

Statement: The text has been modified as proposed to use the defined terms from Article 100 and Article 625. Additionally, 511.10(B)(3) has been re-worded for clarity. This PI will be referred to CMP12 for information or comment.



Public Input No. 1884-NFPA 70-2023 [Section No. 511.12]

~~511.12 Ground-Fault-Circuit-Interrupter Protection for Personnel:~~

~~Ground-fault-circuit-interrupter protection for personnel shall be provided as required in 210.8(B) -~~

Statement of Problem and Substantiation for Public Input

In accordance with 4.1.1 of the Style Manual, general requirements contained in Chapters 1 through 4 shall not be repeated in other Articles. Based on this rule, a direct pointer to 210.8(B) is not necessary and not in accordance with the Style Manual. The paragraph can be deleted.

Submitter Information Verification

Submitter Full Name: Joseph Bablo
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 07 06:00:16 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8507-NFPA 70-2024](#)

Statement: The text pointing the user to 210.8(B) is deleted in accordance with 4.1.1 of the Style Manual. The ordinary location requirements for GFCIs are in effect for "other than dwelling units" and are not modified by this section, so the section text is not necessary. The ordinary locations requirements remain unchanged.



Public Input No. 4113-NFPA 70-2023 [Section No. 511.12]

~~511.12- Ground-Fault-Circuit-Interrupter Protection for Personnel:~~

~~Ground-fault-circuit-interrupter protection for personnel shall be provided as required in- 210.8(B) -~~

Statement of Problem and Substantiation for Public Input

Delete section 511.12. The section references a general requirement in Article 210 which does not need to be referenced in Article 511 and Article 512. The 2023 NEC Style Manual provides guidance for references to requirements in Chapters 1 through 4 in section 4.1.1: "General requirements contained in Chapters 1 through 4 shall not be repeated in other articles of the document. Committees shall always be mindful of the structure of the document as specified in 90.3 when contemplating the inclusion of a reference to another requirement. The use of redundant references shall be avoided. Only references to other requirements within the document shall be included."

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4124-NFPA 70-2023 [Section No. 513.12]	Deleting the same reference in two articles.
Public Input No. 4124-NFPA 70-2023 [Section No. 513.12]	

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 16:59:28 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8507-NFPA 70-2024](#)

Statement: The text pointing the user to 210.8(B) is deleted in accordance with 4.1.1 of the Style Manual. The ordinary location requirements for GFCIs are in effect for "other than dwelling units" and are not modified by this section, so the section text is not necessary. The ordinary locations requirements remain unchanged.



Public Input No. 1941-NFPA 70-2023 [Section No. 511.16]

~~511.16~~ Grounding and Bonding Requirements:

~~(A)~~ General Grounding Requirements:

All metal raceways, the metal armor or metallic sheath on cables, and all non-current-carrying metal parts of fixed or portable electrical equipment, regardless of voltage, shall be grounded.

~~(B)~~ Supplying Circuits with Grounded and Grounding Conductors in Class I Locations:

Grounding in Class I locations shall comply with 501.30.

~~(1)~~ Circuits Supplying Portable Equipment or Pendants:

Where a circuit supplies portables or pendants and includes a grounded conductor in accordance with 200.3; receptacles, attachment plugs, connectors, and similar devices shall be of the grounding type and the grounded conductor of the flexible cord shall be connected to the screw shell of any lampholder or to the grounded terminal of any utilization equipment supplied.

~~(2)~~ Approved Means:

Approved means shall be provided for maintaining continuity of the equipment grounding conductor between the fixed wiring system and the non-current-carrying metal portions of pendant luminaires, portable luminaires, and portable utilization equipment.

Statement of Problem and Substantiation for Public Input

The grounding and bonding requirements are found in Article 250 which applies to Chapter 5 articles. The special requirements for bonding are found in Article 501 for Class I locations and in Article 505 for Zones 0, 1, and 2. There is no need for grounding and bonding requirements which create confusion in this article.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4141-NFPA 70-2023 [Section No. 516.16]	
Public Input No. 4139-NFPA 70-2023 [Section No. 514.16]	
Public Input No. 4131-NFPA 70-2023 [Section No. 513.16]	
Public Input No. 2034-NFPA 70-2023 [Section No. 515.16]	
Public Input No. 2034-NFPA 70-2023 [Section No. 515.16]	
Public Input No. 4131-NFPA 70-2023 [Section No. 513.16]	
Public Input No. 4139-NFPA 70-2023 [Section No. 514.16]	
Public Input No. 4141-NFPA 70-2023 [Section No. 516.16]	

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submission Date: Mon Aug 07 19:01:51 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8639-NFPA 70-2024](#)

Statement: The text has been modified as proposed to use the defined terms from Article 100 and Article 625. Additionally, 511.10(B)(3) has been re-worded for clarity. This PI will be referred to CMP12 for information or comment.



Public Input No. 676-NFPA 70-2023 [Section No. 511.16]

~~511.16~~ Grounding and Bonding Requirements:

~~(A)~~ General Grounding Requirements:

All metal raceways, the metal armor or metallic sheath on cables, and all non-current-carrying metal parts of fixed or portable electrical equipment, regardless of voltage, shall be grounded.

~~(B)~~ Supplying Circuits with Grounded and Grounding Conductors in Class I Locations:

Grounding in Class I locations shall comply with 501.30.

~~(1)~~ Circuits Supplying Portable Equipment or Pendants:

Where a circuit supplies portables or pendants and includes a grounded conductor in accordance with 200.3, receptacles, attachment plugs, connectors, and similar devices shall be of the grounding type and the grounded conductor of the flexible cord shall be connected to the screw shell of any lampholder or to the grounded terminal of any utilization equipment supplied.

~~(2)~~ Approved Means:

Approved means shall be provided for maintaining continuity of the equipment grounding conductor between the fixed wiring system and the non-current-carrying metal portions of pendant luminaires, portable luminaires, and portable utilization equipment.

Statement of Problem and Substantiation for Public Input

This is already (better) addressed in 501.30 and Article 250. Furthermore, it uses antiquated language ("shall be grounded") that has proved to be vague, hence the efforts of the last several code revision cycles to remove it.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Affiliation: Steel Tube Institute
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 20 14:01:58 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8639-NFPA 70-2024](#)

Statement: The text has been modified as proposed to use the defined terms from Article 100 and Article 625. Additionally, 511.10(B)(3) has been re-worded for clarity. This PI will be referred to CMP12 for information or comment.



Public Input No. 8-NFPA 70-2023 [New Section after 512.1]

512.2 General Requirements:

Electrical installations in cannabis related facilities shall only be designed, installed, and inspected by sober personnel.

Informational note 1: vapors in cannabis manufacturing facilities may subject electrical maintenance personnel to unintended inebriation from exposure to cannabis.

Informational note 2: product testers who may take advantage of an internal transfer opportunity to the electrical department may be at risk of performing electrical work while unsober.

Statement of Problem and Substantiation for Public Input

We have various articles requiring that certain electrical work be performed by qualified persons (as though some electrical work doesn't have to be performed by qualified persons). Why not also require that those working in cannabis manufacturing facilities performing electrical work be sober?

Submitter Information Verification

Submitter Full Name: John Doe

Organization: [Not Specified]

Street Address:

City:

State:

Zip:

Submittal Date: Tue Jan 03 21:11:22 EST 2023

Committee: NEC-P14

Committee Statement

Resolution: Safety related workplace practices are not within the scope of the NEC.



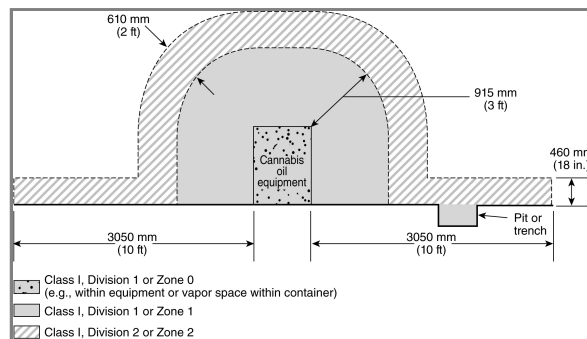
Public Input No. 1218-NFPA 70-2023 [Section No. 512.3(A)(1)]

(1) Where Flammable Gases or Vapors Are Released.

For sources of gases or vapors from a flammable material, ~~the location~~ locations shall be classified in accordance with the following and as shown in Figure 512.3(A)(1):

- (1) The space within 915 mm (3 ft) in all directions from any such equipment or container and extending to the floor or grade level shall be classified as Class I, Division 1 or Zone 1, whichever is applicable.
- (2) The space extending 610 mm (2 ft) beyond the Class I, Division 1 or Zone 1 location shall be classified as Class I, Division 2 or Zone 2, whichever is applicable.
- (3) The space extending 1525 mm (5 ft) horizontally beyond the space described in 512.3(A)(1)(2) up to a height of 460 mm (18 in.) above the floor or grade level shall be classified as Class I, Division 2 or Zone 2, whichever is applicable.
- (4) The space inside of a tank or container and the inside of equipment that contains a flammable material shall be classified as Class I, Division 1 or Zone 0, whichever is applicable.
- (5) Sumps, pits, or belowgrade channels within 3.05 m (10 ft) horizontally of a vapor source shall be classified as Class I, Division 1 or Zone 1. If the sump, pit, or channel extends beyond 3.05 m (10 ft) horizontally from the vapor source, it shall be provided with a vapor stop or classified as Class I, Division 1 or Zone 1 for its entire length.

Figure 512.3(A)(1) Area Classification for Equipment and Systems Other than Booths, Where Flammable Gases or Vapors Are Released.



Statement of Problem and Substantiation for Public Input

In accordance with 3.5.3 of the NEC Style Manual, references shall be plural rather than singular.

Submitter Information Verification

Submitter Full Name: William Fiske
Organization: Intertek Testing Services
Affiliation: Self
Street Address:
City:
State:
Zip:
Submission Date: Tue Jun 27 13:49:00 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8785-NFPA 70-2024](#)

Statement: In accordance with Style Manual 3.5.3 the word "location" is made plural. Revisions made to for renumbering in accordance with the NEC Style Manual.



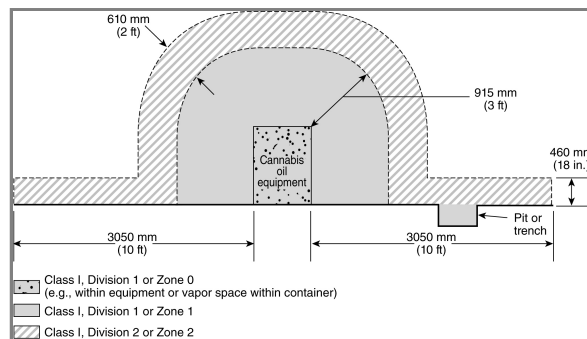
Public Input No. 1219-NFPA 70-2023 [Section No. 512.3(A)(1)]

(1) Where Flammable Gases or Vapors Are Released.

For sources of gases or vapors from a flammable material, ~~the location~~ locations shall be classified in accordance with the following and as shown in Figure 512.3(A)(1):

- (1) The space within 915 mm (3 ft) in all directions from any such equipment or container and extending to the floor or grade level shall be classified as Class I, Division 1 or Zone 1, whichever is applicable.
- (2) The space extending 610 mm (2 ft) beyond the Class I, Division 1 or Zone 1 location shall be classified as Class I, Division 2 or Zone 2, whichever is applicable.
- (3) The space extending 1525 mm (5 ft) horizontally beyond the space described in 512.3(A)(1)(2) up to a height of 460 mm (18 in.) above the floor or grade level shall be classified as Class I, Division 2 or Zone 2, whichever is applicable.
- (4) The space inside of a tank or container and the inside of equipment that contains a flammable material shall be classified as Class I, Division 1 or Zone 0, whichever is applicable.
- (5) Sumps, pits, or belowgrade channels within 3.05 m (10 ft) horizontally of a vapor source shall be classified as Class I, Division 1 or Zone 1. If the sump, pit, or channel extends beyond 3.05 m (10 ft) horizontally from the vapor source, it shall be provided with a vapor stop or classified as Class I, Division 1 or Zone 1 for its entire length.

Figure 512.3(A)(1) Area Classification for Equipment and Systems Other than Booths, Where Flammable Gases or Vapors Are Released.



Statement of Problem and Substantiation for Public Input

In accordance with 3.5.3 of the NEC Style Manual, references should be plural.

Submitter Information Verification

Submitter Full Name: William Fiske
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Affiliation: Self
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Submittal Date: Tue Jun 27 13:53:35 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8645-NFPA 70-2024](#)

Statement: The requirements for listed equipment are contained in Article 512 Part III. The term "listed" has been deleted here as it is redundant and limiting. In accordance with Style Manual 3.5.3 the word "location" is made plural.



Public Input No. 1222-NFPA 70-2023 [Section No. 512.3(A)(2)]

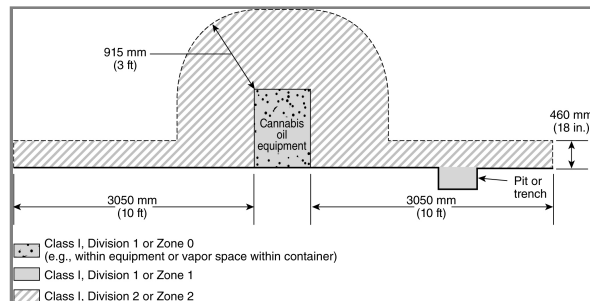
(2) Where Flammable Gases or Vapors Are Not Released, Except During Disconnection or Opening.

~~Where listed equipment~~ Where equipment is marked to indicate that the level of release during disconnection or opening is maintained below 25 percent LFL without ventilation, flammable solvents shall not be released during the extraction process except during disconnecting or opening of vessels containing flammable solvents, or during off-gassing of spent material or extracted plant oil.

For sources of gas or vapor from a flammable material, the location shall be classified in accordance with the following and as shown in Figure 512.3(A)(2):

- (1) The space within 915 mm (3 ft) in all directions from any such equipment or container and extending to the floor or grade level shall be classified as Class I, Division 2 or Zone 2, whichever is applicable.
- (2) The space extending beyond the Division 2 or Zone 2 area shall be unclassified.
- (3) The space inside of a tank or container and the inside of equipment that contains a flammable material shall be classified as Class I, Division 1 or Zone 0, whichever is applicable.
- (4) The space extending 2134 mm (7 ft) horizontally beyond the space described in 512.3(A)(2)(1) up to a height of 460 mm (18 in.) above the floor or grade level shall be classified as Class I, Division 2 or Zone 2, whichever is applicable.
- (5) Sumps, pits, or belowgrade channels within 3.05 m (10 ft) horizontally of a vapor source shall be classified as Class I, Division 1 or Zone 1. If the sump, pit, or channel extends beyond 3.05 m (10 ft) horizontally from the vapor source, it shall be provided with a vapor stop or it shall be classified as Class I, Division 1 or Zone 1 for its entire length.

Figure 512.3(A)(2) Area Classification for Equipment and Systems Other than Booths, Where Flammable Gases or Vapors Are Not Released Except During Disconnection or Opening.



Statement of Problem and Substantiation for Public Input

As written, the requirement applies only to listed equipment. It is important to limit the release of flammable vapors when the equipment is open, regardless of the listing status of equipment. Certainly it could not be the intent that unlisted equipment be subject to less rigorous Code requirements than listed equipment.

Submitter Information Verification

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Submission Date: Tue Jun 27 14:01:50 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8645-NFPA 70-2024](#)

Statement: The requirements for listed equipment are contained in Article 512 Part III. The term “listed” has been deleted here as it is redundant and limiting. In accordance with Style Manual 3.5.3 the word “location” is made plural.



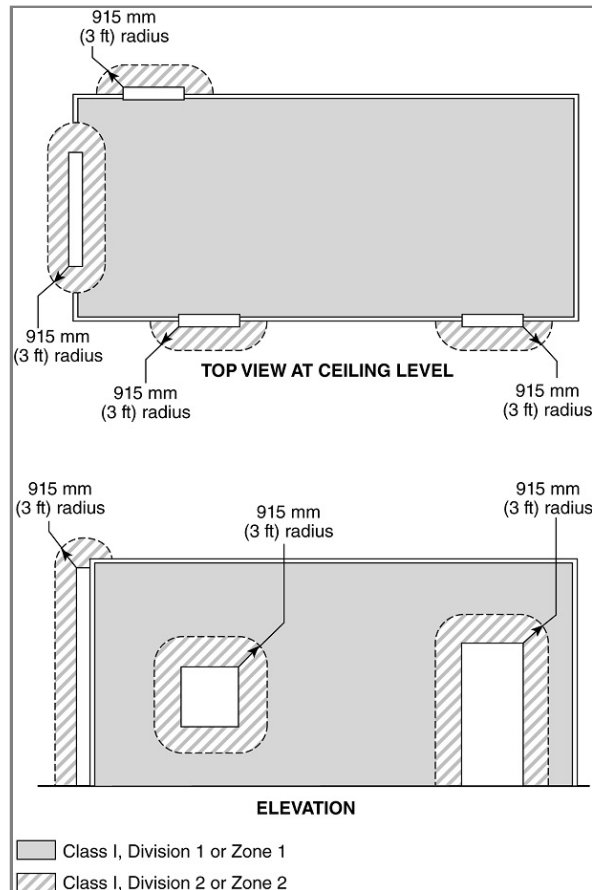
Public Input No. 1220-NFPA 70-2023 [Section No. 512.3(B)(1)]

(1) Where Flammable Gases or Vapors Are Released.

For sources of gas or vapor from a flammable material, ~~the location~~ locations shall be classified in accordance with the following and as shown in Figure 512.3(B)(1):

- (1) The space within the booth shall be classified as Class I, Division 1 or Zone 1, whichever is applicable.
- (2) The space within 915 mm (3 ft) of any opening shall be classified as Class I, Division 2 or Zone 2, whichever is applicable.
- (3) The interior of fresh air supply ducts and fresh air supply plenums shall be unclassified.

Figure 512.3(B)(1) Area Classification for Booths Where Flammable Gases or Vapors Are Released.



Statement of Problem and Substantiation for Public Input

In accordance with 3.5.3 of the NEC Style Manual, references should be plural rather than singular.

Submitter Information Verification

Submitter Full Name: William Fiske
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Submittal Date: Tue Jun 27 13:55:54 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8788-NFPA 70-2024](#)

Statement: In accordance with Style Manual 3.5.3 the word "location" is made plural.



Public Input No. 1221-NFPA 70-2023 [Section No. 512.3(B)(2)]

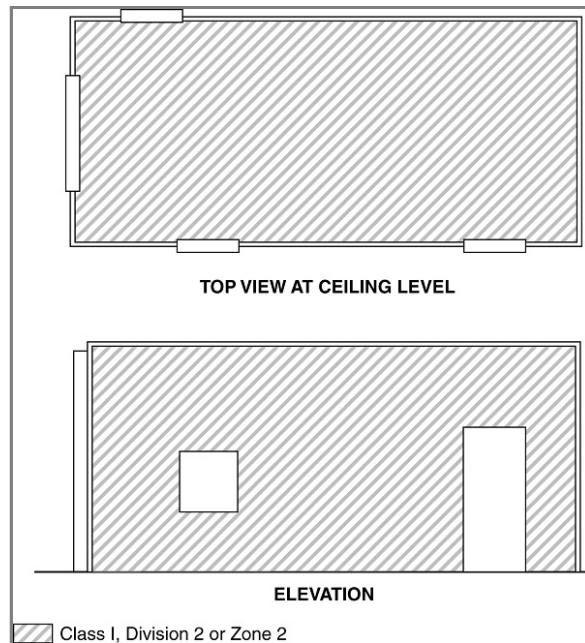
(2) Where Flammable Gases or Vapors Are Not Released, Except During Disconnection or Opening.

Where listed equipment is marked to indicate that the level of release during disconnection or opening is maintained below 25 percent LFL without ventilation, flammable solvents shall not be released during the extraction process except during disconnecting or opening of vessels containing flammable solvents, or during off-gassing of spent material or extracted plant oil.

For sources of gas or vapor from a flammable material, ~~the location~~ locations shall be classified in accordance with the following and as shown in Figure 512.3(B)(2):

- (1) The space within the booth shall be classified as Class I, Division 2 or Zone 2, whichever is applicable.
- (2) The space outside any opening shall be unclassified.
- (3) The interior of fresh air supply ducts and fresh air supply plenums shall be unclassified.

Figure 512.3(B)(2) Area Classification for Booths Where Flammable Gases or Vapors Are Not Released Except During Disconnection or Opening.



Statement of Problem and Substantiation for Public Input

In accordance with 3.5.3 of the NEC Style Manual, references should be plural rather than singular.

Submitter Information Verification

Submitter Full Name: William Fiske
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Submission Date: Tue Jun 27 13:58:31 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8652-NFPA 70-2024](#)

Statement: The requirements for listed equipment are contained in Art. 512 Part III. The term "listed" has been deleted here as it is redundant and limiting. In accordance with Style Manual 3.5.3 the word "location" is made plural.

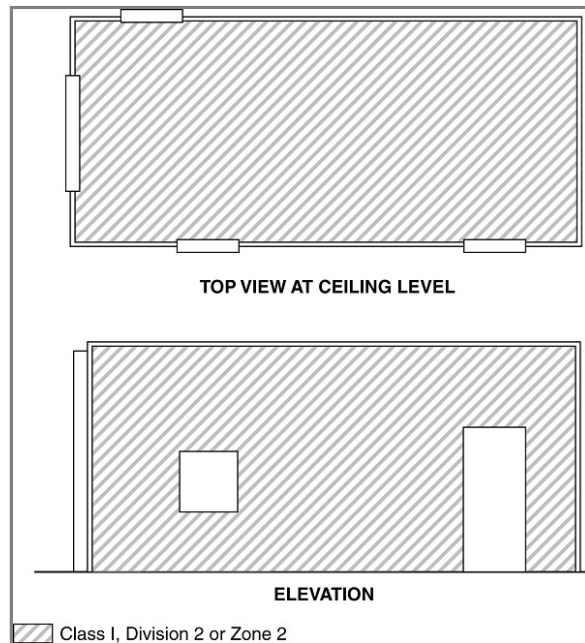

Public Input No. 1223-NFPA 70-2023 [Section No. 512.3(B)(2)]
(2) Where Flammable Gases or Vapors Are Not Released, Except During Disconnection or Opening.

Where ~~listed~~ equipment is marked to indicate that the level of release during disconnection or opening is maintained below 25 percent LFL without ventilation, flammable solvents shall not be released during the extraction process except during disconnecting or opening of vessels containing flammable solvents, or during off-gassing of spent material or extracted plant oil.

For sources of gas or vapor from a flammable material, the location shall be classified in accordance with the following and as shown in Figure 512.3(B)(2):

- (1) The space within the booth shall be classified as Class I, Division 2 or Zone 2, whichever is applicable.
- (2) The space outside any opening shall be unclassified.
- (3) The interior of fresh air supply ducts and fresh air supply plenums shall be unclassified.

Figure 512.3(B)(2) Area Classification for Booths Where Flammable Gases or Vapors Are Not Released Except During Disconnection or Opening.



Statement of Problem and Substantiation for Public Input

As written, only listed equipment is subject to the requirement that vapor concentration be limited when the equipment is open. The requirement should apply regardless of listing status. Certainly unlisted equipment should not be subject to less rigorous Code requirements than unlisted equipment.

Submitter Information Verification

Submitter Full Name: William Fiske
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Submission Date: Tue Jun 27 14:07:45 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8652-NFPA 70-2024](#)

Statement: The requirements for listed equipment are contained in Art. 512 Part III. The term "listed" has been deleted here as it is redundant and limiting. In accordance with Style Manual 3.5.3 the word "location" is made plural.



Public Input No. 1224-NFPA 70-2023 [Section No. 512.3(B) [Excluding any Sub-Sections]]

Air exhausted from the booths shall not be recirculated or exhausted from the booths into the room in which the booths are installed. Ventilation other than exhaust ventilation ~~can be~~ shall permitted to be provided to the booth, but ~~cannot be~~ shall not be recirculated or exhausted from the booth into the room in which the booth is installed.

Statement of Problem and Substantiation for Public Input

In accordance with 3.1.1 of the NEC Style Manual, mandatory language is required for Code rules.

Submitter Information Verification

Submitter Full Name: William Fiske
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Submittal Date: Tue Jun 27 14:13:38 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8790-NFPA 70-2024](#)

Statement: In accordance with Style Manual 3.1.1 the rule is revised to eliminate the words can and cannot and replace with the proper permissive mandatory language, accordingly.



Public Input No. 2696-NFPA 70-2023 [Section No. 512.3 [Excluding any Sub-Sections]]

~~Cannabis~~ Area classification for cannabis oil equipment and systems that can release flammable materials during operation shall ~~be classified in~~ be in accordance with 512.3(A) and (B).

Informational Note No. 1: Some cannabis oil applications can result in the release of heavier-than-air flammable gases or vapors into the surrounding atmosphere as a normal part of the overall extraction process (e.g., during disconnecting or opening of vessels containing flammable solvents, or during off-gassing of spent material or extracted plant oil). Cannabis oil equipment and systems can also include the connection of external containers, or other external sources, of flammable solvent.

Informational Note No. 2: See NFPA 30, *Flammable and Combustible Liquids Code*; NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*; and NFPA 497, *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, for information on area classification.

Informational Note No. 3: See NFPA 36, *Standard for Solvent Extraction Plants*, for information on area classification in commercial-scale extraction processes.

Statement of Problem and Substantiation for Public Input

The current language in Section 512.3 states that cannabis oil equipment and systems that can release flammable materials during operation shall be classified in accordance with 512.3(A) and (B). The problem is that it is the location where the equipment and systems are installed that is classified and not the equipment. Revising the section to state that area classification for cannabis oil equipment and systems shall be in accordance with 512.3(A) and (B) will clarify that it is the location that is classified. This change also makes it clear that the documentation required by Section 500.4 is applicable.

Submitter Information Verification

Submitter Full Name: Christopher Jensen
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Submission Date: Thu Aug 24 16:38:26 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8654-NFPA 70-2024](#)

Statement: The text has been re-worded for clarity.



Public Input No. 2738-NFPA 70-2023 [Section No. 512.10]

512.10 Wiring Installation and Operation.

All wiring installed or operated within any of the hazardous (classified) locations defined in 512.3 shall comply with the requirements of ~~Part II of Article 501 - or~~ , Part II or 505.15, as applicable, for the division or zone location in which it is installed.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

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Submittal Date: Thu Aug 24 19:40:26 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8515-NFPA 70-2024](#)

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

**Public Input No. 1533-NFPA 70-2023 [Section No. 512.20(A)]**

(A) Cannabis Oil Preparatory Equipment.

~~Equipment~~ Electrical components on equipment that is used to prepare the plant material for subsequent extraction of the plant oil (e.g., trimming, deseeding, drying/curing) shall be listed for the location.

Statement of Problem and Substantiation for Public Input

Not all plant oil preparatory equipment uses electrical components (i.e., those which are pneumatically operated or are mechanical processes). The current language may be misinterpreted or misapplied, thereby requiring a listing of equipment where no listing exists. If equipment does not use electricity, it would not be regulated by the National Electrical Code.

Submitter Information Verification

Submitter Full Name: Todd Laberge
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City:
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Zip:
Submittal Date: Mon Jul 24 11:13:52 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The term "Equipment" is a defined term within the NEC. This term is used throughout Chapter 5 in this manner without confusion as to applicability.



Public Input No. 1534-NFPA 70-2023 [Section No. 512.20(B)]

(B) Cannabis Oil Extraction Equipment.

~~Equipment~~ Electrical components on equipment that uses flammable materials (solvents) in the process of extracting the plant oil from the plant material shall be listed for the location.

Informational Note: Extraction equipment can use flammable materials as solvents to extract the plant oil from the plant material by saturating the plant material in a vented container, sealed container, or pressure vessel. Typical flammable materials used in the extraction process include butane, ethanol, hexane, pentane, propane, and LPG.

Statement of Problem and Substantiation for Public Input

By clarifying that this Article applies to the electrical components on an extraction machine rather than the machine itself, the potential for misapplication and enforcement of this Article will be reduced. This would also ensure consistency with (2021 Edition) NFPA 1 Chapter 38 and (2021 Edition) International Fire Code Chapter 39.

As written, this Article could be misinterpreted to require listing to UL Standard 1389 for the cannabis oil extraction machine itself, rather than listing of the electrical components on the machine for their intended use and location. This would be in direct conflict with NFPA 1 Sections 38.6.1.6.1.4 and 38.6.1.6.3, in addition to International Fire Code (IFC) Section 3904.2, which collectively provide for either a listing to UL 1389, or approval via independent third-party engineering review and report. The extraction industry has successfully operated without UL 1389 listed equipment, based on independent third-party reviews in thousands of facilities, since 2014. The allowance for listing or approval is also consistent with NFPA 1 Section 60.5.1.6.4 and IFC Section 5003.2.3 which allow for listing or approval for equipment that uses, stores, or handles hazardous materials. The "approval" is based on the local AHJ approving the independent third-party review and report. In addition, NFPA 1 Section 38.6.1.6.6 requires a field inspection of the equipment to ensure compliance with the technical report and analysis. Listing to UL 1389 does not require this field inspection and commissioning of the extraction machine. Typically up to 30% of extraction machines and buildings fail initial inspection.

Currently, there are no UL 1389 listed hydrocarbon extractors available on the market. The singular company previously marketing UL 1389 listed flammable-liquid based extractors has stopped producing equipment. As of the writing of this Public Input, there are no cannabis plant oil extraction machines available that are listed to UL Standard 1389, and as such would prevent the installation an operation of any new systems if this Article were enforced to require UL 1389 listing. Retroactive enforcement of this Article could halt operations of existing facilities that are operating safely.

In addition, not all extraction equipment uses electrical components. For example, hydrocarbon (LP-gas) extractors do not use electricity to perform the extraction operation itself. Heat and pressure are used instead. Where hydrocarbon extraction systems use electrical components (e.g., the solvent recovery pump, which sits on or immediately adjacent to the extractor), these pieces of equipment are listed for Class I Division 1 locations. Associated chillers, heaters, etc., are located outside of the electrically hazardous location (i.e., outside of the extraction room). For flammable liquid-based extraction operations, the machines are typically centrifuges which involve the use of a Class I Division 2 electrically classified motor and control panel. Similar to hydrocarbon extraction, all other electrical components are outside the electrically classified space, or are electrically classified in accordance with Article 512.3(A).

This clarification will ensure proper enforcement of this Article, and the continued installation and operation of new equipment.

Submitter Information Verification

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Submission Date: Mon Jul 24 11:19:36 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The term "Equipment" is a defined term within the NEC. This term is used throughout Chapter 5 in this manner without confusion as to applicability.



Public Input No. 1535-NFPA 70-2023 [Section No. 512.20(C)]

(C) Cannabis Oil Booths.

~~Enclosed~~ Electrical equipment in enclosed areas used to house cannabis oil equipment and systems shall be listed for the location.

Informational Note: Cannabis oil booths can be designed to house a single piece or multiple pieces of cannabis oil equipment. Booths range in size and can be large enough to permit entrance of personnel to perform the processing tasks.

Statement of Problem and Substantiation for Public Input

By clarifying that this Article applies to the electrical components within an extraction booth rather than the booth itself, the potential for misapplication and enforcement of this Article will be reduced. This would also ensure consistency with (2021 Edition) NFPA 1 Chapters 38 and 60, and (2021 Edition) International Fire Code Chapters 39 and 50.

As written, this Article could be misinterpreted to require listing to UL Standard 1389 for the extraction booth, rather than listing of the electrical components within the booth for their intended use and location. Extraction booths or any enclosure can be constructed onsite and in compliance with the locally adopted Building Code and Fire Code, and do not require listing. Given that extraction booths and rooms for flammable solvent processes are required to be electrically classified locations per Article 500 and 512, the lighting, detection and alarm system equipment, and other electrically energized equipment are all required to be electrically classified in accordance with the location designation. A requirement of the booth as-a-whole to be listed to UL 1389 is unnecessary.

In addition, a requirement for UL listing would be in direct conflict with NFPA 1 Section 60.5.1.6.4 and IFC Section 5003.2.3 which allow for listing or approval for equipment that uses, stores, or handles hazardous materials, if the booth itself is considered a piece of equipment. The "approval" can be granted by the local AHJ upon review of an independent third-party engineering review and report. Such reports are developed in accordance with NFPA 1 Section 1.15 and IFC Section 104.8.2 and are standard for this industry.

Further, within the UL 1389 Standard itself is language that mandates only UL 1389 listed extraction equipment can be used within the booth. As of the writing of this Public Input, the only company that manufactures UL 1389 compliant extraction machines has ceased operations; therefore, any extraction operation performed in an extraction booth will be using the booth in violation of its listing. That firm only manufactured flammable-liquid extraction machines, and as such any hydrocarbon extraction operation within an extraction booth across the United States or Canada are using their UL listed booth in violation of its listing as well.

Thousands of extraction booths are currently and safely in operation across the United States and Canada without listing to UL Standard 1389, and have been since 2016. Most of these booths have been in operation long before the UL Standard was published, and many more continue to be installed and operated safely without listing. The UL listing does give the user and local AHJ a level of comfort knowing that the booth and associated equipment have been reviewed for safety and proper regulatory compliance; however, approved third-party technical reports provide a similar evaluation. Both provide the local AHJ with a level of independent review.

The NFPA 1 Chapter 38 committee and IFC Chapter 39 committee, which review and provide the content for cannabis extraction operations, both have not included language to require listing of booths to UL 1389. Electrical equipment within these booths is listed and installed in accordance with the location classification.

This clarification will ensure proper enforcement of this Article, and the continued installation and operation of new booths and rooms.

Submitter Information Verification

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Committee: NEC-P14

Committee Statement

Resolution: The term "Equipment" is a defined term within the NEC. This term is used throughout Chapter 5 in this manner without confusion as to applicability.



Public Input No. 1536-NFPA 70-2023 [Section No. 512.20(E)]

(E) Cannabis Oil Systems.

~~Any combination~~ Electrical components within any combination of cannabis oil equipment needed for the overall extraction process (e.g., cannabis oil preparatory equipment, cannabis oil extraction equipment, cannabis oil booths, cannabis oil post-processing equipment) shall be listed for the location.

Informational Note: See NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance*, for information related to general electrical equipment maintenance and developing an effective electrical preventive maintenance (EPM) program.

Statement of Problem and Substantiation for Public Input

This proposed change is consistent with Public Inputs 1533, 1534, and 1535, seeking to clarify that this Article applies to the electrical components within or upon equipment, rather than the equipment itself, to ensure that "listing" is not interpreted to mean listing to UL Standard 1389 for preparatory equipment, extraction machines, or extraction booths.

The detailed justification for components within each individual piece of equipment to be listed (e.g., extraction preparation equipment, extraction equipment, booths etc.) are noted in Public Inputs 1533, 1534, and 1535. This proposed change applies to the aggregation of the equipment designated as a "system" in this Article 512.20(E).

Please note that a change has not been proposed for post-processing equipment (Article 512.20(D)), as that equipment is traditionally listed to UL 61010-1 or other applicable standard, and a clarification for listing to UL 1389 is not considered necessary.

Submitter Information Verification

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Submission Date: Mon Jul 24 13:23:23 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The term "Equipment" is a defined term within the NEC. This term is used throughout Chapter 5 in this manner without confusion as to applicability.



Public Input No. 1225-NFPA 70-2023 [Section No. 512.20 [Excluding any Sub-Sections]]

Installation of cannabis oil equipment and systems shall be in a distinct room or area ~~located at commercial or industrial facilities~~. Where all electrical equipment within cannabis oil booths is listed for Class I, Division 1 or Zone 1 locations, gas detection shall not be required to be provided within the booth. Where gas detection in accordance with 500.7(K) is provided within booths listed for Class I, Division 2 or Zone 2 locations, electrical equipment shall be permitted.

Statement of Problem and Substantiation for Public Input

Existing text requires that equipment be installed in "commercial or industrial facilities." The first problem with that is neither commercial nor industrial is defined in the NEC. The second problem is that many cannabis oil extraction and processing operations are very small scale, boutique setups, that have been approved in the past. To prohibit such installations in the future would require a stronger substantiation than has been presented up to this time.

Submitter Information Verification

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Submittal Date: Tue Jun 27 14:24:55 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8659-NFPA 70-2024](#)

Statement: The terms "commercial and industrial facilities" have been deleted as this concept is addressed in 512.1. The text has been re-worded to more clearly specify what equipment is permitted when gas detection in accordance with 500.7(K)(1) or 500.7(K)(2), or 505.8(I)(1) or 505.8(I)(2) is provided in cannabis oil booths. Definitions have been moved to Article 100.

**Public Input No. 1226-NFPA 70-2023 [Section No. 512.20 [Excluding any Sub-Sections]]**

Installation of cannabis oil equipment and systems shall be in a distinct room or area located at commercial or industrial facilities. Where all electrical equipment within cannabis oil booths is listed for Class I, Division 1 or Zone 1 locations, gas detection shall not be required to be provided within the booth. ~~Where gas detection in accordance with 500.7(K) is provided within booths listed for Class I, Division 2 or Zone 2 locations, electrical equipment shall be permitted. _~~

Statement of Problem and Substantiation for Public Input

The last sentence of 512.20 refers to 500.7(K); however, no part of 500.7(K) applies to the situation described in 512.20. 500.7(K)(2) is for locations classified as Class I, Division 1 [or Zone 1 under 505.8(l)(2)] due to inadequate ventilation. 500.7(K)(4) [or 505.8(l)(4)] is for interiors of control panels, and that requirement calls for Class I, Division 2 [Zone 2] equipment, not general-purpose equipment.. 505.7(K)(3) [505.8(l)(3) covers interior of a building or enclosed space that doesn't contain a source of flammable vapors, but is open to a Class I, Division 2 [Zone 2] location. 500.7(K)(3) and 505.8(l) allow general-purpose electrical equipment, with three requirements, none of which are named in the existing text of 512.20.

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8659-NFPA 70-2024](#)

Statement: The terms "commercial and industrial facilities" have been deleted as this concept is addressed in 512.1. The text has been re-worded to more clearly specify what equipment is permitted when gas detection in accordance with 500.7(K)(1) or 500.7(K)(2), or 505.8(l)(1) or 505.8(l)(2) is provided in cannabis oil booths. Definitions have been moved to Article 100.

**Public Input No. 2739-NFPA 70-2023 [Section No. 512.22]****512.22** Equipment Installed in Hazardous (Classified) Locations.

All equipment installed or operated within any of the classified locations defined in 512.3 shall comply with the requirements of ~~Part III of Article 501 - or~~, Part III or 505.9, as applicable, for the division or zone area in which they are used.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 24 19:41:22 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8516-NFPA 70-2024](#)

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts



Public Input No. 3732-NFPA 70-2023 [Section No. 512.32]

512.32 ~~Marking 2~~ Listing Requirements .

Cannabis oil preparatory equipment, extraction equipment, booths, and post-processing equipment shall be listed and marked to show the hazardous (classified) location for which it is permitted to be installed.

(A) Division Equipment.

Equipment for Class I, Division 1 or Class I, Division 2 shall be marked in accordance with 500.8(C).

(B) Zone Equipment.

Equipment for Zone 1 or Zone 2 shall be marked in accordance with 500.8(C)(2).

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. A new section is added to comply with the NEC Style Manual Section 2.2.1 regarding Listing Requirements.

2.2.1 Parallel Numbering Required. Technical committees shall use the following section numbers for the same purposes within articles. This requirement shall not apply to Articles 90, 100, and 110. If the article does not contain listing or reconditioning requirements, the subdivisions shall not be included in the article.

Required Parallel Numbering Format

XXX.1 Scope.

XXX.2 Listing Requirements.

XXX.3 Reconditioned Equipment.

XXX.3(A) Permitted to be Installed.

XXX.3(B) Not Permitted to be Installed.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Submission Date: Tue Sep 05 15:04:25 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8524-NFPA 70-2024](#)

Statement: The current statement for 512.32 was revised to eliminate the words "listed and" as this section is only to describe the marking requirements. The listing requirements are stated in 512.2.



Public Input No. 333-NFPA 70-2023 [Section No. 513.1]

513.1 Scope.

This article shall apply to buildings or structures in any part of which aircraft containing Class I (flammable) liquids or Class II (combustible) liquids whose temperatures are above their flash points are housed or stored and in which aircraft might undergo service, repairs, or alterations. It shall not apply to locations used exclusively for aircraft that have never contained fuel or ~~unfueled aircraft~~ de-fueled aircraft.

Informational Note No. 1: See NFPA 409, *Standard on Aircraft Hangars*, for definitions of *aircraft hangar* and *unfueled aircraft*.

Informational Note No. 2: See NFPA 30, *Flammable and Combustible Liquids Code*, for information on fuel classification.

Statement of Problem and Substantiation for Public Input

NFPA 409 changed their term from unfueled aircraft to de-fueled aircraft with the 2022 publication of NFPA 409. Proposing to change the scope of this article to correlate with that definition change.

Submitter Information Verification

Submitter Full Name: Richard Holub
Organization: The DuPont Company, Inc.
Street Address:
City:
State:
Zip:
Submission Date: Mon Feb 13 07:58:10 EST 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8667-NFPA 70-2024](#)

Statement: The revision reflects the change in terminology to align with NFPA-409 definition for "defueled" which was made in 2022



Public Input No. 372-NFPA 70-2023 [Section No. 513.1]

513.1 Scope.

This article shall apply to buildings or structures in any part of which aircraft containing Class I (flammable) liquids or Class II (combustible) liquids whose temperatures are above their flash points are housed or stored and in which aircraft might undergo service, repairs, or alterations. It shall not apply to locations used exclusively for aircraft that have never contained fuel or ~~unfueled~~ defueled aircraft.

Informational Note No. 1: See NFPA 409, *Standard on Aircraft Hangars*, for definitions of *aircraft hangar* and ~~unfueled~~ defueled aircraft.

Informational Note No. 2: See NFPA 30, *Flammable and Combustible Liquids Code*, for information on fuel classification.

Statement of Problem and Substantiation for Public Input

NFPA 409 (2016) Chapter 12 unfueled hangar has changed in NFPA 409 (2022) to Chapter 14 defueled hangers in NFPA. The text has generally remained the same but the term unfueled has changed to defueled. Unfueled is no longer defined in NFPA 409 (2022). This term has been removed throughout NFPA 409 and for the most part replaced with defueled. The previous definition of unfueled is slightly different from defueled; primarily less than 0.5% of tank capacity for unfueled and less than 1.0% of tank capacity for defueled. NFPA 409's discussion on this change focused on how these percentages were determined. The 0.5% for unfueled was based on the largest aircraft tank, a Boeing 747, containing 110G (2-55G drums). This was in accordance with NFPA 30 which permits up to 120G of a Class II combustible liquid to be stored in a single control area with a sprinkler system. The NFPA 409 committee determined that a significant spill was unlikely to occur with a defueled aircraft.

Submitter Information Verification

Submitter Full Name: Michael Obrien
Organization: Mt Obrien Engineering
Street Address:
City:
State:
Zip:
Submittal Date: Wed Feb 22 18:51:08 EST 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8667-NFPA 70-2024](#)

Statement: The revision reflects the change in terminology to align with NFPA-409 definition for "defueled" which was made in 2022

**Public Input No. 2740-NFPA 70-2023 [Section No. 513.4(B)]****(B) Stanchions, Rostrums, and Docks.**

Electrical wiring, outlets, and equipment (including lamps) on or attached to stanchions, rostrums, or docks that are located in a hazardous (classified) location as defined in 513.3(C) shall comply with the applicable requirements of Article 501, Parts II and III of ~~Article 504~~ or III or 505.17 through 505.30, as applicable.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

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City:

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Submittal Date: Thu Aug 24 19:42:22 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: FR-8526-NFPA 70-2024

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.



Public Input No. 2036-NFPA 70-2023 [Section No. 513.8]

513.8 Underground Wiring.

All underground wiring shall comply with 513.8 (A)

~~– Wiring and Equipment Embedded, Under Slab, or Underground.~~

~~All wiring installed in or under the hangar floor shall comply with the requirements for Class I, Division 1 locations.~~

~~., (B), or (C). Where such wiring is located in vaults, pits, or ducts, adequate drainage shall be provided and shall comply with the requirements for Class I, Division I locations .~~

(

~~B) Uninterrupted Raceways, Embedded, Under Slab, or Underground. Uninterrupted raceways that are embedded in a hangar floor or buried beneath the hangar floor shall be considered to be within the Class I location above the floor, regardless of the point at which the raceway descends below or rises above the floor~~

A) Metal Conduit.

Threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC) with listed threaded fittings shall be permitted. Any portion of electrical wiring that is below the surface of a Class I, Division 1 or Division 2 location shall be sealed within 3.05 m (10 ft) of the point of emergence above grade. The conduit shall not contain any unions, couplings, boxes, or fittings between the conduit seal and the point of emergence above grade.

(B) Type MI Cable.

Type MI cable shall be permitted where it is installed in accordance with Part II of Article 332.

(C) Nonmetallic Conduit.

Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or high-density polyethylene conduit (HDPE) shall be permitted where buried under not less than 600 mm (2 ft) of cover. Where PVC conduit, RTRC conduit, or HDPE conduit is used, threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC) shall be used for the last 600 mm (2 ft) of the underground run to emergence or to the point of connection to the aboveground raceway. An equipment grounding conductor (EGC) shall be included to provide electrical continuity of the raceway system and for grounding of non-current-carrying metal parts .

Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the Minnesota Department of Labor and Industry. Currently, the Department's inspection staff includes 14-office/field staff, 12-state field inspectors, 2-virtual inspectors and 50 plus contract electrical inspectors that complete over 170,000 electrical inspections annually.

This is the last area in the code where the NEC considers underground a Class I, Division I area. The proposed code text mirrors the text in 514.8, underground wiring for motor fuel dispensing facilities where fuel spills will occur more frequently and more often than in aircraft hangers which determines the underground area Class I, Division I area. If it is necessary, what is the substantiated need for the current requirement?

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 11 11:05:17 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8671-NFPA 70-2024](#)

Statement: The revision aligns Article 514, Class I Div.1, Change (B) or (C) Class I Div.1 to comply with Style manual update to article and part.



Public Input No. 4124-NFPA 70-2023 [Section No. 513.12]

~~513.12~~ ~~Ground-Fault-Circuit-Interrupter Protection for Personnel:~~

~~Ground-fault circuit-interrupter protection for personnel shall be provided as required in 210.8~~

~~(B).~~

Statement of Problem and Substantiation for Public Input

Delete section 513.12. The section references a general requirement in Article 210 which does not need to be referenced in Article 511 and Article 512. The 2023 NEC Style Manual provides guidance for references to requirements in Chapters 1 through 4 in section 4.1.1: "General requirements contained in Chapters 1 through 4 shall not be repeated in other articles of the document. Committees shall always be mindful of the structure of the document as specified in 90.3 when contemplating the inclusion of a reference to another requirement. The use of redundant references shall be avoided. Only references to other requirements within the document shall be included."

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 4113-NFPA 70-2023 [Section No. 511.12]</u>	Deleting the same reference in two articles.
<u>Public Input No. 4113-NFPA 70-2023 [Section No. 511.12]</u>	

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 17:17:05 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: FR-8527-NFPA 70-2024

Statement: The text pointing the user to 210.8(B) is deleted in accordance with 4.1.1 of the Style Manual. The ordinary location requirements for GFCIs are in effect for "other than dwelling units" and are not modified by this section, so the section text is not necessary. The ordinary locations requirements remain unchanged.



Public Input No. 4131-NFPA 70-2023 [Section No. 513.16]

~~513.16~~ Grounding and Bonding Requirements:

~~(A)~~ General Grounding Requirements:

All metal raceways, the metal armor or metallic sheath on cables, and all non-current-carrying metal parts of fixed or portable electrical equipment, regardless of voltage, shall be grounded. Grounding in Class I locations shall comply with 501.30 for Class I, Division 1 and 2 locations and 505.30 for Zone 0, 1, and 2 locations.

~~(B)~~ Supplying Circuits with Grounded and Equipment Grounding Conductors in Class I Locations:

~~(1)~~ Circuits Supplying Portable Equipment or Pendants:

Where a circuit supplies portables or pendants and includes a grounded conductor, receptacles, attachment plugs, connectors, and similar devices shall be of the grounding type, and the grounded conductor of the flexible cord shall be connected to the screw shell of any lampholder or to the grounded terminal of any utilization equipment supplied.

~~(2)~~ Approved Means:

Approved means shall be provided for maintaining continuity of the equipment grounding conductor between the fixed wiring system and the non-current-carrying metal portions of pendant luminaires, portable luminaires, and portable utilization equipment.

Statement of Problem and Substantiation for Public Input

Delete 513.12. The grounding and bonding requirements are found in Article 250 which applies to Chapter 5 articles. The special requirements for bonding are found in Article 501 for Class I locations and in Article 505 for Zones 0, 1, and 2. There is no need for grounding and bonding requirements which create confusion in this article. The requirements are found in Article 250 and Article 410.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4141-NFPA 70-2023 [Section No. 516.16]	
Public Input No. 4139-NFPA 70-2023 [Section No. 514.16]	
Public Input No. 2034-NFPA 70-2023 [Section No. 515.16]	
Public Input No. 1941-NFPA 70-2023 [Section No. 511.16]	
Public Input No. 1941-NFPA 70-2023 [Section No. 511.16]	
Public Input No. 2034-NFPA 70-2023 [Section No. 515.16]	
Public Input No. 4139-NFPA 70-2023 [Section No. 514.16]	
Public Input No. 4141-NFPA 70-2023 [Section No. 516.16]	

Submitter Information Verification

Submitter Full Name: John Simmons
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Submission Date: Wed Sep 06 17:45:16 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8674-NFPA 70-2024](#)
Statement: Revisions made to align with 500.30 and 505.30.



Public Input No. 4529-NFPA 70-2023 [Section No. 514.3]

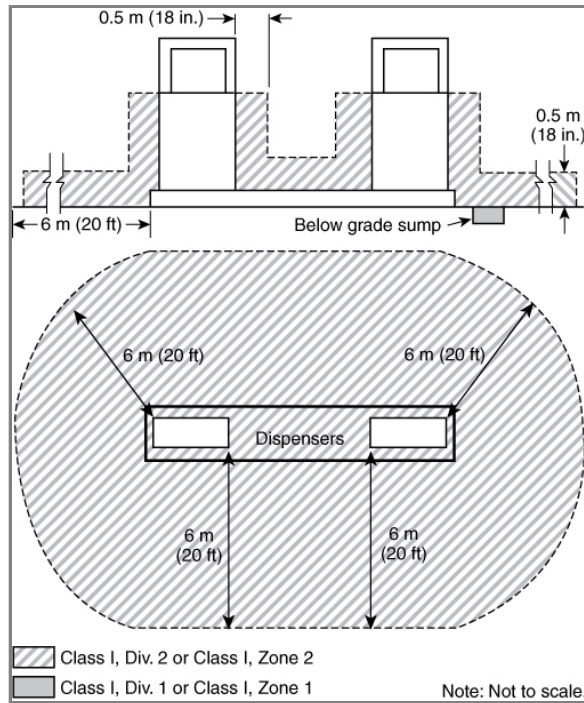
514.3 Classification of Locations.

Where the term “Class I” is used with respect to Zone classifications within this article of the Code, it shall apply to Zone 0, Zone 1, and Zone 2 designations.

Informational Note: The term “Class I” was originally included as a prefix to Zone 0, Zone 1, and Zone 2 locations and references as an identifier for flammable gases, vapors, or liquids to differentiate from Class II and Class III locations. Zone 0, Zone 1, and Zone 2 only apply to flammable gases, vapors, or liquids so the “Class I” prefix is redundant and has been deleted, except for text that is extracted from other documents or to remain consistent throughout this article.

[See Figure 514.3.]

Figure 514.3 Classified Areas Adjacent to Dispensers. [30A:Figure 8.3.3(a)]



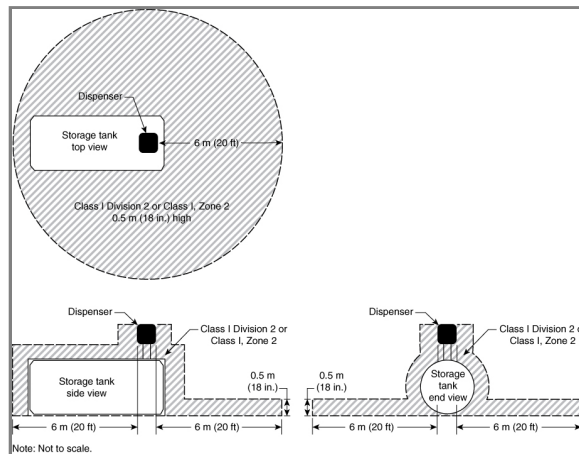
(A) Unclassified Locations.

Where the authority having jurisdiction can satisfactorily determine that flammable liquids having a flash point below 38°C (100°F), such as gasoline, will not be handled, such location shall not be required to be classified.

(B) Classified Locations.

[See Figure 514.3(B).]

Figure 514.3(B) Classified Areas Adjacent to Dispenser Mounted on Aboveground Storage Tank. [30A:Figure 8.3.3(b)]



(1) Class I Locations.

Table 514.3(B)(1) shall be applied where Class I liquids are stored, handled, or dispensed and shall be used to delineate and classify motor fuel dispensing facilities and commercial garages as defined in Article 100. Table 515.3 shall be used for the purpose of delineating and classifying aboveground tanks. A Class I location shall not extend beyond an unpierced wall, roof, or other solid partition. [30A:8.1, 8.2, 8.3]

Table 514.3(B)(1) Class I Locations — Motor Fuel Dispensing Facilities

<u>Location</u>	<u>Division (Group D)</u>	<u>Zone (Group IIA)</u>	<u>Extent of Classified Location¹</u>
Dispensing Device (except Overhead Type)^{2, 3}			
Under dispenser containment	1	1	Entire space within and under dispenser pit or containment
Dispenser	2	2	Within 450 mm (18 in.) of dispenser enclosure or that portion of dispenser enclosure containing liquid-handling components, extending horizontally in all directions and down to grade level
Outdoor	2	2	Up to 450 mm (18 in.) above grade level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
Indoor			
- with mechanical ventilation	2	2	Up to 450 mm (18 in.) above floor level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
- with gravity ventilation	2	2	Up to 450 mm (18 in.) above floor level, extending 7.5 m (25 ft) horizontally in all directions from dispenser enclosure
Dispensing Device — Overhead Type⁴			
	1	1	Space within dispenser enclosure and all electrical equipment integral with dispensing hose or nozzle
	2	2	Within 450 mm (18 in.) of dispenser enclosure, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level, extending 6 m (20 ft) horizontally in all directions from a point vertically below edge of dispenser enclosure
Remote Pump —			
Outdoor	1	1	Entire space within any pit or box below grade level, any part of which is within 3 m (10 ft) horizontally from any edge of pump
	2	2	Within 900 mm (3 ft) of any edge of pump, extending horizontally in all directions
	2	2	Up to 450 mm (18 in.) above grade level, extending 3 m (10 ft) horizontally in all directions from any edge of pump
Indoor	1	1	Entire space within any pit
	2	2	Within 1.5 m (5 ft) of any edge of pump, extending in all directions
	2	2	Up to 900 mm (3 ft) above floor level, extending 7.5 m (25 ft) horizontally in all directions from any edge of pump
	unclassified	unclassified	Except as noted below
Sales, Storage, Rest Rooms			
including structures (such as the attendant's kiosk) on or adjacent to dispensers	1	1	Entire volume, if there is any opening to room within the extent of a Division 1 or Zone 1 location
	2	2	Entire volume, if there is any opening to room within the extent of a Division 2 or Zone 2 location
Tank, Aboveground			
Inside tank	1	0	Entire inside volume
Shell, ends, roof, dike area	1	1	Entire space within dike, where dike height exceeds distance from tank shell to inside of dike wall for more than 50 percent of tank circumference
	2	2	Entire space within dike, where dike height does not exceed distance from tank shell to inside of dike wall for more than 50 percent of tank circumference
Vent	2	2	Within 3 m (10 ft) of shell, ends, or roof of tank
	1	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	2	Between 1.5 m and 3 m (5 ft and 10 ft) from open end of vent, extending in all directions

<u>Location</u>	<u>Division (Group D)</u>	<u>Zone (Group IIA)</u>	<u>Extent of Classified Location¹</u>
Tank, Underground			
Inside tank	1	0	Entire inside volume
Fill Opening	1	1	Entire space within any pit or box below grade level, any part of which is within a Division 1 or Division 2 classified location or within a Zone 1 or Zone 2 classified location
	2	2	Up to 450 mm (18 in.) above grade level, extending 1.5 m (5 ft) horizontally in all directions from any tight-fill connection and extending 3 m (10 ft) horizontally in all directions from any loose-fill connection
Vent	1	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	2	Between 1.5 m and 3 m (5 ft and 10 ft) from open end of vent, extending in all directions
Vapor Processing System			
Pits	1	1	Entire space within any pit or box below grade level, any part of which: (1) is within a Division 1 or Division 2 classified location; (2) is within a Zone 1 or Zone 2 classified location; (3) houses any equipment used to transfer or process vapors
Equipment in protective enclosures	2	2	Entire space within enclosure
Equipment <i>not</i> within protective enclosure	2	2	Within 450 mm (18 in.) of equipment containing flammable vapors or liquid, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level within 3 m (10 ft) horizontally of the vapor processing equipment
- Equipment enclosure	1	1	Entire space within enclosure, if flammable vapor or liquid is present under normal operating conditions
	2	2	Entire space within enclosure, if flammable vapor or liquid is not present under normal operating conditions
- Vacuum assist blower	2	2	Within 450 mm (18 in.) of blower, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level, extending 3 m (10 ft) horizontally in all directions
Vault	1	1	Entire interior space, if Class I liquids are stored within

¹For marine application, *grade level* means the surface of a pier, extending down to water level.

²Refer to Figure 514.3 and Figure 514.3(B) for an illustration of classified location around dispensing devices.

³Area classification inside the dispenser enclosure is covered in UL 87, *Standard for Power-Operated Dispensing Devices for Petroleum Products*.

⁴Ceiling-mounted hose reel. [30A:Table 8.3.1]

(2) Compressed Natural Gas, Liquefied Natural Gas, and Liquefied Petroleum Gas Areas.

Table 514.3(B)(2) shall be used to delineate and classify areas where CNG, LNG, compressed or liquefied hydrogen, LP-Gas, or combinations of these, are dispensed as motor vehicle fuels along with Class I or Class II liquids that are also dispensed as motor vehicle fuels. [30A:12.1]

Where CNG or LNG dispensers are installed beneath a canopy or enclosure, either the canopy or enclosure shall be designed to prevent accumulation or entrapment of ignitable vapors or all electrical equipment installed beneath the canopy or enclosure shall be suitable for Class I, Division 2 hazardous (classified) locations. [30A:12.4]

Dispensing devices for LP-Gas shall be located as follows:

- (1) At least 3 m (10 ft) from any dispensing device for Class I liquids
- (2) At least 1.5 m (5 ft) from any dispensing device for Class I liquids where the following conditions exist:
 - a. The LP-Gas deliver nozzle and filler valve release no more than 4 cm³ (0.1 oz) of liquid upon disconnection.
 - b. The fixed maximum liquid level gauge remains closed during the entire refueling process.

[30A:12.5.2]

Informational Note No. 1: See NFPA 58, *Liquefied Petroleum Gas Code*, for requirements on dispensing devices for LP-Gas.

Informational Note No. 2: See NFPA 58, *Liquefied Petroleum Gas Code*, and NFPA 59, *Utility LP-Gas Plant Code*, for information on classified areas pertaining to LP-Gas systems other than residential or commercial.

Informational Note No. 3: See 514.3(C) for motor fuel dispensing stations in marinas and boatyards.

Table 514.3(B)(2) Electrical Equipment Classified Areas for Dispensing Devices

<u>Dispensing Device</u>	<u>Extent of Classified Area</u>	
	<u>Class I, Division 1</u>	<u>Class I, Division 2</u>
Compressed natural gas (CNG)	Entire space within the dispenser enclosure	1.5 m (5 ft) in all directions from dispenser enclosure
Liquefied natural gas (LNG)	Entire space within the dispenser enclosure	3 m (10 ft) in all directions from the dispenser enclosure
Liquefied petroleum gas (LP-Gas)	Entire space within the dispenser enclosure; 450 mm (18 in.) from the exterior surface of the dispenser enclosure to an elevation of 1.22 m (4 ft) above the base of the dispenser; the entire pit or open space beneath the dispenser and within 6 m (20 ft) horizontally from any edge of the dispenser when the pit or trench is not mechanically ventilated	Up to 450 mm (18 in.) above ground and within 6 m (20 ft) horizontally from any edge of the dispenser enclosure, including pits or trenches within this area when provided with adequate mechanical ventilation

[30A:Table 12.6.2]

(3) Fuel Storage.

(a) Aboveground tanks storing CNG or LNG shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property. [30A:12.3.1]

Informational Note: See NFPA 52, *Vehicular Natural Gas Fuel Systems Code*, Section 8.4, for the relevant distances for CNG and LNG.

(b) Aboveground tanks storing hydrogen shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property. [30A:12.3.2]

Informational Note: See NFPA 2, *Hydrogen Technologies Code*, for the relevant distances for hydrogen.

(c) Aboveground tanks storing LP-Gas shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property. [30A:12.3.3]

Informational Note: See NFPA 58, *Liquefied Petroleum Gas Code*, Section 6.3, for the relevant distances for LP-Gas.

(d) Aboveground tanks storing CNG, LNG, or LP-Gas shall be separated from each other by at least 6 m (20 ft) and from dispensing devices that dispense liquid or gaseous motor vehicle fuels by at least 6 m (20 ft). [30A:12.3.3]

Exception No. 1: The required separation shall not apply to tanks or dispensers storing or handling fuels of the same chemical composition.

Exception No. 2: The required separation shall not apply when both the gaseous fuel storage and dispensing equipment are at least 15 m (50 ft) from any other aboveground motor fuel storage or dispensing equipment.

Informational Note: See NFPA 52, *Vehicular Natural Gas Fuel Systems Code*, or NFPA 58, *Liquefied Petroleum Gas Code*, for additional information.

(e) *Dispenser Installations Beneath Canopies.* Where CNG or LNG dispensers are installed beneath a canopy or enclosure, either the canopy or enclosure shall be designed to prevent accumulation or entrapment of ignitable vapors or all electrical equipment installed beneath the canopy or enclosure shall be suitable for Class I, Division 2 hazardous (classified) locations. [30A:12.4]

(f) *Specific Requirements for LP-Gas Dispensing Devices.* [30A:12.5] Dispensing devices for LP-Gas shall be located as follows:

- (1) At least 3 m (10 ft) from any dispensing device for Class I liquids
- (2) At least 1.5 m (5 ft) from any dispensing device for Class I liquids where the following conditions exist:
 - a. The LP-Gas deliver nozzle and filler valve release no more than 4 cm³ (0.1 oz) of liquid upon disconnection.
 - b. The fixed maximum liquid level gauge remains closed during the entire refueling process. [30A:12.5.2]

Table 514.3(B)(2) shall be used to delineate and classify areas for the purpose of installation of electrical wiring and electrical utilization equipment.

(C) Motor Fuel Dispensing Stations in Boatyards and Marinas.

Informational Note: See NFPA 303, *Fire Protection Standard for Marinas and Boatyards*, and NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, for additional information.

(1) General.

Electrical wiring and equipment located at or serving motor fuel dispensing locations shall be installed on the side of the wharf, pier, or dock opposite from the liquid piping system.

(2) Classification of Class I, Division 1 and 2 Areas.

The criteria provided in 514.3(C)(2)(a) and (C)(2)(b) shall be used for the purposes of applying Table 514.3(B)(1) and Table 514.3(B)(2) to motor fuel dispensing equipment on floating or fixed piers, wharfs, or docks.

(a) *Closed Construction.* Where the construction of floating docks, piers, or wharfs is closed so that there is no space between the bottom of the dock, pier, or wharf and the water, as in the case of concrete-enclosed expanded foam or similar construction, and the construction includes integral service boxes with supply chases, the following shall apply:

- (1) The space above the surface of the floating dock, pier, or wharf shall be a Class I, Division 2 location with distances in accordance with Table 514.3(B)(1) for dispenser and outdoor locations.
- (2) Spaces below the surface of the floating dock, pier, or wharf that have areas or enclosures, such as tubs, voids, pits, vaults, boxes, depressions, fuel piping chases, or similar spaces, where flammable liquid or vapor can accumulate shall be a Class I, Division 1 location.

Exception No. 1: Dock, pier, or wharf sections that do not support fuel dispensers and abut, but are located 6.0 m (20 ft) or more from, dock sections that support a fuel dispenser(s) shall be permitted to be Class I, Division 2 locations where documented air space is provided between dock sections to allow flammable liquids or vapors to dissipate without traveling to such dock sections. The documentation shall comply with the requirements of 500.4.

Exception No. 2: Dock, pier, or wharf sections that do not support fuel dispensers and do not directly abut sections that support fuel dispensers shall be permitted to be unclassified where documented air space is provided and where flammable liquids or vapors cannot travel to such dock sections. The documentation shall comply with the requirements of 500.4.

(b) *Open Construction.* Where the construction of piers, wharfs, or docks is open, as in the case of decks built on stringers supported by pilings, floats, pontoons, or similar construction, the following shall apply:

- (1) The area 450 mm (18 in.) above the surface of the dock, pier, or wharf and extending 6.0 m (20 ft) horizontally in all directions from the outside edge of the dispenser and down to the water level shall be a Class 1, Division 2 location.
- (2) Enclosures such as tubs, voids, pits, vaults, boxes, depressions, piping chases, or similar spaces where flammable liquids or vapors can accumulate within 6.0 m (20 ft) of the dispenser shall be a Class I, Division 1 location.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
API_input_to_NEC_NFPA_70_FINAL_Searles_1.pdf	API_input_to_NEC_NFPA_70_FINAL_Searles_1	

Statement of Problem and Substantiation for Public Input

Add a new Figure to show a Class I, Div. 2 or Class I, Zone 2 classified (hazardous) location extending from the edge of the dispenser out to a distance of the maximum reach of the hose and nozzle plus 1 m (3 ft), from top of the lower portion of the dispenser (the cabinet where the fuel system components are located) down to grade. This Figure would apply when a dispenser is actively dispensing fuel. See attached example sketch.

Figure 514.3 is taken from NFPA 30A, but only shows the "permanent" hazardous area associated with a fuel dispenser. The figure does not take into account that when fuel is actively being dispensed, an additional "temporary" hazardous area exists as the fuel and vapors come out of the nozzle. When dispensing fuel, the hose can be extended in any direction from the attachment point at the dispenser to its longest extent - approximately 18 feet (depending on the length of the hose and where it is attached to the dispenser). The original figure was intended to define the "permanent" hazardous area so that the electrical wiring and equipment associated with the dispenser could be properly installed. As retail gasoline stations and customer patterns have evolved, there have been attempts to install general purpose electrical equipment that is not associated with the dispenser in close proximity to fuel dispensers (e.g. vending machines, ATMs, refrigerated coolers, air/vacuum machines, etc.). Doing so presents a hazard to the public since in practice fuel vapors and potentially spilled fuel can exist in additional locations beyond those shown in the current Figure 514.3.

This Public Input is to add an additional figure with hazardous areas that more thoroughly define the hazardous area around a dispenser only while it is dispensing fuel. This will provide clarity on the types of electrical equipment and the appropriate installation methods required when installed in close proximity to fuel dispensers.

It is suggested that NEC Code Panel 14 could coordinate any committee action taken on this Public Input with the committee responsible for NFPA 30A to identify and address any potential hazards associated with flammable and combustible liquids at motor fuel dispensing facilities as related to electrical equipment installations that are governed by NEC.

Submitter Information Verification

Submitter Full Name: Prentiss Searles
Organization: American Petroleum Institute
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Submittal Date: Fri Sep 08 08:52:59 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: No technical substantiation provided for this PI. NFPA-30A covers temporary and fixed classification, this is extracted text from NFPA-30A.

Statement of Problem and Substantiation for Public Input

API PI (A-1)

Public Input on NFPA 70 – 514.3

Add a new Figure to show a Class I, Div. 2 or Class I, Zone 2 classified (hazardous) location extending from the edge of the dispenser out to a distance of the maximum reach of the hose and nozzle plus 1 m (3 ft), from top of the lower portion of the dispenser (the cabinet where the fuel system components are located) down to grade. This Figure would apply when a dispenser is actively dispensing fuel. See attached example sketch.

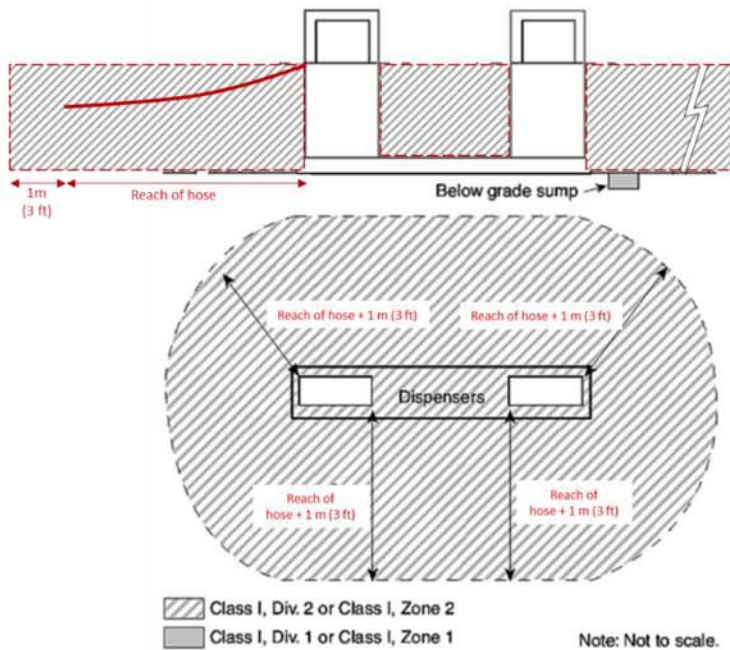


Figure 514.xx Classified Areas Adjacent to Dispensers while in Use.

Statement of Problem and Substantiation for Public Input

Figure 514.3 is taken from NFPA 30A, but only shows the “permanent” hazardous area associated with a fuel dispenser. The figure does not take into account that when fuel is actively being dispensed, an additional “temporary” hazardous area exists as the fuel and vapors come out of the nozzle. When dispensing fuel, the hose can be extended in any direction from the attachment point at the dispenser to its longest extent - approximately 18 feet (depending on the length of the hose and where it is

attached to the dispenser). The original figure was intended to define the “permanent” hazardous area so that the electrical wiring and equipment associated with the dispenser could be properly installed. As retail gasoline stations and customer patterns have evolved, there have been attempts to install general purpose electrical equipment that is not associated with the dispenser in close proximity to fuel dispensers (e.g. vending machines, ATMs, refrigerated coolers, air/vacuum machines, etc.). Doing so presents a hazard to the public since in practice fuel vapors and potentially spilled fuel can exist in additional locations beyond those shown in the current Figure 514.3.

This Public Input is to add an additional figure with hazardous areas that more thoroughly define the hazardous area around a dispenser only while it is dispensing fuel. This will provide clarity on the types of electrical equipment and the appropriate installation methods required when installed in close proximity to fuel dispensers.

It is suggested that NEC Code Panel 14 could coordinate any committee action taken on this Public Input with the committee responsible for NFPA 30A to identify and address any potential hazards associated with flammable and combustible liquids at motor fuel dispensing facilities as related to electrical equipment installations that are governed by NEC.



Public Input No. 4536-NFPA 70-2023 [Section No. 514.3(B)(1)]

(1) Class I Locations.

Table 514.3(B)(1) shall be applied where Class I liquids are stored, handled, or dispensed and shall be used to delineate and classify motor fuel dispensing facilities and commercial garages as defined in Article 100. Table 515.3 shall be used for the purpose of delineating and classifying aboveground tanks. A Class I location shall not extend beyond an unpierced wall, roof, or other solid partition. [30A:8.1, 8.2, 8.3]

Table 514.3(B)(1) Class I Locations — Motor Fuel Dispensing Facilities

<u>Location</u>	<u>Division (Group D)</u>	<u>Zone (Group IIA)</u>	<u>Extent of Classified Location¹</u>
Dispensing Device (except Overhead Type)^{2, 3}			
Under dispenser containment	1	1	Entire space within and under dispenser pit or containment
Dispenser	2	2	Within 450 mm (18 in.) of dispenser enclosure or that portion of dispenser enclosure containing liquid-handling components, extending horizontally in all directions and down to grade level
Outdoor	2	2	Up to 450 mm (18 in.) above grade level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
Indoor			
- with mechanical ventilation	2	2	Up to 450 mm (18 in.) above floor level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
- with gravity ventilation	2	2	Up to 450 mm (18 in.) above floor level, extending 7.5 m (25 ft) horizontally in all directions from dispenser enclosure
Dispensing Device — Overhead Type⁴			
	1	1	Space within dispenser enclosure and all electrical equipment integral with dispensing hose or nozzle
	2	2	Within 450 mm (18 in.) of dispenser enclosure, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level, extending 6 m (20 ft) horizontally in all directions from a point vertically below edge of dispenser enclosure
Remote Pump —			
Outdoor	1	1	Entire space within any pit or box below grade level, any part of which is within 3 m (10 ft) horizontally from any edge of pump
	2	2	Within 900 mm (3 ft) of any edge of pump, extending horizontally in all directions
	2	2	Up to 450 mm (18 in.) above grade level, extending 3 m (10 ft) horizontally in all directions from any edge of pump
Indoor	1	1	Entire space within any pit
	2	2	Within 1.5 m (5 ft) of any edge of pump, extending in all directions
	2	2	Up to 900 mm (3 ft) above floor level, extending 7.5 m (25 ft) horizontally in all directions from any edge of pump
	unclassified	unclassified	Except as noted below
Sales, Storage, Rest Rooms			
including structures (such as the attendant's kiosk) on or adjacent to dispensers	1	1	Entire volume, if there is any opening to room within the extent of a Division 1 or Zone 1 location
	2	2	Entire volume, if there is any opening to room within the extent of a Division 2 or Zone 2 location
Tank, Aboveground			
Inside tank	1	0	Entire inside volume
Shell, ends, roof, dike area	1	1	Entire space within dike, where dike height exceeds distance from tank shell to inside of dike wall for more than 50 percent of tank circumference
	2	2	Entire space within dike, where dike height does not exceed distance from tank shell to inside of dike wall for more than 50 percent of tank circumference
Vent	2	2	Within 3 m (10 ft) of shell, ends, or roof of tank
	1	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	2	Between 1.5 m and 3 m (5 ft and 10 ft) from open end of vent, extending in all directions

<u>Location</u>	<u>Division (Group D)</u>	<u>Zone (Group IIA)</u>	<u>Extent of Classified Location¹</u>
Tank, Underground			
Inside tank	1	0	Entire inside volume
Fill Opening	1	1	Entire space within any pit or box below grade level, any part of which is within a Division 1 or Division 2 classified location or within a Zone 1 or Zone 2 classified location
	2	2	Up to 450 mm (18 in.) above grade level, extending 1.5 m (5 ft) horizontally in all directions from any tight-fill connection and extending 3 m (10 ft) horizontally in all directions from any loose-fill connection
Vent	1	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	2	Between 1.5 m and 3 m (5 ft and 10 ft) from open end of vent, extending in all directions
Vapor Processing System			
Pits	1	1	Entire space within any pit or box below grade level, any part of which: (1) is within a Division 1 or Division 2 classified location; (2) is within a Zone 1 or Zone 2 classified location; (3) houses any equipment used to transfer or process vapors
Equipment in protective enclosures	2	2	Entire space within enclosure
Equipment <i>not</i> within protective enclosure	2	2	Within 450 mm (18 in.) of equipment containing flammable vapors or liquid, extending horizontally in all directions and down to grade level
- Equipment enclosure	2	2	Up to 450 mm (18 in.) above grade level within 3 m (10 ft) horizontally of the vapor processing equipment
	1	1	Entire space within enclosure, if flammable vapor or liquid is present under normal operating conditions
- Vacuum assist blower	2	2	Entire space within enclosure, if flammable vapor or liquid is not present under normal operating conditions
	2	2	Within 450 mm (18 in.) of blower, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level, extending 3 m (10 ft) horizontally in all directions
Vault	1	1	Entire interior space, if Class I liquids are stored within

¹For marine application, *grade level* means the surface of a pier, extending down to water level.

²Refer to Figure 514.3 and Figure 514.3(B) for an illustration of classified location around dispensing devices.

³Area classification inside the dispenser enclosure is covered in UL 87, *Standard for Power-Operated Dispensing Devices for Petroleum Products*.

⁴Ceiling-mounted hose reel. [30A:Table 8.3.1]

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
API_input_to_NEC_NFPA_70_FINAL_Searles_2.pdf	API_input_to_NEC_NFPA_70_FINAL_Searles_2	
API_input_to_NEC_NFPA_70_FINAL_Searles_514.3_B_1_.pdf	API_input_to_NEC_NFPA_70_FINAL_Searles_514.3_B_1	

Statement of Problem and Substantiation for Public Input

Table 514.3(B)(1) currently defines the hazardous area associated with the tank fill point in the Tank, Underground section on the "Fill Opening" line, but the table does not account for the temporary or transient hazardous area that exists while fuel is being delivered to the tank. There have been attempts to install, and actual installation of, general purpose electrical equipment in close proximity to tank fill points (e.g. air/vacuum machines, Electric Vehicle Supply Equipment, etc.). Doing so presents a hazard to the public since in practice fuel vapors and potentially spilled fuel can exist in locations beyond those in close proximity to the actual fill point as currently defined in Table 514.3(B)(1).

This Public Input is to add an additional hazardous area around a tank fill that applies while fuel is being transferred so that general purpose electrical equipment and installation methods installed near a tank fill do not present an ignition hazard during fuel transfer operations.

When fuel is actively being transferred through the fill opening, there is also a hazardous area around the tank truck. NFPA 497

defines this hazardous area in Figure 5.10.4(d) to be a 3ft spherical area around the transfer point and a linear area extending 10 ft radially from the transfer point. However, a standalone hazardous area for the truck cannot be accurately defined because the location of the truck is not fixed - experience shows that based on the truck driver and actual site conditions at the time the truck arrives, the location where the truck parks to transfer fuel can vary. A typical hose used during a fuel transfer is 20 ft long, so the truck can be a maximum of 20 ft from the fill point. Since the fill point is fixed, the extent of the 10 ft hazardous area around the truck from NFPA 497 can be added to the maximum distance of 20 ft that the truck can be from the fill point to determine that a Division 2 or Zone 2 classified (hazardous) location can be up to 9 m (30 ft) from the fill point. Final determination of distance between 6 m and 9 m should be based on committee accepted credible release rate or spill size.

It is suggested that NEC Code Panel 14 could coordinate any committee action taken on this Public Input with the committee responsible for NFPA 30A to identify and address any potential hazards associated with flammable and combustible liquids at motor fuel dispensing facilities as related to electrical equipment installations that are governed by NEC.

Submitter Information Verification

Submitter Full Name: Prentiss Searles
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City:
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Zip:
Submittal Date: Fri Sep 08 09:16:53 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: No technical substantiation for this PI. NFPA-30A covers temporary and fixed classification, this is extracted text from NFPA-30A.

API PI (A-2)

Public Input on NFPA 70 – 514.3(B)(1)

Add a new line to Table 514.3(B)(1) in the Tank, Underground section for “Fill Opening – during fuel transfer” such that there is an additional Division 2 / Zone 2 classified (hazardous) location “Up to 1m (3 ft) above grade level, extending to a distance between 6 m and 9 m (approx. 20-30 ft) horizontally in all directions from any tank fill connection while fuel transfer is occurring.”

Statement of Problem and Substantiation for Public Input

Table 514.3(B)(1) currently defines the hazardous area associated with the tank fill point in the Tank, Underground section on the “Fill Opening” line, but the table does not account for the temporary or transient hazardous area that exists while fuel is being delivered to the tank. There have been attempts to install, and actual installation of, general purpose electrical equipment in close proximity to tank fill points (e.g. air/vacuum machines, Electric Vehicle Supply Equipment, etc.). Doing so presents a hazard to the public since in practice fuel vapors and potentially spilled fuel can exist in locations beyond those in close proximity to the actual fill point as currently defined in Table 514.3(B)(1).

This Public Input is to add an additional hazardous area around a tank fill that applies while fuel is being transferred so that general purpose electrical equipment and installation methods installed near a tank fill do not present an ignition hazard during fuel transfer operations.

When fuel is actively being transferred through the fill opening, there is also a hazardous area around the tank truck. NFPA 497 defines this hazardous area in Figure 5.10.4(d) to be a 3ft spherical area around the transfer point and a linear area extending 10 ft radially from the transfer point. However, a standalone hazardous area for the truck cannot be accurately defined because the location of the truck is not fixed - experience shows that based on the truck driver and actual site conditions at the time the truck arrives, the location where the truck parks to transfer fuel can vary. A typical hose used during a fuel transfer is 20 ft long, so the truck can be a maximum of 20 ft from the fill point. Since the fill point is fixed, the extent of the 10 ft hazardous area around the truck from NFPA 497 can be added to the maximum distance of 20 ft that the truck can be from the fill point to determine that a Division 2 or Zone 2 classified (hazardous) location can be up to 9 m (30 ft) from the fill point. Final determination of distance between 6 m and 9 m should be based on committee accepted credible release rate or spill size.

It is suggested that NEC Code Panel 14 could coordinate any committee action taken on this Public Input with the committee responsible for NFPA 30A to identify and address any potential hazards associated with flammable and combustible liquids at motor fuel dispensing facilities as related to electrical equipment installations that are governed by NEC.

(1) Class I Locations.

Table 514.3(B)(1) shall be applied where Class I liquids are stored, handled, or dispensed and shall be used to delineate and classify motor fuel dispensing facilities and commercial garages as defined in Article 100. Table 515.3 shall be used for the purpose of delineating and classifying aboveground tanks. A Class I location shall not extend beyond an unpierced wall, roof, or other solid partition. [30A:8.1, 8.2, 8.3]

Table 514.3(B)(1) Class I Locations — Motor Fuel Dispensing Facilities

Location	Division (Group D)	Zone (Group IIA)	Extent of Classified Location ¹
Dispensing Device (except Overhead Type) 2, 3			
Under dispenser containment	1	1	Entire space within and under dispenser pit or containment Within 450 mm (18 in.) of dispenser enclosure or that portion of dispenser enclosure containing liquid-handling components, extending horizontally in all directions and down to grade level
Dispenser	2	2	Up to 450 mm (18 in.) above grade level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
Outdoor	2	2	Up to 450 mm (18 in.) above floor level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
Indoor			
- with mechanical ventilation	2	2	Up to 450 mm (18 in.) above floor level, extending 7.5 m (25 ft) horizontally in all directions from dispenser enclosure
- with gravity ventilation	2	2	Up to 450 mm (18 in.) above floor level, extending 7.5 m (25 ft) horizontally in all directions from dispenser enclosure
Dispensing Device — Overhead Type⁴			
	1	1	Space within dispenser enclosure and all electrical equipment integral with dispensing hose or nozzle
	2	2	Within 450 mm (18 in.) of dispenser enclosure, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level, extending 6 m (20 ft) horizontally in all directions from a point vertically below edge of dispenser enclosure
Remote Pump —			
Outdoor	1	1	Entire space within any pit or box below grade level, any part of which is within 3 m (10 ft) horizontally from any edge of pump

Location	Division (Group D)	Zone (Group IIA)	Extent of Classified Location¹
Indoor	2	2	Within 900 mm (3 ft) of any edge of pump, extending horizontally in all directions
	2	2	Up to 450 mm (18 in.) above grade level, extending 3 m (10 ft) horizontally in all directions from any edge of pump
	1	1	Entire space within any pit
	2	2	Within 1.5 m (5 ft) of any edge of pump, extending in all directions
	2	2	Up to 900 mm (3 ft) above floor level, extending 7.5 m (25 ft) horizontally in all directions from any edge of pump
	unclassified	unclassified	Except as noted below
Sales, Storage, Rest Rooms including structures (such as the attendant's kiosk) on or adjacent to dispensers	1	1	Entire volume, if there is any opening to room within the extent of a Division 1 or Zone 1 location
	2	2	Entire volume, if there is any opening to room within the extent of a Division 2 or Zone 2 location
Tank, Aboveground			
Inside tank	1	0	Entire inside volume
Shell, ends, roof, dike area	1	1	Entire space within dike, where dike height exceeds distance from tank shell to inside of dike wall for more than 50 percent of tank circumference
	2	2	Entire space within dike, where dike height does not exceed distance from tank shell to inside of dike wall for more than 50 percent of tank circumference
Vent	2	2	Within 3 m (10 ft) of shell, ends, or roof of tank
	1	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	2	Between 1.5 m and 3 m (5 ft and 10 ft) from open end of vent, extending in all directions
Tank, Underground			
Inside tank	1	0	Entire inside volume
Fill Opening	1	1	Entire space within any pit or box below grade level, any part of which is within a Division 1 or Division 2 classified location

Location	Division (Group D)	Zone (Group IIA)	Extent of Classified Location ¹
			or within a Zone 1 or Zone 2 classified location
	2	2	Up to 450 mm (18 in.) above grade level, extending 1.5 m (5 ft) horizontally in all directions from any tight-fill connection and extending 3 m (10 ft) horizontally in all directions from any loose-fill connection
- <u>During fuel transfer</u>	<u>2</u>	<u>2</u>	<u>Up to 1m (3 ft) above grade level, extending to a distance between 6 m and 9 m (approx. 20-30 ft) horizontally in all directions from any tank fill connection while fuel transfer is occurring.</u>
Vent	1	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	2	Between 1.5 m and 3 m (5 ft and 10 ft) from open end of vent, extending in all directions
Vapor Processing System			
Pits	1	1	Entire space within any pit or box below grade level, any part of which: (1) is within a Division 1 or Division 2 classified location; (2) is within a Zone 1 or Zone 2 classified location; (3) houses any equipment used to transfer or process vapors
Equipment in protective enclosures	2	2	Entire space within enclosure
Equipment <i>not</i> within protective enclosure	2	2	Within 450 mm (18 in.) of equipment containing flammable vapors or liquid, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level within 3 m (10 ft) horizontally of the vapor processing equipment
- Equipment enclosure	1	1	Entire space within enclosure, if flammable vapor or liquid is present under normal operating conditions
	2	2	Entire space within enclosure, if flammable vapor or liquid is not present under normal operating conditions

Location	Division (Group D)	Zone (Group IIA)	Extent of Classified Location¹
- Vacuum assist blower	2	2	Within 450 mm (18 in.) of blower, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level, extending 3 m (10 ft) horizontally in all directions
Vault	1	1	Entire interior space, if Class I liquids are stored within

¹For marine application, *grade level* means the surface of a pier, extending down to water level.

²Refer to Figure 514.3 and Figure 514.3(B) for an illustration of classified location around dispensing devices.

³Area classification inside the dispenser enclosure is covered in UL 87, *Standard for Power-Operated Dispensing Devices for Petroleum Products*.

⁴Ceiling-mounted hose reel. [30A:Table 8.3.1]



Public Input No. 4537-NFPA 70-2023 [Section No. 514.3(B)(1)]

(1) Class I Locations.

Table 514.3(B)(1) shall be applied where Class I liquids are stored, handled, or dispensed and shall be used to delineate and classify motor fuel dispensing facilities and commercial garages as defined in Article 100. Table 515.3 shall be used for the purpose of delineating and classifying aboveground tanks. A Class I location shall not extend beyond an unpierced wall, roof, or other solid partition. [30A:8.1, 8.2, 8.3]

Table 514.3(B)(1) Class I Locations — Motor Fuel Dispensing Facilities

<u>Location</u>	<u>Division (Group D)</u>	<u>Zone (Group IIA)</u>	<u>Extent of Classified Location¹</u>
Dispensing Device (except Overhead Type)^{2, 3}			
Under dispenser containment	1	1	Entire space within and under dispenser pit or containment
Dispenser	2	2	Within 450 mm (18 in.) of dispenser enclosure or that portion of dispenser enclosure containing liquid-handling components, extending horizontally in all directions and down to grade level
Outdoor	2	2	Up to 450 mm (18 in.) above grade level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
Indoor			
- with mechanical ventilation	2	2	Up to 450 mm (18 in.) above floor level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
- with gravity ventilation	2	2	Up to 450 mm (18 in.) above floor level, extending 7.5 m (25 ft) horizontally in all directions from dispenser enclosure
Dispensing Device — Overhead Type⁴			
	1	1	Space within dispenser enclosure and all electrical equipment integral with dispensing hose or nozzle
	2	2	Within 450 mm (18 in.) of dispenser enclosure, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level, extending 6 m (20 ft) horizontally in all directions from a point vertically below edge of dispenser enclosure
Remote Pump —			
Outdoor	1	1	Entire space within any pit or box below grade level, any part of which is within 3 m (10 ft) horizontally from any edge of pump
	2	2	Within 900 mm (3 ft) of any edge of pump, extending horizontally in all directions
	2	2	Up to 450 mm (18 in.) above grade level, extending 3 m (10 ft) horizontally in all directions from any edge of pump
Indoor	1	1	Entire space within any pit
	2	2	Within 1.5 m (5 ft) of any edge of pump, extending in all directions
	2	2	Up to 900 mm (3 ft) above floor level, extending 7.5 m (25 ft) horizontally in all directions from any edge of pump
	unclassified	unclassified	Except as noted below
Sales, Storage, Rest Rooms			
including structures (such as the attendant's kiosk) on or adjacent to dispensers	1	1	Entire volume, if there is any opening to room within the extent of a Division 1 or Zone 1 location
	2	2	Entire volume, if there is any opening to room within the extent of a Division 2 or Zone 2 location
Tank, Aboveground			
Inside tank	1	0	Entire inside volume
Shell, ends, roof, dike area	1	1	Entire space within dike, where dike height exceeds distance from tank shell to inside of dike wall for more than 50 percent of tank circumference
	2	2	Entire space within dike, where dike height does not exceed distance from tank shell to inside of dike wall for more than 50 percent of tank circumference
Vent	2	2	Within 3 m (10 ft) of shell, ends, or roof of tank
	1	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	2	Between 1.5 m and 3 m (5 ft and 10 ft) from open end of vent, extending in all directions

<u>Location</u>	<u>Division (Group D)</u>	<u>Zone (Group IIA)</u>	<u>Extent of Classified Location¹</u>
Tank, Underground			
Inside tank	1	0	Entire inside volume
Fill Opening	1	1	Entire space within any pit or box below grade level, any part of which is within a Division 1 or Division 2 classified location or within a Zone 1 or Zone 2 classified location
	2	2	Up to 450 mm (18 in.) above grade level, extending 1.5 m (5 ft) horizontally in all directions from any tight-fill connection and extending 3 m (10 ft) horizontally in all directions from any loose-fill connection
Vent	1	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	2	Between 1.5 m and 3 m (5 ft and 10 ft) from open end of vent, extending in all directions
Vapor Processing System			
Pits	1	1	Entire space within any pit or box below grade level, any part of which: (1) is within a Division 1 or Division 2 classified location; (2) is within a Zone 1 or Zone 2 classified location; (3) houses any equipment used to transfer or process vapors
Equipment in protective enclosures	2	2	Entire space within enclosure
Equipment <i>not</i> within protective enclosure	2	2	Within 450 mm (18 in.) of equipment containing flammable vapors or liquid, extending horizontally in all directions and down to grade level
- Equipment enclosure	2	2	Up to 450 mm (18 in.) above grade level within 3 m (10 ft) horizontally of the vapor processing equipment
	1	1	Entire space within enclosure, if flammable vapor or liquid is present under normal operating conditions
- Vacuum assist blower	2	2	Entire space within enclosure, if flammable vapor or liquid is not present under normal operating conditions
	2	2	Within 450 mm (18 in.) of blower, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level, extending 3 m (10 ft) horizontally in all directions
Vault	1	1	Entire interior space, if Class I liquids are stored within

¹For marine application, *grade level* means the surface of a pier, extending down to water level.

²Refer to Figure 514.3 and Figure 514.3(B) for an illustration of classified location around dispensing devices.

³Area classification inside the dispenser enclosure is covered in UL 87, *Standard for Power-Operated Dispensing Devices for Petroleum Products*.

⁴Ceiling-mounted hose reel. [30A:Table 8.3.1]

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
API_input_to_NEC_NFPA_70_FINAL_Searles_3.pdf	API_input_to_NEC_NFPA_70_FINAL_Searles_3	
API_input_to_NEC_NFPA_70_FINAL_Searles_3_514.3_B_1_.pdf	API_input_to_NEC_NFPA_70_FINAL_Searles_3_514.3_B_1	

Statement of Problem and Substantiation for Public Input

Table 514.3(B)(1) in the Tank, Aboveground section currently does not define any hazardous area associated with the tank fill point. Since other characteristics of the tank are used to define a hazardous area around the tank, this is acceptable when the tank fill point is not actively being used to transfer fuel. However, the current hazardous areas defined for an aboveground tank do not account for the temporary or transient hazardous area that exists while fuel is being delivered. There have been attempts to install, and actual installation of, general purpose electrical equipment in close proximity to tank fill points (e.g. air/vacuum machines, Electric Vehicle Supply Equipment, etc.). Doing so presents a hazard to the public since in practice fuel vapors and potentially spilled fuel can exist in locations beyond those in close proximity to the actual fill point as currently defined in Table 514.3(B)(1).

This Public Input is to add an additional hazardous area around a tank fill that applies while fuel is being transferred so that electrical equipment and installation methods installed near a tank fill do not present an ignition hazard during fuel transfer operations.

When fuel is actively being transferred through the fill opening, there is also a hazardous area around the tank truck. NFPA 497

defines this hazardous area in Figure 5.10.4(d) to be a 3ft spherical area around the transfer point and a linear area extending 10 ft radially from the transfer point. However, a standalone hazardous area for the truck cannot be accurately defined because the location of the truck is not fixed - experience shows that based on the truck driver and actual site conditions at the time the truck arrives, the location where the truck parks to transfer fuel can vary. A typical hose used during a fuel transfer is 20 ft long, so the truck can be a maximum of 20 ft from the fill point. Since the fill point is fixed, the extent of the 10 ft hazardous area around the truck from NFPA 497 can be added to the maximum distance of 20 ft that the truck can be from the fill point to determine that a Division 2 or Zone 2 classified (hazardous) location can be up to 9 m (30 ft) from the fill point. Final determination of distance between 6 and 9m should be based on committee discussion.

It is suggested that NEC Code Panel 14 could coordinate any committee action taken on this Public Input with the committee responsible for NFPA 30A to identify and address any potential hazards associated with flammable and combustible liquids at motor fuel dispensing facilities as related to electrical equipment installations that are governed by NEC.

Submitter Information Verification

Submitter Full Name: Prentiss Searles
Organization: American Petroleum Institute
Street Address:
City:
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Zip:
Submittal Date: Fri Sep 08 09:21:53 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: No technical substantiation for this PI. NFPA-30A covers temporary and fixed classification, this is extracted text from NFPA-30A.

API PI (A-3)

Public Input on NFPA 70 – 514.3(B)(1)

Add a new line to Table 514.3(B)(1) in the Tank, Aboveground section for “Fill Opening – during fuel transfer” such that there is an additional Division 2 / Zone 2 classified (hazardous) location “Up to 1m (3 ft) above grade level, extending to a distance between 6m and 9m (approx. 20-30 ft) horizontally in all directions from any tank fill connection while fuel transfer is occurring.”

Statement of Problem and Substantiation for Public Input

Table 514.3(B)(1) in the Tank, Aboveground section currently does not define any hazardous area associated with the tank fill point. Since other characteristics of the tank are used to define a hazardous area around the tank, this is acceptable when the tank fill point is not actively being used to transfer fuel. However, the current hazardous areas defined for an aboveground tank do not account for the temporary or transient hazardous area that exists while fuel is being delivered. There have been attempts to install, and actual installation of, general purpose electrical equipment in close proximity to tank fill points (e.g. air/vacuum machines, Electric Vehicle Supply Equipment, etc.). Doing so presents a hazard to the public since in practice fuel vapors and potentially spilled fuel can exist in locations beyond those in close proximity to the actual fill point as currently defined in Table 514.3(B)(1).

This Public Input is to add an additional hazardous area around a tank fill that applies while fuel is being transferred so that electrical equipment and installation methods installed near a tank fill do not present an ignition hazard during fuel transfer operations.

When fuel is actively being transferred through the fill opening, there is also a hazardous area around the tank truck. NFPA 497 defines this hazardous area in Figure 5.10.4(d) to be a 3ft spherical area around the transfer point and a linear area extending 10 ft radially from the transfer point. However, a standalone hazardous area for the truck cannot be accurately defined because the location of the truck is not fixed - experience shows that based on the truck driver and actual site conditions at the time the truck arrives, the location where the truck parks to transfer fuel can vary. A typical hose used during a fuel transfer is 20 ft long, so the truck can be a maximum of 20 ft from the fill point. Since the fill point is fixed, the extent of the 10 ft hazardous area around the truck from NFPA 497 can be added to the maximum distance of 20 ft that the truck can be from the fill point to determine that a Division 2 or Zone 2 classified (hazardous) location can be up to 9 m (30 ft) from the fill point. Final determination of distance between 6 and 9m should be based on committee discussion.

It is suggested that NEC Code Panel 14 could coordinate any committee action taken on this Public Input with the committee responsible for NFPA 30A to identify and address any potential hazards associated with flammable and combustible liquids at motor fuel dispensing facilities as related to electrical equipment installations that are governed by NEC.

(1) Class I Locations.

Table 514.3(B)(1) shall be applied where Class I liquids are stored, handled, or dispensed and shall be used to delineate and classify motor fuel dispensing facilities and commercial garages as defined in Article 100. Table 515.3 shall be used for the purpose of delineating and classifying aboveground tanks. A Class I location shall not extend beyond an unpierced wall, roof, or other solid partition. [30A:8.1, 8.2, 8.3]

Table 514.3(B)(1) Class I Locations — Motor Fuel Dispensing Facilities

Location	Division (Group D)	Zone (Group IIA)	Extent of Classified Location ¹
Dispensing Device (except Overhead Type) 2, 3			
Under dispenser containment	1	1	Entire space within and under dispenser pit or containment Within 450 mm (18 in.) of dispenser enclosure or that portion of dispenser enclosure containing liquid-handling components, extending horizontally in all directions and down to grade level
Dispenser	2	2	Up to 450 mm (18 in.) above grade level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
Outdoor	2	2	Up to 450 mm (18 in.) above floor level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
Indoor			
- with mechanical ventilation	2	2	Up to 450 mm (18 in.) above floor level, extending 6 m (20 ft) horizontally in all directions from dispenser enclosure
- with gravity ventilation	2	2	Up to 450 mm (18 in.) above floor level, extending 7.5 m (25 ft) horizontally in all directions from dispenser enclosure
Dispensing Device — Overhead Type⁴			
	1	1	Space within dispenser enclosure and all electrical equipment integral with dispensing hose or nozzle
	2	2	Within 450 mm (18 in.) of dispenser enclosure, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level, extending 6 m (20 ft) horizontally in all directions from a point vertically below edge of dispenser enclosure
Remote Pump —			
Outdoor	1	1	Entire space within any pit or box below grade level, any part of which is within 3 m (10 ft) horizontally from any edge of pump

Location	Division (Group D)	Zone (Group IIA)	Extent of Classified Location ¹
Indoor	2	2	Within 900 mm (3 ft) of any edge of pump, extending horizontally in all directions
	2	2	Up to 450 mm (18 in.) above grade level, extending 3 m (10 ft) horizontally in all directions from any edge of pump
	1	1	Entire space within any pit
	2	2	Within 1.5 m (5 ft) of any edge of pump, extending in all directions
	2	2	Up to 900 mm (3 ft) above floor level, extending 7.5 m (25 ft) horizontally in all directions from any edge of pump
	unclassified	unclassified	Except as noted below
Sales, Storage, Rest Rooms including structures (such as the attendant's kiosk) on or adjacent to dispensers	1	1	Entire volume, if there is any opening to room within the extent of a Division 1 or Zone 1 location
	2	2	Entire volume, if there is any opening to room within the extent of a Division 2 or Zone 2 location
Tank, Aboveground			
Inside tank	1	0	Entire inside volume
Shell, ends, roof, dike area	1	1	Entire space within dike, where dike height exceeds distance from tank shell to inside of dike wall for more than 50 percent of tank circumference
	2	2	Entire space within dike, where dike height does not exceed distance from tank shell to inside of dike wall for more than 50 percent of tank circumference
Vent	2	2	Within 3 m (10 ft) of shell, ends, or roof of tank
	1	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	2	Between 1.5 m and 3 m (5 ft and 10 ft) from open end of vent, extending in all directions
<u>Fill Opening</u>			
<u>– during fuel transfer</u>	<u>2</u>	<u>2</u>	<u>Up to 1m (3 ft) above grade level, extending to a distance between 6m and 9m (approx. 20-30 ft) horizontally in all directions from any tank fill connection while fuel transfer is occurring.</u>

Location	Division (Group D)	Zone (Group IIA)	Extent of Classified Location ¹
Tank, Underground			
Inside tank	1	0	Entire inside volume
Fill Opening	1	1	Entire space within any pit or box below grade level, any part of which is within a Division 1 or Division 2 classified location or within a Zone 1 or Zone 2 classified location
	2	2	Up to 450 mm (18 in.) above grade level, extending 1.5 m (5 ft) horizontally in all directions from any tight-fill connection and extending 3 m (10 ft) horizontally in all directions from any loose-fill connection
Vent	1	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	2	Between 1.5 m and 3 m (5 ft and 10 ft) from open end of vent, extending in all directions
Vapor Processing System			
Pits	1	1	Entire space within any pit or box below grade level, any part of which: (1) is within a Division 1 or Division 2 classified location; (2) is within a Zone 1 or Zone 2 classified location; (3) houses any equipment used to transfer or process vapors
Equipment in protective enclosures	2	2	Entire space within enclosure
Equipment <i>not</i> within protective enclosure	2	2	Within 450 mm (18 in.) of equipment containing flammable vapors or liquid, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level within 3 m (10 ft) horizontally of the vapor processing equipment
- Equipment enclosure	1	1	Entire space within enclosure, if flammable vapor or liquid is present under normal operating conditions
	2	2	Entire space within enclosure, if flammable vapor or liquid is not present under normal operating conditions

Location	Division (Group D)	Zone (Group IIA)	Extent of Classified Location¹
- Vacuum assist blower	2	2	Within 450 mm (18 in.) of blower, extending horizontally in all directions and down to grade level
	2	2	Up to 450 mm (18 in.) above grade level, extending 3 m (10 ft) horizontally in all directions
Vault	1	1	Entire interior space, if Class I liquids are stored within

¹For marine application, *grade level* means the surface of a pier, extending down to water level.

²Refer to Figure 514.3 and Figure 514.3(B) for an illustration of classified location around dispensing devices.

³Area classification inside the dispenser enclosure is covered in UL 87, *Standard for Power-Operated Dispensing Devices for Petroleum Products*.

⁴Ceiling-mounted hose reel. [30A:Table 8.3.1]



Public Input No. 4539-NFPA 70-2023 [Section No. 514.3(B)(3)]

(3) Fuel Storage.

(a) Aboveground tanks storing CNG or LNG shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property. [30A:12.3.1]

Informational Note: See NFPA 52, *Vehicular Natural Gas Fuel Systems Code*, Section 8.4, for the relevant distances for CNG and LNG.

(b) Aboveground tanks storing hydrogen shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property. [30A:12.3.2]

Informational Note: See NFPA 2, *Hydrogen Technologies Code*, for the relevant distances for hydrogen.

(c) Aboveground tanks storing LP-Gas shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property. [30A:12.3.3]

Informational Note: See NFPA 58, *Liquefied Petroleum Gas Code*, Section 6.3, for the relevant distances for LP-Gas.

(d) Aboveground tanks storing CNG, LNG, or LP-Gas shall be separated from each other by at least 6 m (20 ft) and from dispensing devices that dispense liquid or gaseous motor vehicle fuels by at least 6 m (20 ft). [30A:12.3.3]

Exception No. 1: The required separation shall not apply to tanks or dispensers storing or handling fuels of the same chemical composition.

Exception No. 2: The required separation shall not apply when both the gaseous fuel storage and dispensing equipment are at least 15 m (50 ft) from any other aboveground motor fuel storage or dispensing equipment.

Informational Note: See NFPA 52, *Vehicular Natural Gas Fuel Systems Code*, or NFPA 58, *Liquefied Petroleum Gas Code*, for additional information.

(e) *Dispenser Installations Beneath Canopies.* Where CNG or LNG dispensers are installed beneath a canopy or enclosure, either the canopy or enclosure shall be designed to prevent accumulation or entrapment of ignitable vapors or all electrical equipment installed beneath the canopy or enclosure shall be suitable for Class I, Division 2 hazardous (classified) locations. [30A:12.4]

(f) *Specific Requirements for LP-Gas Dispensing Devices.* [30A:12.5] Dispensing devices for LP-Gas shall be located as follows:

(1) At least 3 m (10 ft) from any dispensing device for Class I liquids

(2) At least 1.5 m (5 ft) from any dispensing device for Class I liquids where the following conditions exist:

- a. The LP-Gas deliver nozzle and filler valve release no more than 4 cm³ (0.1 oz) of liquid upon disconnection.
- b. The fixed maximum liquid level gauge remains closed during the entire refueling process. [30A:12.5.2]

Table 514.3(B)(2) shall be used to delineate and classify areas for the purpose of installation of electrical wiring and electrical utilization equipment.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
API_input_to_NEC_NFPA_70_FINAL_Searles_5.pdf		
API_input_to_NEC_NFPA_70_FINAL_Searles_5_514.3_B_3_.pdf		

Statement of Problem and Substantiation for Public Input

Motor fuel dispensing facilities are typically designed with sloped pavement so that spilled fuel flows to specific locations with drains. If the pavement is not sloped, spilled fuel would stand on the pavement and the area covered by the spill would slowly expand. A standing area of flammable liquid results in a large area of flammable vapor forming over the entire area of the liquid as it evaporates. Experience shows that such spills, when they do occur, typically find an ignition source and result in a large fire, which endangers members of the public, employees at the facility and first responders.

This Public Input enables designers and operators of motor fuel dispensing facilities and the AHJ to identify areas where spilled fuel could pool and consider if it is appropriate to install 'general purpose' electrical equipment, which could be an ignition source in the event of a fuel spill, or if additional controls are needed to ensure safety of the public.

It is recognized that large flammable liquid spills do not occur frequently, so it is not appropriate to consider any area where the

liquid could pool to be a classified (hazardous) location. However, it is also recognized that the primary purpose of motor fuel dispensing facilities is to dispense motor fuels and that public safety during this activity is paramount. As retail gasoline stations and customer patterns have evolved, there have been attempts to install general purpose electrical equipment that is not associated with the dispensing of motor fuels in close proximity to equipment that does dispense motor fuels (e.g. vending machines, ATMs, refrigerated coolers, air/vacuum machines, etc.). Doing so presents a hazard to the public since in practice fuel vapors and potentially spilled fuel can exist in additional locations beyond those defined as classified (hazardous) locations by Article 514.

It is suggested that NEC Code Panel 14 could coordinate any committee action taken on this Public Input with the committee responsible for NFPA 30A to identify and address any potential hazards associated with flammable and combustible liquids at motor fuel dispensing facilities as related to electrical equipment installations that are governed by NEC.

Submitter Information Verification

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Submittal Date: Fri Sep 08 09:34:45 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: No technical substantiation for this PI. NFPA-30A covers temporary and fixed classification, this is extracted text from NFPA-30A.

API PI (C-1)

Public Input on NFPA 70 – 514.3(B)(4)

Add a new requirement after existing 514.11(B)(3):

(4) Areas Downsloped from Tank Fills.

Electrical equipment not listed for installation in classified areas shall not be installed adjacent to areas where flammable liquids spilled in fuel transfer areas may flow towards or into drains, unless protected by engineering controls or approved by the AHJ.

Informational Note 1: Engineering controls or other mitigation that an AHJ may approve could include additional separation between the area of pooling and electrical equipment or installation of electrical equipment that complies with Parts II and III of Article 501.

Informational Note 2: Motor fuel dispensing facilities are typically designed with sloped pavement so that spilled fuel flows to specific locations with drains. As the liquid flows, there can be areas of the facility where the liquid pools, typically near the drain locations. Pools of flammable liquid create a large area of flammable vapors as the liquid evaporates, which can be ignited and result in large fires.

Statement of Problem and Substantiation for Public Input

Motor fuel dispensing facilities are typically designed with sloped pavement so that spilled fuel flows to specific locations with drains. If the pavement is not sloped, spilled fuel would stand on the pavement and the area covered by the spill would slowly expand. A standing area of flammable liquid results in a large area of flammable vapor forming over the entire area of the liquid as it evaporates. Experience shows that such spills, when they do occur, typically find an ignition source and result in a large fire, which endangers members of the public, employees at the facility and first responders.

This Public Input enables designers and operators of motor fuel dispensing facilities and the AHJ to identify areas where spilled fuel could pool and consider if it is appropriate to install 'general purpose' electrical equipment, which could be an ignition source in the event of a fuel spill, or if additional controls are needed to ensure safety of the public.

It is recognized that large flammable liquid spills do not occur frequently, so it is not appropriate to consider any area where the liquid could pool to be a classified (hazardous) location. However, it is also recognized that the primary purpose of motor fuel dispensing facilities is to dispense motor fuels and that public safety during this activity is paramount. As retail gasoline stations and customer patterns have evolved, there have been attempts to install general purpose electrical equipment that is not associated with the dispensing of motor fuels in close proximity to equipment that does dispense motor fuels (e.g. vending machines, ATMs, refrigerated coolers, air/vacuum machines, etc.). Doing so presents a hazard to the public since in practice fuel vapors and potentially spilled fuel can exist in additional locations beyond those defined as classified (hazardous) locations by Article 514.

It is suggested that NEC Code Panel 14 could coordinate any committee action taken on this Public Input with the committee responsible for NFPA 30A to identify and address any potential hazards associated with flammable and combustible liquids at motor fuel dispensing facilities as related to electrical equipment installations that are governed by NEC.

[514.3(B)(3)]

(3) Fuel Storage.

1. Aboveground tanks storing CNG or LNG shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property. [30A:12.3.1]

Informational Note: See NFPA 52, *Vehicular Natural Gas Fuel Systems Code*, Section 8.4, for the relevant distances for CNG and LNG.

2. Aboveground tanks storing hydrogen shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property. [30A:12.3.2]

Informational Note: See NFPA 2, *Hydrogen Technologies Code*, for the relevant distances for hydrogen.

3. Aboveground tanks storing LP-Gas shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property. [30A:12.3.3]

Informational Note: See NFPA 58, *Liquefied Petroleum Gas Code*, Section 6.3, for the relevant distances for LP-Gas.

4. Aboveground tanks storing CNG, LNG, or LP-Gas shall be separated from each other by at least 6 m (20 ft) and from dispensing devices that dispense liquid or gaseous motor vehicle fuels by at least 6 m (20 ft). [30A:12.3.3]

Exception No. 1: The required separation shall not apply to tanks or dispensers storing or handling fuels of the same chemical composition.

Exception No. 2: The required separation shall not apply when both the gaseous fuel storage and dispensing equipment are at least 15 m (50 ft) from any other aboveground motor fuel storage or dispensing equipment.

Informational Note: See NFPA 52, *Vehicular Natural Gas Fuel Systems Code*, or NFPA 58, *Liquefied Petroleum Gas Code*, for additional information.

5. *Dispenser Installations Beneath Canopies.* Where CNG or LNG dispensers are installed beneath a canopy or enclosure, either the canopy or enclosure shall be designed to prevent accumulation or entrapment of ignitable vapors or all electrical equipment installed beneath the canopy or enclosure shall be suitable for Class I, Division 2 hazardous (classified) locations. [30A:12.4]
6. *Specific Requirements for LP-Gas Dispensing Devices.* [30A:12.5] Dispensing devices for LP-Gas shall be located as follows:
 1. At least 3 m (10 ft) from any dispensing device for Class I liquids

2. At least 1.5 m (5 ft) from any dispensing device for Class I liquids where the following conditions exist:
 1. The LP-Gas deliver nozzle and filler valve release no more than 4 cm³ (0.1 oz) of liquid upon disconnection.
 2. The fixed maximum liquid level gauge remains closed during the entire refueling process. [30A:12.5.2]

Table 514.3(B)(2) shall be used to delineate and classify areas for the purpose of installation of electrical wiring and electrical utilization equipment.

(4) Areas Downsloped from Tank Fills.

Electrical equipment not listed for installation in classified areas shall not be installed adjacent to areas where flammable liquids spilled in fuel transfer areas may flow towards or into drains, unless protected by engineering controls or approved by the AHJ.

Informational Note 1: Engineering controls or other mitigation that an AHJ may approve could include additional separation between the area of pooling and electrical equipment or installation of electrical equipment that complies with Parts II and III of Article 501.

Informational Note 2: Motor fuel dispensing facilities are typically designed with sloped pavement so that spilled fuel flows to specific locations with drains. As the liquid flows, there can be areas of the facility where the liquid pools, typically near the drain locations. Pools of flammable liquid create a large area of flammable vapors as the liquid evaporates, which can be ignited and result in large fires.

**Public Input No. 2741-NFPA 70-2023 [Section No. 514.4]****514.4 Wiring and Equipment Installed in Hazardous (Classified) Locations.**

All electrical equipment and wiring installed in the hazardous (classified) locations specified in 514.3 shall comply with Article 501, Parts II and III of ~~Article 504~~. Conductor insulation in these locations shall comply with 501.20.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

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Submittal Date: Thu Aug 24 19:43:16 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: FR-8528-NFPA 70-2024

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Part.

**Public Input No. 4152-NFPA 70-2023 [Section No. 514.7]****514.7 Wiring and Equipment Above Hazardous (Classified) Locations.**

Fixed wiring and equipment above hazardous (classified) locations shall be installed in accordance with 514.3 and shall be one or more of the following:

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, or electrical metallic tubing (EMT) with listed fittings.
- (2) Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or electrical nonmetallic tubing (ENT).
- (3) Flexible metal conduit (FMC), liquidtight flexible metal conduit (LFMC), or liquidtight flexible nonmetallic conduit (LFNC), with listed fittings.
- (4) Type MC cable, Type AC cable, Type TC cable, or Type TC-ER cable, including installation in cable trays, with listed fittings. Type TC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (5) Type MI cable terminated with listed fittings and supported to avoid tensile stress.
- (6) Manufactured wiring systems.
- (7) Type PLTC cable or Type PLTC-ER cable used in Class 2, ~~Class 3,~~ or ~~Class 3- Class 4~~ circuits. Type PLTC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (8) Type ITC cable or ITC-ER cable in accordance with 335.4 and 335.5 and terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (9) Cellular metal floor raceways or cellular concrete floor raceways only for supplying ceiling outlets or extensions to the area below the floor. Such raceways shall have no connections leading into or through any Class I location above the floor.

Statement of Problem and Substantiation for Public Input

Adding Class 4 to the list. Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.

Submitter Information Verification

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Submittal Date: Wed Sep 06 18:55:36 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: No substantiation is provided to show that Class 4 systems are appropriate for use in Class I, Division 2 locations, Additionally, PLTC cable is rated at 300 volts while Class 4 systems are rated for up to 450 volts.



Public Input No. 4438-NFPA 70-2023 [Section No. 514.7]

514.7 Wiring and Equipment Above Hazardous (Classified) Locations.

Fixed wiring and equipment above hazardous (classified) locations shall be installed in accordance with 514.3 and shall be one or more of the following:

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, or electrical metallic tubing (EMT) with listed fittings.
- (2) Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or electrical nonmetallic tubing (ENT).
- (3) Flexible metal conduit (FMC), liquidtight flexible metal conduit (LFMC), or liquidtight flexible nonmetallic conduit (LFNC), with listed fittings.
- (4) Type MC cable, Type AC cable, Type TC cable, or Type TC-ER cable, including installation in cable trays, with listed fittings. Type TC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (5) Type MI cable terminated with listed fittings and supported to avoid tensile stress.
- (6) Manufactured wiring systems.
- (7) Type PLTC cable or Type PLTC-ER cable used in Class 2 or Class 3 circuits. Type PLTC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (8) Type ITC cable or ITC-ER cable in accordance with 335.4 ~~and 10 and~~ 335.5 ~~and 12 and~~ terminated with listed fittings. Type ITC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (9) Cellular metal floor raceways or cellular concrete floor raceways only for supplying ceiling outlets or extensions to the area below the floor. Such raceways shall have no connections leading into or through any Class I location above the floor.

Statement of Problem and Substantiation for Public Input

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
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Submittal Date: Thu Sep 07 15:23:07 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.

**Public Input No. 2742-NFPA 70-2023 [Section No. 514.8(B)]**

(B) Type MI Cable.

Type MI cable shall be permitted where it is installed in accordance with ~~Part II of Article 332~~, Part II.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Zip:

Submittal Date: Thu Aug 24 19:44:11 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8798-NFPA 70-2024](#)

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.



Public Input No. 1415-NFPA 70-2023 [Section No. 514.8(C)]

(C) Nonmetallic Conduit.

Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or high-density polyethylene conduit (HDPE) shall be permitted where buried under not less than 600 mm (2 ft) of cover. Where PVC conduit, RTRC conduit, or HDPE conduit is used, threaded rigid metal conduit (RMC) or threaded intermediate metal conduit (IMC) shall be used for the last 600 mm (2 ft) of the underground run to emergence or to the point of connection to the aboveground raceway. An equipment grounding conductor (EGC) shall be included to provide electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.

Informational Note No. 1: The requirements of NEC 501.30(B) apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between Class 1 locations and the point of grounding for service equipment or point of grounding for a separately derived system, inside and outside of the classified area on each side of the nonmetallic conduit located in accordance with this section.

Statement of Problem and Substantiation for Public Input

Confusion exists for installers and inspectors on whether or not the additional raceway bonding requirements apply to the metallic raceways that extend from where the underground conduit emerges from the ground back to the service or point of grounding for a separately derived system when they are located outside of the classified area. To clarify an informational note could be added explaining the requirements of NEC 501.30(B) apply to all metal raceways, fittings, boxes, cable trays, and enclosures, and other parts of raceway systems between Class 1 locations and the point of grounding for service equipment or point of grounding for a separately derived system, inside and outside of the classified area on each side of the underground nonmetallic conduit.

Submitter Information Verification

Submitter Full Name: Brad McVey

Organization:

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jul 14 21:04:01 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: Recommended revision is not necessary. Raceway bonding and grounding are addressed in section 500.30 and 505.30.



Public Input No. 3127-NFPA 70-2023 [Section No. 514.11]

514.11 Circuit Disconnects.

(A) Emergency Electrical Disconnects.

Fuel dispensing systems and EV Charging equipment located in close proximity (50') to fuel dispensing systems shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects. Such devices or disconnects shall be installed in approved locations but not less than 6 m (20 ft) or more than 30 m (100 ft) from the fuel dispensing devices that they serve. Emergency shutoff devices or electrical disconnects shall disconnect power to all dispensing devices; to all remote pumps serving the dispensing devices; to all associated power, control, and signal circuits; and to all other electrical equipment in the hazardous (classified) locations surrounding the fuel dispensing devices. When more than one emergency shutoff device or electrical disconnect is provided, all devices shall be interconnected. Resetting from an emergency shutoff condition shall require manual intervention and the manner of resetting shall be approved by the authority having jurisdiction. [30A:6.7] The emergency shutoff device shall disconnect simultaneously from the source of supply, all conductors of the circuits, including the grounded conductor, if any. Equipment grounding conductors shall remain connected.

Exception: Intrinsically safe systems shall not be required to meet this requirement.

(B) Attended Self-Service Motor Fuel Dispensing Facilities.

At attended motor fuel dispensing facilities, the devices or disconnects shall be readily accessible to the attendant. [30A:6.7.1]

(C) Unattended Self-Service Motor Fuel Dispensing Facilities.

At unattended motor fuel dispensing facilities, the devices or disconnects shall be readily accessible to patrons and at least one additional device or disconnect shall be readily accessible to each group of dispensing devices on an individual island. [30A:6.7.2]

Statement of Problem and Substantiation for Public Input

This was covered in the changes put forth by the NFPA 30A committee that were voted down at the NFPA meeting. There needs to be something that states these devices need to also be shut down in the case of an emergency at the dispensing facility. The distance can certainly be negotiated, but equipment dealing with this much power in close proximity to fuel dispensing must be able to be shut down in the case of an emergency (where the EStop is activated at the station).

Submitter Information Verification

Submitter Full Name: Randy Moses
Organization: Dover Fueling Systems
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 13:46:11 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: Section 514.11(A) is extracted from NFPA 30A and technical changes to this requirement must first be made in that document.



Public Input No. 4538-NFPA 70-2023 [Section No. 514.11]

514.11 Circuit Disconnects.

(A) Emergency Electrical Disconnects.

Fuel dispensing systems shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects. Such devices or disconnects shall be installed in approved locations but not less than 6 m (20 ft) or more than 30 m (100 ft) from the fuel dispensing devices that they serve. Emergency shutoff devices or electrical disconnects shall disconnect power to all dispensing devices; to all remote pumps serving the dispensing devices; to all associated power, control, and signal circuits; and to all other electrical equipment in the hazardous (classified) locations surrounding the fuel dispensing devices. When more than one emergency shutoff device or electrical disconnect is provided, all devices shall be interconnected. Resetting from an emergency shutoff condition shall require manual intervention and the manner of resetting shall be approved by the authority having jurisdiction. [30A:6.7] The emergency shutoff device shall disconnect simultaneously from the source of supply, all conductors of the circuits, including the grounded conductor, if any. Equipment grounding conductors shall remain connected.

Exception: Intrinsically safe systems shall not be required to meet this requirement.

(B) Emergency Electrical Disconnects for Other Types of Energy Dispensers.

Where another type of energy used for powering motor vehicles is dispensed from 30 m (100 ft) of a fuel dispenser or fuel tank fill opening shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects, which are interconnected to the Emergency Electrical Disconnects required by 514.11(A), such that activation of one disconnect results in shutdown of both systems.

Exception: Where all electrical equipment associated with the energy dispensing device(s) complies with Parts II and III of Article 501, interconnection between multiple fuel systems is not required.

(C) Attended Self-Service Motor Fuel Dispensing Facilities.

At attended motor fuel dispensing facilities, the devices or disconnects shall be readily accessible to the attendant. [30A:6.7.1]

(~~C~~ D) Unattended Self-Service Motor Fuel Dispensing Facilities.

At unattended motor fuel dispensing facilities, the devices or disconnects shall be readily accessible to patrons and at least one additional device or disconnect shall be readily accessible to each group of dispensing devices on an individual island. [30A:6.7.2]

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
API_input_to_NEC_NFPA_70_FINAL_Searles_4.pdf		

Statement of Problem and Substantiation for Public Input

The existing requirement for Emergency Electrical Disconnects applies to motor fuel (i.e. gasoline/diesel) systems. As other types of fuel systems and energy systems - such as hydrogen, CNG, RNG, LNG, LP-Gas, and Electric Vehicle Supply Equipment - are added to existing motor fuel dispensing facilities, an incident in the area for one type of fuel/energy could quickly spread and impact the area for another type of fuel/energy. Additionally, if multiple types of fuel/energy are co-located in close proximity to one another, then the disconnect required by the existing 514.11(A) would only isolate electrical supply to the gasoline/diesel fuel systems and any electrical equipment associated with any other types of fuel/energy systems would remain energized and thus could be an ignition source.

This Public Input adds a requirement for all fuel and energy transfer systems to be treated equally when they are located at a motor fuel dispensing facility such that all electrical equipment is disconnected in the event of an incident (e.g. fuel leak or spill) to prevent electrical equipment from being an ignition source.

The separation distance between 100 ft) is identified as the existing requirement in 514.11, which establishes the maximum distance a disconnect can be located is 100 ft. If two fuel or energy systems are more than 100 ft apart, the likelihood that an incident on one impacts the others is low. However, an exception is proposed to recognize that electrical equipment directly associated with the supply of fuel for some types of fuel/energy systems will be rated for use in an atmosphere containing hydrocarbon vapors and this equipment will not be a potential ignition source, so does not need to be isolated.

It is suggested that NEC Code Panel 14 could coordinate any committee action taken on this Public Input with the committee responsible for NFPA 30A to identify and address any potential hazards associated with flammable and combustible liquids at motor fuel dispensing facilities as related to electrical equipment installations that are governed by NEC.

Submitter Information Verification

Submitter Full Name: Prentiss Searles

Organization: American Petroleum Institute

Street Address:

City:

State:

Zip:

Submittal Date: Fri Sep 08 09:29:34 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: Section 514.11 is extracted from NFPA 30A and technical changes to this requirement must first be made in that document.

API PI (B-1)

Public Input on NFPA 70 – 514.11

Add a new requirement after existing 514.11(A):

514.11(xx) Emergency Electrical Disconnects for Other Types of Energy Dispensers.

Where another type of energy used for powering motor vehicles is dispensed from 30 m (100 ft) of a fuel dispenser or fuel tank fill opening shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects, which are interconnected to the Emergency Electrical Disconnects required by 514.11(A), such that activation of one disconnect results in shutdown of both systems.

Exception: Where all electrical equipment associated with the energy dispensing device(s) complies with Parts II and III of Article 501, interconnection between multiple fuel systems is not required.

Statement of Problem and Substantiation for Public Input

The existing requirement for Emergency Electrical Disconnects applies to motor fuel (i.e. gasoline/diesel) systems. As other types of fuel systems and energy systems - such as hydrogen, CNG, RNG, LNG, LP-Gas, and Electric Vehicle Supply Equipment - are added to existing motor fuel dispensing facilities, an incident in the area for one type of fuel/energy could quickly spread and impact the area for another type of fuel/energy. Additionally, if multiple types of fuel/energy are co-located in close proximity to one another, then the disconnect required by the existing 514.11(A) would only isolate electrical supply to the gasoline/diesel fuel systems and any electrical equipment associated with any other types of fuel/energy systems would remain energized and thus could be an ignition source.

This Public Input adds a requirement for all fuel and energy transfer systems to be treated equally when they are located at a motor fuel dispensing facility such that all electrical equipment is disconnected in the event of an incident (e.g. fuel leak or spill) to prevent electrical equipment from being an ignition source.

The separation distance between 100 ft) is identified as the existing requirement in 514.11, which establishes the maximum distance a disconnect can be located is 100 ft. If two fuel or energy systems are more than 100 ft apart, the likelihood that an incident on one impacts the others is low. However, an exception is proposed to recognize that electrical equipment directly associated with the supply of fuel for some types of fuel/energy systems will be rated for use in an atmosphere containing hydrocarbon vapors and this equipment will not be a potential ignition source, so does not need to be isolated.

It is suggested that NEC Code Panel 14 could coordinate any committee action taken on this Public Input with the committee responsible for NFPA 30A to identify and address any potential hazards associated with flammable and combustible liquids at motor fuel dispensing facilities as related to electrical equipment installations that are governed by NEC.

**Public Input No. 2039-NFPA 70-2023 [Section No. 514.13]****514.13 Provisions for Maintenance and Service of Dispensing Equipment.**

Each dispensing device shall be provided with a means to remove all external voltage sources, including ~~power~~ grounded conductors, communications, data, and video circuits and including feedback, during periods of maintenance and service of the dispensing equipment. The location of this means shall be permitted to be other than inside or adjacent to the dispensing device. The means shall be capable of being locked in the open position in accordance with 110.25.

Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the Minnesota Department of Labor and Industry. Currently, the Department's inspection staff includes 14-office/field staff, 12-state field inspectors, 2-virtual inspectors and 50 plus contract electrical inspectors that complete over 170,000 electrical inspections annually.

The proposed change removes "power" as the code text already requires the installer to remove external voltage sources. The proposed language adds "grounded conductors." The addition of code language in 514.13 will more closely mirror the text in 514.11 for emergency disconnects. In both cases, the emergency disconnects and the means to remove voltage for the provision of maintenance and service need to achieve the same outcomes, as the same hazards are present in both circumstances.

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 11 11:12:06 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8676-NFPA 70-2024](#)

Statement: Agree that current terminology is needed for clarity, ungrounded and grounded power conductors, communications, data, and video circuits, during periods of maintenance and service of the dispensing equipment. Revision to lockable open to comply with Style Manual 3.2.5.3.

**Public Input No. 2541-NFPA 70-2023 [Section No. 514.13]****514.13 Provisions for Maintenance and Service of Dispensing Equipment.**

Each dispensing device shall be provided with a means to remove all external voltage sources, including power, communications, data, and video circuits and including feedback, during periods of maintenance and service of the dispensing equipment. The location of this means shall be permitted to be other than inside or adjacent to the dispensing device. The means shall be ~~capable of being locked in the open position~~ lockable open in accordance with 110.25.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document when a disconnecting means is required to be lockable open elsewhere in the code. The text is revised to comply with the NEC Style Manual. The NEC Style Manual Section 3.2.5 Consistent Application of Terms, 3.2.5.3 Lockable Open. Where a requirement specifies that a disconnecting means be capable of being locked in the open position, the phrase lockable open in accordance with 110.25 shall be used.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

Street Address:

City:

State:

Zip:

Submittal Date: Sun Aug 20 07:00:41 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: FR-8676-NFPA 70-2024

Statement: Agree that current terminology is needed for clarity, ungrounded and grounded power conductors, communications, data, and video circuits, during periods of maintenance and service of the dispensing equipment. Revision to lockable open to comply with Style Manual 3.2.5.3.



Public Input No. 4139-NFPA 70-2023 [Section No. 514.16]

~~514.16~~ Grounding and Bonding:

~~All metal raceways, the metal armor or metallic sheath on cables, and all non-current-carrying metal parts of fixed and portable electrical equipment, regardless of voltage, shall be grounded and bonded. Grounding and bonding in Class I locations shall comply with 504.30.~~

Statement of Problem and Substantiation for Public Input

Delete 514.16. The grounding and bonding requirements are found in Article 250 which applies to Chapter 5 articles. The special requirements for bonding are found in Article 501 for Class I locations and in Article 505 for Zones 0, 1, and 2. There is no need for grounding and bonding requirements which create confusion in this article. The requirements are found in Article 250 and Article 410.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4141-NFPA 70-2023 [Section No. 516.16]	
Public Input No. 4131-NFPA 70-2023 [Section No. 513.16]	
Public Input No. 2034-NFPA 70-2023 [Section No. 515.16]	
Public Input No. 1941-NFPA 70-2023 [Section No. 511.16]	
Public Input No. 1941-NFPA 70-2023 [Section No. 511.16]	
Public Input No. 2034-NFPA 70-2023 [Section No. 515.16]	
Public Input No. 4131-NFPA 70-2023 [Section No. 513.16]	
Public Input No. 4141-NFPA 70-2023 [Section No. 516.16]	

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 18:17:37 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8684-NFPA 70-2024](#)

Statement: The text was updated to align grounding requirements with 500.30 and 505.30.



Public Input No. 2030-NFPA 70-2023 [Section No. 515.4]

~~515.4~~ Wiring and Equipment Located in Hazardous (Classified) Locations:

~~All electrical wiring and equipment within the hazardous (classified) locations specified in 515.3 shall comply with the applicable requirements of Table 515.2.~~

Statement of Problem and Substantiation for Public Input

The information provided in 515.4 repeats the information provided in 515.2 and is not needed. Section 515.4 states: "In addition to the requirements of this article, bulk storage plants shall comply with Table 515.2, as applicable, except as modified by this article. The requirement applies to "bulk storage plants" which would include wiring and equipment.

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 11 10:33:51 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8687-NFPA 70-2024](#)

Statement: Section 515.4 was deleted as wiring and equipment is addressed in Table 515.2.

**Public Input No. 2743-NFPA 70-2023 [Section No. 515.7(C)]**

(C) Portable Luminaires or Other Utilization Equipment.

Portable luminaires or other utilization equipment and their flexible cords shall comply with ~~Part III of~~ Article 501 ~~or~~ Part III or 505.17 for the class of location above which they are connected or used.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 24 19:45:24 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: FR-8530-NFPA 70-2024

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

**Public Input No. 2329-NFPA 70-2023 [Section No. 515.8(C)]****~~(G) Nonmetallic Wiring:~~**

~~Where PVC conduit, RTRC conduit, or cable with a nonmetallic sheath is used, an equipment grounding conductor shall be included to provide for electrical continuity of the raceway system and for grounding of non-current-carrying metal parts.~~

Statement of Problem and Substantiation for Public Input

515.8 (C) (delete) This article is redundant as a requirement to include an equipment ground conductor is included in articles 334.108 (NM/NMC), 352.60 (PVC), 355.60 (RTRC) and Chapter 250. Article 90.3 details that chapters 1,2,3 and 4 “apply generally to all electrical installations” and that chapters 5,6 and 7 “Supplements or modifies Chapters 1 through 7”. Article 515.8 (C) does not supplement or modify any of the wiring methods detailed within the article and therefore it should be deleted.

Submitter Information Verification

Submitter Full Name: Gary Hein

Organization: [Not Specified]

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 16 12:38:09 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: This article contemplates arcing and sparking at lower voltages where the general articles are for shock protection.



Public Input No. 2034-NFPA 70-2023 [Section No. 515.16]

~~515.16~~ Grounding and Bonding:

~~All metal raceways, the metal armor or metallic sheath on cables, and all non-current-carrying metal parts of fixed or portable electrical equipment, regardless of voltage, shall be grounded and bonded.~~

~~Grounding and bonding in Class I locations shall comply with 501.30 for Class I, Division 1 and 2 locations and 505.30 for Zone 0, 1, and 2 locations.~~

~~Informational Note: See NFPA 30, *Flammable and Combustible Liquids Code*, 6.5.4, for information on grounding for static protection.~~

Statement of Problem and Substantiation for Public Input

Delete 515.16. The requirements for grounding are found in Article 250. This section does not modify the grounding requirements and as such it shouldn't repeat requirements that are found in Article 250. Modified requirements for bonding are found in 501.30. There is no need to refer to bonding in Article 515 when the requirements are available in Article 250 and are modified in 501.30 unless there is a specific modification that would apply only to Article 515 application(s).

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4141-NFPA 70-2023 [Section No. 516.16]	
Public Input No. 4139-NFPA 70-2023 [Section No. 514.16]	
Public Input No. 4131-NFPA 70-2023 [Section No. 513.16]	
Public Input No. 1941-NFPA 70-2023 [Section No. 511.16]	
Public Input No. 1941-NFPA 70-2023 [Section No. 511.16]	
Public Input No. 4131-NFPA 70-2023 [Section No. 513.16]	
Public Input No. 4139-NFPA 70-2023 [Section No. 514.16]	
Public Input No. 4141-NFPA 70-2023 [Section No. 516.16]	

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
State:
Zip:
Submission Date: Fri Aug 11 11:03:39 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8690-NFPA 70-2024](#)

Statement: The text was modified to align with the requirements of 500.30 and 505.30.

The committee has updated informational notes in this section to comply with the NEC® Style Manual, 2.1.10.



Public Input No. 1072-NFPA 70-2023 [Section No. 516.1]

516.1 Scope.

This article covers the regular or frequent application of flammable liquids, combustible liquids, and combustible powders by spray operations and the application of flammable liquids or combustible liquids at temperatures above their flashpoint by spraying, dipping, coating, printing, or other means.

Informational Note No. 1: See NFPA 33-~~2024~~ 2024, *Standard for Spray Application Using Flammable or Combustible Materials*, or NFPA 34-~~2024~~ 2024, *Standard for Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids*, for extracted text that is followed by a reference in brackets. Only editorial changes were made to the extracted text to make it consistent with this Code.

Informational Note No. 2: See NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Particulate Solids*, for information regarding ventilation.

Statement of Problem and Substantiation for Public Input

Article 516 content needs to be aligned with the new standards.

Submitter Information Verification

Submitter Full Name: Donald Ankele
Organization: UL Solutions
Street Address:
City:
State:
Zip:
Submission Date: Wed Jun 14 11:29:44 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8701-NFPA 70-2024](#)

Statement: The revisions in Informational Notes 1 and 2 reflect the current edition of NFPA 33 and NFPA 34.



Public Input No. 2744-NFPA 70-2023 [Section No. 516.2]

516.2 Other Articles.

In addition to the requirements of this article, spray application, dipping, coating, and printing processes using flammable or combustible materials shall comply with Table 516.2, as applicable, except as modified by this article.

Table 516.2 Other Articles

<u>Requirement</u>	<u>Division Classified Locations</u>	<u>Zone Classified Locations</u>
Area classification	500.5, 500.6	505.5, 505.6, 505.7, 506.5, 506.6, 506.7
Equipment	500.7, 500.8, 501.5, 502.5, 502.6, Part III of Article 501, Part III of Article 502, Part III	505.8, 505.9, 505.20, 505.22, 506.8, 506.9
Wiring	Part II of Article 501, Part II of Article 502, Part II	505.15, 505.16, 505.17, 505.18, 505.19, 505.26, 505.30, 506.15, 506.17, 506.20, 506.30

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 24 19:47:29 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8531-NFPA 70-2024](#)

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

**Public Input No. 1074-NFPA 70-2023 [Section No. 516.5(A)(3)]****(3) Equipment.**

Open flames, spark-producing equipment or processes, and equipment whose exposed surfaces exceed the autoignition temperature of the material being sprayed shall not be located in a spray area or in any surrounding area that is classified as Division 2, Zone 2, or Zone 22. [33:6.2.5]

Exception:-

This requirement shall not apply to drying, curing, or fusing apparatus. [33:6.2.5.1]

Any utilization equipment or apparatus that is capable of producing sparks or particles of hot metal and that is located above or adjacent to either the spray area or the surrounding Division 2, Zone 2, or Zone 22 areas shall be of the totally enclosed type or shall be constructed to prevent the escape of sparks or particles of hot metal. [33:6.2.6]

Statement of Problem and Substantiation for Public Input

These revisions align to extracted text from NFPA 33:2024.

Submitter Information Verification

Submitter Full Name: Donald Ankele
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 14 11:38:22 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8699-NFPA 70-2024](#)

Statement: The revision reflects the change in NFPA 33 extracted text. Exception is being left to align with the NEC style manual, and this exception will referencing the statement above 33:6.2.5.



Public Input No. 1358-NFPA 70-2023 [Section No. 516.5(D)(5)]

(5) Limited Finishing Workstations.

(a) For limited finishing workstations, the area inside the 915 mm (3 ft) space horizontally and vertically beyond the volume enclosed by the outside surface of the curtains or partitions shall be classified as Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22, as shown in Figure 516.5(D)(5).

(b) A limited finishing workstation shall be designed and constructed to have all of the following:

- (3) A dedicated make-up air supply
- (4) Curtains or partitions that are noncombustible or limited combustible
- (5) A dedicated mechanical exhaust and filtration system
- (6) An approved automatic extinguishing system

[**33**: 14.3.1]

Informational Note: See

~~NFPA 701, Standard Methods of Fire Tests for Flame Propagation of Textiles and Films, for information on limited combustible curtains or partitions~~

(1)

NFPA 101, Life Safety Code (2024) for information on how to determine whether a material is noncombustible or limited combustible .

(g) The amount of material sprayed in a limited finishing workstation shall not exceed 3.8 L (1 gal) in any 8-hour period. [33:14.3.2]

(h) Curtains or partitions shall be fully closed during any spray operations. [33:14.3.4]

(i) The equipment within the limited finishing workstation shall be interlocked such that the spray application equipment cannot be operated unless the exhaust ventilation system is operating and functioning properly and spray application is automatically stopped if the exhaust ventilation system fails.

(j) Any limited finishing workstation used for spray application operations shall not be used for any operation that is capable of producing sparks or particles of hot metal or for operations that involve open flames or electrical utilization equipment capable of producing sparks or particles of hot metal. [33:14.3.6]

(k) Where industrial air heaters are used to elevate the air temperature for drying, curing, or fusing operations, a high limit switch shall be provided to automatically shut off the drying apparatus if the air temperature in the limited finishing workstation exceeds the maximum discharge-air temperature allowed by the standard that the heater is listed to or 93°C (200°F), whichever is less. [33:14.3.7.1]

(l) A means shall be provided to show that the limited finishing workstation is in the drying or curing mode of operation and that the limited finishing workstation is to be unoccupied. [33:14.3.7.2]

(m) Any containers of flammable or combustible liquids shall be removed from the limited finishing workstation before the drying apparatus is energized. [33:14.3.7.3]

(n) Portable spot-drying, curing, or fusion apparatus shall be permitted to be used in a limited finishing workstation, provided that it is not located within the hazardous (classified) location defined in 14.3.5 of NFPA 33 when spray application operations are being conducted. [33:14.3.8]

(o) Recirculation of exhaust air shall be permitted when the provisions of 516.5(D)(4)(3) are both met. [33:14.3.9]

Figure 516.5(D)(4) Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22 Locations Adjacent to an Enclosed Spray Booth or Spray Room. [33:Figure 6.5.4]

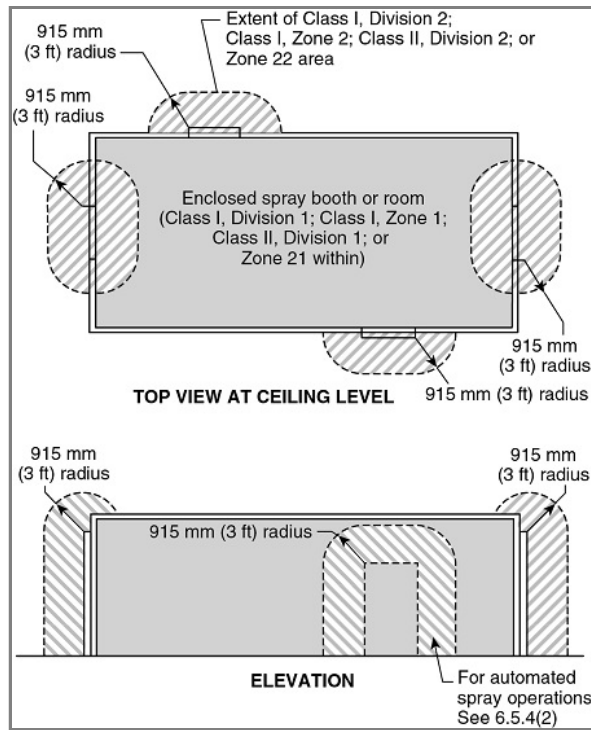
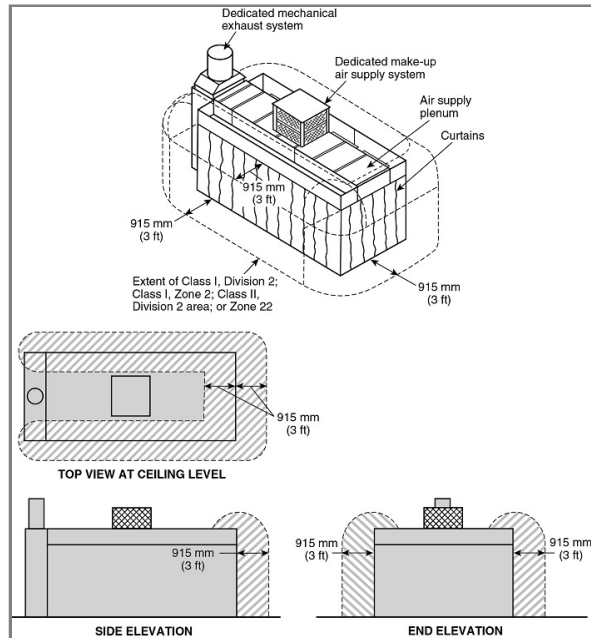


Figure 516.5(D)(5) Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22 Locations Adjacent to a Limited Finishing Workstation. [33:Figure 14.3.6.1]



Statement of Problem and Substantiation for Public Input

NFPA 701 is a test method for measuring flame propagation performance of textiles or films. It does not assess whether a material is or is not limited combustible or noncombustible. The Life Safety Code contains sections 4.6.13 and 4.6.14 that describe how to assess whether a material is or is not limited combustible or noncombustible. The text is shown below. This PI does not require that tests be conducted but simply provides the correct reference. Materials that meet NFPA 701 are very far from being either limited combustible or noncombustible and it is not safe to use a material that simply meets NFPA 701 for this application. The concepts of limited combustible and noncombustible are widely used throughout the NFPA system of documents.

Instead of referencing NFPA 101 this informational note could also reference NFPA 5000, which has identical language.

Note that the only change proposed by this PI is to the informational note and that other apparent changes are caused by Terra.

NFPA 101 text:
4.6.13 * Noncombustible Material.

4.6.13.1 A material that complies with any one of the following shall be considered a noncombustible material:

(1)* The material, in the form in which it is used, and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat.

(2) The material is reported as passing ASTM E136, Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C.

(3) The material is reported as complying with the pass/fail criteria of ASTM E136 when tested in accordance with the test method and procedure in ASTM E2652, Standard Test Method for Assessing Combustibility of Materials Using a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C.

4.6.13.2 Where the term limited-combustible is used in this Code, it shall also include the term noncombustible.

4.6.14 * Limited-Combustible Material. A material shall be considered a limited-combustible material where one of the following is met:

(1) The conditions of 4.6.14.1 and 4.6.14.2, and the conditions of either 4.6.14.3 or 4.6.14.4, shall be met.

(2) The conditions of 4.6.14.5 shall be met.

4.6.14.1 The material does not comply with the requirements for a noncombustible material in accordance with 4.6.13.

4.6.14.2 The material, in the form in which it is used, exhibits a potential heat value not exceeding 3500 Btu/lb (8141 kJ/kg) when tested in accordance with NFPA 259.

4.6.14.3 The material shall have a structural base of noncombustible material with a surfacing not exceeding a thickness of 1/8 in. (3.2 mm) where the surfacing exhibits a flame spread index not greater than 50 when tested in accordance with ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials, or UL 723, Test for Surface Burning Characteristics of Building Materials.

4.6.14.4 The material shall be composed of materials that in the form and thickness used neither exhibit a flame spread index greater than 25 nor exhibit evidence of continued progressive combustion when tested in accordance with ASTM E84 or UL 723 and are of such composition that all surfaces that would be exposed by cutting through the material on any plane would neither exhibit a flame spread index greater than 25 nor exhibit evidence of continued progressive combustion when tested in accordance with ASTM E84 or UL 723.

4.6.14.5 Materials shall be considered limited-combustible materials where tested in accordance with ASTM E2965, Standard Test Method for Determination of Low Levels of Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter, at an incident heat flux of 75 kW/m² for a 20-minute exposure, and both the following conditions are met:

(1) The peak heat release rate shall not exceed 150 kW/m² for longer than 10 seconds.

(2) The total heat released shall not exceed 8 MJ/m².

4.6.14.6 Where the term limited-combustible is used in this Code, it shall also include the term noncombustible.

Submitter Information Verification

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Submittal Date: Mon Jul 10 17:49:16 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8706-NFPA 70-2024](#)

Statement: The revision reflects updates to extract locations in NFPA 33. Revision also includes a change from NFPA 701 to NFPA 101 in the Informational Note.



Public Input No. 3181-NFPA 70-2023 [Section No. 516.5(D)(5)]

(5) Limited Finishing Workstations.

A limited finishing workstation shall be designed and constructed in accordance with the requirements of 1 through 11.

(a) For limited finishing workstations, the area inside the 915 mm (3 ft) space horizontally and vertically beyond the volume enclosed by the outside surface of the curtains or partitions shall be classified as Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22, as shown in Figure 516.5(D)(5).

(b) A limited finishing workstation shall be designed and constructed to have all of the following:

- (3) A dedicated make-up air supply and air supply plenum. [33:14.3.2.1]
- (4) Curtains or partitions that are noncombustible or limited combustible. [33:14.3.2.2]
- (5) A dedicated mechanical exhaust and filtration system. [33:14.3.2.3]
- (6) An approved automatic extinguishing system

(1) :

(1) -{33: 14.3:

+

(1) 2.4 }

~~Informational Note: See NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, for information on limited combustible curtains or partitions.~~

(g) The amount of material sprayed in a limited finishing workstation shall not exceed 3.8 L (1 gal) in any 8-hour period. [33: 14.3.2.3]

(h) Curtains or partitions shall be fully closed during any spray operations. [33: 14.3.4.5]

(i) The equipment within the limited finishing workstation shall be interlocked such that the spray application equipment cannot be operated unless the exhaust ventilation system is operating and functioning properly and spray application is automatically stopped if the exhaust ventilation system fails. [33:14.3.6.2]

(j) Any limited finishing workstation used for spray application operations shall not be used for any operation that is capable of producing sparks or particles of hot metal or for operations that involve open flames or electrical utilization equipment capable of producing sparks or particles of hot metal. [33: 14.3.6.7]

(k) Where industrial air heaters are used to elevate the air temperature for drying, curing, or fusing operations, a high limit switch shall be provided to automatically shut off the drying apparatus if the air temperature in the limited finishing workstation exceeds the maximum discharge-air temperature allowed by the standard that the heater is listed to or 93°C (200°F), whichever is less. [33: 14.3.7.8 .1]

(l) A means shall be provided to show that the limited finishing workstation is in the drying or curing mode of operation and that the limited finishing workstation is to be unoccupied. [33: 14.3.7.8 .2]

(m) Any containers of flammable or combustible liquids shall be removed from the limited finishing workstation before the drying apparatus is energized. [33: 14.3.7.8 .3]

(n) Portable spot-drying, curing, or fusion apparatus shall be permitted to be used in a limited finishing workstation, provided that it is not located within the hazardous (classified) location defined in 14.3.5 of NFPA 33 when spray application operations are being conducted. [33: 14.3.8.9]

(o) Recirculation of exhaust air shall be permitted when the provisions of 516.5(D)(4)(3) are both met. [33: 14.3.9.10]

Figure 516.5(D)(4) Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22 Locations Adjacent to an Enclosed Spray Booth or Spray Room. [33:Figure 6.5.4]

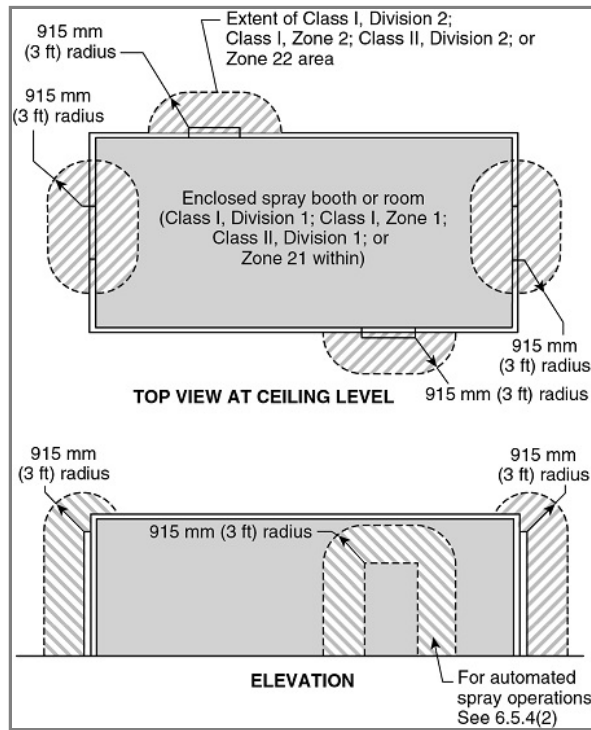
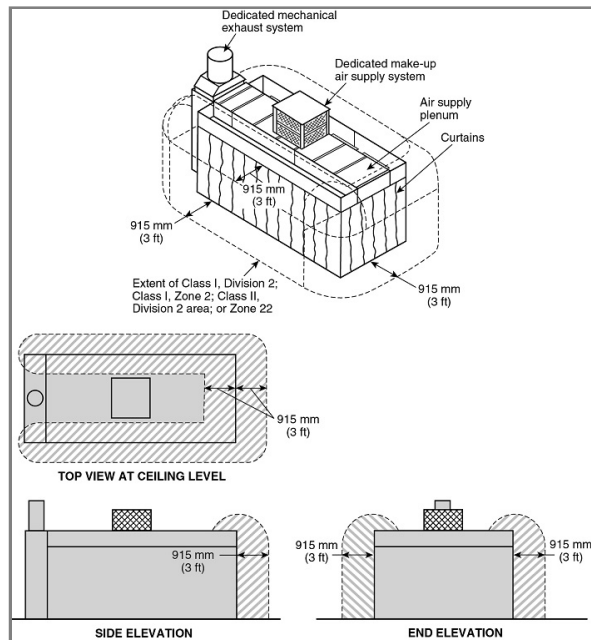


Figure 516.5(D)(5) Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22 Locations Adjacent to a Limited Finishing Workstation. [33:Figure 14.3.6.1]



Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
516.5_D_5.docx	revision to 515.5(D)(5)	

Statement of Problem and Substantiation for Public Input

This revision updates the extracted references to NFPA 33, 2024 Edition.

Submitter Information Verification

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Submittal Date: Wed Aug 30 07:58:53 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: [FR-8706-NFPA 70-2024](#)

Statement: The revision reflects updates to extract locations in NFPA 33. Revision also includes a change from NFPA 701 to NFPA 101 in the Informational Note.

PI 1075 - 516.5(D)(5) Limited Finishing Workstations.

(5) Limited Finishing Workstations.

(a) For limited finishing workstations, the area inside the 915 mm (3 ft) space horizontally and vertically beyond the volume enclosed by the outside surface of the curtains or partitions shall be classified as Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22, as shown in **Figure 516.5(D)(5)**.

(b) A limited finishing workstation shall be designed and constructed to have all of the following:

(1) A dedicated make-up air supply **and air supply plenum, [33:14.3.2.1]**

(2) Curtains or partitions that are noncombustible or limited combustible **[33:14.3.2.2]**

(3) A dedicated mechanical exhaust and filtration system **[33:14.3.2.3]**

(4) An approved automatic extinguishing system **[33:14.3.1] [33:14.3.2.4]**

Informational Note: See NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, for information on limited combustible curtains or partitions.

(c) The amount of material sprayed in a limited finishing workstation shall not exceed 3.8 L (1 gal) in any 8-hour period. **[33:14.3.2] [33:14.3.3]**

(d) Curtains or partitions shall be fully closed during any spray operations. **[33:14.3.4] [33:14.3.5]**

(e) The equipment within the limited finishing workstation shall be interlocked such that the spray application equipment cannot be operated unless the exhaust ventilation system is operating and functioning properly and spray application is automatically stopped if the exhaust ventilation system fails. **[33:14.3.6.2]**

(f) Any limited finishing workstation used for spray application operations shall not be used for any operation that is capable of producing sparks or particles of hot metal or for operations that involve open flames or electrical

utilization equipment capable of producing sparks or particles of hot metal.

[33:14.3.6] [33:14.3.7]

(g) Where industrial air heaters are used to elevate the air temperature for drying, curing, or fusing operations, a high limit switch shall be provided to automatically shut off the drying apparatus if the air temperature in the limited finishing workstation exceeds the maximum discharge-air temperature allowed by the standard that the heater is listed to or 93°C (200°F), whichever is less. [33:14.3.7.1] [33:14.3.8.1]

(h) A means shall be provided to show that the limited finishing workstation is in the drying or curing mode of operation and that the limited finishing workstation is to be unoccupied. [33:14.3.7.2] [33:14.3.8.2]

(i) Any containers of flammable or combustible liquids shall be removed from the limited finishing workstation before the drying apparatus is energized.

[33:14.3.7.3] [33:14.3.8.3]

(j) Portable spot-drying, curing, or fusion apparatus shall be permitted to be used in a limited finishing workstation, provided that it is not located within the hazardous (classified) location defined in 14.3.5 of **NFPA 33** when spray application operations are being conducted. [33:14.3.8] [33:14.3.9]

(k) Recirculation of exhaust air shall be permitted when the provisions of **516.5(D)(4)(3)** are both met. [33:14.3.9] [33:14.3.10]

**Public Input No. 2745-NFPA 70-2023 [Section No. 516.6]****516.6 Wiring and Equipment in Class I Locations.****(A) Wiring and Equipment — Vapors.**

All electrical wiring and equipment within the hazardous (classified) locations (containing vapor only — not residues) defined in 516.5 shall comply with the requirements of Article 501, Part II and ~~Part III of Article 501 or Part III or~~ with 505.17 through 505.30, as applicable.

(B) Wiring and Equipment — Vapors and Residues.

Unless specifically listed for locations containing deposits of dangerous quantities of flammable or combustible vapors, mists, residues, dusts, or deposits (as applicable), there shall be no electrical equipment in any spray area as herein defined whereon deposits of combustible residue could readily accumulate, except wiring in rigid metal conduit, intermediate metal conduit, Type MI cable, or in metal boxes or fittings containing no taps, splices, or terminal connections. [33:6.4.2]

(C) Illumination.

Luminaires shall be permitted to be installed as follows:

- (1) Luminaires, like that shown in Figure 516.6(C)(1), that are attached to the walls or ceiling of a spray area but that are outside any classified area and are separated from the spray area by glass panels shall be suitable for use in unclassified locations. Such fixtures shall be serviced from outside the spray area. [33:6.6.1]
- (2) Luminaires, like that shown in Figure 516.6(C)(1), that are attached to the walls or ceiling of a spray area; that are separated from the spray area by glass panels and that are located within a Class I, Division 2; a Class I, Zone 2; a Class II, Division 2; or a Zone 22 location shall be suitable for such location. Such fixtures shall be serviced from outside the spray area. [33:6.6.2]
- (3) Luminaires, like that shown in Figure 516.6(C)(2), that are an integral part of the walls or ceiling of a spray area shall be permitted to be separated from the spray area by glass panels that are an integral part of the fixture. Such fixtures shall be listed for use in Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22 locations, whichever is applicable, and also shall be listed for accumulations of deposits of combustible residues. Such fixtures shall be permitted to be serviced from inside the spray area. [33:6.6.3]
- (4) Glass panels used to separate luminaires from the spray area or that are an integral part of the luminaire shall meet the following requirements:
 - (5) Panels for luminaires or for observation shall be of heat-treated glass, laminated glass, wired glass, or hammered-wired glass and shall be sealed to confine vapors, mists, residues, dusts, and deposits to the spray area. [33: 5.5.1]
Exception to a.: Listed spray booth assemblies that have vision panels constructed of other materials shall be permitted.
 - (6) Panels for luminaires shall be separated from the luminaire to prevent the surface temperature of the panel from exceeding 93°C (200°F). [33: 5.5.2]
 - (7) The panel frame and method of attachment shall be designed to not fail under fire exposure before the vision panel fails. [33: 5.5.3]

Figure 516.6(C)(1) Example of a Luminaire Mounted Outside the Spray Area and Serviced from Outside the Spray Area. [33:Figure 6.6.1.1]

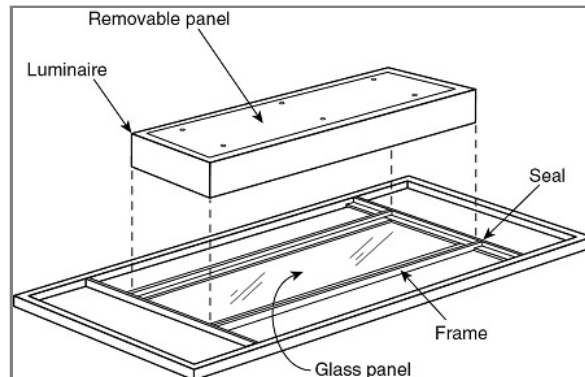
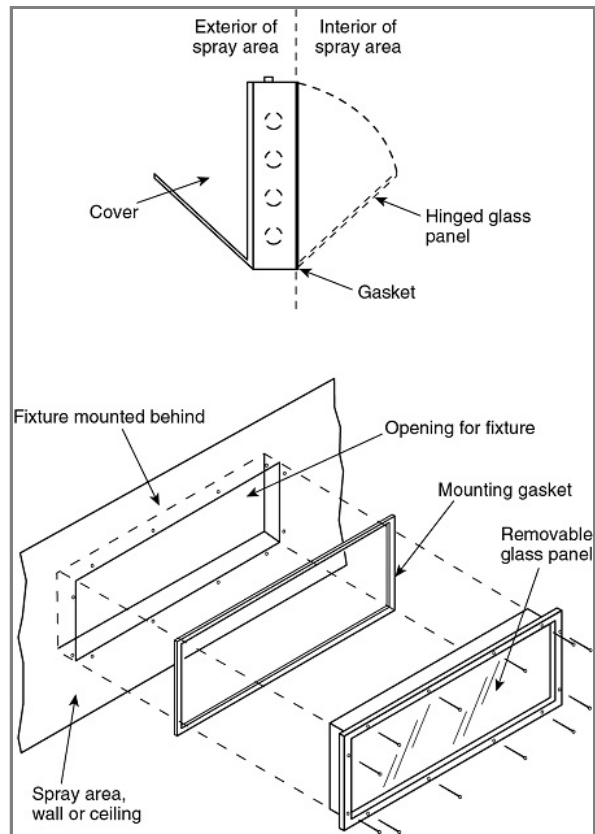


Figure 516.6(C)(2) Example of Luminaires That Are Integral Parts of the Spray Area and That Are Serviced from Inside the Spray Area. [33:Figure 6.6.3.1]

**(D) Portable Equipment.**

Portable electric luminaires or other utilization equipment shall not be used in a spray area during spray operations.

Exception No. 1: Where portable electric luminaires are required for operations in spaces not readily illuminated by fixed lighting within the spraying area, they shall be of the type identified for Class I, Division 1 or Class 1, Zone 1 locations where readily ignitable residues could be present. [33:6.9 Exception]

Exception No. 2: Where portable electric drying apparatus is used in spray booths and the following requirements are met:

- (1) *The apparatus and its electrical connections are not located within the spray enclosure during spray operations.*
- (2) *Electrical equipment within 450 mm (18 in.) of the floor is identified for Class I, Division 2 or Class 1, Zone 2 locations.*
- (3) *All metallic parts of the drying apparatus are electrically bonded and grounded.*
- (4) *Interlocks are provided to prevent the operation of spray equipment while drying apparatus is within the spray enclosure, to allow for a 3-minute purge of the enclosure before energizing the drying apparatus and to shut off drying apparatus on failure of ventilation system.*

(E) Electrostatic Equipment.

Electrostatic spraying or detearing equipment shall be installed and used only as provided in 516.10.

Informational Note: See NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*, for additional information.

(F) Static Electric Discharges.

All persons and all electrically conductive objects, including any metal parts of the process equipment or apparatus, containers of material, exhaust ducts, and piping systems that convey flammable or combustible liquids, shall be electrically grounded. [34:6.8.1]

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

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Submittal Date: Thu Aug 24 19:49:18 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8726-NFPA 70-2024](#)
Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.



Public Input No. 306-NFPA 70-2023 [Section No. 516.6(C)]

(C) Illumination.

Luminaires shall be permitted to be installed as follows:

- (1) Luminaires, like that shown in Figure 516.6(C)(1), that are attached to the walls or ceiling of a spray area but that are outside any classified area and are separated from the spray area by glass panels shall be suitable for use in unclassified locations. Such fixtures shall be serviced from outside the spray area. [33:6.6.1]
- (2) Luminaires, like that shown in Figure 516.6(C)(1), that are attached to the walls or ceiling of a spray area; that are separated from the spray area by glass panels and that are located within a Class I, Division 2; a Class I, Zone 2; a Class II, Division 2; or a Zone 22 location shall be suitable for such location. Such fixtures shall be serviced from outside the spray area. [33:6.6.2]
- (3) Luminaires, like that shown in Figure 516.6(C)(2), that are an integral part of the walls or ceiling of a spray area shall be permitted to be separated from the spray area by glass panels that are an integral part of the fixture. Such fixtures shall be listed for use in Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22 locations, whichever is applicable, and also shall be listed for accumulations of deposits of combustible residues. Such fixtures shall be permitted to be serviced from inside the spray area. [33:6.6.3]
- (4) Glass panels used to separate luminaires from the spray area or that are an integral part of the luminaire shall meet the following requirements:
 - (5) Panels for luminaires or for observation shall be of heat-treated glass, laminated glass, wired glass, or hammered-wired glass and shall be sealed to confine vapors, mists, residues, dusts, and deposits to the spray area. [33: 5.

5

a. 6.1]

Exception to a.: Listed spray booth assemblies that have vision panels constructed of other materials shall be permitted.

b. Panels for luminaires shall be separated from the luminaire to prevent the surface temperature of the panel from exceeding

93°C

a. 105°C (

200°F

a. 221°F). [33: 5.

5

a. 6.2]

b. The panel frame and method of attachment shall be designed to not fail under fire exposure before the vision panel fails. [33: 5.

5

a. 6.3]

Figure 516.6(C)(1) Example of a Luminaire Mounted Outside the Spray Area and Serviced from Outside the Spray Area. [33:Figure 6.6.1.1]

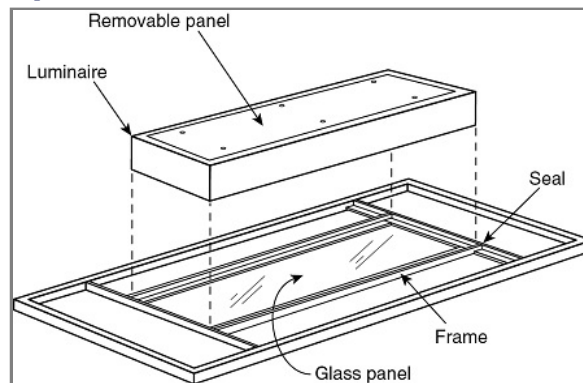
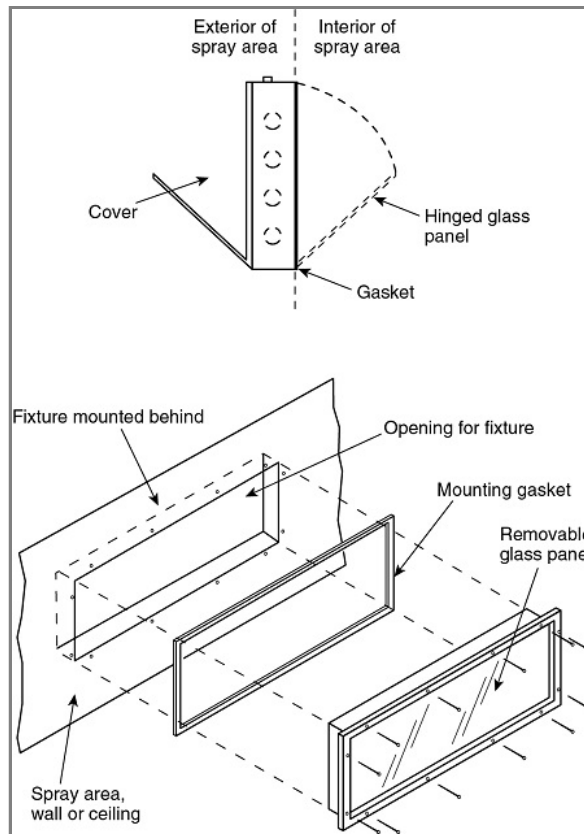


Figure 516.6(C)(2) Example of Luminaires That Are Integral Parts of the Spray Area and That Are Serviced from Inside the Spray Area. [33:Figure 6.6.3.1]



Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
516.6_C_.docx	516.6(C) Revision	

Statement of Problem and Substantiation for Public Input

Extract references are updated to align with NFPA 33 2024 Edition. Note that a Word version of the revision is included due to formatting issues in Terra View.

Submitter Information Verification

Submitter Full Name: Donald Ankele
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Submittal Date: Wed Feb 08 12:09:06 EST 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8712-NFPA 70-2024](#)

Statement: The revision reflects updates to the requirements and locations of text extracted from NFPA-33.

516.6(C) Illumination.

Luminaires shall be permitted to be installed as follows:

(1) Luminaires, like that shown in [Figure 516.6\(C\)\(1\)](#), that are attached to the walls or ceiling of a spray area but that are outside any classified area and are separated from the spray area by glass panels shall be suitable for use in unclassified locations. Such fixtures shall be serviced from outside the spray area. [\[33:6.6.1\]](#)

(2) Luminaires, like that shown in [Figure 516.6\(C\)\(1\)](#), that are attached to the walls or ceiling of a spray area; that are separated from the spray area by glass panels and that are located within a Class I, Division 2; a Class I, Zone 2; a Class II, Division 2; or a Zone 22 location shall be suitable for such location. Such fixtures shall be serviced from outside the spray area. [\[33:6.6.2\]](#)

(3) Luminaires, like that shown in [Figure 516.6\(C\)\(2\)](#), that are an integral part of the walls or ceiling of a spray area shall be permitted to be separated from the spray area by glass panels that are an integral part of the fixture. Such fixtures shall be listed for use in Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22 locations, whichever is applicable, and also shall be listed for accumulations of deposits of combustible residues. Such fixtures shall be permitted to be serviced from inside the spray area. [\[33:6.6.3\]](#)

(4) Glass panels used to separate luminaires from the spray area or that are an integral part of the luminaire shall meet the following requirements:

a. Panels for luminaires or for observation shall be of heat-treated glass, laminated glass, wired glass, or hammered-wired glass and shall be sealed to confine vapors, mists, residues, dusts, and deposits to the spray area. [\[33:5-5-4 5.6.1\]](#)

Exception to a.: Listed spray booth assemblies that have vision panels constructed of other materials shall be permitted.

b. Panels for luminaires shall be separated from the luminaire to prevent the surface temperature of the panel from exceeding $93\text{105}^{\circ}\text{C}$ ($200\text{221}^{\circ}\text{F}$). [\[33:5-5-25.6.2\]](#)

c. The panel frame and method of attachment shall be designed to not fail under fire exposure before the vision panel fails. [\[33:5-5-35.6.3\]](#)

1.
2.



Public Input No. 1077-NFPA 70-2023 [Section No. 516.6(D)]

(D) Portable Equipment.

Portable electric luminaires or other utilization equipment ~~shall not be used in a spray area during spray operations.~~

~~Exception No. 1: Where portable electric luminaires are required for operations in spaces not readily illuminated by fixed lighting within the spraying area, they shall be of the type identified~~

and electrical wiring that is located in the spray area and is subject to deposits of combustible residues shall be listed for such exposure and shall be suitable for Class I, Division 1

~~or Class 1, Zone 1 locations where readily ignitable residues could be present. [33: 6.9 Exception] Exception No. 2: ; Zone 1; Class II, Division 1; or Zone 21 locations, whichever is applicable.~~

Where portable electric drying apparatus is used in spray booths

~~and~~

the following

~~requirements are~~

use restrictions shall be met:

- (1) The apparatus and its electrical connections are not located within the spray enclosure during spray operations.
- (2) Electrical equipment within 450 mm (18 in.) of the floor is identified for Class I, Division 2 or Class I, Zone 2 locations.
- (3) All metallic parts of the drying apparatus are electrically bonded and grounded.
- (4) Interlocks are provided to prevent the operation of spray equipment while drying apparatus is within the spray enclosure, to allow for a 3-minute purge of the enclosure before energizing the drying apparatus and to shut off drying apparatus on failure of ventilation system.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
PI_1077_to_revise_516.6_D_.docx	PI 1077 to revise 516.6(D)	

Statement of Problem and Substantiation for Public Input

This revision aligns to text in NFPA 33:2024. Note that a Word version of the revision is included due to formatting issues in Terra View.

Submitter Information Verification

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Submittal Date: Wed Jun 14 12:14:18 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: FR-8718-NFPA 70-2024

Statement: The extract was revised to reflect the NEC Style manual.

(D) Portable Equipment.

Portable equipment shall comply with the following:

(1) Portable electric luminaires or other utilization equipment shall not be used in a spray area during spray operations.

~~Exception No. 1:~~

(2) Where portable electric luminaires are required for operations in spaces not readily illuminated by fixed lighting within the spraying area, they shall be of the type identified for Class I, Division 1 or Class 1, Zone 1 locations where readily ignitable residues could be present. [33:6.9 Exception]

~~Exception No. 2:~~

(3) Where portable electric drying apparatus is used in spray booths and the following requirements are met:

(a)(1) The apparatus and its electrical connections are not located within the spray enclosure during spray operations.

(b)(2) Electrical equipment within 450 mm (18 in.) of the floor is identified for Class I, Division 2 or Class I, Zone 2 locations.

(c)(3) All metallic parts of the drying apparatus are electrically bonded and grounded.

(d)(4) Interlocks are provided to prevent the operation of spray equipment while drying apparatus is within the spray enclosure, to allow for a 3-minute purge of the enclosure before energizing the drying apparatus and to shut off drying apparatus on failure of ventilation system.



Public Input No. 1080-NFPA 70-2023 [Section No. 516.6(F)]

(F) Static Electric Discharges.

All persons and all electrically conductive objects, including any metal parts of the process equipment or apparatus, containers of material, exhaust ducts, and piping systems that convey ignitable (flammable or combustible)_ liquids, shall be electrically grounded. [34:6.8.1]

Statement of Problem and Substantiation for Public Input

This revision aligns the extracted text with NFPA 34:2024.

Submitter Information Verification

Submitter Full Name: Donald Ankele
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 14 13:53:02 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8720-NFPA 70-2024](#)
Statement: The revision reflects the change in NFPA 34 extracted text.

**Public Input No. 4154-NFPA 70-2023 [Section No. 516.7(A)]****(A) Wiring.**

All fixed wiring above hazardous (classified) locations shall be permitted to be one or more of the following:

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, or electrical metallic tubing (EMT) with listed fittings.
- (2) Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or electrical nonmetallic tubing (ENT).
- (3) Type MC cable, Type TC cable, or Type TC-ER cable, including installation in cable trays, terminated with listed fittings. Type TC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (4) Type MI cable terminated with listed fittings and installed and supported to avoid tensile stress.
- (5) Type PLTC cable or Type PLTC-ER cable used in Class 2, ~~Class 3,~~ or ~~Class 3~~ Class 4 circuits. Type PLTC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (6) Type ITC cable or Type ITC-ER cable in accordance with 335.4 and 335.5 and terminated with listed fittings. Type ITC-ER cable shall include an EGC in addition to any drain wire.
- (7) Cellular metal raceways supplying ceiling outlets or as extensions to the area below the floor of a hazardous (classified) location. If cellular metal raceways are used, they shall not have connections leading into or passing through the hazardous (classified) location unless suitable seals are provided.

Statement of Problem and Substantiation for Public Input

Adding Class 4 to the list. Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.

Submitter Information Verification

Submitter Full Name: Chad Jones
Organization: Cisco Systems
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 18:59:29 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: No substantiation is provided to show that Class 4 systems are appropriate for use in hazardous (classified) locations. Additionally, PLTC cable is rated at 300 volts while Class 4 systems are rated for up to 450 volts.



Public Input No. 4443-NFPA 70-2023 [Section No. 516.7(A)]

(A) Wiring.

All fixed wiring above hazardous (classified) locations shall be permitted to be one or more of the following:

- (1) Rigid metal conduit (RMC) or intermediate metal conduit (IMC) with listed threaded or threadless fittings, or electrical metallic tubing (EMT) with listed fittings.
- (2) Rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), or electrical nonmetallic tubing (ENT).
- (3) Type MC cable, Type TC cable, or Type TC-ER cable, including installation in cable trays, terminated with listed fittings. Type TC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (4) Type MI cable terminated with listed fittings and installed and supported to avoid tensile stress.
- (5) Type PLTC cable or Type PLTC-ER cable used in Class 2 or Class 3 circuits. Type PLTC-ER cable shall include an equipment grounding conductor (EGC) in addition to any drain wire.
- (6) Type ITC cable or Type ITC-ER cable in accordance with ~~335.4 and 10 and 335.5 and 12 and~~ terminated with listed fittings. Type ITC-ER cable shall include an EGC in addition to any drain wire.
- (7) Cellular metal raceways supplying ceiling outlets or as extensions to the area below the floor of a hazardous (classified) location. If cellular metal raceways are used, they shall not have connections leading into or passing through the hazardous (classified) location unless suitable seals are provided.

Statement of Problem and Substantiation for Public Input

Updated section number to correlate with Article 335 renumbering

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 4236-NFPA 70-2023 [Article 335]	Reference update

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
Organization: Abbassi Electric Corp.
Street Address:
City:
State:
Zip:
Submission Date: Thu Sep 07 15:27:29 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: The current sections referenced in the Code are correct. Section numbering changes within Article 335 have yet to be approved.

**Public Input No. 1078-NFPA 70-2023 [Section No. 516.10(A) [Excluding any Sub-Sections]]**

This section shall apply to any equipment using electrostatically charged elements for the atomization, charging, and/or precipitation of hazardous materials for coatings on articles or for other similar purposes in which the charging or atomizing device is attached to a mechanical support or manipulator, including robotic devices. This section shall not apply to devices that are held or manipulated by hand. Where robot or programming procedures involve manual manipulation of the robot arm while spraying with the high voltage on, the requirements of 516.10(B) shall apply. The installation of electrostatic spraying equipment shall comply with the requirements of 516.10(A)(1) through (A)(10). Spray equipment shall be listed or shall be approved when automatic electrostatic spray equipment is protected using listed optical flame detection equipment. All automatic electrostatic equipment systems shall comply with the requirements of 516.6(B) through (D) and 516.6(F).

Statement of Problem and Substantiation for Public Input

This revision aligns the text to NFPA 33:2024.

Submitter Information Verification

Submitter Full Name: Donald Ankele
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 14 12:18:18 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8728-NFPA 70-2024](#)
Statement: The revision reflects the change to spray equipment in NFPA 33 2024 Edition.

**Public Input No. 2746-NFPA 70-2023 [Section No. 516.10(C)(1)]****(1) Electrical Equipment and Sources of Ignition.**

Electrical equipment and other sources of ignition shall comply with the requirements of ~~Part III of Article 502 or~~ Part III or 506.20, as applicable. Portable electric luminaires and other utilization equipment shall not be used within a Class II location during operation of the finishing processes. Such luminaires or utilization equipment used during cleaning or repairing operations shall be of a type identified for Class II, Division 1 locations and all exposed metal parts shall be connected to an equipment grounding conductor.

Exception: Portable electric luminaires shall be of the type listed for Class II, Division 1 locations where required for operations in spaces not readily illuminated by fixed lighting within the spraying area and where readily ignitable residues might be present.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams

Organization: Delta Charter Township

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 24 19:50:52 EDT 2023

Committee: NEC-P14

Committee Statement

Resolution: FR-8736-NFPA 70-2024

Statement: The text is revised to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.



Public Input No. 307-NFPA 70-2023 [Section No. 516.10(C)(4)]

(4) Electrostatic Fluidized Beds.

Electrostatic fluidized beds and associated equipment shall be of identified types. The high-voltage circuits shall be designed such that any discharge produced when the charging electrodes of the bed are approached or contacted by a grounded object shall not be of sufficient intensity to ignite any powder-air mixture likely to be encountered or to result in an appreciable shock hazard. [33:15.14.1]

(a) Transformers, power packs, control apparatus, and all other electrical portions of the equipment shall be located outside the powder-coating area or shall otherwise comply with the requirements of 516.10(C)(1). [33:15.14.2]

Exception: The charging electrodes and their connections to the power supply shall be permitted within the powder-coating area.

(b) All electrically conductive objects within the powder-coating area shall be adequately grounded. The powder-coating equipment shall carry a prominent, permanently installed warning regarding the necessity for grounding these objects. [33:15.14.3]

Informational Note: See NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*; NFPA 34, *Standard for Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids*; and NFPA 77, *Recommended Practice on Static Electricity*, for information on grounding and bonding for static electricity purposes.

(c) Objects being coated shall be maintained in electrical contact (less than 1 megohm) with the conveyor or other support in order to ensure proper grounding. Hangers shall be regularly cleaned to ensure effective electrical contact. Areas of electrical contact shall be sharp points or knife edges where possible. [33:15.14.5]

(d) The electrical equipment and compressed air supplies shall be interlocked with a ventilation system so that the equipment cannot be operated unless the ventilating fans are in operation. [33: Chapter 15 15.14.6]

Statement of Problem and Substantiation for Public Input

extracts are referenced to align with NFPA 33 2024 Edition.

Submitter Information Verification

Submitter Full Name: Donald Ankele
Organization: UL LLC
Street Address:
City:
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Zip:
Submittal Date: Wed Feb 08 12:23:21 EST 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8735-NFPA 70-2024](#)

Statement: The revision reflects the change in NFPA33 as extracted text, 2024 Edition.



Public Input No. 4141-NFPA 70-2023 [Section No. 516.16]

~~516.16~~ Grounding:

~~All metal raceways, the metal armors or metallic sheath on cables, and all non-current-carrying metal parts of fixed or portable electrical equipment, regardless of voltage, shall be grounded and bonded. Grounding and bonding shall comply with 501.30, 502.30, or 505.30, as applicable.~~

Statement of Problem and Substantiation for Public Input

Delete 516.16. The grounding and bonding requirements are found in Article 250 which applies to Chapter 5 articles. The special requirements for bonding are found in Article 501 for Class I locations and in Article 505 for Zones 0, 1, and 2. There is no need for grounding and bonding requirements which create confusion in this article.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1941-NFPA 70-2023 [Section No. 511.16]	
Public Input No. 2034-NFPA 70-2023 [Section No. 515.16]	
Public Input No. 4131-NFPA 70-2023 [Section No. 513.16]	
Public Input No. 4139-NFPA 70-2023 [Section No. 514.16]	
Public Input No. 1941-NFPA 70-2023 [Section No. 511.16]	
Public Input No. 2034-NFPA 70-2023 [Section No. 515.16]	
Public Input No. 4131-NFPA 70-2023 [Section No. 513.16]	
Public Input No. 4139-NFPA 70-2023 [Section No. 514.16]	

Submitter Information Verification

Submitter Full Name: John Simmons
Organization: Florida East Coast JATC
Affiliation: IBEW
Street Address:
City:
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Submission Date: Wed Sep 06 18:24:02 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: [FR-8737-NFPA 70-2024](#)
Statement: Revision to align with 500.30, 505.30, or 506.30..



Public Input No. 303-NFPA 70-2023 [New Section after 516.18]

516.19 Spray Application Operations in Inflatable Finishing Workstations

An inflatable finishing workstation shall be listed for temporary use or shall be approved for temporary use in accordance with 516.19(A) through (J).

(A) Uses Permitted.

An inflatable finishing workstation shall only be used outdoors:

- (1) where separated by a minimum distance of 6.1 m (20 ft) from any permanent or temporary structures with blank, fire resistive masonry walls or those equivalent to 1 hour fire rated construction.
- (2) where separated by a minimum distance of 6.1 m (20 ft) from a public way, and separated by a minimum distance of 15.2 m (50 ft) from any permanent or temporary structures with combustible walls or those not having blank, fire resistive masonry walls, or
- (3) where there are unprotected openings in the walls within 15.2 m (50 ft). [33:14.2.2]

(B) Uses Not Permitted.

An inflatable finishing workstation shall not be used:

- (1) For processes in which combustible dry powders are applied or combustible dusts are created in quantities that are hazardous. [33:14.4.1.2]

Informational Note: See NFPA 652, *Standard on the Fundamentals of Combustible Dust*, for Dust Hazard Analysis (DHA) that can be used to determine if the process generates sufficient combustible dust to be hazardous.

- (2) Where electrostatic spray application equipment is used. [33:14.1.3]
- (3) As a permanent installation.
- (4) Where it will block emergency vehicle access to adjacent structures. [33:14.4.2.3]

(C) Construction:

An inflatable finishing workstation shall have the following construction.

- (1) All walls and the floor shall be constructed of materials that are noncombustible, limited combustible or that do not continue to burn for more than 2 seconds after a specified test flame is removed from a specified test sample. [33:14.4.3.1]

Informational Note No.1: See NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films* for information on testing to determine that a polymer film does not continue to burn for more than 2 seconds after a specified test flame is removed from a suitable sample.

- (2) Materials that enclose the spray area within the inflatable workstation shall be static dissipative. [33:14.4.3.2]

Informational Note No. 2: See ASTM D-257, *Standard Test Methods for DC Resistance or Conductance of Insulating Materials*, for a procedure to determine resistivity.

Informational Note No. 3: Typically, a dissipative material is one having a surface resistivity equal to or greater than 10^5 but less than 10^9 ohms per square, or a volume resistivity equal to or greater than 10^5 but less than 10^9 ohm-meters. Some applications might require different resistivities, though the intent is to dissipate electrostatic charges when the surface is bonded to ground.

- (3) A means to electrostatically ground the air-inflated structure to dissipate any accumulated charge the inflatable finishing workstation at one or more grounding connection points. [33:14.4.3.3]
- (4) Air intake filters that are a part of a wall or ceiling assembly shall be listed. [33:14.4.3.5]
- (5) An inflatable finishing workstation shall have means to be anchored against wind load during installation and operation. [33:14.4.3.6]

Informational Note No.4: The inflatable structure manufacturer typically provides instructions with the recommended anchoring method, including limits on wind speed and load limits.

Informational Note 5: See NFPA 5000, *Building Construction and Safety Code*, for requirements related to inflatable structures.

(D) Means of Egress.

An inflatable finishing workstation shall have a minimum of two means of egress. The inflatable finishing workstation shall be considered to contain high-hazard contents when determining the means of egress. [33:14.4.4]

Informational Note: See NFPA 101, Life Safety Code, for means of egress requirements.

(E) Ventilation.

An inflatable finishing workstation shall have ventilation means as follows:

- (1) Mechanical ventilation capable of confining and removing vapors and mists and capable of confining and controlling combustible residues, dusts, and deposits
- (2) The concentration of the vapors and mists in the exhaust stream of the ventilation system shall not exceed 10 percent of the lower flammable limit of the flammable material being sprayed.
- (3) Exhaust shall be directed away from any air intake.
- (4) The exhaust discharge point shall be at least 6.1 m (20 ft) from openings into any building or other inflatable finishing workstations.

Informational Note: Locating the exhaust discharge point away from intakes into other inflatable finishing workstations will help prevent introducing contaminated air into adjacent inflatable finishing workstations.

- (5) The exhaust shall not discharge in the direction of any combustible construction that is within 7.5 m (25 ft) of the exhaust duct discharge point.
- (6) The exhaust shall not discharge in the direction of any unprotected opening in any noncombustible or limited-combustible construction that is within 7.5 m (25 ft) of the exhaust duct discharge point.
- (7) The exhaust shall not discharge in the direction of any exit discharge or public way that is within 7.5 m (25 ft) of the exhaust duct discharge point. [33:14.4.5]

(F) Supply Air.

An inflatable finishing workstation shall have supply air follows:

- (1) Air for inflating the structure and for introduction of dilution air shall be provided by mechanical ventilation using clean make-up air.

Informational Note: Combustion from equipment such as portable generators or the exhaust from other spray operations may contaminate make-up air. Refer to the manufacturer's installation instructions for guidance on locating supply air intakes.

- (2) Heating of supply air shall not be permitted.
- (3) Recirculation of process exhaust air shall not be permitted. [33:14.4.5.4]

(G) Electrical and Other Sources of Ignition.

- (1) An inflatable finishing workstation shall have the following area classification during spray application:

- (a) The area within the inflatable finishing workstation shall be Class I, Division 1 or Zone 1.
- (b) Areas within 1.5 m (5 ft) of exhaust shall be Class 1, Division 1 or Zone 1.
- (c) Areas between 1.5 m (5 ft) and 3 m (10 ft) of the exhaust shall be Class I, Division 2 or Zone 2.
- (d) The area within 1.5 m (5 ft) horizontally and vertically from the surface of the inflatable finishing workstation shall be Class I, Division 2 or Zone 2 (see Figure 516.19).

- (2) An inflatable finishing workstation shall also comply with the following:

- (a) The electrical area classifications are not applicable when the inflatable finishing workstation is stored.

[insert Figure 516.19 here]. [33: Figure 14.4.6.4]

- (b) Electrical wiring and electrical utilization equipment shall not be utilized within the inflatable workstation.
- (c) Electrical wiring and electrical utilization equipment that is used adjacent to the inflatable finishing workstation shall be identified for the location.

Informational Note No. 1: Manufacturer instructions typically include guidance for the location of the inflatable finishing workstation relative to electrical utilization equipment or processes that may generate sparks.

Informational Note No. 2: The areas in and adjacent to the inflatable finishing workstation are typically considered unclassified after sufficient air flow has removed the flammable vapors following the completion of the spraying process.

(d) All designated ground connections of an inflatable finishing workstation and all electrically conductive objects in the spray area shall be electrically connected to ground while inflated for use. [33:14.4.6]

Informational Note No. 3: See NFPA 77, Recommended Practice on Static Electricity, for additional information regarding the dissipation of electrostatic charges.

Informational Note No. 4: Electrically conductive objects include, but are not limited to, containers of coating material, wash cans, guards, hose connectors, brackets, and any personnel who enter the spray area.

(H) Ignitable Liquids.

An inflatable finishing workstation shall be limited to the quantity of ignitable liquids as follows:

(1) Ignitable (flammable and combustible) liquids within the inflatable finishing workstation shall not exceed a total of 3.8 L (1 gal) at any time.

(2) Pressurized containers larger than 3.8 L (1 gal) for paint delivery shall not be used. [33:14.4.7]

(I) Protection.

An inflatable finishing workstation shall have portable fire extinguishers provided and the extinguishers shall be selected for extra-hazard locations. At least one portable fire extinguisher shall be located external to the inflatable finishing workstation near the exhaust side. [33:14.4.8]

Informational Note: See NFPA 10, for details regarding the selection and location of portable fire extinguishers.

(J) Operations and Maintenance

An inflatable finishing workstation shall be operated as follows:

(1) Overspray accumulation shall be removed from surfaces of the inflatable finishing workstation in accordance with instructions for use.

(2) Signs stating NO SMOKING OR OPEN FLAMES shall be conspicuously posted adjacent to the inflatable finishing workstation while inflated for use.

(3) Welding, cutting, and other spark-producing operations shall not be permitted in or adjacent to spray areas. [33:14.4.9]

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
516.19_ Revised_PI_303.docx	PI 303 New 516.19	

Statement of Problem and Substantiation for Public Input

This proposal adds enforceable requirements for inflatable finishing workstations as found in a new Section 14.4 in NFPA 33, 2024 Edition.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 3240-NFPA 70-2023 [Definition:]	Revision to requirements that include a listing requirement.
Public Input No. 3240-NFPA 70-2023 [Definition:]	

Submitter Information Verification

Submitter Full Name: Donald Ankele
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submission Date: Wed Feb 08 11:22:44 EST 2023
Committee: NEC-P14

Committee Statement

Resolution: Many aspects of the PI may be beneficial but consideration is needed to limit all the material in the section to fall within the scope of the NEC.

Public Input No. 303-NFPA 70-2023

New Section after 516.18

516.19 Spray Application Operations in Inflatable Finishing Workstations

An inflatable finishing workstation shall be listed for temporary use or shall be approved for temporary use in accordance with 516.19(A) through (J).

(A) Uses Permitted.

An inflatable finishing workstation shall only be used outdoors:

1. where separated by a minimum distance of 6.1 m (20 ft) from any permanent or temporary structures with blank, fire resistive masonry walls or those equivalent to 1 hour fire rated construction,
2. where separated by a minimum distance of 6.1 m (20 ft) from a public way, and separated by a minimum distance of 15.2 m (50 ft) from any permanent or temporary structures with combustible walls or those not having blank, fire resistive masonry walls, or
3. where there are unprotected openings in the walls within 15.2 m (50 ft). [33:14.2.2]

(B) Uses Not Permitted.

An inflatable finishing workstation shall not be used:

(1) For processes in which combustible dry powders are applied or combustible dusts are created in quantities that are hazardous. [33:14.4.1.2]

Informational Note: See NFPA 652, *Standard on the Fundamentals of Combustible Dust*, for Dust Hazard Analysis (DHA) that can be used to determine if the process generates sufficient combustible dust to be hazardous.

(2) Where electrostatic spray application equipment is used. [33:14.1.3]

(3) As a permanent installation.

(4) Where it will block emergency vehicle access to adjacent structures. [33:14.4.2.3]

(C) Construction:

An inflatable finishing workstation shall have the following construction.

(1) All walls and the floor shall be constructed of materials that are noncombustible, limited combustible or that do not continue to burn for more than 2 seconds after a specified test flame is removed from a specified test sample. [33: 14.4.3.1]

Informational Note No.1: See NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films* for information on testing to determine that a polymer film does not continue to burn for more than 2 seconds after a specified test flame is removed from a suitable sample.

(2) Materials that enclose the spray area within the inflatable workstation shall be static dissipative. [33:14.4.3.2]

Informational Note No. 2: See ASTM D-257, Standard Test Methods for DC Resistance or Conductance of Insulating Materials, for a procedure to determine resistivity.

Informational Note No. 3: Typically, a dissipative material is one having a surface resistivity equal to or greater than 10^5 but less than 10^9 ohms per square, or a volume resistivity equal to or greater than 10^5 but less than 10^9 ohm-meters. Some applications might require different resistivities, though the intent is to dissipate electrostatic charges when the surface is bonded to ground.

(3) A means to electrostatically ground the air-inflated structure to dissipate any accumulated charge the inflatable finishing workstation at one or more grounding connection points. [33:14.4.3.3]

(4) Air intake filters that are a part of a wall or ceiling assembly shall be listed. [33:14.4.3.5]

(5) An inflatable finishing workstation shall have means to be anchored against wind load during installation and operation. [33:14.4.3.6]

Informational Note No.4: The inflatable structure manufacturer typically provides instructions with the recommended anchoring method, including limits on wind speed and load limits.

Informational Note 5: See NFPA 5000, Building Construction and Safety Code, for requirements related to inflatable structures.

(D) Means of Egress.

An inflatable finishing workstation shall have a minimum of two means of egress. The inflatable finishing workstation shall be considered to contain high-hazard contents when determining the means of egress. [33:14.4.4]

Informational Note: See NFPA 101, Life Safety Code, for means of egress requirements.

(E) Ventilation.

An inflatable finishing workstation shall have ventilation means as follows:

(1) Mechanical ventilation capable of confining and removing vapors and mists and capable of confining and controlling combustible residues, dusts, and deposits

(2) The concentration of the vapors and mists in the exhaust stream of the ventilation system shall not exceed 10 percent of the lower flammable limit of the flammable material being sprayed.

(3) Exhaust shall be directed away from any air intake.

(4) The exhaust discharge point shall be at least 6.1 m (20 ft) from openings into any building or other inflatable finishing workstations.

Informational Note: Locating the exhaust discharge point away from intakes into other inflatable finishing workstations will help prevent introducing contaminated air into adjacent inflatable finishing workstations.

(5) The exhaust shall not discharge in the direction of any combustible construction that is within 7.5 m (25 ft) of the exhaust duct discharge point.

(6) The exhaust shall not discharge in the direction of any unprotected opening in any noncombustible or limited-combustible construction that is within 7.5 m (25 ft) of the exhaust duct discharge point.

(7) The exhaust shall not discharge in the direction of any exit discharge or public way that is within 7.5 m (25 ft) of the exhaust duct discharge point. [33:14.4.5]

(F) Supply Air.

An inflatable finishing workstation shall have supply air follows:

(1) Air for inflating the structure and for introduction of dilution air shall be provided by mechanical ventilation using clean make-up air.

Informational Note: Combustion from equipment such as portable generators or the exhaust from other spray operations may contaminate make-up air. Refer to the manufacturer's installation instructions for guidance on locating supply air intakes.

(2) Heating of supply air shall not be permitted.

(3) Recirculation of process exhaust air shall not be permitted. [33:14.4.5.4]

(G) Electrical and Other Sources of Ignition.

(1) An inflatable finishing workstation shall have the following area classification during spray application:

(a) The area within the inflatable finishing workstation shall be Class I, Division 1 or Zone 1.

(b) Areas within 1.5 m (5 ft) of exhaust shall be Class 1, Division 1 or Zone 1.

(c) Areas between 1.5 m (5 ft) and 3 m (10 ft) of the exhaust shall be Class I, Division 2 or Zone 2.

(d) The area within 1.5 m (5 ft) horizontally and vertically from the surface of the inflatable finishing workstation shall be Class I, Division 2 or Zone 2 (see Figure 516.19).

(2) An inflatable finishing workstation shall also comply with the following:

(a) The electrical area classifications are not applicable when the inflatable finishing workstation is stored.

[insert Figure 516.19 here] [33: Figure 14.4.6.4]

(b) Electrical wiring and electrical utilization equipment shall not be utilized within the inflatable workstation.

(c) Electrical wiring and electrical utilization equipment that is used adjacent to the inflatable finishing workstation shall be identified for the location.

Informational Note No. 1: Manufacturer instructions typically include guidance for the location of the inflatable finishing workstation relative to electrical utilization equipment or processes that may generate sparks.

Informational Note No. 2: The areas in and adjacent to the inflatable finishing workstation are typically considered unclassified after sufficient air flow has removed the flammable vapors following the completion of the spraying process.

(d) All designated ground connections of an inflatable finishing workstation and all electrically conductive objects in the spray area shall be electrically connected to ground while inflated for use. [33:14.4.6]

Informational Note No. 3: See NFPA 77, Recommended Practice on Static Electricity, for additional information regarding the dissipation of electrostatic charges.

Informational Note No. 4: Electrically conductive objects include, but are not limited to, containers of coating material, wash cans, guards, hose connectors, brackets, and any personnel who enter the spray area.

(H) Ignitable Liquids.

An inflatable finishing workstation shall be limited to the quantity of ignitable liquids as follows:

(1) Ignitable (flammable and combustible) liquids within the inflatable finishing workstation shall not exceed a total of 3.8 L (1 gal) at any time.

(2) Pressurized containers larger than 3.8 L (1 gal) for paint delivery shall not be used. [33:14.4.7]

(I) Protection.

An inflatable finishing workstation shall have portable fire extinguishers provided and the extinguishers shall be selected for extra-hazard locations. At least one portable fire extinguisher shall be located external to the inflatable finishing workstation near the exhaust side. [33:14.4.8]

Informational Note: See NFPA 10, for details regarding the selection and location of portable fire extinguishers.

(J) Operations and Maintenance

An inflatable finishing workstation shall be operated as follows:

(1) Overspray accumulation shall be removed from surfaces of the inflatable finishing workstation in accordance with instructions for use.

(2) Signs stating NO SMOKING OR OPEN FLAMES shall be conspicuously posted adjacent to the inflatable finishing workstation while inflated for use.

(3) Welding, cutting, and other spark-producing operations shall not be permitted in or adjacent to spray areas. [33:14.4.9]



Public Input No. 1079-NFPA 70-2023 [Section No. 516.18]

516.18 ~~Area Classification for~~ Temporary Membrane Enclosures.

A) Electrical area classification

Area classification within temporary membrane enclosures shall be as follows:

- (1) The area within the membrane enclosure shall be considered a Class I, Division 1 area, as shown in Figure 516.18.
- (2) A 1.5 m (5 ft) zone outside of the membrane enclosure shall be considered Class I, Division 2, as shown in Figure 516.18.

Informational Note No. 1: See NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*, for information on occupancy, ventilation, fire protection, and permitting for spray application operations in membrane enclosures. This document limits spray application operations within both outdoor and indoor temporary membrane enclosures, as well as use and time constraints. The risks to people and property are unique when spray painting within the confined spaces of temporary membrane enclosures.

Informational Note No. 2: See NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*, Section 18.6, for the limits of material used in a vertical plane for membrane enclosures.

Informational Note No. 3: See NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, Test Method 2, for construction information.

Informational Note No. 4: See NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*, 18.3.2.1.1, for membrane installation beneath sprinklers.

Informational Note No. 5: See NFPA 13, *Standard for the Installation of Sprinkler Systems*, 8.15.15, for information on the protection of membrane structures.

(B) Membrane Material

Membrane enclosures shall have the following construction:

- (1) Membrane enclosures shall be constructed of noncombustible or limited combustible materials.
- (2) Installers shall provide documentation that the membrane material meets one of these requirements before installation. [33 :18.3]

Informational Note No. 1: See NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, for information on limited combustible curtains or partitions.

Informational Note No. 2: See NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, for information on limiting flame spread to walls, ceilings and for preventing flashover.

Informational Note: See ANSI/FM 4950, *Welding Pads, Welding Blankets and Welding Curtains for Hot Work Operations*, for information on materials that are classified as welding curtains.

- (3) Membrane material that is in other than in a vertical plane, the membrane material shall be both of the following:

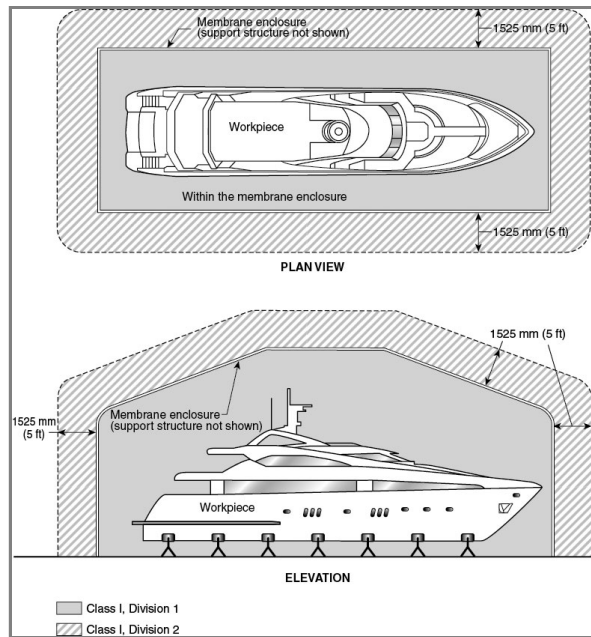
(a) Listed for installation beneath sprinklers

(b) Installed to meet the requirements for drop-out ceilings and ceiling materials. [33 :18.4.3.2.1]

Informational Note No. 1: See NFPA 13, *Standard for the Installation of Sprinkler Systems*, for information drop-out ceilings and ceiling materials.

Informational Note No. 2: See UL Subject 723S, *Outline of Investigation for Drop-Out Ceilings Installed Beneath Automatic Sprinklers*, or as FM Class Number 4651, *Plastic Suspended Ceiling Panels* for requirements for ceiling panels and ceiling materials that are designed such that the activation of the sprinkler and the ability of the sprinkler discharge to reach the hazard being protected are not adversely impacted.

Figure 516.18 Electrical Classifications for Outdoor Membrane Enclosures. [33:Figure 18.6.1.2]



Statement of Problem and Substantiation for Public Input

This revision aligns extracted text with NFPA 33:2024, Chapter 18.

Submitter Information Verification

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Committee: NEC-P14

Committee Statement

Resolution: The existing text retains the area classification. The proposed added text falls outside the scope of the NEC.



Public Input No. 3240-NFPA 70-2023 [Definition:]

Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
110	UL 10C	Positive Pressure Fire Tests of Door Assemblies
-		
	UL 305	Panic Hardware
-		
	UL 486D	Sealed Wire Connector Systems
-		
	UL 2043	Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces
-		
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
210	UL 498	Attachment Plugs and Receptacles
-		
	UL 935	Fluorescent-Lamp Ballasts
-		
	UL 943	Ground Fault Circuit Interrupters
-		
	UL 1029	High-Intensity-Discharge Lamp Ballast
-		
	UL 1699	Arc-Fault Circuit-Interrupters
-		
	UL 1699A	Outlet Branch Circuit AFCIs
225	UL 6	Electrical Rigid Metal Conduit — Steel
-		
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
-		
	UL 360	Liquid-Tight Flexible Metal Conduit
-		
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
-		
	UL 1242	Electrical Intermediate Metal Conduit — Steel
-		
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
-		
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
230	UL 6	Electrical Rigid Metal Conduit — Steel
-		
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
-		

UL 67	Panelboards
-	
UL 98	Enclosed and Dead-Front Switches
-	
UL 218	Fire Pump Controllers
-	
UL 231	Power Outlets
-	
UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers
-	
UL 360	Liquid-Tight Flexible Metal Conduit
-	
UL 414	Meter Sockets
-	
UL 486A-486B	Wire Connectors
-	
UL 486C	Splicing Wire Connectors
-	
UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
-	
UL 508	Industrial Control Equipment
-	
UL 508A	Industrial Control Panels
-	
UL 514B	Conduit, Tubing and Cable Fittings
-	
UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
-	
UL 845	Motor Control Centers
-	
UL 857	Busways
-	
UL 869A	Reference Standard for Service Equipment
-	
UL 891	Switchboards

UL 977	Fused Power-Circuit Devices
-	
UL 1008	Transfer Switch Equipment

[UL 1008A](#) [Transfer Switch Equipment, Over 1000 Volts](#)

-

[UL 1008M](#) [Meter-Mounted Transfer Switches](#)

-

[UL 1008S](#) [Solid-State Transfer Switches](#)

-

[UL 1053](#) [Ground-Fault Sensing and Relaying Equipment](#)

-

[UL 1062](#) [Unit Substations](#)

-

[UL 1066](#) [Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures](#)

-

[UL 1242](#) [Electrical Intermediate Metal Conduit — Steel](#)

-

[UL 1429](#) [Pullout Switches](#)

-

[UL 1449](#) [Surge Protective Devices](#)

-

[UL 1558](#) [Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear](#)

-

[UL 1660](#) [Liquid-Tight Flexible Nonmetallic Conduit](#)

-

[UL 1740](#) [Robots and Robotic Equipment](#)

-

[UL 1953](#) [Power Distribution Blocks](#)

-

[UL 2011](#) [Machinery](#)

-

[UL 2200](#) [Stationary Engine Generator Assemblies](#)

-

[UL 2416](#) [Audio/Video, Information and Communication Technology Equipment Cabinet, Enclosure and Rack Systems](#)

-

[UL 2446](#) [Unitary Boiler Room Systems](#)

-

[UL 2565](#) [Industrial Metalworking and Woodworking Machine Tools](#)

-

[UL 2735](#) [Electric Utility Meters](#)

-

[UL 2745](#) [Meter Socket Adapters for Communications Equipment](#)

-

[UL 2876](#) [Remote Racking Devices for Switchgear and Controlgear](#)

-

[UL 4248-1](#) [Fuseholders — Part 1: General Requirements](#)

-

[UL 60947-1](#) [Low-Voltage Switchgear and Controlgear — Part 1: General Rules](#)

-

[UL 61800-5-1](#) [Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy.](#)

[240 UL 248-1](#) [Low-Voltage Fuses — Part 1: General Requirements](#)

-

[UL 248-2](#) [Low-Voltage Fuses — Part 2: Class C Fuses](#)

-

[UL 248-3](#) [Low-Voltage Fuses — Part 2: Class CA and CB Fuses](#)

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[UL 248-4](#) [Low-Voltage Fuses — Part 4: Class CC Fuses](#)

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[UL 248-5](#) [Low-Voltage Fuses — Part 5: Class G Fuses](#)

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[UL 248-6](#) [Low-Voltage Fuses — Part 6: Class H Non-Renewable Fuses](#)

-

[UL 248-8](#) [Low-Voltage Fuses — Part 8: Class J Fuses](#)

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[UL 248-9](#) [Low-Voltage Fuses — Part 9: Class K Fuses](#)

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[UL 248-10](#) [Low-Voltage Fuses — Part 10: Class L Fuses](#)

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[UL 248-11](#) [Low-Voltage Fuses — Part 11: Plug Fuses](#)

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[UL 248-12](#) [Low-Voltage Fuses — Part 12: Class R Fuses](#)

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[UL 248-15](#) [Low-Voltage Fuses — Part 15: Class T Fuses](#)

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[UL 248-17](#) [Low-Voltage Fuses — Part 17: Class CF Fuses](#)

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[UL 248-18](#) [Low-Voltage Fuses — Part 18: Class CD Fuses](#)

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[UL 489](#) [Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures](#)

-

UL 489I	Solid State Molded-Case Circuit Breakers	
-		
UL 943	Ground-Fault Circuit-Interruption	
-		
UL 1053	Ground-Fault Sensing and Relaying Equipment	
-		
UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures	
-		
242	UL 4248-1	Fuseholders — Part 1: General Requirements
250	UL 1449	Surge Protective Devices
	UL 1	Flexible Metal Conduit
-		
UL 4	Armored Cable	
-		
UL 5	Surface Metal Raceways and Fittings	
-		
UL 6	Electrical Rigid Metal Conduit — Steel	
-		
UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	
-		
UL 360	Liquid-Tight Flexible Metal Conduit	
-		
UL 467	Grounding and Bonding Equipment	
-		
UL 486A-486B	Wire Connectors	
-		
UL 486C	Splicing Wire Connectors	
-		
UL 486D	Sealed Wire Connector Systems	
-		
UL 498	Attachment Plugs and Receptacles	
-		
UL 504	Mineral-Insulated, Metal-Sheathed Cable	
-		
UL 514A	Metallic Outlet Boxes	
-		
UL 514B	Conduit, Tubing, and Cable Fittings	
-		
UL 797	Electrical Metallic Tubing — Steel	
-		

	UL 797A	Electrical Metallic Tubing — Aluminum
-		
	UL 1242	Electrical Intermediate Metal Conduit — Steel
-		
	UL 1569	Metal-Clad Cables
-		
	UL 1652	Flexible Metallic Tubing
300	UL 4	Armored Cable
-		
	UL 44	Thermoset-Insulated Wires and Cables
-		
	UL 83	Thermoplastic-Insulated Wires and Cables
-		
	UL 83A	Fluoropolymer Insulated Wire
-		
	UL 263	Fire Tests of Building Construction and Materials
-		
	UL 504	Mineral-Insulated, Metal-Sheathed Cable
-		
	UL 746C	Polymeric Materials — Use in Electrical Equipment Evaluations
-		
	UL 1569	Metal-Clad Cable
-		
	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
-		
	UL 2239	Hardware for Support of Conduit, Tubing and Cable
-		
	UL 2556	Wire and Cable Test Methods
-		
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
310	UL 44	Thermoset-Insulated Wires and Cables
-		
	UL 83	Thermoplastic-Insulated Wires and Cables
-		
	UL 83A	Fluoropolymer Insulated Wire
-		
	UL 224	Extruded Insulating Tubing
-		
	UL 1063	Machine-Tool Wires and Cables
-		

UL 1441	Coated Electrical Sleeving
315 ANSI C119.4	Electric Connectors — Connectors for Use between Aluminum-to-Aluminum and Aluminum-to-Copper Conductors Designed for Normal Operation at or Below 93°C and Copper-to-Copper Conductors Designed for Normal Operation at or Below 100°C
-	
IEEE 48	IEEE Standard for Test Procedures and Requirements for Alternating-Current Cable Terminations Used on Shielded Cables Having Laminated Insulation Rated 2.5 kV through 765 kV or Extruded Insulation Rated 2.5 kV through 500 kV
-	
IEEE 386	IEEE Standard for Separable Insulated Connector Systems for Power Distribution Systems Rated 2.5 kV through 35 kV
-	
IEEE 404	IEEE Standard for Extruded and Laminated Dielectric Shielded Cable Joints Rated 2.5 kV to 500 kV
-	
UL 4	Armored Cable
-	
UL 504	Mineral-Insulated, Metal-Sheathed Cable
-	
UL 1072	Medium Voltage Power Cables
-	
UL 1569	Metal-Clad Cable
312 UL 50	Enclosures for Electrical Equipment
-	
UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
-	
UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
-	
UL 916	Energy Management Equipment
-	
UL 2808	Energy Monitoring Equipment
-	
UL 61010-1 and UL 61010-2-030	Electrical Equipment for Measurement, Control, and Laboratory Use — Part 2-030: Particular Requirements for Testing and Measuring Circuits
314 UL 50	Enclosures for Electrical Equipment
-	
UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
-	
UL 486D	Sealed Wire Connector Systems
-	
UL 498	Attachment Plugs and Receptacles
-	
UL 498B	Receptacles with Integral Switching Means
-	

UL 498D Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts

-

UL 498E Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection

-

UL 514A Metallic Outlet Boxes

-

UL 514B Conduit, Tubing, and Cable Fittings

-

UL 514C Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers

-

UL 514D Cover Plates for Flush-Mounted Wiring Devices

-

320 UL 1953 Power Distribution Blocks
UL 4 Armored Cable

-

UL 44 Thermoset-Insulated Wires and Cables

-

UL 83 Thermoplastic-Insulated Wires and Cables

-

UL 83A Fluoropolymer Insulated Wire

-

UL 514B Conduit, Tubing, and Cable Fittings

-

UL 514C Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers

-

UL 1063 Machine-Tool Wires and Cables

-

UL 1565 Positioning Devices

-

UL 2239 Hardware for the Support of Conduit, Tubing, and Cable

322 UL 486A-486B Wire Connectors

-

UL 498 Attachment Plugs and Receptacles

-

UL 514A Metallic Outlet Boxes

324 UL 486A-486B Wire Connectors

-

	UL 498	Attachment Plugs and Receptacles
330	UL 44	Thermoset-Insulated Wires and Cables
-		
	UL 66	Fixture Wire
-		
	UL 83	Thermoplastic-Insulated Wires and Cables
-		
	UL 83A	Fluoropolymer Insulated Wire
-		
	UL 514B	Conduit, Tubing, and Cable Fittings
-		
	UL 1063	Machine-Tool Wires and Cables
-		
	UL 1565	Positioning Devices
-		
	UL 1569	Metal-Clad Cables
-		
	UL 2225	Cables and Cable-Fittings For Use In Hazardous (Classified) Locations
-		
	UL 2239	Hardware for the Support of Conduit, Tubing, and Cable
332	UL 504	Mineral-Insulated, Metal-Sheathed Cable
-		
	UL 514B	Conduit, Tubing and Cable Fittings
334	UL 719	Nonmetallic-Sheathed Cables
-		
	UL 2256	Nonmetallic Sheathed Cable Interconnects
-		
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installations
335	UL 2250	Instrumentation Tray Cable
336	UL 514B	Conduit, Tubing, and Cable Fittings
-		
	UL 1277	Electrical Power and Control Tray Cables with Optional Optical-Fiber Members
-		
	UL 2225	Cables and Cable-Fittings For Use In Hazardous (Classified) Locations
337	UL 1309A	Cable for Use in Mobile Installations
338	UL 514B	Conduit, Tubing, and Cable Fittings
-		
	UL 854	Service-Entrance Cables
340	UL 514B	Conduit, Tubing, and Cable Fittings
340	UL 493	Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables

342	UL 514B	Conduit, Tubing, and Cable Fittings

	UL 1242	Electrical Intermediate Metal Conduit — Steel
344	UL 6	Electrical Rigid Metal Conduit — Steel
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
	UL 514B	Conduit, Tubing, and Cable Fittings
348	UL 1	Flexible Metal Conduit
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
350	UL 360	Liquid-Tight Flexible Steel Conduit
	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
352	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
353	UL 651A	Schedule 40 and 80 High Density Polyethylene (HDPE) Conduit
354	UL 1990	Nonmetallic Underground Conduit with Conductors
355	UL 2420	Belowground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
	UL 2515A	Supplemental Requirements for Extra-Heavy Wall Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
356	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
358	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 797	Electrical Metallic Tubing — Steel
	UL 797A	Electrical Metallic Tubing — Aluminum and Stainless Steel
360	UL 514B	Conduit, Tubing, and Cable Fittings
	UL 1652	Flexible Metallic Tubing
362	UL 1653	Electrical Nonmetallic Tubing
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
366	UL 870	Wireways, Auxiliary Gutters, and Associated Fittings
368	UL 509	Bus Drop Cable
370	ANSI/CSA C22.2 No. 273	Cablebus
374	UL 209	Cellular Metal Floor Raceways and Fittings
	UL 360	Liquid-Tight Flexible Metal Conduit

	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
376	UL 870	Wireways, Auxiliary Gutters and Associated Fittings
	UL 1953	Power Distribution Blocks
378	UL 870	Wireways, Auxiliary Gutters, and Associated Fittings
382	UL 5A	Nonmetallic Surface Raceways and Fittings
	UL183	Manufactured Wiring Systems
	UL 467	Grounding and Bonding Equipment
	UL 498	Attachment Plugs and Receptacles
	UL 498D	Attachment Plugs, Cord Connectors and Receptacles with Arcuate (Locking Type) Contacts
	UL 498E	Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection
	UL 498F	Plugs, Socket-Outlets and Couplers with Arcuate (Locking Type) Contacts
	UL 498M	Marine Shore Power Inlets
	UL 514D	Cover Plates for Flush-Mounted Wiring Devices
	UL 746C	Polymeric Materials — Use in Electrical Equipment Evaluations
	UL 943	Ground-Fault Circuit-Interruption
	UL 991	Tests for Safety-Related Controls Employing Solid-State Devices
	UL 1077	Supplementary Protectors for Use in Electrical Equipment
	UL 1699	Arc-Fault Circuit-Interruption
	UL 1998	Software in Programmable Components
384	UL 5B	Strut-Type Channel Raceways and Fittings
386	UL 5	Surface Metal Raceways and Fittings
388	UL 5A	Nonmetallic Surface Raceways and Fittings
392	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
393	UL 13	Power-Limited Circuit Cables
	UL 50	Enclosures for Electrical Equipment, Non-Environmental Considerations

[UL 50E](#) [Enclosures for Electrical Equipment, Environmental Considerations](#)

[UL 514C](#) [Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers](#)

[UL 1310](#) [Class 2 Power Units](#)

[UL 2043](#) [Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces](#)

[UL 2577](#) [Suspended Ceiling Power Grid Systems and Equipment](#)

[UL 62368-1](#) [Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements](#)

[396 UL 1072](#) [Medium-Voltage Power Cables](#)

[404](#) [UL 20](#) [General-Use Snap Switches](#)

[UL 98](#) [Enclosed and Dead-Front Switches](#)

[UL 98A](#) [Open-Type Switches](#)

[UL 363](#) [Knife Switches](#)

[UL 489](#) [Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Timers and Time Switches](#)

[UL 773](#) [Plug-In Locking Type Photocontrols for Use with Area Lighting](#)

[UL 773A](#) [Nonindustrial Photoelectric Switches for Lighting Control](#)

[UL 917](#) [Clock-Operated Switches](#)

[UL 977](#) [Fused Power-Circuit Devices](#)

[UL 1066](#) [Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures](#)

[UL 1472](#) [Solid-State Dimming Controls](#)

[UL 1429](#) [Pullout Switches](#)

[UL 60730-1](#) [Automatic Electrical Controls — Part 1: General Requirements](#)

[UL 60730-2](#) [Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Timers and Time Switches](#)

[UL 60730-2-Z](#) [Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Timers and Time Switches](#)

[ANSI/NEMA WD 6-2016](#) [Wiring Devices — Dimensional Specifications](#)
[406 UL 498](#) [Attachment Plugs and Receptacles](#)

[UL 498B](#) [Receptacles with Integral Switching Means](#)

[UL 498D](#) [Attachment Plugs, Cord Connectors and Receptacles with Arcuate \(Locking Type\) Contacts](#)

[UL 498E](#) [Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection](#)

[UL 498F](#) [Plugs, Socket-Outlets and Couplers with Arcuate \(Locking Type\) Contacts](#)

[UL 498M](#) [Marine Shore Power Inlets](#)

[UL 514A](#) [Metallic Outlet Boxes](#)

[UL 514C](#) [Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers](#)

[UL 514D](#) [Cover Plates for Flush-Mounted Wiring Devices](#)

[UL 943](#) [Ground-Fault Circuit-Interrupters](#)

[UL 943B](#) [Appliance Leakage-Current Interrupters](#)

[UL 943C](#) [Special Purpose Ground-Fault Circuit-Interrupters](#)

[UL 970](#) [Retail Fixtures and Merchandising Displays](#)

[UL 1286](#) [Office Furnishings Systems](#)

[UL 1310](#) [Class 2 Power Units](#)

[UL 1682](#) [Plugs, Receptacles, and Cable Connectors, of the Pin and Sleeve Type](#)

[UL 1691](#) [Single Pole Locking-Type Separable Connectors](#)

-

[UL 1699](#) [Arc-Fault Circuit-Interrupters](#)

-

[UL 2999](#) [Individual Commercial Office Furnishings](#)

408 [UL 44](#) [Thermoset-Insulated Wires and Cables](#)

-

[UL 67](#) [Panelboards](#)

-

[UL 891](#) [Switchboards](#)

-

[UL 1558](#) [Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear](#)

409 [UL 508](#) [Industrial Control Equipment](#)

-

[UL 508A](#) [Industrial Control Panels](#)

410 [ANSI/CSA-C22.2 No. 184.2](#) [Solid-State Controls for Lighting Systems \(SSCLS\)](#)

-

[UL 153](#) [Portable Electric Luminaires](#)

-

[UL 496](#) [Lampholders](#)

-

[UL 498](#) [Attachment Plugs and Receptacles](#)

-

[UL 498B](#) [Receptacles with Integral Switching Means](#)

-

[UL 498D](#) [Attachment Plugs, Cord Connectors and Receptacles with Arcuate \(Locking Type\) Contacts](#)

-

[UL 498E](#) [Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection](#)

-

[UL 498F](#) [Plugs, Socket-Outlets and Couplers with Arcuate \(Locking Type\) Contacts](#)

-

[UL 542](#) [Fluorescent Lamp Starters](#)

-

[UL 588](#) [Seasonal and Holiday Decorative Products](#)

-

[UL 935](#) [Fluorescent-Lamp Ballasts](#)

-

UL 943	Ground-Fault Circuit-Interruptions
-	
UL 970	Retail Fixtures and Merchandising Displays
-	
UL 1029	High-Intensity-Discharge Lamp Ballasts
-	
UL 1029A	Ignitors and Related Auxiliaries for HID Lamp Ballasts
-	
UL 1574	Track Lighting Systems
-	
UL 1598	Luminaires
-	
UL 1598B	Luminaire Reflector Kits for Installation on Previously Installed Fluorescent Luminaires, Supplemental Requirements
-	
UL 1598C	Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits
-	
UL 1993	Self-Ballasted Lamps and Lamp Adapters
-	
UL 2388	Flexible Lighting Products
-	
UL 8750	Light Emitting Diode (LED) Equipment for Use in Lighting Products
-	
UL 8752	Organic Light Emitting Diode (OLED) Panels
-	
UL 8753	Field-Replaceable Light Emitting Diode (LED) Light Engines
-	
UL 8754	Holders, Bases and Connectors for Solid-State (LED) Light Engines and Arrays
-	
UL 8800	Horticultural Lighting Equipment and Systems

411	UL 1310 Class 2 Power Units
-	
UL 1838	Low-Voltage Landscape Lighting Systems
-	
UL 2108	Low-Voltage Lighting Systems
-	
UL 5085-3	Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers
422 ANSI/CSA-C22.2 No. 339	Hand-held motor-operated electric tools — Safety — Particular requirements for chain beam saws

-	
UL 22	Amusement and Gaming Machines
-	
UL 73	Motor-Operated Appliances
-	
UL 82	Electric Gardening Appliances
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UL 122	Photographic Equipment
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[UL 1863](#) [Communication Circuit Accessories](#)

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[UL 2024](#) [Cable Routing Assemblies and Communications Raceways](#)

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Tables 11(A) and 11(B)	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
	UL 1310	Class 2 Power Units
	UL 1434	Thermistor-Type Devices
	UL 5085-3	Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers
Tables 12(A) and 12(B)	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
	UL 1310	Class 2 Power Units
	UL 1434	Thermistor-Type Devices
	UL 5085-3	Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements

Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title
110	UL 969	Marking and Labeling Systems
-		
	UL 9691	Recommended Practice for Nameplates for Use in Electrical Installations
300	UL 635	Insulating Bushings
314	UL 514C	Conduit, Tubing, and Cable Fittings
-		
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
320	UL 514A	Metallic Outlet Boxes
-		
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
322	UL 5	Surface Metal Raceways and Fittings
-		
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
324	UL 5	Surface Metal Raceways and Fittings
-		
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
330	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
332	UL 1565	Positioning Devices
-		
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
334	UL 6	Electrical Rigid Metal Conduit — Steel
-		
UL 6A		Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
-		
UL 514B		Conduit, Tubing, and Cable Fittings
-		
UL 651		Schedule 40 and 80 Rigid PVC Conduit
-		
UL 797		Electrical Metallic Tubing — Steel
-		
UL 797A		Electrical Metallic Tubing — Aluminum and Stainless Steel

[UL 1242](#) [Electrical Intermediate Metal Conduit — Steel](#)

[UL 1565](#) [Positioning Devices](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[UL 2420](#) [Belowground Reinforced Thermosetting Resin Conduit \(RTRC\) and Fittings](#)

[UL 2515](#) [Aboveground Reinforced Thermosetting Resin Conduit \(RTRC\) and Fittings](#)

[UL 2515A](#) [Supplemental Requirements for Extra Heavy Wall Reinforced Thermosetting Resin Conduit \(RTRC\) and Fittings.](#)

335 [UL 2250](#) [Instrumentation Tray Cable](#)

337 [UL 1565](#) [Positioning Devices](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

340 [UL 493](#) [Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables](#)

342 [UL 635](#) [Insulating Bushings](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

344 [UL 635](#) [Insulating Bushings](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

348 [UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

350 [UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

352 [UL 635](#) [Insulating Bushings](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

353 [UL 635](#) [Insulating Bushings](#)

355 [UL 635](#) [Insulating Bushings](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

356 [UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

358 [UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

362 [UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

368 [UL 857](#) [Busways](#)

392 [UL 568](#) [Nonmetallic Cable Tray Systems](#)

400 [UL 62](#) [Flexible Cords and Cables](#)

[UL 498](#) [Attachment Plugs and Receptacles](#)

[UL 498B](#) [Receptacles with Integral Switching Means](#)

[UL 498D Attachment Plugs, Cord Connectors and Receptacles with Arcuate \(Locking Type\) Contacts](#)

-

[UL 498E Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection](#)

-

[UL 514B Conduit, Tubing, and Cable Fittings](#)

-

[UL 817 Cord Sets and Power-Supply Cords](#)

-

[UL 1650 Portable Power Cable](#)

-

[UL 1680 Stage and Lighting Cables](#)

[402 UL 66 Fixture Wire](#)

[408 UL 50 Enclosures for Electrical Equipment, Non-Environmental Considerations](#)

-

[UL 50E Enclosures for Electrical Equipment, Environmental Considerations](#)

[424 UL 834 Heating, Water Supply, and Power Boilers — Electric](#)

-

[UL 1693 Electric Radiant Heating Panels and Heating Panel Sets](#)

-

[UL 1995 Heating and Cooling Equipment](#)

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[UL 1996 Electric Duct Heaters](#)

-

[UL 60335-1 Safety of Household and Similar Electrical Appliances, Part 1: General Requirements](#)

-

[UL 60335-2-40 Household and Similar Electrical Appliances, Part 2–40](#)

[425 UL 834 Heating, Water Supply, and Power Boilers — Electric](#)

[426 UL 1588 Roof and Gutter De-Icing Cable Units](#)

[427 UL 515 Electrical Resistance Trace Heating for Commercial Applications](#)

-

[UL 1462 Mobile Home Pipe Heating Cable](#)

-

[UL 2049 Residential Pipe Heating Cable](#)

[430 UL 248-13 Low Voltage Fuses — Part 13: Semiconductor Fuses](#)

[445 UL 3001 Distributed Energy Generation and Storage Systems](#)

-

[UL 3010 Single Site Energy Systems](#)

[450 UL 50 Enclosures for Electrical Equipment, Non-Environmental Considerations](#)

-

[UL 50E Enclosures for Electrical Equipment, Environmental Considerations](#)

-

[UL 248-1 Low-Voltage Fuses — Part 1: General Requirements](#)

UL 248-2 Low-Voltage Fuses — Part 2: Class C Fuses

UL 248-3 Low-Voltage Fuses — Part 3: Class CA and CB Fuses

UL 248-4 Low-Voltage Fuses — Part 4: Class CC Fuses

UL 248-5 Low-Voltage Fuses — Part 5: Class G Fuses

UL 248-8 Low-Voltage Fuses — Part 8: Class J Fuses

UL 248-9 Low-Voltage Fuses — Part 9: Class K Fuses

UL 489 Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures

UL 1561 Dry-Type General Purpose and Power Transformers

UL 5085-2 Low Voltage Transformers — Part 2: General Purpose Transformers

460 UL 810 Capacitors

UL 1283 Electromagnetic Interference Filters

UL 60384-14 Fixed Capacitors for Use in Electronic Equipment — Part 14: Sectional Specification: Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains
470 UL 508 Industrial Control Equipment

UL 1283 Electromagnetic Interference Filters

500 ANSI/IEEE C2 National Electrical Safety Code, Section 127A, Coal Handling Areas

API RP 14F Recommended Practice for Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Division 1 and Division 2 Locations

API RP 500 Recommended Practice for Classification of Locations of Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2

API RP 2003 Protection Against Ignitions Arising Out of Static Lightning and Stray Currents.

ASHRAE 15 Safety Standard for Refrigeration Systems.

ASME B1.20.1 Pipe Threads, General Purpose (Inch)

[IEEE 844.2](#) [Standard for Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance](#)

-

[IEEE 60079-30-2](#) [IEEE/IEC International Standard for Explosive atmospheres — Part 30-2: Electrical resistance trace heating — Application guide for design, installation, and maintenance](#)

-

[IIAR 2](#) [Standard for Safe Design of Closed-Circuit Ammonia Refrigeration Systems](#)

-

[ISA-12.10](#) [Area Classification in Hazardous \(Classified\) Dust Locations](#)

-

[ISO 965-1](#) [ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data](#)

-

[ISO 965-3](#) [ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads](#)

-

[NFPA 30](#) [Flammable and Combustible Liquids Code](#)

-

[NFPA 32](#) [Standard for Drycleaning Facilities](#)

-

[NFPA 33](#) [Standard for Spray Application Using Flammable or Combustible Materials](#)

-

[NFPA 34](#) [Standard for Dipping, Coating and Printing Processes Using Flammable or Combustible Liquids](#)

-

[NFPA 35](#) [Standard for the Manufacture of Organic Coatings](#)

-

[NFPA 36](#) [Standard for Solvent Extraction Plants](#)

-

[NFPA 45](#) [Standard on Fire Protection for Laboratories Using Chemicals](#)

-

[NFPA 55](#) [Compressed Gases and Cryogenic Fluids Code](#)

-

[NFPA 58](#) [Liquefied Petroleum Gas Code](#)

-

[NFPA 59](#) [Utility LP-Gas Plant Code](#)

-

[NFPA 77](#) [Recommended Practice on Static Electricity](#)

-

[NFPA 497](#) [Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous \(Classified\) Locations for Electrical Installations in Chemical Process Areas](#)

-

[NFPA 499](#) [Recommended Practice for the Classification of Combustible Dusts and of Hazardous \(Classified\) Locations for Electrical Installation in Chemical Process Areas](#)

	NFPA 780	Standard for the Installation of Lightning Protection Systems
	NFPA 820	Standard for Fire Protection in Wastewater Treatment and Collection Facilities
	UL 60079-29-2	Explosive Atmospheres — Part 29-2: Gas detectors — Selection, installation, use and maintenance of detectors for flammable gases and oxygen
	UL 120002	Certificate Standard for AEx Equipment for Hazardous (Classified) Locations
	UL 120101	Definitions and Information Pertaining to Electrical Equipment in Hazardous (Classified) Locations
	UL 121303	Guide for Combustible Gas Detection as a Method of Protection
	UL RP 121203	Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and 22 Hazardous (Classified) Locations
501	UL 62	Flexible Cord and Cable
	UL 504	Mineral-Insulated, Metal-Sheathed Cable
502	UL RP 121203	Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous (Classified) Locations
503	NFPA 505	Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations
	UL RP 121203	Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous (Classified) Locations
504	ISA-RP 12.06.01	Recommended Practice for Wiring Methods for Hazardous (Classified) Locations Instrumentation — Part 1: Intrinsic Safety
505	ANSI/API RP 14FZ	Recommended Practice for Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Zone 0, Zone 1, and Zone 2 Locations
	API RP 505	Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2
	API RP 2003	Protection Against Ignitions Arising Out of Static Lightning and Stray Currents.
	ASME B1.20.1	Pipe Threads, General Purpose (Inch)
	EI 15	Model Code of Safe Practice, Part 15: Area Classification Code for Installations Handling Flammable Fluids
	IEEE 844.2	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance

IEEE 60079-30-2	Explosive Atmospheres — Part 30-2: Electrical resistance trace heating — Application guide for design, installation and maintenance
-	
IIAR 2	Standard for Safe Design of Closed-Circuit Ammonia Refrigeration Systems
-	
ISA-60079-10-1 (12.24.01)	Explosive Atmospheres — Part 10-1: Classification of Areas — Explosive gas atmospheres
-	
ISA-60079-29-2	Explosive Atmospheres — Part 29-2: Gas detectors — Selection, installation, use and maintenance of detectors for flammable gases and oxygen
-	
ISO 965-1	ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data
-	
ISO 965-3	ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads
-	
NFPA 30	Flammable and Combustible Liquids Code
-	
NFPA 77	Recommended Practice on Static Electricity
-	
NFPA 497	Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
-	
NFPA 780	Standard for the Installation of Lightning Protection Systems
-	
UL 80079-20-1	Explosive Atmospheres — Part 20-1: Material Characteristics for Gas and Vapour Classification — Test Methods and Data
-	
UL 120101	Definitions and Information Pertaining to Electrical Equipment in Hazardous (Classified) Locations
-	
UL 121303	Guide for Use of Detectors for Flammable Gases
-	
UL RP 121203	Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous (Classified) Locations
506 ASME B1.20.1	Pipe Threads, General Purpose (Inch)
-	
IEEE 844.2	Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance
-	
IEEE 60079-30-2	Explosive Atmospheres — Part 30-2: Electrical resistance trace heating — Application guide for design, installation and maintenance
-	

ISA-60079-10-2 (12.10.05)	Explosive Atmospheres — Part 10-2: Classification of Areas — Combustible Dust Atmospheres
-	
NFPA 499	Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installation in Chemical Process Areas
-	
UL RP 121203	Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous (Classified) Locations
511 NFPA 30A	Code for Motor Fuel Dispensing Facilities and Repair Garages
-	
512 NFPA 88A ICC IFC	Standard for Parking Structures International Fire Code
-	
NFPA 1	Fire Code
-	
NFPA 30	Flammable and Combustible Liquids Code
-	
NFPA 33	Standard for Spray Application Using Flammable or Combustible Materials
-	
NFPA 36	Standard for Solvent Extraction Plants
-	
NFPA 58	Liquefied Petroleum Gas Code
-	
NFPA 70B	Recommended Practice for Electrical Equipment Maintenance
-	
NFPA 497	Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
513 NFPA 30	Flammable and Combustible Liquids Code
-	
NFPA 33	Standard for Spray Application Using Flammable or Combustible Materials
-	
514 NFPA 409 NFPA 2	Standard on Aircraft Hangars Hydrogen Technologies Code
-	
NFPA 30A	Code for Motor Fuel Dispensing Facilities and Repair Garages
-	
NFPA 52	Vehicular Natural Gas Fuel Systems Code
-	
NFPA 58	Liquefied Petroleum Gas Code
-	
NFPA 59	Utility LP-Gas Plant Code
-	

	NFPA 303	Fire Protection Standard for Marinas and Boatyards
515	NFPA 30	Flammable and Combustible Liquids Code
516	NFPA 13	Standard for the Installation of Sprinkler Systems

[NFPA 33](#) [Standard for Spray Application Using Flammable or Combustible Materials](#)

[NFPA 34](#) [Standard for Dipping, Coating and Printing Processes Using Flammable or Combustible Liquids](#)

[NFPA 77](#) [Recommended Practice on Static Electricity](#)

[NFPA 91](#) [Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Particulate Solids](#)

	NFPA 701	Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
620	UL 4	Armored Cable

[UL 44](#) [Thermoset-Insulated Wires and Cables](#)

[UL 66](#) [Fixture Wire](#)

[UL 504](#) [Mineral Insulated Wire](#)

[UL 1063](#) [Machine-Tool Wires and Cables](#)

	UL 1569	Metal Clad Cable
625	UL 3001	Distributed Energy Generation and Storage Systems

	UL 3010	Single Site Energy Systems
630	UL 1276	Welding Cable
650	UL 1651	Optical Fiber Cable
660	UL 62	Flexible Cords and Cables

	UL 817	Cord Sets and Power Supply Cords
668	UL 4	Armored Cable

	UL 62	Flexible Cords and Cables
670	UL 2011	Machinery
675	UL 44	Thermoset-Insulated Wires and Cables

[UL 83](#) [Thermoplastic-Insulated Wires and Cables](#)

[UL 83A](#) [Fluoropolymer Insulated Wire](#)

UL 1063 Machine-Tool Wires and Cables

-

UL 1263 Irrigation Cable
690 UL 3001 Distributed Energy Generation and Storage Systems

-

UL 3010 Single Site Energy Systems
691 UL 3001 Distributed Energy Generation and Storage Systems

-

UL 3010 Single Site Energy Systems
692 UL 44 Thermoset-Insulated Wires and Cables

-

UL 83 Thermoplastic-Insulated Wires and Cables

-

UL 83A Fluoropolymer Insulated Wire

-

UL 1063 Machine-Tool Wires and Cables

-

UL 3001 Distributed Energy Generation and Storage Systems

-

UL 3010 Single Site Energy Systems
694 UL 44 Thermoset-Insulated Wires and Cables

-

UL 62 Flexible Cords and Cables

-

UL 83 Thermoplastic-Insulated Wires and Cables

-

UL 83A Fluoropolymer Insulated Wire

-

UL 1063 Machine-Tool Wires and Cables

-

UL 3001 Distributed Energy Generation and Storage Systems

-

UL 3010 Single Site Energy Systems
700 UL 3001 Distributed Energy Generation and Storage Systems
701 UL 3001 Distributed Energy Generation and Storage Systems
702 UL 3001 Distributed Energy Generation and Storage Systems
705 UL 3001 Distributed Energy Generation and Storage Systems

-

UL 3010 Single Site Energy Systems
710 UL 3001 Distributed Energy Generation and Storage Systems

-

UL 3010 Single Site Energy Systems

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Annex_A_Revision_to_add_UL_900_to_516.docx	Add UL 900 to Annex A, Article 516	

Statement of Problem and Substantiation for Public Input

Revisions proposed to add extracted text from NFPA 33 for Inflatable Finishing Workstations included a listing reference to UL 900 for filters. In accordance with the style manual, the reference is added here. Note that a Word version of the revision is included due to formatting issues in Terra View.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 303-NFPA 70-2023 [New Section after 516.18]	This revision is dependent upon acceptance of related PI 303.
Public Input No. 303-NFPA 70-2023 [New Section after 516.18]	

Submitter Information Verification

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Submittal Date: Wed Aug 30 16:44:33 EDT 2023
Committee: NEC-P14

Committee Statement

Resolution: There were no revisions made to add 516.19 that would have added this update to Annex A.1(a).

Annex A Revision to add UL 900 to 516

516 NFPA 33 Standard for Spray Application Using Flammable or Combustible Materials

NFPA 34 Standard for Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids

UL 844 Luminaires for Use in Hazardous (Classified) Locations

[UL 900](#) [Air Filter Units](#)



Public Input No. 3318-NFPA 70-2023 [Definition:]

Table A.1(a) Product Safety Standards for Conductors and Equipment That Have an Associated Listing Requirement

Article	Standard Number	Standard Title
110	UL 10C	Positive Pressure Fire Tests of Door Assemblies
-		
	UL 305	Panic Hardware
-		
	UL 486D	Sealed Wire Connector Systems
-		
	UL 2043	Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces
-		
	UL 62275	Cable Management Systems — Cable Ties for Electrical Installation
210	UL 498	Attachment Plugs and Receptacles
-		
	UL 935	Fluorescent-Lamp Ballasts
-		
	UL 943	Ground Fault Circuit Interrupters
-		
	UL 1029	High-Intensity-Discharge Lamp Ballast
-		
	UL 1699	Arc-Fault Circuit-Interrupters
-		
	UL 1699A	Outlet Branch Circuit AFCIs
225	UL 6	Electrical Rigid Metal Conduit — Steel
-		
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
-		
	UL 360	Liquid-Tight Flexible Metal Conduit
-		
	UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
-		
	UL 1242	Electrical Intermediate Metal Conduit — Steel
-		
	UL 1660	Liquid-Tight Flexible Nonmetallic Conduit
-		
	UL 2515	Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
230	UL 6	Electrical Rigid Metal Conduit — Steel
-		
	UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
-		

UL 67	Panelboards
-	
UL 98	Enclosed and Dead-Front Switches
-	
UL 218	Fire Pump Controllers
-	
UL 231	Power Outlets
-	
UL 347	Medium-Voltage AC Contactors, Controllers, and Control Centers
-	
UL 360	Liquid-Tight Flexible Metal Conduit
-	
UL 414	Meter Sockets
-	
UL 486A-486B	Wire Connectors
-	
UL 486C	Splicing Wire Connectors
-	
UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
-	
UL 508	Industrial Control Equipment
-	
UL 508A	Industrial Control Panels
-	
UL 514B	Conduit, Tubing and Cable Fittings
-	
UL 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
-	
UL 845	Motor Control Centers
-	
UL 857	Busways
-	
UL 869A	Reference Standard for Service Equipment
-	
UL 891	Switchboards

UL 977	Fused Power-Circuit Devices
-	
UL 1008	Transfer Switch Equipment

[UL 1008A](#) [Transfer Switch Equipment, Over 1000 Volts](#)

[UL 1008M](#) [Meter-Mounted Transfer Switches](#)

[UL 1008S](#) [Solid-State Transfer Switches](#)

[UL 1053](#) [Ground-Fault Sensing and Relaying Equipment](#)

[UL 1062](#) [Unit Substations](#)

[UL 1066](#) [Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures](#)

[UL 1242](#) [Electrical Intermediate Metal Conduit — Steel](#)

[UL 1429](#) [Pullout Switches](#)

[UL 1449](#) [Surge Protective Devices](#)

[UL 1558](#) [Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear](#)

[UL 1660](#) [Liquid-Tight Flexible Nonmetallic Conduit](#)

[UL 1740](#) [Robots and Robotic Equipment](#)

[UL 1953](#) [Power Distribution Blocks](#)

[UL 2011](#) [Machinery](#)

[UL 2200](#) [Stationary Engine Generator Assemblies](#)

[UL 2416](#) [Audio/Video, Information and Communication Technology Equipment Cabinet, Enclosure and Rack Systems](#)

[UL 2446](#) [Unitary Boiler Room Systems](#)

[UL 2565](#) [Industrial Metalworking and Woodworking Machine Tools](#)

[UL 2735](#) [Electric Utility Meters](#)

[UL 2745](#) [Meter Socket Adapters for Communications Equipment](#)

-

[UL 2876](#) [Remote Racking Devices for Switchgear and Controlgear](#)

-

[UL 4248-1](#) [Fuseholders — Part 1: General Requirements](#)

-

[UL 60947-1](#) [Low-Voltage Switchgear and Controlgear — Part 1: General Rules](#)

-

[UL 61800-5-1](#) [Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy.](#)

[240 UL 248-1](#) [Low-Voltage Fuses — Part 1: General Requirements](#)

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[UL 248-2](#) [Low-Voltage Fuses — Part 2: Class C Fuses](#)

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[UL 248-3](#) [Low-Voltage Fuses — Part 2: Class CA and CB Fuses](#)

-

[UL 248-4](#) [Low-Voltage Fuses — Part 4: Class CC Fuses](#)

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[UL 248-5](#) [Low-Voltage Fuses — Part 5: Class G Fuses](#)

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[UL 248-6](#) [Low-Voltage Fuses — Part 6: Class H Non-Renewable Fuses](#)

-

[UL 248-8](#) [Low-Voltage Fuses — Part 8: Class J Fuses](#)

-

[UL 248-9](#) [Low-Voltage Fuses — Part 9: Class K Fuses](#)

-

[UL 248-10](#) [Low-Voltage Fuses — Part 10: Class L Fuses](#)

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[UL 248-11](#) [Low-Voltage Fuses — Part 11: Plug Fuses](#)

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[UL 248-12](#) [Low-Voltage Fuses — Part 12: Class R Fuses](#)

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[UL 248-15](#) [Low-Voltage Fuses — Part 15: Class T Fuses](#)

-

[UL 248-17](#) [Low-Voltage Fuses — Part 17: Class CF Fuses](#)

-

[UL 248-18](#) [Low-Voltage Fuses — Part 18: Class CD Fuses](#)

-

[UL 489](#) [Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures](#)

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UL 489I	Solid State Molded-Case Circuit Breakers	
-		
UL 943	Ground-Fault Circuit-Interruption	
-		
UL 1053	Ground-Fault Sensing and Relaying Equipment	
-		
UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures	
-		
242	UL 4248-1	Fuseholders — Part 1: General Requirements
250	UL 1449	Surge Protective Devices
	UL 1	Flexible Metal Conduit
-		
UL 4	Armored Cable	
-		
UL 5	Surface Metal Raceways and Fittings	
-		
UL 6	Electrical Rigid Metal Conduit — Steel	
-		
UL 6A	Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel	
-		
UL 360	Liquid-Tight Flexible Metal Conduit	
-		
UL 467	Grounding and Bonding Equipment	
-		
UL 486A-486B	Wire Connectors	
-		
UL 486C	Splicing Wire Connectors	
-		
UL 486D	Sealed Wire Connector Systems	
-		
UL 498	Attachment Plugs and Receptacles	
-		
UL 504	Mineral-Insulated, Metal-Sheathed Cable	
-		
UL 514A	Metallic Outlet Boxes	
-		
UL 514B	Conduit, Tubing, and Cable Fittings	
-		
UL 797	Electrical Metallic Tubing — Steel	
-		

	UL 797A	Electrical Metallic Tubing — Aluminum
-		
	UL 1242	Electrical Intermediate Metal Conduit — Steel
-		
	UL 1569	Metal-Clad Cables
-		
	UL 1652	Flexible Metallic Tubing
300	UL 4	Armored Cable
-		
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[UL 248-12](#) [Low-Voltage Fuses — Part 12: Class R Fuses](#)

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[UL 248-15](#) [Low-Voltage Fuses — Part 15: Class T Fuses](#)

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[UL 248-17](#) [Low-Voltage Fuses — Part 17: Class CF Fuses](#)

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[UL 248-18](#) [Low-Voltage Fuses — Part 18: Class CD Fuses](#)

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[UL 489](#) [Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures](#)

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[UL 489H](#) [Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures, for Use with Direct Current \(DC\) Microgrids](#)

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[UL 1066](#) [Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures](#)

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[UL 1741](#) [Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources](#)

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[UL 9540](#) [Energy Storage Systems and Equipment](#)

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[UL 1](#) [Flexible Metal Conduit](#)

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[UL 4](#) [Armored Cable](#)

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[UL 83](#) [Thermoplastic-Insulated Wires and Cables](#)

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[UL 360](#) [Liquid-Tight Flexible Metal Conduit](#)

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[UL 493](#) [Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables](#)

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[UL 497A](#) [Secondary Protectors for Communications Circuits](#)

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[UL 1008](#) [Transfer Switch Equipment](#)

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[UL 1008A](#) [Transfer Switch Equipment, Over 1000 Volts](#)

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[UL 1008M](#) [Meter-Mounted Transfer Switches](#)

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[UL 1008S](#) [Solid-State Transfer Switches](#)

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[UL 1569](#) [Metal-Clad Cables](#)

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[UL 2196](#) [Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables](#)
[710](#) [UL 1741](#) [Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources](#)

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[UL 2200](#) [Stationary Engine Generator Assemblies](#)

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[UL 8801](#) [Photovoltaic Luminaire Systems](#)

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[UL 9540](#) [Energy Storage Systems and Equipment](#)

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[UL 62109-1](#) [Power Converters for use in Photovoltaic Power Systems — Part 1: General Requirements](#)

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[UL 62109-2](#) [Power Converters for Use in Photovoltaic Power Systems — Part 2: Particular Requirements for Inverters](#)

[722](#) [UL 13](#) [Standard for Power-Limited Circuit Cables](#)

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[UL 444](#) [Standard for Safety for Communications Cables](#)

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[UL 1424](#) [Cables for Power-Limited Fire-Alarm Circuits](#)

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[UL 1651](#) [Optical Fiber Cable](#)

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[UL 1666](#) [Test for Flame Propagation Height of Electrical and Optical-Fiber Cable Installed Vertically in Shafts](#)

-

[UL 1685](#) [Standard for Safety for Vertical-Tray Fire-Propagation and Smoke- Release Test for Electrical and Optical-Fiber Cables](#)

-

[UL 1724](#) [Fire Tests for Electrical Circuit Protective Systems](#)

-

[UL 2024](#) [Standard for Safety for Communications Cables](#)

-

[UL 2196](#) [Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables](#)

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[UL 2556](#) [Standard for Wire and Cable Test Methods](#)

[725](#) [UL 1310](#) [Class 2 Power Units](#)

[UL 5085-3](#) [Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers](#)

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[UL 9990](#) [Information and Communication Technology \(ICT\) Power Cables](#)

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[UL 61010-2-201](#) [Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use — Part 2-201: Particular Requirements for Control Equipment](#)

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[UL 61800-5-1](#) [Adjustable Speed Electrical Power Drive Systems — Part 5-1: Safety Requirements — Electrical, Thermal and Energy](#)

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[UL 62368-1](#) [Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements](#)

[726](#) [UL 1400-1](#) [Fault-Managed Power Systems — Part 1 General Requirements](#)

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[UL 1400-2](#) [Fault-Managed Power Systems — Part 2 Requirements for Cables](#)

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[UL 1666](#) [Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts](#)

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[UL 1685](#) [Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables](#)

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[UL 2556](#) [Wire and Cable Test Methods](#)

[728](#) [UL 5](#) [Surface Metal Raceways and Fittings](#)

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[UL 5A](#) [Nonmetallic Surface Raceways and Fittings](#)

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UL 5B	Strut-Type Channel Raceways and Fittings
-	
UL 5C	Surface Raceways and Fittings for Use with Data, Signal, and Control Circuits
-	
UL 209	Cellular Metal Floor Raceways and Fittings
-	
UL 467	Grounding and Bonding Equipment
-	
UL 514A	Metallic Outlet Boxes
-	
UL 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
-	
UL 568	Nonmetallic Cable Tray Systems
-	
UL 884	Underfloor Raceways and Fittings
-	
UL 1724	Fire Tests for Electrical Circuit Protective Systems
-	
UL 2024	Cable Routing Assemblies and Communications Raceways
-	
UL 2196	Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables
760 UL 268	Smoke Detectors for Fire Alarm Signaling Systems
-	
UL 268A	Smoke Detectors for Duct Application
-	
UL 486C	Splicing Wire Connectors
-	
UL 497B	Protectors for Data Communication and Fire Alarm Circuits
-	
UL 1424	Cables for Power-Limited Fire-Alarm Circuits
-	
UL 1425	Cables for Non-Power-Limited Fire-Alarm Circuits
-	
UL 1480	Speakers for Fire Alarm and Signaling Systems, Including Accessories
-	
UL 1666	Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts
-	
UL 1685	Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables
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[UL 2196](#) [Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables](#)

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[UL 60730-2-14](#) [Automatic Electrical Controls; Part 2: Particular Requirements for Electric Actuators](#)
[770](#) [UL 467](#) [Grounding and Bonding Equipment](#)

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[UL 568](#) [Nonmetallic Cable Tray Systems](#)

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[UL 1651](#) [Optical Fiber Cable](#)

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[UL 2024](#) [Optical Fiber and Communication Cable Raceway](#)

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[UL 2196](#) [Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables](#)

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[UL 62275](#) [Cable Management Systems — Cable Ties for Electrical Installation](#)
[800](#) [UL 444](#) [Communications Cables](#)

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[UL 467](#) [Grounding and Bonding Equipment](#)

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[UL 489A](#) [Circuit Breakers for Use in Communication Equipment](#)

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[UL 497](#) [Protectors for Paired-Conductor Communications Circuits](#)

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[UL 497A](#) [Secondary Protectors for Communications Circuits](#)

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[UL 497C](#) [Protectors for Coaxial Communications Circuits](#)

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[UL 497E](#) [Protectors for Antenna Lead-In Conductors](#)

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[UL 523](#) [Telephone Service Drop Wire](#)

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[UL 568](#) [Nonmetallic Cable Tray Systems](#)

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[UL 723](#) [Test for Surface Burning Characteristics of Building Materials](#)

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[UL 1581](#) [Reference Standard for Electrical Wires, Cables, and Flexible Cords](#)

-

[UL 1666](#) [Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts](#)

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[UL 1685](#) [Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables](#)

-

[UL 1863](#) [Communication Circuit Accessories](#)

-

[UL 2024](#) [Cable Routing Assemblies and Communications Raceways](#)

-

[UL 62275](#) [Cable Management Systems — Cable Ties for Electrical Installation](#)

805 [UL 444](#) [Communications Cables](#)

-

[UL 497](#) [Protectors for Paired-Conductor Communications Circuits](#)

-

[UL 497A](#) [Secondary Protectors for Communications Circuits](#)

-

[UL 497C](#) [Protectors for Coaxial Communications Circuits](#)

-

[UL 497E](#) [Protectors for Antenna Lead-In Conductors](#)

-

[UL 523](#) [Telephone Service Drop Wire](#)

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[UL 719](#) [Nonmetallic-Sheathed Cables](#)

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[UL 1310](#) [Class 2 Power Units](#)

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[UL 1581](#) [Reference Standard for Electrical Wires, Cables, and Flexible Cords](#)

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[UL 1685](#) [Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables](#)

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[UL 1863](#) [Communication Circuit Accessories](#)

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[UL 2043](#) [Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces](#)

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[UL 62275](#) [Cable Management Systems — Cable Ties for Electrical Installation](#)

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[UL 62368-1](#) [Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements](#)

810 [UL 150](#) [Antenna Rotators](#)

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[UL 452](#) [Antenna-Discharge Units](#)

-

[UL 467](#) [Grounding and Bonding Equipment](#)

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	UL 497E	Protectors for Antenna Lead-In Conductors
820	UL 444	Communications Cables

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	UL 497E	Protectors for Antenna Lead-In Conductors
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	UL 1655	Community-Antenna Television Cables
830	UL 444	Communications Cables

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	UL 497A	Secondary Protectors for Communications Circuits
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	UL 497C	Protectors for Coaxial Communications Circuits
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	UL 497E	Protectors for Antenna Lead-In Conductors
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	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
840	UL 444	Communications Cables

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	UL 467	Grounding and Bonding Equipment
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	UL 498A	Current Taps and Adapters
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	UL 1310	Class 2 Power Units
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	UL 1651	Optical Fiber Cable
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	UL 1863	Communication Circuit Accessories
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	UL 2024	Cable Routing Assemblies and Communications Raceways
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Tables 11(A) and 11(B)	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
	UL 1310	Class 2 Power Units
	UL 1434	Thermistor-Type Devices
	UL 5085-3	Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers
Tables 12(A) and 12(B)	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements
	UL 1310	Class 2 Power Units
	UL 1434	Thermistor-Type Devices
	UL 5085-3	Low Voltage Transformers — Part 3: Class 2 and Class 3 Transformers
	UL 62368-1	Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements

Table A.1(b) Product Safety Standards for Conductors and Equipment That Do Not Have an Associated Listing Requirement

Article	Standard Number	Standard Title
110	UL 969	Marking and Labeling Systems
-		
	UL 9691	Recommended Practice for Nameplates for Use in Electrical Installations
300	UL 635	Insulating Bushings
314	UL 514C	Conduit, Tubing, and Cable Fittings
-		
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
320	UL 514A	Metallic Outlet Boxes
-		
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
322	UL 5	Surface Metal Raceways and Fittings
-		
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
324	UL 5	Surface Metal Raceways and Fittings
-		
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
330	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
332	UL 1565	Positioning Devices
-		
	UL 2239	Hardware for the Support of Conduit, Tubing and Cable
334	UL 6	Electrical Rigid Metal Conduit — Steel
-		
UL 6A		Electrical Rigid Metal Conduit — Aluminum, Red Brass and Stainless Steel
-		
UL 514B		Conduit, Tubing, and Cable Fittings
-		
UL 651		Schedule 40 and 80 Rigid PVC Conduit
-		
UL 797		Electrical Metallic Tubing — Steel
-		
UL 797A		Electrical Metallic Tubing — Aluminum and Stainless Steel

[UL 1242](#) [Electrical Intermediate Metal Conduit — Steel](#)

[UL 1565](#) [Positioning Devices](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[UL 2420](#) [Belowground Reinforced Thermosetting Resin Conduit \(RTRC\) and Fittings](#)

[UL 2515](#) [Aboveground Reinforced Thermosetting Resin Conduit \(RTRC\) and Fittings](#)

[UL 2515A](#) [Supplemental Requirements for Extra Heavy Wall Reinforced Thermosetting Resin Conduit \(RTRC\) and Fittings.](#)

[335 UL 2250](#) [Instrumentation Tray Cable](#)

[337 UL 1565](#) [Positioning Devices](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[340 UL 493](#) [Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables](#)

[342 UL 635](#) [Insulating Bushings](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[344 UL 635](#) [Insulating Bushings](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[348 UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[350 UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[352 UL 635](#) [Insulating Bushings](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[353 UL 635](#) [Insulating Bushings](#)

[355 UL 635](#) [Insulating Bushings](#)

[UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[356 UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[358 UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[362 UL 2239](#) [Hardware for the Support of Conduit, Tubing and Cable](#)

[368 UL 857](#) [Busways](#)

[392 UL 568](#) [Nonmetallic Cable Tray Systems](#)

[400 UL 62](#) [Flexible Cords and Cables](#)

[UL 498](#) [Attachment Plugs and Receptacles](#)

[UL 498B](#) [Receptacles with Integral Switching Means](#)

[UL 498D](#) [Attachment Plugs, Cord Connectors and Receptacles with Arcuate \(Locking Type\) Contacts](#)

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[UL 498E](#) [Attachment Plugs, Cord Connectors and Receptacles — Enclosure Types for Environmental Protection](#)

-

[UL 514B](#) [Conduit, Tubing, and Cable Fittings](#)

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[UL 817](#) [Cord Sets and Power-Supply Cords](#)

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[UL 1650](#) [Portable Power Cable](#)

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[UL 1680](#) [Stage and Lighting Cables](#)

[402](#) [UL 66](#) [Fixture Wire](#)

[408](#) [UL 50](#) [Enclosures for Electrical Equipment, Non-Environmental Considerations](#)

-

[UL 50E](#) [Enclosures for Electrical Equipment, Environmental Considerations](#)

[424](#) [UL 834](#) [Heating, Water Supply, and Power Boilers — Electric](#)

-

[UL 1693](#) [Electric Radiant Heating Panels and Heating Panel Sets](#)

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[UL 1995](#) [Heating and Cooling Equipment](#)

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[UL 1996](#) [Electric Duct Heaters](#)

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[UL 60335-1](#) [Safety of Household and Similar Electrical Appliances, Part 1: General Requirements](#)

-

[UL 60335-2-40](#) [Household and Similar Electrical Appliances, Part 2–40](#)

[425](#) [UL 834](#) [Heating, Water Supply, and Power Boilers — Electric](#)

[426](#) [UL 1588](#) [Roof and Gutter De-Icing Cable Units](#)

[427](#) [UL 515](#) [Electrical Resistance Trace Heating for Commercial Applications](#)

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[UL 1462](#) [Mobile Home Pipe Heating Cable](#)

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[UL 2049](#) [Residential Pipe Heating Cable](#)

[430](#) [UL 248-13](#) [Low Voltage Fuses — Part 13: Semiconductor Fuses](#)

[445](#) [UL 3001](#) [Distributed Energy Generation and Storage Systems](#)

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[UL 3010](#) [Single Site Energy Systems](#)

[450](#) [UL 50](#) [Enclosures for Electrical Equipment, Non-Environmental Considerations](#)

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[UL 50E](#) [Enclosures for Electrical Equipment, Environmental Considerations](#)

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[UL 248-1](#) [Low-Voltage Fuses — Part 1: General Requirements](#)

UL 248-2 Low-Voltage Fuses — Part 2: Class C Fuses

UL 248-3 Low-Voltage Fuses — Part 3: Class CA and CB Fuses

UL 248-4 Low-Voltage Fuses — Part 4: Class CC Fuses

UL 248-5 Low-Voltage Fuses — Part 5: Class G Fuses

UL 248-8 Low-Voltage Fuses — Part 8: Class J Fuses

UL 248-9 Low-Voltage Fuses — Part 9: Class K Fuses

UL 489 Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures

UL 1561 Dry-Type General Purpose and Power Transformers

UL 5085-2 Low Voltage Transformers — Part 2: General Purpose Transformers

460 UL 810 Capacitors

UL 1283 Electromagnetic Interference Filters

UL 60384-14 Fixed Capacitors for Use in Electronic Equipment — Part 14: Sectional Specification: Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains
470 UL 508 Industrial Control Equipment

UL 1283 Electromagnetic Interference Filters

500 ANSI/IEEE C2 National Electrical Safety Code, Section 127A, Coal Handling Areas

API RP 14F Recommended Practice for Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Division 1 and Division 2 Locations

API RP 500 Recommended Practice for Classification of Locations of Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2

API RP 2003 Protection Against Ignitions Arising Out of Static Lightning and Stray Currents.

ASHRAE 15 Safety Standard for Refrigeration Systems.

ASME B1.20.1 Pipe Threads, General Purpose (Inch)

[IEEE 844.2](#) [Standard for Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance](#)

-

[IEEE 60079-30-2](#) [IEEE/IEC International Standard for Explosive atmospheres — Part 30-2: Electrical resistance trace heating — Application guide for design, installation, and maintenance](#)

-

[IIAR 2](#) [Standard for Safe Design of Closed-Circuit Ammonia Refrigeration Systems](#)

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[ISA-12.10](#) [Area Classification in Hazardous \(Classified\) Dust Locations](#)

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[ISO 965-1](#) [ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data](#)

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[ISO 965-3](#) [ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads](#)

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[NFPA 30](#) [Flammable and Combustible Liquids Code](#)

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[NFPA 32](#) [Standard for Drycleaning Facilities](#)

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[NFPA 33](#) [Standard for Spray Application Using Flammable or Combustible Materials](#)

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[NFPA 34](#) [Standard for Dipping, Coating and Printing Processes Using Flammable or Combustible Liquids](#)

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[NFPA 35](#) [Standard for the Manufacture of Organic Coatings](#)

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[NFPA 36](#) [Standard for Solvent Extraction Plants](#)

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[NFPA 45](#) [Standard on Fire Protection for Laboratories Using Chemicals](#)

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[NFPA 55](#) [Compressed Gases and Cryogenic Fluids Code](#)

-

[NFPA 58](#) [Liquefied Petroleum Gas Code](#)

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[NFPA 59](#) [Utility LP-Gas Plant Code](#)

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[NFPA 77](#) [Recommended Practice on Static Electricity](#)

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[NFPA 497](#) [Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous \(Classified\) Locations for Electrical Installations in Chemical Process Areas](#)

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[NFPA 499](#) [Recommended Practice for the Classification of Combustible Dusts and of Hazardous \(Classified\) Locations for Electrical Installation in Chemical Process Areas](#)

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<u>NFPA 780</u>	<u>Standard for the Installation of Lightning Protection Systems</u>
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<u>NFPA 820</u>	<u>Standard for Fire Protection in Wastewater Treatment and Collection Facilities</u>
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<u>UL 60079-29-2</u>	<u>Explosive Atmospheres — Part 29-2: Gas detectors — Selection, installation, use and maintenance of detectors for flammable gases and oxygen</u>
-	
<u>UL 120002</u>	<u>Certificate Standard for AEx Equipment for Hazardous (Classified) Locations</u>
-	
<u>UL 120101</u>	<u>Definitions and Information Pertaining to Electrical Equipment in Hazardous (Classified) Locations</u>
-	
<u>UL 121303</u>	<u>Guide for Combustible Gas Detection as a Method of Protection</u>
-	
<u>UL RP 121203</u>	<u>Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and 22 Hazardous (Classified) Locations</u>
<u>501 UL 62</u>	<u>Flexible Cord and Cable</u>
-	
<u>UL 504</u>	<u>Mineral-Insulated, Metal-Sheathed Cable</u>
<u>502 UL RP 121203</u>	<u>Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous (Classified) Locations</u>
<u>503 NFPA 505</u>	<u>Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations</u>
-	
<u>UL RP 121203</u>	<u>Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous (Classified) Locations</u>
<u>504 ISA-RP 12.06.01</u>	<u>Recommended Practice for Wiring Methods for Hazardous (Classified) Locations Instrumentation — Part 1: Intrinsic Safety</u>
<u>505 ANSI/API RP 14FZ</u>	<u>Recommended Practice for Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Zone 0, Zone 1, and Zone 2 Locations</u>
-	
<u>API RP 505</u>	<u>Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2</u>
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<u>API RP 2003</u>	<u>Protection Against Ignitions Arising Out of Static Lightning and Stray Currents</u>
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<u>ASME B1.20.1</u>	<u>Pipe Threads, General Purpose (Inch)</u>
-	
<u>EI 15</u>	<u>Model Code of Safe Practice, Part 15: Area Classification Code for Installations Handling Flammable Fluids</u>
-	
<u>IEEE 844.2</u>	<u>Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance</u>
-	

[IEEE 60079-30-2](#) [Explosive Atmospheres — Part 30-2: Electrical resistance trace heating — Application guide for design, installation and maintenance](#)

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[IIAR 2](#) [Standard for Safe Design of Closed-Circuit Ammonia Refrigeration Systems](#)

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[ISA-60079-10-1 \(12.24.01\)](#) [Explosive Atmospheres — Part 10-1: Classification of Areas — Explosive gas atmospheres](#)

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[ISA-60079-29-2](#) [Explosive Atmospheres — Part 29-2: Gas detectors — Selection, installation, use and maintenance of detectors for flammable gases and oxygen](#)

-

[ISO 965-1](#) [ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data](#)

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[ISO 965-3](#) [ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads](#)

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[NFPA 30](#) [Flammable and Combustible Liquids Code](#)

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[NFPA 77](#) [Recommended Practice on Static Electricity](#)

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[NFPA 497](#) [Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous \(Classified\) Locations for Electrical Installations in Chemical Process Areas](#)

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[NFPA 780](#) [Standard for the Installation of Lightning Protection Systems](#)

-

[UL 80079-20-1](#) [Explosive Atmospheres — Part 20-1: Material Characteristics for Gas and Vapour Classification — Test Methods and Data](#)

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[UL 120101](#) [Definitions and Information Pertaining to Electrical Equipment in Hazardous \(Classified\) Locations](#)

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[UL 121303](#) [Guide for Use of Detectors for Flammable Gases](#)

-

[UL RP 121203](#) [Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous \(Classified\) Locations](#)

[506 ASME B1.20.1](#) [Pipe Threads, General Purpose \(Inch\)](#)

-

[IEEE 844.2](#) [Skin Effect Trace Heating of Pipelines, Vessels, Equipment, and Structures — Application Guide for Design, Installation, Testing, Commissioning, and Maintenance](#)

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[IEEE 60079-30-2](#) [Explosive Atmospheres — Part 30-2: Electrical resistance trace heating — Application guide for design, installation and maintenance](#)

[ISA-60079-10-2 \(12.10.05\)](#) [Explosive Atmospheres — Part 10-2: Classification of Areas — Combustible Dust Atmospheres](#)

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[NFPA 499](#) [Recommended Practice for the Classification of Combustible Dusts and of Hazardous \(Classified\) Locations for Electrical Installation in Chemical Process Areas](#)

- [UL RP 121203](#) [Recommended Practice for Portable/Personal Electronic Products Suitable for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2, Class III, Division 1, Class III, Division 2, Zone 21 and Zone 22 Hazardous \(Classified\) Locations](#)

[511](#) [NFPA 30A](#) [Code for Motor Fuel Dispensing Facilities and Repair Garages](#)

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[512](#) [NFPA 88A](#) [Standard for Parking Structures](#)
[ICC IFC](#) [International Fire Code](#)

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[NFPA 1](#) [Fire Code](#)

-

[NFPA 30](#) [Flammable and Combustible Liquids Code](#)

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[NFPA 33](#) [Standard for Spray Application Using Flammable or Combustible Materials](#)

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[NFPA 36](#) [Standard for Solvent Extraction Plants](#)

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[NFPA 58](#) [Liquefied Petroleum Gas Code](#)

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[NFPA 70B](#) [Recommended Practice for Electrical Equipment Maintenance](#)

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[NFPA 497](#) [Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous \(Classified\) Locations for Electrical Installations in Chemical Process Areas](#)

[513](#) [NFPA 30](#) [Flammable and Combustible Liquids Code](#)

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[NFPA 33](#) [Standard for Spray Application Using Flammable or Combustible Materials](#)

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[514](#) [NFPA 409](#) [Standard on Aircraft Hangars](#)
[NFPA 2](#) [Hydrogen Technologies Code](#)

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[NFPA 30A](#) [Code for Motor Fuel Dispensing Facilities and Repair Garages](#)

-

[NFPA 52](#) [Vehicular Natural Gas Fuel Systems Code](#)

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[NFPA 58](#) [Liquefied Petroleum Gas Code](#)

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[NFPA 59](#) [Utility LP-Gas Plant Code](#)

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	NFPA 303	Fire Protection Standard for Marinas and Boatyards
515	NFPA 30	Flammable and Combustible Liquids Code
516	NFPA 13	Standard for the Installation of Sprinkler Systems

[NFPA 33](#) [Standard for Spray Application Using Flammable or Combustible Materials](#)

[NFPA 34](#) [Standard for Dipping, Coating and Printing Processes Using Flammable or Combustible Liquids](#)

[NFPA 77](#) [Recommended Practice on Static Electricity](#)

[NFPA 91](#) [Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Particulate Solids](#)

	NFPA 701	Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
620	UL 4	Armored Cable

[UL 44](#) [Thermoset-Insulated Wires and Cables](#)

[UL 66](#) [Fixture Wire](#)

[UL 504](#) [Mineral Insulated Wire](#)

[UL 1063](#) [Machine-Tool Wires and Cables](#)

	UL 1569	Metal Clad Cable
625	UL 3001	Distributed Energy Generation and Storage Systems

	UL 3010	Single Site Energy Systems
630	UL 1276	Welding Cable
650	UL 1651	Optical Fiber Cable
660	UL 62	Flexible Cords and Cables

	UL 817	Cord Sets and Power Supply Cords
668	UL 4	Armored Cable

	UL 62	Flexible Cords and Cables
670	UL 2011	Machinery
675	UL 44	Thermoset-Insulated Wires and Cables

[UL 83](#) [Thermoplastic-Insulated Wires and Cables](#)

[UL 83A](#) [Fluoropolymer Insulated Wire](#)

UL 1063 Machine-Tool Wires and Cables

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UL 1263 Irrigation Cable
690 UL 3001 Distributed Energy Generation and Storage Systems

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UL 3010 Single Site Energy Systems
691 UL 3001 Distributed Energy Generation and Storage Systems

-

UL 3010 Single Site Energy Systems
692 UL 44 Thermoset-Insulated Wires and Cables

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UL 83 Thermoplastic-Insulated Wires and Cables

-

UL 83A Fluoropolymer Insulated Wire

-

UL 1063 Machine-Tool Wires and Cables

-

UL 3001 Distributed Energy Generation and Storage Systems

-

UL 3010 Single Site Energy Systems
694 UL 44 Thermoset-Insulated Wires and Cables

-

UL 62 Flexible Cords and Cables

-

UL 83 Thermoplastic-Insulated Wires and Cables

-

UL 83A Fluoropolymer Insulated Wire

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UL 1063 Machine-Tool Wires and Cables

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UL 3001 Distributed Energy Generation and Storage Systems

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UL 3010 Single Site Energy Systems
700 UL 3001 Distributed Energy Generation and Storage Systems
701 UL 3001 Distributed Energy Generation and Storage Systems
702 UL 3001 Distributed Energy Generation and Storage Systems
705 UL 3001 Distributed Energy Generation and Storage Systems

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UL 3010 Single Site Energy Systems
710 UL 3001 Distributed Energy Generation and Storage Systems

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UL 3010 Single Site Energy Systems

Statement of Problem and Substantiation for Public Input

Lists UL121203 for article 502 and 503 and 506 but these articles make no reference to this UL document.

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Committee: NEC-P14

Committee Statement

Resolution: [FR-9285-NFPA 70-2024](#)

Statement: The revision to remove UL RP 121203 from Annex A Table A.1(b) corrects the existing error. This document is not referenced in 502, 503, and 506.



Public Input No. 1417-NFPA 70-2023 [Section No. Table]

Table 13

Table 13 Equipment Suitable for Hazardous (Classified) Locations

<u>Area Classification</u>	<u>Type (Level) of Protection</u>	
Zone 0	Intrinsically safe	Intrinsically safe for Class I, Division 1
	Intrinsic safety (Group II)	ia
	Encapsulation (Group II)	ma
	Flameproof (Group II)	da ¹
	Inherently safe optical radiation	op is, with EPL Ga ²
	Optical system with interlock	op sh, with EPL Ga ²
	Special protection (Group II)	sa
	EPL ³	Ga
Zone 1	Equipment suitable for use in Zone 0	-
	Equipment suitable for use in Class I, Division 1	-
	Flameproof (Group II)	d, db
	Intrinsic safety (Group II)	ib
	Increased safety (Group II)	e, eb
	Pressurized enclosure (Group II)	p, px, pxb, py, pyb
	Encapsulation (Group II)	m, mb
	Pressurized room (Group II)	pb
	Powder filling (Group II)	q, qb
	Liquid immersion (Group II)	o, ob
	Electrical resistance trace heating	60079-30-1, with EPL Gb ²
	Skin effect trace heating	IEEE 844.1, with EPL Gb ²
	Inherently safe optical radiation	op is, with EPL Gb ²
	Optical system with interlock	op sh, with EPL Gb ²
	Protected optical radiation	op pr, with EPL Gb ²
	Special protection (Group II)	sb
EPL ³	Gb	
Zone 2	Equipment suitable for use in Zone 0	-
	Equipment suitable for use in Zone 1	-
	Equipment suitable for use in Class I, Division 1	-
	Equipment suitable for use in Class I, Division 2	-
	Type of protection "n" (Group II)	nA, nC, nL, nR
	Pressurized enclosure (Group II)	pz, pzc
	Intrinsic safety (Group II)	ic
	Flameproof (Group II)	dc
	Increased safety (Group II)	ec
	Liquid immersion (Group II)	oc
	Encapsulation (Group II)	mc
	Pressurized room (Group II)	pc
	<u>Artificially ventilated room (Group II)</u>	<u>v, vc</u>
	Electrical resistance trace heating	60079-30-1, with EPL Gc ²
	Skin effect trace heating	IEEE 844.1, with EPL Gc ²
	Impedance heating	IEEE 844.3, with EPL Gc ²
	Inherently safe optical radiation	op is, with EPL Gc ²
	Optical system with interlock	op sh, with EPL Gc ²
	Protected optical radiation	op pr, with EPL Gc ²
Special protection (Group II)	sc	
EPL ³	Gc	
Other electrical apparatus ⁴	-	

<u>Area Classification</u>	<u>Type (Level) of Protection</u>	
Unclassified	Associated apparatus for Zone 0 (Group II)	[ia]
	Associated apparatus for Zone 1 (Group II)	[ib]
	Associated apparatus for Zone 2 (Group II)	[ic]
	<u>Associated pressurization equipment (Group II)</u>	[p]
	<u>Associated equipment for an artificially ventilated room (Group II)</u>	[vc]
	Associated optical radiation equipment (Group II)	[op is]
	Associated optical radiation equipment (Group II)	[op sh]
Zone 20	Equipment suitable for use in Class II, Division 1	-
	Intrinsic safety (Group III)	ia
	Intrinsically safe	Intrinsically safe for Class II Division 1
	Protection by enclosure (Group III)	ta
	Encapsulation (Group III)	ma
	Inherently safe optical radiation	op is, with EPL Da ²
	Optical system with interlock	op sh, with EPL Da ²
	Special protection (Group III)	sa
EPL ³	Da	
Group IIIA Only	Equipment suitable for use in Class III, Division 1	-
Zone 21	Equipment suitable for use in Zone 20	-
	Equipment suitable for use in Class II, Division 1	-
	Intrinsic safety (Group III)	ib
	Protection by enclosure (Group III)	tb
	Pressurized enclosure (Group III)	p, px, pxb, py, pyb
	Encapsulation (Group III)	mb
	Pressurized room (Group III)	pb
	Electrical resistance trace heating	60079-30-1, with EPL Db ²
	Skin effect trace heating	IEEE 844.1, with EPL Db ²
	Impedance heating	IEEE 844.3, with EPL Db ²
	Inherently safe optical radiation	op is, with EPL Db ²
	Optical system with interlock	op sh, with EPL Db ²
	Protected optical radiation	op pr, with EPL Db ²
	Special protection (Group III)	sb
EPL ³	Db	
Group IIIA Only	Equipment suitable for use in Class III, Division 1	-
Zone 22	Equipment suitable for use in Zone 20	-
	Equipment suitable for use in Zone 21	-
	Equipment suitable for use in Class II, Division 1	-
	Equipment suitable for use in Class II, Division 2	-
	Intrinsic safety (Group III)	ic
	Protection by enclosure (Group III)	tc
	Pressurized enclosure (Group III)	pz, pzc
	Encapsulation (Group III)	mc
	Pressurized room (Group III)	pc
	-	-
	Electrical resistance trace heating	60079-30-1, with EPL Dc ²
	Skin effect trace heating	IEEE 844.1, with EPL Dc ²
	Impedance heating	IEEE 844.3, with EPL Dc ²
	Inherently safe optical radiation	op is, with EPL Dc ²
	Optical system with interlock	op sh, with EPL Dc ²

<u>Area Classification</u>	<u>Type (Level) of Protection</u>	
	Protected optical radiation	op pr, with EPL Dc ²
	Type 22 vacuum cleaners and dust collectors	62784
	Special protection (Group III)	sc
	EPL ³	Dc
Other electrical apparatus ⁴	-	
Group IIIA Only	Equipment suitable for use in Class III, Division 2	-
Unclassified	Associated apparatus for Zone 20 (Group III)	[ia]
	Associated apparatus for Zone 21 (Group III)	[ib]
	Associated apparatus for Zone 22 (Group III)	[ic]
	Associated pressurization equipment (Group III)	[p]
	Associated optical radiation equipment (Group III)	[op is]
	Associated optical radiation equipment (Group III)	[op sh]
Class I, Division 1	Equipment marked for use in Class I, Division 1 ⁵	-
	Intrinsically safe	Intrinsically safe for Class I
	Pressurized enclosure	Type X, for Class I
	Pressurized enclosure	Type Y, for Class I
	Equipment suitable for use in Zone 0	-
	Intrinsic safety (Group II)	ia
	Encapsulation (Group II)	ma
	Inherently safe optical radiation	op is, with EPL Ga ²
	Optical system with interlock	op sh, with EPL Ga ²
Special protection (Group II)	sa	
Class I, Division 2	Equipment suitable for use in Class I, Division 1	-
	Equipment marked for use in Class I, Division 2 ⁵	-
	Pressurized enclosure	Type Z, for Class I
	Equipment suitable for use in Zone 0, Zone 1 or Zone 2	-
	Type of protection "n" (Group II)	nA, nC, nL, nR
	Pressurized enclosure (Group II)	px, pxb, py, pyb, pz, pzb
	Intrinsic safety (Group II)	ia, ib, ic
	Flameproof (Group II)	da, db, dc
	Increased safety (Group II)	eb, ec
	Liquid immersion (Group II)	ob, oc
	Encapsulation (Group II)	ma, mb, mc
	Pressurized room (Group II)	pb
	Pressurized room (Group II)	pc
	<u>Artificially ventilated room (Group II)</u> , -	<u>v, vc</u>
	Electrical resistance trace heating	60079-30-1, with EPL Gb or Gc ²
	Skin effect trace heating	IEEE 844.1, with EPL Gb or Gc ²
	Impedance heating	IEEE 844.3, with EPL Gb or Gc ²
	Inherently safe optical radiation	op is, with EPL Ga, Gb or Gc ²
	Optical system with interlock	op sh, with EPL Ga, Gb or Gc ²
	Protected optical radiation	op pr, with EPL Gb or Gc ²
Special protection (Group II)	sa, sb, sc	
Other electrical apparatus ⁴	-	
Unclassified	Associated apparatus for Class I, Division 1	-
Class II, Division 1 ⁶	Equipment marked for use in Class II, Division 1 ⁵	-
	Intrinsically safe	Intrinsically safe for Class II
	Pressurized enclosure	Type X, for Class II
	Pressurized enclosure	Type Y, for Class II

<u>Area Classification</u>	<u>Type (Level) of Protection</u>
	Equipment suitable for use in Zone 20 -
	Intrinsic safety (Group III) ia
	Protection by enclosure (Group III) ta
	Encapsulation (Group III) ma
	Inherently safe optical radiation op is, with EPL Da ²
	Optical system with interlock op sh, with EPL Da ²
	Special protection (Group III) sa
	Equipment suitable for use in Class II, Division 1 -
	Equipment marked for use in Class II, Division 2 ⁵ -
	Pressurized enclosure Type Z, for Class II
	Equipment suitable for use in Zone 20, Zone 21 or Zone 22 -
	Intrinsic safety (Group III) ia, ib, ic
	Protection by enclosure (Group III) ta, tb, tc
	Pressurized enclosure (Group III) px, pxb, py, pyb, pz, pzc
	Encapsulation (Group III) ma, mb, mc
	Pressurized room (Group III) pb
Class II, Division 2 ⁶	Pressurized room (Group III) pc
	Electrical resistance trace heating 60079-30-1, with EPL Db or Dc ²
	Skin effect trace heating IEEE 844.1, with EPL Db or Dc ²
	Impedance heating IEEE 844.3, with EPL Db or Dc ²
	Inherently safe optical radiation op is, with EPL Da, Db or Dc ²
	Optical system with interlock op sh, with EPL Da, Db or Dc ²
	Protected optical radiation op pr, with EPL Db or Dc ²
	Special protection (Group III) sa, sb, sc
	Other electrical apparatus ⁴ -
Unclassified	Associated apparatus for Class II, Division 1 -
	Equipment suitable for use in Class II, Division 1 -
	Equipment marked for use in Class III, Division 1 ^{5,7} -
	Intrinsically safe Intrinsically safe for Class II or Class III
	Equipment suitable for use in Zone 20 or Zone 21 -
Class III, Division 1	Intrinsic safety (Group III) ia, ib
	Protection by enclosure (Group III) ta, tb
	Encapsulation (Group III) ma, mb
	Inherently safe optical radiation op is, with EPL Da or Db ²
	Optical system with interlock op sh, with EPL Da or Db ²
	Special protection (Group III) sa
Class III, Division 2	Equipment suitable for use in Class II, Division 1 -
	Equipment suitable for use in Class II, Division 2 -
	Equipment suitable for use in Class III, Division 1 -
	Equipment marked for use in Class III, Division 2 ⁵ -
	Intrinsically safe Intrinsically safe for Class II or Class III
	Equipment suitable for use in Zone 20, Zone 21 or Zone 22 -
	Intrinsic safety (Group III) ia, ib, ic
	Protection by enclosure (Group III) ta, tb, tc
	Pressurized enclosure (Group III) px, pxb, py, pyb, pz, pzc
	Encapsulation (Group III) ma, mb, mc
	Electrical resistance trace heating 60079-30-1, with EPL Db or Dc ²

<u>Area Classification</u>	<u>Type (Level) of Protection</u>
Skin effect trace heating	IEEE 844.1, with EPL Db or Dc ²
Impedance heating	IEEE 844.3, with EPL Db or Dc ²
Inherently safe optical radiation	op is, with EPL Da, Db or Dc ²
Optical system with interlock	op sh, with EPL Da, Db or Dc ²
Protected optical radiation	op pr, with EPL Db or Dc ²
Special protection (Group III)	sa, sb, sc
Other electrical apparatus ⁴	-
Unclassified	Associated apparatus for Class III, Division 1

Note: This table is structured to show the area classification on the left side and the permitted equipment on the right side. Zone equipment is suitable for use in some class/division locations and vice versa. This is indicated by the phrase "Equipment suitable for use in...", for example, in Class I, Division 1 locations, "Equipment suitable for use in Zone 0" means all equipment listed under Zone 0 can be used with an appropriate equipment group and temperature class.

¹"da" is limited to sensors of portable combustible gas detectors.

²Equipment marked with these types of protection is available in multiple levels of protection not specifically identified within the Ex marking.

³The EPL takes precedence over the type of protection, for example "AEx ia ___ Gb" is suitable for Zone 1, not Zone 0; "AEx op is ___ Db" is suitable for Zone 21, not Zone 20; and "AEx 60079-30-1 ___ Gc" is suitable for Zone 2, not Zone 1. Selection according to the mark EPL is critical to the safe application of this equipment.

⁴"Other electrical apparatus" indicates electrical apparatus complying with the requirements of a recognized standard for industrial electrical apparatus that does not in normal service (a) have ignition-capable hot surfaces, or (b) produce incendive arcs or sparks. [See 501.105(B), 501.115(B), 501.125(B), 502.100(B), 502.115(B), 502.125(B), or 502.130(B).] "Other electrical apparatus" also includes equipment or systems currently acceptable as alternative means of protection (see 500.7).

⁵With the exception of intrinsically safe or purged/pressurized equipment, equipment for use in a Class XX, Division XX, location is not required to be marked with a type of protection, only the location where that equipment is permitted to be installed.

⁶For use in Class II and Class III locations, such (zone-acceptable) equipment is subject to the requirements of 502.6 or 503.6, respectively. Group IIIA equipment is not suitable for use in Class II locations.

⁷In Class III, Division 1 locations, switches, controllers, circuit breakers, fuses, control transformers, resistors, utilization equipment (fixed and portable), electric cranes, hoists, and similar equipment can be housed in dusttight enclosures.

Statement of Problem and Substantiation for Public Input

This proposal is necessary to define a new Type of Protection "v" for artificially ventilated rooms under the Zone system in Article 100, and to reference this new Type of Protection in Article 505 and Table 13 of the 2023 NEC. These references acknowledge the use of this Type of Protection as a new means to mitigate the risk of explosion in hazardous (classified) locations. Type of Protection "v" is included in ANSI/UL 60079-13, and this ANSI standard is already included in the 2023 NEC for the new Type of Protection "p" for pressurized rooms. Type of Protection "v" was not initially included in the 2023 NEC due to changes that were underway, but not yet completed, to the requirements in ANSI/UL 60079-13 so as to improve the consistency of application of the requirements. These changes have now been successfully completed, and Type of Protection "v" can now be included in the 2026 NEC.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 1060-NFPA 70-2023 [New Definition after Definition: Array.]	Addresses Type of Protection, "v"
Public Input No. 1061-NFPA 70-2023 [New Section after 505.8(P)]	Addresses Type of Protection, "v"
Public Input No. 1062-NFPA 70-2023 [Section No. 505.16(B)(3)]	Addresses Type of Protection, "v"
Public Input No. 1064-NFPA 70-2023 [Section No. 505.20(C)]	Addresses Type of Protection, "v"

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Committee: NEC-P14

Committee Statement

Resolution: [FR-8792-NFPA 70-2024](#)

Statement: The revisions reflect new protection techniques class 'v' and 'vc' that are permitted in the code in Table 13.